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STRUCTURAL ADJUSTMENT IN TEXTILES AND CLOTHING IN THE POST-ATC TRADING ENVIRONMENT

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By Denis Audet

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ABSTRACT

Structural Adjustment in Textiles and Clothing in the Post-ATC Trading Environment

This study focuses on the adjustment challenges facing the textile and clothing industries across the globe. The analytical work was initially suggested during informal consultations between the OECD Trade Committee and Civil Society Organisations. It took two years of extensive discussions in the Working Party of the Trade Committee to deepen understanding of the issues and finalise the study.

Thousands of jobs have disappeared in the textile and clothing sectors, and a considerable restructuring is anticipated with the demise of quantitative restrictions by the end of 2004 as agreed under the WTO Agreement on Textiles and Clothing. The end 2004 event is best viewed as part of a longer process of adjustment, which has taken place over both the medium term (the phase-out of quantitative restrictions has lasted a decade) and the long term (the textiles and clothing industry has long migrated with the industrial evolution of countries). The planning for the post-2004 market, combined with technological developments and evolutionary changes in national policies, has already encouraged a major reordering of patterns in trade and investment. Firms in all countries and segments of the industry will continue to face challenges of adjustment.

The end 2004 event is also causing concern that a few of the larger developing countries may capture a disproportionate share of the economic benefits arising from the quota phase-out. The concerned countries are looking for the on-going multilateral trade negotiations in the context of the Doha Development Agenda to secure improved market access conditions which will help them minimise their adjustment hardships.

The study reviews the most recent market developments throughout the entire supply chain, from natural fibres to retail distribution. It examines the policy challenges in the fields of trade, labour adjustment, technology and innovation, and other regulatory dimensions which are important determinants of a country's drive towards global integration. The study covers the adjustment in both developed and developing countries and underscores the vulnerability of suppliers located in small developing and least developed countries that have specialised in the final assembly of clothing products using imported textiles.

The study argues that countries aspiring to maintain an export-led strategy in textiles and clothing need to shift their industrial cluster of expertise from manufacturing to the higher value-added segments of the supply chain. National suppliers would thus need to place greater emphasis on education and training of services-related skills, such as design, material sourcing, quality control, logistics and retail distribution; and to encourage the establishment of joint structures where domestic suppliers can share market knowledge and offer more integrated solutions to prospective buyers.

The study also argues that a key objective of governments is to strengthen the capacity of the private sector to deal effectively with rapid change and growing competition in order to capture the trade opportunities that are being created through improved market access. This involves: supporting the emergence of qualified pools of expertise and the adaptability of the workforce; improving the regulatory environment on essential business services; stimulating collaborative innovation processes in the fields of dissemination and technological transfers; and negotiating improved market access for textile and clothing products, especially seeking to eliminate remaining obstacles to the establishment of retail distribution systems and distorting production measures.

Keywords: structural adjustment, textiles, clothing, Agreement on Textiles and Clothing (ATC), Multi-Fibre Arrangement (MFA), trade policies, labour adjustment, technology and innovation, customs facilitation.

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The study is published on the responsibility of the Secretary-General of the OECD. It can be found on the following website: http://www.oecd.org/trade

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PART I: SYNTHESIS

I. Introduction

1. The scheduled elimination of quantitative restrictions under the WTO Agreement on Textiles and Clothing (ATC) at the end of 2004 is challenging the global sourcing channels that were formed over decades of trade restrictions and entails considerable adjustment for all stakeholders, especially those clothing assemblers in remote low-wage countries.[1] Given the economic importance of these industries for both developed and developing countries, this review examines the process of adjustment in the textile and clothing industries in the post-ATC period with a view to assist governments in establishing a coherent policy and regulatory framework to facilitate the adjustment of the private sector.

2. The import quotas initially imposed under the Multi-Fibre Arrangement (MFA) have contributed to the international fragmentation of the supply chain by accelerating the diversification of supply. This process worked to the disadvantage of the more efficient and quota-constrained suppliers, many of which sub-contracted clothing assembly into low-wage third countries. Hence the Arrangement benefited the least competitive suppliers most of which located in small developing countries and least developed countries. Aware of their post-ATC vulnerability, the least competitive countries are now aiming to improve their access to the developed countries' markets to minimise the expected hardships. These countries are particularly anxious about losing export markets to Chinese exports and are lobbying for expanded product eligibility under the General System of Preferences (GSP) and other preferential programmes, complemented by more liberal rules of origin to qualify for preferential access.

3. During decades of MFA-related quotas, the textile industry did not migrate to developing countries' locations as fast as the clothing industry. In the post-ATC period, there will be no major obstacles to prevent the emergence of high quality textile capacity in developing countries and stronger clusters of expertise. Moreover, there will be neither quantitative trade restrictions nor MFA-related guaranteed market access to mask the competitive weaknesses of exporting countries. These weaknesses must be addressed if countries were to maintain an export-led development strategy in textiles and clothing.

4. This review argues that the role that textile and clothing production now plays in the industrialisation process of developing countries is far more differentiated than it was a generation ago. While low-wages can still give developing countries a competitive edge in world markets, quick turnaround times are now playing a far more crucial role in determining international competitiveness in the fashion-oriented and ever more time-sensitive textile and clothing markets. The comparative advantage of developing countries in the assembly process, *i.e.* the sewing process, based on low wages, does not necessarily carry over into a comparative advantage in the management of the entire supply chain when all services-related dimensions are taken into consideration. Countries that aspire to maintain an export-led strategy in textiles and clothing need to shift their industrial cluster of expertise from manufacturing to the higher value-added segments of the supply chain. This can be done by upgrading their domestic skills in design, material sourcing, quality control, logistics and retail distribution.

5. For developed countries, the post-ATC environment will have varying effects on different segments of the supply chain. Their textile and clothing suppliers will be exposed to strengthened competitive pressure. They are also the host countries of the world's fashion and design hubs. The retail groups in developed countries will have greater liberty in sourcing products on a global basis and can

accelerate the expansion of their distribution networks on a worldwide basis. Moreover, world exports of textile and clothing machinery originate predominantly from developed countries. On net, the interests of developed countries in textile and clothing are multifaceted, and their long-term interests are better served by an open and liberal multilateral trading environment.

6. Although the prime responsibility for adjustment falls on the firms themselves, governments have a supporting role to play in establishing a coherent policy and regulatory framework. The objective of this framework should be to strengthen the capacity of the private sector to deal with rapid change and growing competition, and to capture the trade opportunities that are being created through improved market access. This process involves dismantling trade-distorting production measures, improving the regulatory environment on essential business services, supporting the emergence of qualified pools of expertise and the adaptability of the workforce, negotiating improved market access for textile and clothing products, and eliminating the obstacles to the establishment of retail distribution systems in developing countries.

7. Liberal trade and investment policies play a key role in this adjustment process through their dynamic impact in restraining price pressure on imported inputs and in facilitating the emergence of competitive firms that are able to compete on domestic and international markets. However, the liberalisation often encounters serious structural impediments and imposes temporary hardships on certain segments of the economy. Governments can ease the transition by facilitating the redeployment of affected resources to other productive activities without reverting to costly trade protection and subsidisation measures.

II. A Typology of the Textile and Clothing Supply Chain

8. The textile and clothing industries have fundamental distinctive characteristics and involve a large and diversified range of activities that use varying mix of labour and capital. For the sake of simplicity, the entire supply chain is presented as four production segments. The structural adjustment pressures or the drivers of change for each of the respective production segments are discussed in section III below.

9. *"Natural Fibres"*, the preparation of natural fibres involves various agricultural activities that are influenced by factor endowments, *i.e.* the quality of land and regional climate, and agricultural policies in respective countries. Diverse natural fibres are used in the production of textiles, *i.e.* cotton, flax, jute, silk, sisal and wool. Two of them involve animal husbandry, *i.e.* silkworms and sheep herding.

10. "*Textiles*", the preparation of textile products, either from natural or man-made fibres, involves manufacturing activities where technological innovations have greatly increased the speed of textile operations and have resulted in huge productivity gains. The non-clothing applications of textiles or the so-called "technical textiles" are now more important than clothing applications and account for the fastest growing segment of total textile production within developed countries.

11. "*Clothing*", the preparation of clothing articles also involves manufacturing activities. The clothing sector is also referred to as "apparel" or "garment" sector to describe the same economic sector. The pre-assembly stage involves designing, grading and marking of patterns and cutting of textiles into individual components, and has been revolutionised with the application of computer-aided design (CAD) and computer-assisted methods (CAM) systems. By contrast, the assembly stage remains highly labour-intensive and involves delicate handling and sewing operations that do not lend themselves to automated progress. Aside from productivity gains attributable to better needles and more secure fabric-holding techniques, the sewing techniques remain basically similar to those that were used a century ago. This industry is almost unique in its low ratio of capital equipment to labour inputs. However, technological progress in telecommunications and transportation networks has made it easier for clothing manufacturers

to divide the supply chain on an international basis and to perform the assembly stage in low-wage countries.

12. "*Retailing*", the retailing activities have changed significantly with the blurring of the traditional boundaries between retailers, brand name marketers and manufacturers. Retailers are increasingly involved in global sourcing as lead buyers through a wide variety of organisational channels, such as vertical integration, sub-contracting and licensing arrangements. The retail stage has also become increasingly concentrated into large and lean retail organisations that are able to exert considerable influence throughout the supply chain.

III. Adjustment Challenges by Production Segment

A. Adjustment in Natural Fibres

13. In the post-ATC period, the worldwide demand for natural fibres will reflect two consumption trends heading in opposite directions. In the clothing applications of textiles, the demand for natural fibres is growing. But in the non-clothing applications of textiles, it is the demand for man-made fibres that is growing. Hence the demand for natural fibres is unlikely to exceed the average growth rate achieved in recent years in the consumption of textiles for clothing applications which has hovered around 2% per year.

14. In the post-ATC period, the main drivers of adjustment for natural fibres will be related to the migration of textile capacity to some developing countries and the results of ongoing agricultural negotiations and dispute settlement procedures in the World Trade Organisation.

Migrating Demand for Natural Fibres

15. Natural fibre suppliers will have to accompany the migration of textile capacity to the most competitive developing countries, particularly China and India. These two countries are already well endowed in natural fibre production. One implication is that a certain share of world demand for natural fibres traditionally heading to developed countries will be redirected to developing countries. Therefore, some production shares of natural fibres in developed countries will have to compete on quality, delivery and price on world markets. It is also expected that access conditions to developing countries will become more prominent in the trade policy agenda.

16. Tariff protection for natural fibres is generally much lower than the average protection afforded to finished textiles and clothing products. Moreover, various duty-remission programmes are enforced in textile-producing countries to improve the cost competitiveness of the domestic processing industries. Where high tariff protection is granted to natural fibres to protect domestic agricultural producers, the brunt of the protection cost is ultimately born by the domestic processing industries. In developing countries where labour-intensive agricultural production prevails, the reduction of tariffs on fibres may be difficult to justify for policy makers unless there are clear offsetting labour gains in the processing industries. For least developed countries, like Bangladesh, the prospects of losing employment in clothing manufacturing due to intensified competition on export markets may create anxiety for policy makers and reduce the likelihood of downward tariff adjustment in fibres and/or textiles for fear of exacerbating the employment situation.

WTO Agricultural Negotiations and Dispute Settlement

17. Another challenge for natural fibres relates to the outcome of the ongoing WTO multilateral trade negotiations in agriculture. Under the WTO's Agreement on Agriculture, WTO members have undertaken reduction commitments in respect of market access, domestic support and export subsidy. The ongoing

negotiations are expected to produce improved commitments in each of these three areas. Concurrently, the main natural fibre used in clothing applications of textiles is cotton and domestic support to cotton production is the subject of a formal trade dispute under the WTO dispute settlement procedure. The outcome of this dispute could have an important impact on the cost competitiveness of fibre producers worldwide. The prospects of a WTO package that may include a meaningful reduction in domestic support and export subsidy could force high-cost producers to rationalise their production by adopting more efficient production methods or by shifting production to other crops. As attested by the protracted WTO negotiations in agriculture, domestic groups are resisting the adjustment towards less protected and distorted markets that would otherwise benefit the processing industries and support economic diversification into higher value-added production segments.

B. Adjustment in the Textile Industry

18. The main drivers of adjustment in the textile industry in the post-ATC period are related to: (1) the migration of textile capacity to developing countries; (2) the adoption of up-to-date equipment by producers; (3) the fading attractiveness of outward processing programmes (OPP); and (4) the importance of rules of origin to qualify for preferential trade arrangements.

Migration to Developing Countries

19. With the imminent demise of the ATC, there will be no more trade obstacles to the development of stronger clusters of textile expertise in the most competitive developing countries. The recent import surge of up-to-date textile and clothing equipment in China attests to this migration and foreshadows where more textile and clothing production and export in the future will be coming from.[2] With modern equipment, Chinese textile suppliers are improving their productivity and are increasingly producing export-quality textiles. The main beneficiaries of this textile modernisation are the Chinese clothing suppliers that can procure their textile inputs directly from domestic sources and hence meet shorter turnaround delivery requirements. Access to high quality textiles is considered one of the most important determinants of competitiveness of clothing suppliers. Against this background, the textile industry in developed countries will be facing intensified competition in both their export and domestic markets. This migration of textile capacity will nevertheless be influenced by objective competitive factors and thus will be hampered by the presence of distorting domestic measures and weak domestic infrastructure in several developing and least developed countries.[3]

20. The textile industry is also undergoing a major shift in the direction of the non-clothing applications of textiles, *i.e.* the technical textiles, which account for the fastest growing segment of total textile applications. The technical textiles are often defined as those textile materials and products manufactured primarily for their technical and performance properties rather than aesthetic or decorative characteristics. Technical textiles are used in multiple applications, including furniture, automotive, health and hygiene, transportation, construction and environment. The processes involved in producing technical textiles are human and physical capital-intensive and, for the moment, concentrated in developed countries. With the transfer of technology and expanding development of knowledge sharing through global university networks, many developing countries have access to the knowledge base and are enabling the technical textiles industries to flourish. Whenever major industries shift to or expand production in developing countries, it is only a matter of time for inputs to be produced there as well.

Shrinking Productivity Gap

21. Significant productivity gains were achieved during the twentieth century from improved spinning and weaving equipment. The textile industry has also become a capital-intensive industry where up-to-date equipment plays a crucial role in defining the competitiveness of firms.[4] The significant productivity gains

have historically been driven by the symbiotic relationship between a competitive textile and clothing industry and a creative textile and clothing machinery (TCM) industry. However, this symbiotic relationship is weakening as new materials are developed mainly in the chemical industry and as new processes are developed in the machinery industry. As a result, the technological competitiveness of textile and clothing firms largely depends on their ability to adopt new products and processes developed outside the textile and clothing industries. Therefore, the major focus of innovation activities within these industries lies on technology transfer. With globalised knowledge networks, the technology transfer is occurring at a rapid pace, and the historical productivity gap that has differentiated developed and developing countries is expected to shrink as modern equipment can be operated efficiently in the most competitive developing countries.

22. The TCM industry in developed countries nevertheless succeeded throughout the 1980s and the 1990s in maintaining its high share of the world's exports by accompanying the international shift in the demand for capital equipment. The four main exporting countries are Germany, Italy, Japan and Switzerland; together they account for almost two-thirds of industrial countries' exports of machinery. This was made possible through various means, including: (1) industrial consolidation among firms; (2) the development of ties between equipment manufacturers in developed and developing countries; (3) concentrating production on the high value-added segments of the equipment market; and (4) keeping close contacts with equipment users wherever they are located.

Preferential Trade Arrangements

23. Trade policies other than MFA-related quotas have also had a major impact on the development of geographical patterns of trade in textiles and clothing. This review argues that the elimination of import quotas will reduce the attractiveness of outward processing programmes and, conversely, increase the attractiveness of other preferential trade arrangements, such as regional trade arrangements (RTAs) and GSP regimes. The magnitude of economic benefits accruing under these arrangements varies greatly because of their differences in scope and the specificity of the rules of origin that confer preferential access under respective arrangements.

24. The outward processing programmes (OPP) or production sharing programmes involve the temporary export of textiles or pre-cut fabrics from the OPP-initiator country to low-wage countries for final assembly, with the finished articles then being re-imported under preferential provisions. For low-wage countries, the assembly of imported fabrics into clothing is a simple form of industrial activity. OPP eligibility often acts as a booster for their export-oriented strategies by giving them instant access to high quality inputs and foreign distribution networks. For developed countries, outward processing transactions strengthen the competitive position of domestic suppliers by enabling them to transfer the labour–intensive sewing activities in low-wage countries. To make outward processing transactions worthwhile, the cost savings associated with low-wage assembly in offshore centres and tariff reductions must exceed the inherent additional costs of production fragmentation, namely: two-way shipments; longer and larger inventory; and added co–ordination to manage the fragmented supply chain.

25. Under the MFA-related quota regime, the inherent cost inefficiencies of outward processing transactions were partly masked by the trade distorting impact of quota allocations. Moreover, outward processing transactions provided a protected market for textiles made in OPP-initiator countries. In 1995, outward processing trade accounted for 15% of the EU's external trade in textiles and for 24% of total clothing imports by the United States in 1999.[5] Since then, the importance of outward processing trade has considerably diminished in the European Union with the entry into force of several free trade agreements (FTAs) with neighbouring countries that made OPP almost redundant. In a less pronounced way, the importance of outward processing trade for the United States has diminished with the implementation of

NAFTA, but the OPP eligibility was expanded under the Trade Development Act of 2000 and outward processing trade accounted for 10.9% of clothing imports in 2003.

26. Without the trade distorting impact of quota allocations, the inherent vulnerability of business models developed under OPP is exposed. On the one hand, outward processing transactions will remain economically attractive only if the margin of preferential duty exceeds the difference between the OPP-related cost and the logistical cost incurred for competitive suppliers.[6] With distance and time acting as trade barriers, there are no net cost advantages from outward processing transactions involving offshore assembly centres that are either geographically remote from the OPP-initiator country or nearby centres with poor transportation infrastructure.

27. On the other hand, there will be instances where offshore centres will be able to offer lower prices to buyers of clothing products assembled from third country textiles. It means that the textile industry in OPP-initiator countries will lose their protected OPP textile export markets and will also have to adjust to intensified foreign competition in their domestic markets. Simultaneously, OPP recipients that have gradually developed their expertise are conscious of their vulnerability and are requesting improved trade opportunities from developed countries to assist them in competing with the most competitive suppliers. Most requests concern the negotiations of FTAs with developed countries and/or improved GSP access. In any of those options, the improved access will mean more competitive pressure on the domestic textile industry of developed countries.

Trade Opportunities under Regional Trade Arrangements (RTAs)

28. In the post–ATC period, comprehensive RTAs can provide a useful policy framework to underpin the development of a regionally-integrated textile and clothing supply chain and to facilitate economic diversification strategies for its members, but they don't necessarily imply competitiveness. This review argues that a comprehensive RTA is a necessary but insufficient condition to promote trade flows and qualitative transformation in textile and clothing production. Although production and trade opportunities are created under comprehensive RTAs, certain domestic factors play instrumental roles for reaping the trade opportunities. Among these factors are: the ability to attract the right kind of lead retailers, brand name marketers and manufacturers; a pre–existing cluster of expertise; a striving and vibrant entrepreneurial environment; and geographical proximity to minimise the transit time of shipments during transportation.[7]

29. Prior to the North American Free Trade Agreement (NAFTA), access to the US markets for Mexican suppliers was primarily driven by outward processing transactions in which Mexican suppliers merely assembled imported components from the United States. With NAFTA, the trade rules have changed and all activities of the supply chain, not only sewing, can be performed in Mexico (and in Canada). In the context of NAFTA, Mexico has been able to promote the consolidation of its regional clusters of textile and clothing expertise and to move along the supply chain from the simple assembly of imported components, thereby bringing backward and forward linkages to the domestic economy. In a similar way, the customs union between Turkey and the European Union has paved the way for improved opportunities for further integrating the Turkish textile and clothing markets into the larger European markets. However, despite their integration process into larger regional markets, both Mexico and Turkey are not shielded from the need to adjust to external competitive pressures as products originating from other countries, *i.e.* China, are increasingly competitive in both the European Union and NAFTA markets.

Stringent Rules of Origin for Textiles and Clothing

30. Rules of origin (ROOs) are a necessary part of preferential trade arrangements, such as GSP, to ensure that the trade preference is granted to products that effectively originate from the beneficiary

countries. Similarly, they are a necessary part of FTAs to preserve the preferential treatment of trade for member countries – to avoid the problem of trade deflection where imports enter into the region through the member country whose import tariff is the lowest. This review shows that there are considerable disparities in the rules of origin applied under various preferential arrangements and in the utilisation rates of respective arrangements.[8]

31. Specific and more stringent rules of origin are often applied on sensitive products, such as textile and clothing, which make it more difficult for suppliers to achieve the regional content. This creates an incentive for manufacturers to source inputs from regional suppliers and may act as a trade barrier on its own. By limiting the sourcing of inputs from regional partners, ROOs may encourage a vertical integration of the production chain which may not reflect the least cost opportunities to compete effectively in a globalised environment. A further problem with specific rules of origin is that the determination of regional content for yarns, fabrics and final products requiring multiple components can become so burdensome and costly for suppliers that they prefer not to use the preferential arrangements.

32. Several countries have recently improved their GSP regimes by broadening the scope of eligible textile and clothing products and/or offering comprehensive duty-free and quota-free treatment for products originating from the least developed countries (LDCs).[9] This review argues that while rules of origin are necessary elements to ensure that the preferential trade actually benefits its targeted countries, overly restrictive rules may not provide meaningful access and could lead to an under-utilisation of preferential access schemes. By contrast, liberal rules of origin may not benefit the targeted group of countries as much as originally intended and the associated preferential access can invert the structure of tariffs with consequential negative problems for national manufacturers. Moreover, liberal rules of origin do not necessarily confer competitiveness. Inherent competitive factors explain which beneficiary countries of preferential arrangements are more likely to gain the most. The distance between remote trading partners entails long transit periods for shipments and the size of the cluster of expertise in beneficiary countries seems to matter. Finally, the identity of foreign investors also appears to influence the patterns of input procurement.

33. The recent Canadian modifications to its GSP regime offer interesting lessons. In 2003, Canada granted duty-free and quota-free entry to all textile and clothing imports originating from LDCs that meet the 25% content requirement originating from any LDCs, GSP beneficiaries, or Canada. Four main issues are worth noting in the present context: (1) the liberal rules of origin with the right to cumulation from any LDC or GSP beneficiaries have allowed LDCs to drastically boost their clothing exports to Canada within a very short period of time; (2) the improved access has enabled many LDCs to expand their exports but the distribution of gains was nevertheless concentrated in two beneficiary countries: Bangladesh and Cambodia; (3) large trade gains also accrued to the largest developing countries, such as China and India, by shipping textiles to LDCs which were subsequently assembled into clothing products and later exported to Canada; and (4) the duty-free treatment for clothing products has inverted the structure of tariffs with consequential negative problems for Canadian manufacturers who claimed unfair competition. Instead of backtracking on its liberal commitments, Canada announced a series of new tariff cuts in early 2004 to address the problems caused by inverted tariff protection and, simultaneously, launched a programme designed to improve production efficiency for Canadian suppliers. One important lesson to draw from the Canadian experience is that the implementation of liberal rules of origin requires a comprehensive approach to ensure that the domestic processing industry also benefits from the trade liberalisation programmes.

34. With the imminent demise of the ATC, the small developing countries and LDCs are increasingly vocal about their post-ATC vulnerability and are formulating demands to access developed country's markets on an improved preferential basis as a means to compete more effectively with the prime contenders, *i.e.* China and India. Recognising that there are virtually no productions of high quality textiles

in LDCs for the time being, any preferential access arrangements in favour of LDCs must take into account that they have to use competitive textiles originating from third countries to compete on export markets. In these circumstances, it seems inevitable that in providing preferential access to LDCs, there will be some collateral benefits for the suppliers of high quality textiles. In the post-ATC period, rules of origin provisions will be at the forefront of the trade policy agenda as demands from vulnerable offshore centres will become more insistent. The challenge for policy makers in developed countries is to draft rules of origin for their preferential arrangements that will mainly benefit LDCs and small developing countries which are most vulnerable to competition from the large and integrated suppliers in China and India. It also means that any improvement in the rules of origin under preferential trade arrangements will increase the competitive pressure on the domestic textile industry of developed countries.

C. Adjustment in the Clothing Industry

35. The main drivers of adjustment in the clothing industry in the post-ATC period are related to: (1) the importance of time factors as determinants of international competitiveness; and (2) the adjustment in trade protection and WTO safeguard measures.

Time Factors as Determinants of International Competitiveness

36. This review argues that the role that textile and clothing production now plays in the industrialisation process of developing countries is far more differentiated than it was a generation ago. While low wages can still give developing countries a competitive edge in world markets, time factors are now playing a far more crucial role in determining international competitiveness. With the imminent demise of quantitative restrictions, several low-wage countries that had excelled as offshore assembly centres because they had quota allocations are exposed to the inherent vulnerability of production fragmentation. Time factors act as important trade barriers for intermediary inputs involved in an internationally fragmented production process. There are trade-offs between low-wage cost and time factors, whereas time proximity to large consumer markets provides a competitive edge for succeeding in the highly competitive, time-sensitive and fashion-oriented clothing market.

37. Moreover, the emergence of more competitive and integrated suppliers in China is exerting considerable pressure on the vulnerable offshore centres to adjust domestic capacity towards more advanced processes and to diversify their economic activities. The comparative advantage of developing countries in the assembly process, *i.e.* the sewing process, based on low wages, does not necessarily translate into a comparative advantage in the management of the entire supply chain when all services-related dimensions are taken into consideration. Efficiency in managing the entire supply chain is required, including in design, fabric procurement, logistical skills in transportation, quality control, property rights protection, export financing and clearing of trade formalities.

38. To move along the supply chain beyond the mere assembly stage of imported inputs into more advanced activities, exporting countries need to shift their industrial cluster of expertise from manufacturing to services-related functions, such as design, material sourcing, quality control, logistics and retail distribution. To pursue these avenues, national suppliers need to place greater emphasis on education and training of services-related skills; and to encourage the establishment of joint structures where domestic suppliers can share market knowledge and offer more integrated solutions to prospective buyers.

39. This review also stresses the importance of efficient port infrastructure, reliable and competitive modes of transport and efficient customs procedures for maintaining a competitive edge in the highly competitive textile and clothing markets. The reliability of transportation infrastructure and efficiency in customs procedures complements each other in minimising transit periods for shipments involved in international trade and can make geographically remote locations more internationally competitive. Even if

long transit periods can be overcome to some extent by preferential market access arrangements, long transit periods can essentially eliminate from international competition the offshore centres that are either geographically remote from the buyer's markets or nearby centres with poor transportation infrastructure.

Adjustment in Trade Protection

40. As noted earlier, access to high quality textiles is considered one of the most important determinants for the competitiveness for clothing suppliers. Therefore, high tariff protection on textile inputs undermines the efforts of clothing suppliers to shift their production mix that require imported high quality textiles. Policy makers are often confronted with a policy dilemma in deciding which segments of the supply chain should be exposed to a greater dose of import competition to favour the processing sectors and ultimately the consumers. On the one hand, the textile suppliers will argue that they need the protection to reach the critical mass in order to compete on more equal terms with foreign textile suppliers. On the other hand, the clothing suppliers will argue that duty-free access for their inputs is needed to compete with imported clothing products. Various duty-remission programmes can help to reduce the impact of otherwise high tariff protection on textile inputs, particularly when there are no domestic productions of specific textile components. Each country thus needs to assess its competitive strengths and weaknesses throughout the supply chain, and to calibrate its tariff protection in such a way that tariff protection granted to fibres and textiles does not prevent the emergence of competitive suppliers in the high value-added segments of the supply chain.

India's Potential

41. In India, the textile and clothing industries are based on a system of decentralised production, referred to as "reservation of garment manufacture for small-scale industry (SSI)" that provides a series of economic advantages to small-scale labour-intensive firms and high tariff protection is afforded throughout the supply chain, from natural and man-made fibres, to textiles and clothing products. Policy analysts have argued that the SSI framework has discouraged entrepreneurs from investing in optimal production scale plants and has created strong vested interests that are opposed to reforms. They have also argued that India faces formidable domestic hurdles in order to meet international quality standards and thus is ill prepared to reap the opportunities created by the elimination of quantitative restrictions. Mindful of these, the Indian government has recently reduced import duties and is seeking to rationalise the imposition of the value-added tax across the textile and clothing supply chain. India has valuable assets to succeed in the post-ATC period with the domestic availability of several natural fibres, clusters of expertise in man-made fibres, low wages in manufacturing sectors, an increasingly affluent and educated middle-class and a large domestic market. To unleash the great potential of India, domestic reforms are needed to remove the domestic obstacles to growth and to inject a strong dose of import competition to encourage the modernisation of its production capacity. The case of India emphasises the need for all vulnerable countries to assess and to address their domestic competitive weaknesses if they want to pursue an export-led strategy in textiles and clothing.

WTO Safeguard Measures

42. In the post-ATC period, there is considerable anxiety about the emergence of more competitive suppliers in China. The potential market disruption in importing countries is also recognised in the WTO Protocol on the accession of China. The Protocol contains a transitional product-specific safeguard mechanism (Article 16) that enables WTO Members to restrict imports originating from China when the latter cause or threaten to cause market disruption to domestic producers of textile and clothing products. This transitional safeguard provision is valid for a period of 12 years after China's accession (or by December 2013). The WTO Report of the Working Party on the Accession of China (paragraph 242) also contains a textile safeguard provision that enables WTO Members to restrict imports from China when the

latter believes that imports of Chinese origin of textile and clothing products are, due to market disruption, threatening to impede the orderly development of trade in these products. The China's textile safeguard provision is valid until the end of December 2008. Otherwise, WTO members have the ability to apply temporary protection to products and sectors that are seriously injured from import competition. The implementation of this general safeguard measure is subject to a number of procedural provisions, including the determination of serious injury, consultations with affected trading partners and, potentially, the payment of offsetting compensation to aggrieved partners. Under the WTO Anti-Dumping Agreement, members also can take action against dumping and could impose extra import duty on the particular product from the particular country in order to remove the dumping margin and hence the injury to the domestic industry in the importing country.

43. Whether or not the WTO transitional safeguard provision, the China's textile safeguard provision, the general safeguard provision or anti-dumping measures will be invoked frequently in the post-ATC period by WTO members remains an open question. The United States has invoked the China's textile safeguard provision in December 2003 and, following consultations with China, it restrained Chinese imports of knit fabrics, dressing gowns and brassieres for a period of 12 months. According to the US International Trade Commission,[10] the WTO transitional safeguard provision brings an element of uncertainty in the export capacity of Chinese suppliers to access foreign markets and this risk of sourcing from only one country will encourage buyers to diversify their sourcing networks from other low-cost country alternatives to China. This import diversification will be influenced by competitive cost factors in other supplying countries which themselves are influenced by market access opportunities offered under regional and preferential trade arrangements.

The Potential in Emerging Economies

44. The demand for clothing products in developed countries is influenced by underlying changes in demography, disposable income and a growing tendency towards more relaxed and leisure wear, brand name products and fashion wear. But consumers in developed countries are spending a declining share of their disposable income on textile and clothing products. With the maturing of markets in developed countries, the fastest consumption growth opportunities are likely to materialise in the emerging and newly industrialised economies. This underscores the importance of market access to the developing countries in general and the large emerging economies in particular.

45. This review shows that the average applied tariff protection on textiles and clothing remains high compared to average tariffs imposed on manufactured products for the overwhelming majority of developed and developing countries.[11] There are considerable differences in the level of tariffs applied on textiles and clothing and the recurrence of tariff peaks among developed countries. There are also similar imbalances among developing and least developed countries. It is worth noting that the applied tariffs in textiles and clothing in China in 2002 were roughly equivalent to the average applied tariffs by OECD countries and thus were considerably lower than some OECD countries, such as Mexico, which is a large net exporting country of clothing products. All of China's tariffs are bound in the WTO and most bound rates at the end of the implementation period will be much lower than its 2002 applied tariffs. This means that China is effectively reducing its tariff protection over the period. In other developing and least developed countries, high tariff protection remains the norm and given their competitive concerns about China, they are, for the time being, most reluctant to commit to tariff reductions in the context of ongoing multilateral trade negotiations. Therefore, the prospect of improving trade in a south-south direction in textiles and clothing does not look promising. In terms of expanding trade in a north-south direction, the export interests of developed countries may be better served by seeking improved access to the retail distribution systems of developing countries. This is discussed in the following section.

D. Adjustment in Retail Distribution

46. The drivers of adjustment in retail distribution in the post-ATC period are related to: (1) the leadership role played by large retail groups and brand name marketers; (2) the importance of the private codes of conduct and market knowledge; and (3) access to retail distribution in emerging economies.

Leadership Role of Large Retail Groups and Brand Name Marketers

47. Retail distribution is becoming increasingly dominated by large and lean retail organisations in the main consuming countries that are moving toward greater product specialisation, brand name products and market segmentation. The large retail groups and brand name marketers are now exporting their successful distribution models worldwide. With their sheer market size, large retail groups collect market information about the latest trends in styles and tastes and this information-integration function gives them considerable leverage in dealing with suppliers. Nevertheless, there are benefits for offshore suppliers to work in close co-operation with large retail groups and brand name marketers as suppliers learn to: (1) manufacture quality products; (2) apply the buyer's codes of conduct; and (3) deliver products in a timely fashion. The development of business relationships between national clusters of expertise and the large retail groups and brand name marketers is found to play an instrumental role in facilitating the qualitative transformation of the supply chain with backward and forward linkages for the local economy. For exporting countries seeking to develop their export-led strategies, nurturing the contacts between domestic clusters and the large retail groups and brand name marketers is a must.

Codes of Conduct and Market Knowledge

48. Retail groups and brand name marketers invest handsomely in building distinctive corporate names and in sustaining brand name recognition. By fears of tarnishing their names or losing the market knowledge that underpins their capacity to sell at premium prices, they pay great care in selecting suppliers that will protect their market knowledge and will not let their names become associated with exploitative working conditions. Hence, foreign suppliers that are offering strong guarantees to protect market knowledge and implement the buyer's codes of conduct have a competitive edge over other attractive business proposals that do not provide the same level of guarantees even if they offer lower prices. In this respect, strong enforcement of intellectual property laws and private codes of conduct are considered as assets for countries that aspire to maintain an export-led strategy in the upper market segment of clothing products. It also means that non-cost factors are becoming increasingly important within the supply chain, and buying decisions are not based exclusively on price competitiveness, particularly for brand name and eco-labelled products.

Retail Distribution in Emerging Economies

49. The large retail groups and brand name marketers in textiles and clothing are expanding their distribution networks and pursuing business opportunities in countries where there are attractive growth prospects. The establishment of retail distribution services in most developed countries is not hindered by restrictions on foreign ownerships or obstacles on the right of establishment. Although the large retail groups and brand name marketers are predominantly headquartered in developed countries and owned by developed countries' interests, some leading manufacturers in Hong Kong (China) have launched their brand names and are entering retail distribution. This strategic move requires services-related expertise in designing, marketing, retailing, financing and the gathering of market intelligence on foreign markets. This also requires foreign direct investment (FDI) flows originating from Hong Kong (China) or other emerging economies that are pursuing similar diversification strategies. Without either restrictions on FDI or limitations on the access to retail distribution in developed countries, it is only a matter of time before

Asian-controlled and -owned retail distribution chains will operate in developed countries and compete head-to-head with established large or small retail distributors.

50. In developing countries, access to retail distribution systems is less predictable and varies among countries. In China, as of December 2004, foreign retailing services will have the right to set up their distribution networks, through wholly-owned foreign enterprises, without geographical and quantitative restrictions, thereby providing considerable retailing opportunities in this large consumer market. Anecdotal sources estimate that the size of the Chinese affluent middle class hovers around 80 to 100 million people, which would be roughly equivalent to the combined population of France and the United Kingdom. In India, another country with significant potential, foreign direct investment in retailing is not allowed and India has so far made no GATS commitments in respect of retail distribution services. Although the commercial presence of some large groups is currently growing in India, these operations are mainly to facilitate the sourcing of Indian products for exports. In the context of the Doha Development Agenda, countries have an opportunity to improve the access for wholly-owned foreign distribution services to developing countries that are still maintaining obstacles to foreign direct investment and/or restricting the right to distribute foreign-made goods.

IV. Policy Challenges

51. Trade policy measures have had a major impact on production, trade and investment decisions in the past and their influence will be less pronounced in the near future with the elimination of quantitative restrictions which are probably the most restrictive of all trade instruments. As noted throughout this Part, tariff reductions, preferential access under GSP regimes or regional trade arrangements and access to foreign retail distribution systems will remain on the policy agenda of trade policy makers in the post-ATC environment. To facilitate the process of sound structural adjustment in textile and clothing, governments have a support role to play in establishing a coherent policy and regulatory framework that complements the competition-enhancing trade policy framework. This review underscores the complementary role that labour adjustment policies, technology and innovation policies, and other policy and regulatory dimensions, referred to as business facilitation, can play in this process of structural adjustment. The salient points of these policy dimensions are summarised below.

A. Trade-Related Labour Adjustment Policies

52. This review acknowledges that it is difficult to isolate the causes of worker displacement. Technological change, productivity gains, increased import competition and shifts in production can all contribute to job loss. This difficulty has led many policy analysts to oppose targeted labour market adjustment policies and programmes for special groups of workers, *e.g.* workers who lose their jobs due to increased imports, and instead put into place broad labour adjustment programmes for all displaced workers. This issue is likely to remain prominent in the foreseeable future with the intensification of international relations among countries.

53. Available evidence on the impact of globalisation and international trade on labour adjustment suggests that workers who lose their jobs due to increased imports or shifts in production do not appear to be different than other dislocated workers. Similarly, their adjustment process does not seem to differ significantly. Trade-related dislocations may suggest the need for labour market adjustment policies and programmes, but not necessarily a special response. An analysis of the characteristics of displaced workers from the textile and clothing industries shows that they tend to have a low level of education, low skill levels (thus earn low wages), and are predominantly women and minorities (including minority women). All of these characteristics make it more difficult for workers to adjust to changes in the labour market.

54. In place of the debate over special versus general labour market adjustment policies and programmes, more effort needs to be made to determine which interventions are more effective than others. Most of the developed countries are attempting to improve the co-ordination of their unemployment benefits and employment services.

55. Unemployment insurance programmes in most developed countries are designed to assist all unemployed workers, regardless of industry, worker demographics or cause of displacement. The most significant exception to this general framework is the targeted Trade Adjustment Assistance (TAA) programme in the United States that provides assistance to displaced workers due to import competition and shifts in production. By comparison, more comprehensive and generous labour market adjustment programmes in most other developed countries somehow mitigate the need for special programmes for workers from a specific industry or whose job loss can be traced to a specific cause.

56. There has been increasing reliance on training as part of the toolbox of labour market adjustment programmes. Many workers coming out of traditional low-wage manufacturing industries lack basic language and math skills, thereby preventing them from acquiring the specific skills needed for the new jobs being created. The shift in structure of the labour market in developed countries has also resulted in a gap between the skills that workers needed in their old jobs and those required by their future jobs. Governments are employing various subsidies and tax incentives to encourage training and skill enhancement.

57. The main goal of any labour adjustment programme should be re-employment: either returning to one's previous job or finding a new job as soon as possible and with minimal disruption in earnings. With that objective in mind, countries have used various programmes to train workers and provide job search assistance. The recent introduction in Germany and the United States of “wage insurance” aims at encouraging workers to return to work as soon as possible. Wage insurance is designed for those workers whose new wage is lower than their previous wage. By subsidising some portion of the difference between the new and previous wages, it is hoped that workers will be encouraged to take a new job sooner. It is also hoped that new employers will provide the worker with on-the-job training, which has proven to be more effective and cheaper than government-financed classroom training. These programmes also aim at minimising the economic and social impact of plant closings on communities. At the outset, the overall labour adjustment policy challenge is to devise ways to meet the social goals in a cost-efficient and least trade-distorting manner.

B. Technology and Innovation Policies

58. Different countries have different historical backgrounds of industrial development and thus differ with respect of the optimal policy support for specific industries, such as textiles and clothing. This review draws some general lessons from the examination of technology and innovation experiences in many developed countries.

59. There seems to be no fundamental lack of invention and innovation. Hence it does not seem appropriate for governments to launch large-scale basic research projects on textile and clothing technologies outside of horizontal industrial research schemes based on public-private co-funding mechanisms. Although the textile and clothing industries can be considered to be mature, they use technological innovations that are largely generated in other industries, above all in chemicals and machinery. These technology suppliers are well able to sufficiently provide product and process innovations for textiles and clothing without financial support from public research programmes. While governments may stimulate collaborative innovation processes in the fields of dissemination and technological transfers, such approaches should not distort market-oriented innovation programmes.

60. Technology transfer between suppliers and users plays a pivotal role in the performance of textile and clothing suppliers. This review argues that it is appropriate for countries to deploy efforts in technology transfer. Nevertheless, to achieve faster productivity and welfare gains, the process of technology transfer could be strengthened by exploiting more efficiently the enriched opportunities that are offered by modern information and communication technologies for the dissemination of advanced technological knowledge. However, such a policy would require complementary public funding in order to provide financial incentives for innovators to pass proprietary technological knowledge to imitating firms.

61. Many SMEs often face substantial difficulties in the marketing of their products, because they lack a widely recognised reputation for high product quality. Governments could support marketing activities by promoting certification agencies and common brand names. At present, government activities in this area are mainly concentrated on sponsoring fairs and exhibitions.

62. Governments should keep in mind that in the long run innovative capacities basically depend on the availability of suitable human capital. Therefore, a sound education and qualification system seems much more important for sustainable technical progress than public innovation programmes. This applies not only to textiles and clothing, but to any other industry.

C. Business Facilitation Agenda

63. In the post-ATC period, there will be neither quantitative restrictions nor MFA-related guaranteed market access to mask the vulnerable situation of national textile and clothing suppliers whose international competitiveness are hampered by: inefficient domestic regulatory regimes; obsolete infrastructure in essential business services; cumbersome customs procedures; and other distorted market structures. All these dimensions are influenced by the policy and regulatory framework set up by governments. From a trade policy perspective, efficiency in transportation, telecommunications and electricity infrastructure and in customs services is an important determinant of a country's ability to integrate fully in the world economy. Achieving greater synergies among distinct policy and regulatory areas that impact the competitive position of national firms is in essence the purpose of a business facilitation agenda.

Dynamic Macroeconomic Environment

64. Above all, the role of government relates to the pursuit of sound and stable macroeconomic environment that aims at sustaining non-inflationary economic growth. There is strong evidence to attest that real economic growth and, in turn, net employment creation is stimulated in a low-inflationary environment. The pursuit of sound macroeconomic policies fosters market adjustment to change in the competitive environment and facilitates the redeployment of affected resources to other productive sectors. The pursuit of a business facilitation agenda complements other government actions at the macroeconomic and microeconomic levels, *i.e.* trade, labour adjustment and innovation, and brings benefits that go well beyond the textile and clothing industries.

Minimise Transit Time for Shipments

65. This review stresses that the reliability of transportation infrastructure and efficiency in customs procedures complements each other in minimising transit periods for shipments involved in international trade and can make geographically remote locations more internationally competitive. Recognising that each country has a different geographical position relative to large consumer regions and different transportation options, countries need to assess their logistical costs involved in export markets with a view to: (1) setting up an efficiency-enhancing environment in port infrastructure; (2) strengthening competition conditions in and between transportation modes; (3) setting up a competition-enhancing environment in

various port services; (4) addressing the terrorist risks in transportation without losing sight of the beneficiary effects of frictionless transportation systems; and (5) better integrating the enforcement of national laws and regulations, *e.g*. customs procedures, taxation, sanitary and environment protection, with other service providers in ports.

Modernise Customs Procedures

66. Where matters concern the facilitation of international trade, textile and clothing traders are poised to benefit from streamlined border requirements with the dismantling of MFA export permits and related controls in formerly-constrained exporting and importing countries. However, the internationally fragmented supply chain remains vulnerable to cumbersome and outdated customs procedures in countries that are less advanced in the implementation of modern customs systems. This review highlights that the holding up of shipments in customs warehouses due to inefficiencies in customs procedures undermines export-led strategies especially for those countries that rely on imported inputs for a significant share of their production. In dealing with the added emphasis on security and safety measures, governments should not lose sight of the beneficiary effects of smoothly functioning transportation and customs clearance systems.

Reliability of Telecommunications and Electricity Infrastructure

67. This review underscores that reliable and updated telecommunications and electricity infrastructure confers a competitive edge to textile and clothing suppliers. Trade flows in differentiated products, such as textiles and clothing, are found to be sensitive to international variations in communication costs. Outdated regulatory frameworks in electricity and telecommunications services act as taxes on textile and clothing suppliers and, more importantly, undermine the capacity of national suppliers to focus production on the higher value-added segments of the supply chain that are critically dependent on reliable infrastructure to ensure quick market responses. In the post-ATC period, the international competitiveness of textile and clothing suppliers will be enhanced in countries that maintain a competitive environment, spurring investment in innovative telecommunications equipment, electricity generation and distribution systems.

Nurture SME-Related Entrepreneurship

68. This review recognises the importance of nurturing SME-related entrepreneurship but warns against the danger of distorting investment incentives in sub-optimal productive capacity when excessive fiscal advantages and labour law exemptions are offered to small-scale operations. Recent work by the OECD in the context of the Bologna Charter on SME Policies has found that education and training are recognised as the single most effective means for achieving the objective of fostering entrepreneurship in societies.

NOTES

[1] The WTO ATC superseded the Multi-Fibre Arrangement (MFA) regime of quantitative trade restrictions when it entered into force in January 1995 and provided the multilateral trade framework applicable for trade in textiles and clothing for all WTO members. The ATC provides for the elimination by 31 December 2004 of all forms of quantitative restrictions applied to trade in textile and clothing products, including those that originated from the MFA regime. The ATC phases itself out of existence at the end of 2004.

[2] For more details about textile and clothing machinery trade by country, see Figure 4.3 in Part IV.

[3] For more details about infrastructure, see Part V on Business Facilitation.

[4] For more details about long-term productivity gains, see Figures 4.4a and 4.4b in Part IV.

[5] WTO, Trade Policy Review of the United States, 2001, Geneva.

[6] For more details about OPP-related logistical cost by country, see Tables 2.10 and 5.2 in Part II and Part V respectively.

[7] For more details, see Box 2.2 in Part II.

[8] For more details about the utilisation rates of preferential arrangements, see Tables 2.12 and 2.13 in Part II.

[9] For more details about the GSP regimes, see Box 2.1 in Part II.

[10] US International Trade Commission (2004), Textiles and Apparels: Assessments of the Competitiveness of Certain Foreign Suppliers to the U.S. Market, Investigation No. 332-448, Washington, D.C., February.

[11] For more tariff information by country, see Tables 2.8 and 2.9 in Part II.

PART II: MARKET DEVELOPMENTS AND TRADE POLICIES

I. Introduction

1. The scheduled elimination of quantitative restrictions under the WTO Agreement on Textiles and Clothing (ATC) at the end of December 2004 is taking place in an increasingly globalised world economy, where production and marketing activities depend on business decisions that reflect competitive opportunities around the world.[1] Trade policy measures have had major impacts on production and investment decisions in textiles and clothing and on trade flows. In particular, the trade quotas imposed on a bilateral country basis under the Multi-Fibre Arrangement (MFA) have contributed to the international fragmentation of the supply chain by accelerating the diversification of supply. This process worked to the disadvantage of the more efficient and quota-constrained suppliers, many of which sub-contracted clothing assembly into low–wage third countries. The Arrangement also benefited less competitive suppliers. In addition, the elimination of quantitative restrictions is challenging the global sourcing channels that were formed over decades of trade restrictions and will entail considerable adjustment for stakeholders, especially those clothing assemblers in remote low-wage countries. Simultaneously, there is considerable anxiety among the worldwide textile and clothing community about the emergence of more competitive suppliers in China that may capture a disproportionate share of the economic benefits arising from the phasing out of quantitative restrictions.

2. World trade in clothing exceeded world trade in textiles in the late 1980s and since then has expanded at twice the annual growth rate of textiles: 6% versus 3% between 1990 and 2001. Several textile and clothing products were among the 20 most trade-dynamic products during the period 1980–1998 (UNCTAD 2002).[2] In 2002, world trade in clothing reached USD 200 billion and USD 152 billion for textiles, which are respectively equivalent to 3.2 and 2.4% of world merchandise exports.[3]

3. It is anticipated that the dynamism underlying world trade in textiles and clothing will be sustained in the foreseeable future with the scheduled elimination of quantitative restrictions that have regulated international trade in these products for over four decades. The deadline for the quota elimination at the end of December 2004 coincides with the initial deadline of the Doha Development Agenda (DDA) in which changes to existing WTO rules (or new WTO disciplines to be agreed) will also have an impact on international trade in these sectors. The multilateral trade negotiations in the textile and clothing sectors are carried out under the negotiating group on market access whose mandate aims, *inter alia*, to reduce or as appropriate eliminate import tariffs and non-tariff-barriers. Within these negotiations, WTO members have an opportunity to address remaining trade obstacles and other distorting measures that are still constraining production and trade opportunities.

4. Trade liberalisation heightens the pressure on firms to adapt their production mix to meet ever–changing consumer requirements in terms of design, quality and prices, while putting in place efficient production methods that minimise production costs. Liberal trade regimes are an important component of this environment despite the fact that opening markets to international competition often leads to structural changes and imposes temporary hardships on certain segments of the economy. Governments can facilitate this structural adjustment in several ways.

5. In the post–ATC period, governments need to devise a coherent textile and clothing policy framework that strengthens the capacity of domestic producers to deal with rapid change and growing competition, and to capture more effectively trade opportunities that are being created through improved market access. This process involves dismantling trade-distorting measures, improving the business

environment on essential business services, supporting the emergence of qualified pools of expertise and the adaptability of the workforce, and negotiating improved market access for textile and clothing products and retail distribution systems. Liberal trade and investment policies play a key role in this process through their dynamic impact in restraining price pressure on imported inputs that cannot be secured from domestic suppliers, and through facilitating the emergence of competitive firms that are able to compete on domestic and international markets.

6. Section II of this Part presents recent key trends in production, consumption and trade in textiles and clothing and sets the overarching background for the project. In particular, it examines: the pattern of the international fragmentation of the supply chain; the role of large retail groups in production decisions; the productivity gap between producing countries; and the emergence of China as a predominant producing country with integrated suppliers. Section III identifies the remaining sources of trade protection and reviews the trade impact of regional and preferential trade arrangements in these sectors. As such, it identifies the trade policy challenges in the post-ATC period for these sectors.

II. Key Trends in Production, Consumption and Trade

7. The textile and clothing industries have fundamentally distinctive characteristics, and their interdependence is asymmetric. Whereas the clothing industry relies entirely on the textile industry to satisfy its textile needs, less than half of total textile production is used in clothing applications. The non–clothing textile applications are loosely defined as "technical textiles" and their growing importance is discussed in Part IV that deals with technology and innovation.[4] With the largest share of textile demand accounted for by non-clothing textile applications, textile consumption growth is largely influenced by overall economic conditions in national economies, and to a certain extent by prevailing consumption trends in clothing markets. It is estimated that technical textiles are growing at roughly twice the rate of growth of textiles for clothing applications, where growth rates amounted to about 2% in recent years.

8. In developed countries, the demand for clothing products has been influenced by underlying changes in demography, lifestyle, and disposable income and there is a growing tendency towards more relaxed and leisure wear, branded products and fashion wear. Customers are now used to easy access to a wide selection of seasonal products; this trend is expected to continue in the future. However, OECD consumers have been spending a decreasing share of their disposable income on textile and clothing products. A EUROSTAT report (2002) indicates that between 1970 and 1997 the share of textile and clothing in total household expenditure within the European Union fell from 9.3 to 6.4%. A similar downward consumption trend was also noticed in the United States, where the share of clothing products in the Consumer Price Index fell from 10.6 to 5.5% between 1963 and 1995 (Abernathy, *et al.*, 1999).

9. In developing countries, significant income disparities remain among this large group of non-homogeneous countries, with the least developed countries (LDCs) lagging well behind the emerging and newly developed countries. In emerging and newly developed economies, fast economic growth comes with social mobility that materialises in consumption shifts towards higher quality and branded products and fewer traditional wear. With more than three-quarters of the world population living in non-OECD countries, there are large production and trading opportunities that will materialise as their income levels increase. However, in the foreseeable future, the fastest consumption growth opportunities in textile and clothing products are likely to be concentrated in the emerging and newly developed economies.

A. Textile Production Involves a Capital–Intensive Process

10. The textile industry is composed of two main operations: (1) the preparation of yarn that involves spinning; and (2) textile preparation that involves weaving, knitting and finishing. Technological innovations have greatly increased the speed of textile operations and have resulted in huge productivity

gains.[5] In response to competitive pressures and technological progress, a consolidation of textile enterprises has occurred through several means, including a production shift towards faster growth products, the specialisation of operations, the development of diversified inter-firms networks, lower levels of employment, the closure of uncompetitive plants and new work organisation involving the shift of production capacity in low-wage countries. Employment losses and production shifts by production segment are shown in Table 2.1 for the United States for the period 1970–2002 and for the European Union for the period 1996–2000. Between 1970 and 2000, the adjustment process in the textile industry has resulted in the net loss of 2.7 million jobs in five OECD countries, *e.g.* France (-337 000), Germany (-333 000), Japan (-997 000), United Kingdom (-486 000) and the United States (-585 000), and a further loss of 1.4 million jobs in the clothing industry of these five countries.[6]

11. Reflecting the faster growth segments of US textile demand for industrial and house furnishing applications, *e.g.* the non–clothing applications of textiles or technical textiles, the shares of total textile employment increased significantly in the production of carpets and rugs and miscellaneous fabricated textile products, such as draperies, bed sheets, towels, bags and automotive trimmings (Table 2.1). The shares of total employment remained relatively stable in textile finishing and broad woven synthetic fabric. In the European Union, most of the employment losses appear to have occurred in the preparation and spinning of textile fibres and knitted and crocheted articles.

12. Concurrently, textile firms have invested in new equipment that has boosted labour productivity. Capital expenditures and labour productivity indicators by production segment for the United States in 1997 and the European Union in 2000 are shown in Table 2.2. In both regions, labour productivity and capital expenditure per employee are higher in textile manufacturing than in apparel manufacturing. Due to data differences in respect of the year, currency and classification system, it is difficult to compare the productivity levels between the two regions. However, the data shown in Annex Tables A2.1 and A2.2, which are measured in US dollars, indicate that the value-added per employee is higher in the United States than in EU Member states for both textile and clothing manufacturing. These Annex Tables compare various productivity indicators for some 34 countries.

13. Detailed capital expenditures by production segment, as shown in Table 2.2, give an indication of the capital intensity of the different production segments. The most capital-intensive textile segment in the European Union is “other textiles” which includes carpets, rugs, rope, cordage and netting, and the finishing and coating segment in the United States. Textile finishing operations are one of the most important operational steps for product differentiation and specific applications are often copyrighted, thereby conferring a competitive edge to innovating firms.

Table 2.1 Textile and Clothing Employment in the USA and in the EU, by production segment

Textile and Clothing Employment	Employment (Thousands)		Change in employment	Segment as % of Sector Employment	
The United States	1970	2002	2002/1970	1970	2002
Total Textile Employment	1,136.8	619.8	-517.0		
Textile mill products	974.8	431.8	-543.0	85.7%	69.7%
Broad woven fabric mills, cotton	212.1	49.5	-162.6	18.7%	8.0%
Broad woven fabric mills, synthetics	100.1	45.9	-54.2	8.8%	7.4%
Broad woven fabric mills, wool	36.6	5.3	-31.3	3.2%	0.9%
Narrow fabric mills	29.6	16.2	-13.4	2.6%	2.6%
Knitting mills	254.1	89.1	-165.0	22.4%	14.4%
Textile finishing, except wool	83.8	50.1	-33.7	7.4%	8.1%
Carpets and rugs	57.4	62.9	5.5	5.0%	10.1%
Yarn and thread mills	130.9	65.1	-65.8	11.5%	10.5%
Miscellaneous textile goods	70.3	47.7	-22.6	6.2%	7.7%
Miscellaneous fabricated textile products	162	188	26.0	14.3%	30.3%
Curtains and draperies	32[a]	16.6	-15.4	2.8%	2.7%
House furnishings, nec	47[a]	46.9	-0.1	4.1%	7.6%
Automotive and apparel trimmings	31.3[a]	57.3	26.0	2.8%	9.2%
Total Clothing Employment	1,108.4	322	-786.4		
Men's and boys' suits and coats	119	15.2	-103.8	10.7%	4.7%
Men's and boys' furnishings	374.9	105.7	-269.2	33.8%	32.8%
Women's and misses' outerwear	424.3	150.3	-274.0	38.3%	46.7%
Women's and children's undergarments	116.7	13.7	-103.0	10.5%	4.3%
Girls' and children's outerwear	73.5	9.6	-63.9	6.6%	3.0%
Fur goods, and misc. apparel and accessories	65.5[a]	27.5	-38.0	5.6%	8.5%
The European Union	1996	2000	2000/1996	1996	2000
Total Textile Employment	1,166.0	1,110.1	-55.9		
Preparation and spinning of textile fibres	150.9	128.6	-22.3	12.9%	11.6%
Textile weaving	178.5	176.0	-2.6	15.3%	15.9%
Finishing of textiles	114.6	112.6	-2.0	9.8%	10.1%
Made-up articles, except apparel	128.7	126.6	-2.1	11.0%	11.4%
Other textiles	177.2	176.4	-0.8	15.2%	15.9%
Knitted and crocheted fabrics	48.0	50.5	2.5	4.1%	4.5%
Knitted and crocheted articles	188.9	142.3	-46.5	16.2%	12.8%
Total Clothing Employment	1,136.6	1,025.0	-111.5		
Leather clothes	13.4	10.4	-3.0	1.2%	1.0%
Other wearing apparel and accessories	959.3	803.6	-155.7	84.4%	78.4%
Dressing and dyeing of fur	14.7	13.6	-1.0	1.3%	1.3%

Note a: 1972 instead of 1970. Due to confidentially rules, NACE 3-digits are aggregated in one or several categories in some EU member states.

Source: U.S. Bureau of Labor Statistics, National Employment, Hours, and Earnings Data: classified under the Standard Industrial Classification. EU Data: EUROSTAT, EURATEX calculations, classified under the General Industrial Classification of Economic Activities within the European Communities (NACE).

Table 2.2 Productivity and Capital Intensity in the USA and the EU

Textile and Apparel Manufacturing		Employment	Labour Productivity (per employee)	Capital Expenditures	Capital Expenditures (per employee)
The United States, 1997	NAICS		(USD)	(USD 1,000)	(USD)
Textile mills	313	391,899	60,467	2,691,704	6,868
Fiber, Yarn & thread mills	3131	82,291	51,065	537,037	6,526
Fabric mills	3132	217,354	57,963	1,491,377	6,862
Finishing and Coating	3133	92,254	74,754	663,290	7,190
Textile product mills	314	235,441	57,820	718,728	3,053
Furnishing (carpet & curtain)	3141	126,041	68,140	356,404	2,828
Other text. product mills	3149	109,400	45,929	362,324	3,312
Apparel manufacturing	315	710,796	47,524	941,178	1,324
Apparel knitting mills	3151	99,901	46,351	238,122	2,384
Cut & sew apparel mills	3152	558,328	48,001	629,588	1,128
Accessories & others	3159	52,567	44,697	73,468	1,398
The European Union, 2000	NACE		(EURO)	(EUR 1,000)	(EURO)
Manufacture of Textiles	17	1,110,105	31,742	4,694,000	4,228
Spinning of textile fibres	171	128,588	36,603	710,800	5,528
Textile weaving	172	175,965	40,360	924,700	5,255
Finishing of textiles	173	112,569	38,041	659,900	5,862
Made-up articles, exc. apparel	174	126,631	36,996	548,700	4,333
Other textiles	175	176,395	47,121	1,094,600	6,205
Knitted and crocheted fabrics	176	50,476	32,934	298,900	5,922
Knitted and crocheted articles	177	142,349	31,015	532,200	3,739
Apparel manufacturing	18	1,025,032	21,896	1,892,600	1,846
Leather clothes	181	10,424	26,257	14,800	1,420
Other wearing apparel & acc.	182	803,583	26,984	1,635,200	2,035
Dressing and dyeing of fur	183	13,637	22,615	22,300	1,635

Notes: Due to confidentially rules, NACE 3-digits are aggregated in one or several categories in some EU Member states.
Source: US data: U.S. Census Bureau, 1997 Economic Census, June 2001, classified under the North American Industry Classification System (NAICS).; EU data, EUROSTAT, EURATEX calculations, classified under the General Industrial Classification of Economic Activities within the European Communities (NACE).

14. Although EU and US firms are confronted by the same global environment, they have adopted slightly different industrial structures, as illustrated by the higher average number of employees per establishment in the United States than in the European Union: respectively 49.8 versus 14.4 employees per textile enterprise; and 41.8 versus 9.5 employees per clothing enterprise (Table 2.3). It appears that US firms have adjusted by relying more heavily on a process of consolidation, whereas EU firms have relied on the development of diversified inter-firm networks to confer production flexibility. However, these adjustment patterns are not predictions for the adjustment that will occur during the post–ATC period.

Table 2.3 Employment by Size of Establishments in the USA and the EU

Number of employees	Establishment	Employees	Establishment	Employees	Establishment	Employees
The United States	Textile mills		Textile Product mills		Apparel mfg	
1997	313 (NAICS)		314 (NAICS)		315 NAICS)	
1 to 4	1,305	2,686	3,519		5,202	
5 to 9	681		1,412	9,392	2,694	18,056
10 to 19	572	7,859	1,068		2,739	
20 to 49	620	19,413	975		3,194	100,217
50 to 99	450	32,348	421	29,713	1,495	
100 to 249	625		316		1,123	174,613
250 to 499	296	102,966	118	41,744	370	127,722
500 to 999	114	75,682	57	38,143	141	93,037
1000 to 2499	29	37,933	12	15,133	28	37,155
2500 or more	2		1		3	8,170
Total	4,694	391,899	7,899	235,441	16,989	710,796
Average		83.5		29.8		41.8
Average all textiles				49.8		
European Union		Textile mills				Apparel mfg
2000		17 (NACE)				18 (NACE)
1 to 9	48,262	139,322			84,738	214,091
10 to 49	15,079	279,149			18,765	362,005
50 to 249	6,103	345,457			2,942	247,208
250 or more	3,082	280,667			1,162	196,434
Total	72,575	1,044,756			107,663	1,022,304
Average		14.4				9.5

Note: Due to confidentially rules, NACE 3-digits are aggregated in one or several categories in some EU Member states.
Source: US data: U.S. Census Bureau, 1997 Economic Census, June 2001; EU data, EUROSTAT, EURATEX calculations.

15. Different types of fibres which can be mixed together to produce a wide range of textures and finishes are used in the manufacture of textiles. Strengg (2001) estimated that in 1998 man–made fibres accounted for 72% of total industrial applications in the European Union; cotton accounted for 22%; followed by wool with 5%; and the remaining share accounted for by flax and silk. However, cotton has become the main fibre source in the manufacture of clothing products. The report by the American Apparel Manufacturers Association (1998) indicates that between 1980 and 1996 the share of cotton in apparel increased from 35 to 53%, while man-made fibres declined from 62 to 45%, and the remaining 2% was accounted for by wool fibre. In the post-ATC period, continuing emphasis on the development of new materials in the non-clothing textile applications will likely increase the share of man-made fibres in total fibre demand.

16. Currently, the clothing applications of textile production account for about one third of total textile production and faster growth rates are achieved in industrial and house furnishing applications. It is anticipated that the textile industry will continue to be challenged by product proliferation, particularly in the industrial applications, and by the necessity to respond faster to rapidly changing market conditions without compromising quality. Over time, the textile industry has become a capital-intensive industry where product differentiation, supported by R&D on material applications, and up-to-date equipment play crucial roles in defining the competitiveness of firms. This underscores the importance for governments to cultivate an innovation culture with a view to encouraging firms in invest in updated equipment and innovative processes. Part IV reviews and compares how innovation systems are organised in several OECD countries.

17. With the imminent demise of quantitative restrictions, suppliers and investors are already anticipating quota-free market conditions and are investing in countries offering the best potential. In 2003, textile and clothing machinery imports in China reached USD 5 billion, an increase of over 200% compared to 1999 (see Figure 4.3 in Part IV). Undoubtedly, stronger textile and clothing clusters of enterprises and expertise will emerge in China. Against this background, the OECD textile industry will be challenged by intensified competition from the non-OECD countries that are upgrading their production capacity to meet higher production standards. The way in which the industry will innovate and adopt new technology will play a crucial role in defining the relative competitiveness of textile firms in the foreseeable future.

B. Clothing Assembly Involves a Labour–Intensive Process

18. The clothing industry is characterised by a highly labour-intensive assembly process, low barriers to entry (and exit) in the industry and, as a result, a large number of producers with typically a very large number of small– and medium–sized enterprises (SMEs) that concentrate production on just a few product categories. The clothing production is composed of three main operations: the pre-assembly, assembly and post-assembly, and each stage uses different capital/labour ratios. The pre-assembly stage that involves designing, grading and marking of patterns and cutting of textiles into individual components, has been revolutionised with the application of computer–aided design (CAD) systems. The assembly stage is highly labour-intensive and involves complicated manipulation of soft and limp materials while being sewn into three-dimensional products (see Annex B of Part IV for recent developments in the clothing production process).

19. Technological progress in telecommunication and transportation networks has made it easier for clothing manufacturers to fragment production segments on an international basis and to perform the assembly stage in low-cost countries. However, this involves added costs that are due to the transportation of intermediary inputs, the longer inventory holding and added managerial time involved in the co–ordination of an internationally-fragmented supply chain. It is obvious that these added costs must not exceed the cost advantages of offshore assembly; otherwise this business model is not viable. Time and distance act as important trade barriers for intermediary inputs involved in an internationally fragmented production process. However, efficient freight infrastructure and regular maritime services can make geographical distant locations competitive from a shipping standpoint (ITC, 2004).[7] The time factor is an important driver of investment and production decisions for succeeding in the highly competitive, time-sensitive and fashion–oriented clothing market. Thus, there are trade-offs between low wages and time proximity to large consumer markets (measured in the turnaround time during which orders must be filled and delivered). Part V assesses the logistical dimensions in the international movement of textile and clothing products within the context of a business facilitation agenda.

20. The ability to switch the assembly process quickly to adapt to various designs, changing fashion and short production runs may be, on the one hand, a major obstacle to the development of automated assembly processes but, on the other hand, it can confer a competitive edge to lean suppliers specialised in the fashion-oriented segments. Within this environment, international location of assembly processes in low–wage countries is an advantage for standardised products in which the production cycle typically requires one year for completion. It begins with: the definition of specifications; the selection of textiles; negotiations with potential assemblers; the final selection of the assembler; the shipment of inputs; the assembly; the shipment of clothing products; the preparation for retail; and the display on retailers' shelves. For fashion-oriented segments, the cost and proximity advantages derived from quick responses and delivery on just-in-time basis are sometimes sufficient to offset high wages and thus make business models that are located in, or in close proximity to, consuming regions viable.

21. In the post–ATC period, there will be neither quantitative restrictions nor MFA-related guaranteed market access to mask the vulnerable position of national suppliers whose international competitiveness is hampered by obsolete transportation infrastructure, irregular transportation services and other inefficient domestic regulatory regimes. With the elimination of quantitative restrictions, many exporting countries will lose the MFA–related economic rents that were linked to the regime of bilateral trade quotas and will have to address their competitive vulnerability if they aspire to maintain an export–led development strategy in textiles and clothing. The elimination of the quantitative restrictions is challenging the global sourcing channels that were formed over decades of trade restrictions and entails considerable adjustment for all stakeholders. Adjusting to this new environment may require a shift in production methods and product mix, production specialisation in the higher value-added segments of the supply chain or possible diversification in other sectors.

Moving Along the Supply Chain

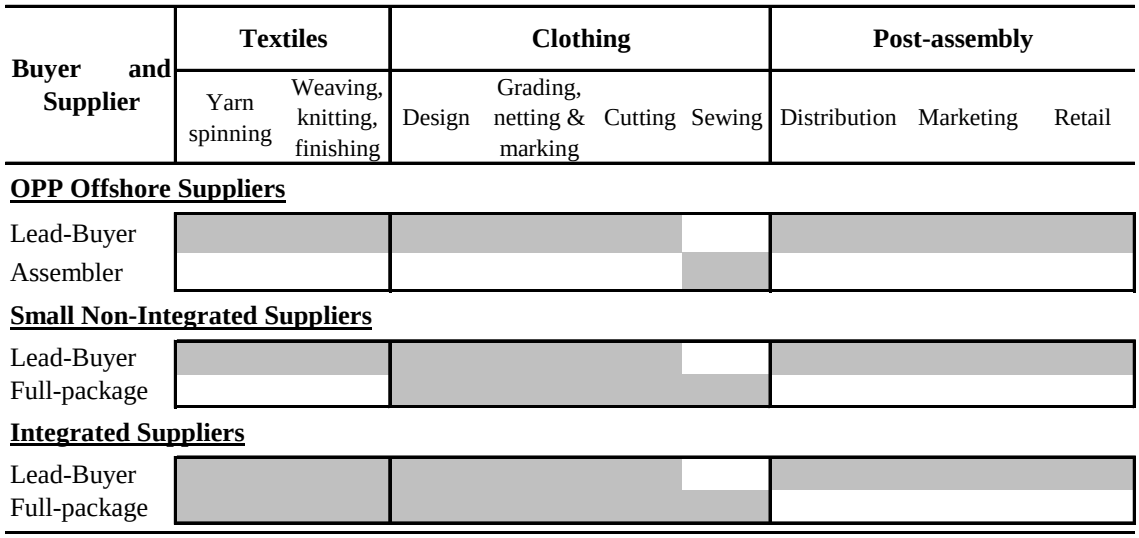
22. The assembly of imported textiles into clothing is a simple form of industrial activity and is the starting point of an export-oriented strategy of low-income countries, typically associated with export–processing zones and outward processing programmes (OPP) that provide instant access to both high quality inputs and foreign distribution networks. As technical and organisational skills develop, buyers in consuming countries will request foreign manufacturers to supply finished products according to the buyers' specifications, typically buyers' brand name products. This is known as *full-package* production. Transition from assembly of imported inputs to *full–package* production takes time and foreign manufacturers have to demonstrate their entrepreneurial capacity in co-ordinating the entire supply chain, which encompasses a wide range of service–related skills, such as managerial know-how, designing, fabric procurement, property rights protection, export financing and handling of trade formalities. *Full–package* status gives substantial autonomy and learning potential for industrial upgrading for foreign suppliers and provides an enduring edge in export-oriented development (Gereffi, 2002).

23. The transition from the simple assembly of imported components to *full–package* production is far from being automatic and access to high quality textiles is essential to support efforts in moving upscale in the value chain. However, many small economies are hampered in this process by various domestic obstacles: they lack the backward linkages to national textile capacity; they do not have an established clothing-manufacturing tradition; or they lack close proximity and easy transportation to large consumer countries (Mortimore, 2002). Moreover, this access may be hampered by excessive tariff protection on intermediary inputs, leading to inverted tariff escalation, and distorted market structures in some developing countries.[8] To move beyond the assembly stage into more advanced activities, small economies need to shift their industrial cluster of expertise from manufacturing to design, material sourcing, quality control and logistics. National suppliers need to establish joint structure where they can share market knowledge and to offer more integrated solutions. Working towards closer co-ordination among national suppliers will enable them to deal more efficiently with large buying groups and to face competition from other integrated suppliers. Hong Kong (China) and Singapore are small economies that have moved up-scale in the value chain by nurturing this shift in the industrial clustering of expertise and by providing a liberal trading environment to support private initiatives in these directions.

24. Chart 2.1 shows a schematic representation of the split between the buyers and suppliers of the main production segments of the supply chain under simple outward processing transactions and more advanced *full-package* transactions. In the case of simple outward processing transactions, Chart 2.1 shows that only the sewing activities is performed in the assembly country and all other activities being performed in the buyer's country. Considering that the cost of the input textiles usually represents about half of total manufacturing cost of clothing products, the mere assembly of imported inputs generates rather limited wealth for the country of final assembly, typically offshore centres. Under *full–package* transactions, the mix of activities being performed in the supplier country becomes more diverse and

creates more backward and forward linkages to the local economy. The backward linkages are more important in countries where quality textiles are readily available from domestic sources, hereby referred to as integrated suppliers. The integrated suppliers can meet shorter delivery requirements because of the time saved in the procurement of the necessary inputs and this confers a cost competitive advantage. The competitiveness of Chinese suppliers relies to a large extent to their ability to obtain high quality textiles from domestic sources at attractive prices. China's low wages and its striving business climate complement their sourcing advantages and make Chinese suppliers highly cost competitive on export markets.

Chart 2.1 Schematic Representation of Production Sharing Possibilities



25. After *full–package* production, another step involves the co-ordination of the entire supply chain through *triangular* manufacturing. The lead suppliers play a similar role as an orchestra chief in suggesting the design, in procuring the textiles, and in overseeing the manufacturing process and the international movements of inputs and final products to the countries of final consumption. It requires skills in design, transportation logistics, quality control and knowledge of extended fabric and equipment procurement. In fulfilling buyers' orders, foreign manufacturers shift parts or all the orders to sub-contractors located in third low-cost countries that have an appropriate MFA quota allocation in the buyers' markets. Entrepreneurs in Hong Kong (China) have mastered the triangular manufacturing model by developing a web of sub-contractors located throughout the Asia region.

26. In the post–ATC period, the attractiveness of triangular operations as a business model will remain but the selection of sub-contractors will be made on business and efficiency grounds rather than on the mere availability of export quota allocation in the buyer's markets. In this environment, the geographical reach for triangular operations is likely to be reduced in order to minimise the time involved for completing the whole fabrication process. Through triangular manufacturing, the lead suppliers can concentrate activities in the highest value–added segments of the supply chain and develop their own brand name products and ultimately begin selling them in their retail chains. Some of the leading clothing manufacturers in Hong Kong (China) have already launched brand name products and entered in retail business (Ramaswamy and Gereffi, 2000). In Hong Kong (China) where wages are too high to perform some manufacturing activities of the supply chain, its future relies in promoting itself as fashion and regional procurement hubs, taking advantage of its international networks and supply chain co-ordination.

27. These developments suggest that the comparative advantage of low–income developing countries in the assembly process, based on relatively low wages, does not necessarily translate into a comparative advantage in the management of the entire supply chain when all services-related dimensions are taken into

consideration. Relative efficiency in managing the entire supply chain is required, including in design, fabric procurement, logistical skills in transportation, quality control, property rights protection, export financing and clearing of trade formalities. As quantitative restrictions are gradually phased out, several low-cost countries that had excelled as offshore assembly centres because they had MFA quota allocations are gradually being exposed to the inherent vulnerability of production fragmentation. Countries that aspire to maintain an export-led strategy in textiles and clothing need to shift their industrial cluster of expertise from manufacturing to the higher value-added segments of the supply chain by upgrading their domestic skills in design, material sourcing, quality control, logistics and retail distribution. This process can be facilitated by encouraging national suppliers to share market knowledge and expertise with a view to offering more integrated solutions to prospective buyers.

C. Leadership Role of Large Retail Groups and Brand Name Marketers

28. The post–assembly stage involves packaging, inventory controls, marketing and retailing. Significant changes have taken place at the retailing stage with the blurring of the traditional boundaries between retailers, brand name marketers and manufacturers. Retailers are increasingly involved in global sourcing through a wide variety of organisational channels, such as vertical integration, sub-contracting and licensing arrangements for brand name products. They may choose between various sourcing approaches, such as a simple sub-contracting of the assembly stage, a *full-package* or triangular manufacturing, depending on the outcome that better suits their retail strategy. The retailer's decisions are influenced by the turnaround time during which the order must be filled and delivered, the quality of the clothing (staple or fashion) and the MFA quota availability for the type of products. The latter factor will be irrelevant as of 2005.

29. The retail stage itself is becoming increasingly dominated by large and lean retail organisations in the main consuming countries that are moving toward greater product specialisation, brand name products and market segmentation. The five largest US retailers accounted for 68% of all apparel sales in publicly held retail outlets in 1995 (Gereffi, 1999). Ever since then the Wal-Mart, Carrefour and the brand name groups have expanded their market penetration strategy in developed countries and have expanding their distribution presence in emerging countries as well. Traditionally, clothing suppliers sold to a distribution network which was mainly composed of small- and medium-sized retailers. In this way, suppliers collected market information about the latest trends in styles and tastes. This information-integration function is now performed by the largest retailers who rely on electronic point-of-sales information which in turn give them more leverage in dealing with manufacturers (Abernathy, *et al.*, 1999). The shift from traditional retailing to the large and lean retail groups is equivalent to a *power shift* which enables large retail groups to exert considerable market pressure on suppliers and to capture a large share of any sources of cost savings or economic rents available throughout the supply chain. Moreover, considering that the largest value-added segments of the entire supply chain are in the distribution, marketing and retailing functions, a large share of wealth creation in the supply chain remains within the large retailers and brand name marketers which are still predominantly from developed countries.

30. Retail groups and brand name marketers invest handsomely in building distinctive corporate names and in sustaining brand name recognition. By fears of tarnishing their names or losing the market knowledge that underpins their capacity to sell at premium prices, they pay great care in selecting suppliers that will protect their market knowledge and will not let their names become associated with exploitative working conditions. Hence, foreign suppliers that are offering strong guarantees to protect market knowledge and implement the buyer's codes of conduct have a competitive edge over other attractive business proposals that do not provide the same level of guarantees even if they offer lower prices. In this respect, strong enforcement of intellectual property laws and private codes of conduct are considered as assets for countries that aspire to maintain an export-led strategy in the upper market segment of clothing products.

31. Large consumer groups and international civil society organisations active on the globalisation debate exert in their own ways pressure on retailers and suppliers for the advancement of their consumer and social agendas. As a result of being subjected to ever-closer scrutiny, several large retail groups are integrating social requirements in their private codes of conduct and, in turn, are imposing more stringent standards on their suppliers. This means that non–cost factors are becoming increasingly important within the supply chain, and buying decisions are not based exclusively on price competitiveness, particularly for brand name and eco-labelled products.

32. The development of the Internet retailing has raised the hope for a new low-cost distribution system capable of capturing a large share of retail businesses and facilitating business-to-business (B2B) contacts. The Internet has largely succeeded in reducing costs in B2B transactions but it faces considerable consumer resistance as an efficient retail distribution system for clothing products. Much of the resistance comes down to the fact that Internet retailing is for the time being ill-suited for clothing retailing. Customers like to try on, touch and feel the texture and the fit of clothes.

33. The emphasis of research on the development of three dimensional scanning technologies, clothing simulation software and integration process software are raising the prospects for fully integrated retail functions into the supply chain where individualised specifications would be electronically transferred to the suppliers. In properly equipped retail outlets, customers would be scanned and would then visualise their body images dressed in the clothes and materials of their choice. Moreover, with a personalised card containing individual body specifications, customers could then order fashion products directly from Internet retailing sites. This fully integrated retail system raises the prospects for shorter delivery cycles; reduced occurrence of errors in specifications; greater efficiency in production; and improved competitive conditions at the retail level. However, for the time being, the current state–of–the-art computer–aided design (CAD) systems have difficulties to simulate accurately how all types of cloth drape a body (see Part IV).

D. Increasing Weight of Developing Countries in the World Economy

34. The globalisation of industrial activities that has been underpinned by economic and trade reforms is offering improved market opportunities to developing countries and is encouraging an international fragmentation of manufacturing production on the basis of factor endowments. This is reflected in the steady increase in developing countries' share in world manufacturing activities, from 15.4% in 1985 to 24.3% in 2001 (Table 2.4). Not all developing countries and regions have participated to the same extent in this expansion. China has achieved an impressive growth by more than tripling its world share during the period 1985–2001. Conversely, the share of industrial countries in the total value-added has declined, though the United States and Canada have in fact succeeded since 1995 to gain additional market shares. Interestingly, 1995 corresponds to the second year of the implementation of the North American Free Trade Agreement (NAFTA) in which Mexico is a member country.

35. The increasing weight of developing countries in the world economy is also evident in the textile sector and in the aggregate sector composed of clothing, leather and footwear (CLF). Unfortunately, the UN data do not cover China for this sectoral breakdown and thus the shares of developing countries in these sectors are under–reported. A further data problem is that a breakdown for the clothing sector alone, without leather and footwear, is not available. Despite these data shortcomings, they show a continuing shift in the world distribution of production in favour of developing countries with larger gains achieved in textiles than in the CLF sector (Table 2.4).

36. The world distribution of textile value-added has also shifted considerably within developed countries between 1985 and 2001. The declining competitiveness of Japanese textile manufacturers has led to a gradual shift of capacity to neighbouring countries and a loss of 7 percentage points in Japan's world

textile share. Eastern European and former USSR countries went through deep adjustment following the collapse of their centrally-planned economic model, with a resulting loss of 11.4 percentage points in their world share. Their adjustment process is beginning to bear positive results as reflected in their increasing world production share of clothing products since 1995 and a marked acceleration in 2001. The European Union and USA/Canada regions have pursued regional integration arrangements in the 1990s while simultaneously implementing MFA quotas and outward processing programmes that require regionally–made textiles. All these factors paved the way for each region to gain at a minimum five percentage points in world textile share up until 2000. However, the USA/Canada share has drop significantly in 2001 in the context of slower economic growth.

Table 2.4 Distribution of World Value-Added, Selected Sectors, %

	1985	1990	1995	2000	2001
All Manufacturing sectors					
Developing countries	15.4%	16.9%	21.4%	24.0%	24.3%
China	2.1%	2.7%	5.3%	7.0%	7.4%
Industrialised countries	84.5%	83.1%	78.7%	76.0%	75.7%
European Union	32.3%	31.4%	31.0%	29.0%	28.7%
USA/Canada	23.9%	23.4%	25.2%	26.1%	26.3%
Japan	15.4%	16.8%	15.8%	14.0%	13.8%
Eastern European & Former USSR	9.5%	8.3%	3.5%	3.8%	3.9%
Textiles[a]					
Developing countries	23.0%	25.1%	29.9%	32.5%	33.0%
Industrialised countries	77.0%	74.9%	70.1%	67.5%	67.0%
European Union	27.4%	27.7%	32.3%	32.6%	32.7%
USA/Canada	14.0%	14.6%	19.7%	19.0%	17.3%
Japan	15.2%	13.2%	10.7%	8.6%	8.2%
Eastern European & Former USSR	18.0%	17.2%	4.9%	5.0%	6.6%
Clothing, Leather, Footwear[a]					
Developing countries	22.7%	24.7%	25.0%	27.8%	27.8%
Industrialised countries	77.3%	75.3%	75.0%	72.2%	72.2%
European Union	33.9%	31.2%	33.5%	30.8%	31.5%
USA/Canada	17.1%	17.6%	21.0%	22.0%	20.7%
Japan	10.2%	10.2%	11.8%	9.1%	8.3%
Eastern European & Former USSR	13.6%	13.7%	5.6%	7.1%	8.6%

Note: At constant 1990 prices.
Note a: China is excluded but not Hong Kong (China) and Chinese Taipei.
Source: International Yearbook of Industrial Statistics 2003, UN Industrial Development Organisation

Developing Countries are Diversifying their Production Base

37. The relative importance of textiles and clothing in total manufacturing activities is diminishing with the diversification of production capacity and in line with the gradual redistribution of world capacity in textile and clothing in developing countries (Table 2.5). Their shares of total manufacturing value–added in textile and CLF industries fell respectively to 5.4 and 3.2% during the 1985–2001 period. For the industrial countries, their shares of total manufacturing value-added for textile and CLF industries fell even more dramatically to 2.0 and 1.5% respectively. However, these aggregate numbers mask considerable disparity at the country level and several developing countries have reached very high levels of export dependency on clothing exports, as shown in Annex Table 2A.5.

38. The data shortcomings noted earlier complicate the assessment of production trends in textile and clothing industries. However, other UN data that report separate data for textiles and clothing (rather than in combination with leather and footwear) offer insights into productivity and profitability levels achieved in many countries (see Annex Tables 2A1 and 2A2).[9]

Table 2.5 Shares of Manufacturing Value-Added in Selected Regions, %

	1985	1990	1995	2000	2001
Textiles					
Developing countries	8.2%	7.6%	6.4%	5.5%	5.4%
Industrialised countries	4.2%	3.7%	2.8%	2.0%	2.0%
European Union	4.0%	3.5%	3.3%	2.7%	2.6%
USA/Canada	2.8%	2.6%	2.5%	1.4%	1.3%
Japan	4.2%	3.0%	2.2%	1.6%	1.6%
Eastern European & Former USSR	8.5%	8.7%	4.4%	3.3%	4.0%
Clothing, Leather, Footwear					
Developing countries	6.3%	5.4%	3.9%	3.2%	3.2%
Industrialised countries	3.3%	2.7%	2.2%	1.5%	1.5%
European Union	3.8%	2.9%	2.5%	1.7%	1.7%
USA/Canada	2.7%	2.3%	2.0%	1.1%	1.1%
Japan	2.2%	1.7%	1.8%	1.2%	1.1%
Eastern European & Former USSR	5.0%	5.1%	3.7%	3.3%	3.7%

Note: At constant 1990 prices. China is excluded but not Hong Kong (China) and Chinese Taipei.
Source: International Yearbook of Industrial Statistics 2003, UN Industrial Development Organisation

Shrinking Productivity Gap

39. Wide discrepancies in labour productivity in textile and clothing sectors exist between developed and developing countries as measured by the value-added per employee (Annex Tables 2A.1 and 2A.2). In the textile sector, the average value-added of an OECD worker was about USD 36 700 in the late 1990s. In the listed non–OECD countries, the average value-added per employee was USD 15 000 but there are considerable variations at the country level. For example, in Bangladesh and the Russian Federation, the value-added per worker was as low as USD 1 100 in the late 1990s. As a result, labour productivity levels in textile operations in Bangladesh, the Russian federation, Vietnam, India, Sri Lanka and Egypt were at least ten times smaller than those reached in Germany, Korea, Japan, Finland or the United States in the late 1990s.

40. Not surprisingly, labour productivity in clothing is lower than in textile operations for all reported countries, except for Chile, Egypt, India and Vietnam, and labour productivity levels are much higher in OECD countries than in non-OECD countries. Nine OECD countries have higher labour productivity than Hong Kong (China), which is the best performer among non-OECD countries. The Czech and Slovak Republics have the lowest levels among OECD countries, slightly below Egyptian productivity levels. Labour productivity gaps among developing countries are significant. At the highest level, there is Hong Kong (China), the economy most heavily engaged in triangular manufacturing, and at the bottom end, countries specialised in the assembly of imported inputs for re-exports, *i.e.* Bangladesh, Vietnam, Sri Lanka, Indonesia, India and Morocco.

41. There are multiple reasons for the productivity gap between developed and developing countries, including external and internal factors. As an external factor, decades of MFA-related quotas have prevented the migration of the textile industry to the developing countries as fast as the migration of the

clothing industry. With the imminent demise of the ATC, there will be no major obstacles to the development of stronger clusters of textile expertise in the most competitive developing countries. The recent import surge of up-to-date textile and clothing equipment in China attests to this migration and foreshadows higher productivity levels and improved domestic availability of high quality textiles that are required for export markets. With the elimination of quotas and a conducive world environment for transfer of technology through machinery imports and globalised knowledge networks, the historical productivity gap that has differentiated developed and developing countries is expected to shrink as modern equipment are operated efficiently in developing countries.

42. There are also domestic obstacles that hamper the implementation of production-enhancing techniques. Inefficient regulatory framework and obsolete domestic infrastructure in essential business services, *e.g.* port infrastructure, transportation modes, telecommunications, electricity and customs, acts as a tax on textile and clothing suppliers and undermines their efforts to invest in productivity-enhancing equipment. These dimensions are assessed in Part V.

43. Moreover, many developing countries do not domestically produce the quality of textiles that is required for export markets and must import high quality textiles. This access may be hampered by excessive tariff protection, inefficient customs clearance procedures and other distorting production incentives to protect low-scale textile production that provides employment to a large pool of low-skilled workers. This situation is best illustrated by the case of India where high tariff protection is coupled with domestic policies that are designed to protect low-scale textile and clothing firms which have resulted in a fragmented production capacity with sub-optimal production scale and unsuitable quality clothing products for export markets. The employment displacement effects of trade liberalisation measures in textiles and clothing are a matter of concerns for all countries, both developed and developing. The linkages between international trade and labour adjustment in the textile and clothing sectors are discussed in Part III.

44. In the post-ATC period, it will be crucial for countries wishing to remain active on export markets to fill in their productivity gaps by addressing their domestic obstacles to growth, setting up an efficiency–enhancing policy environment and facilitating private initiatives to invest in modern equipment and production processes.

E. China: A Threat and an Opportunity

45. In the last two decades, China has sustained an impressive economic growth and became the world's largest exporting country of clothing products and the second largest exporter of textiles. In the coming years, China's competitive position is expected to pick up in strength as it is reaping the gains of domestic reforms implemented pursuant to its recent WTO accession. Sustained import flows of modern textile and clothing machineries (see Figure 4.3 in Part IV) is improving China's production capacity in high quality textiles and strengthening its cluster of expertise. This will directly benefit domestic clothing suppliers who will have rapid access to high quality textiles at competitive prices and, in turn, will meet short turnaround delivery requirements. Referring to the competitive factors underpinning the Chinese textile and clothing sectors, the ITC report (2004) underscores that China is expected to become the "supplier of choice" for most US importers because of its ability to make almost any type of textile and clothing product at any quality level at a competitive price.

46. The WTO Protocol on the accession of China and its schedules contain specific provisions that require China to establish a legally-based trading regime that is compatible with WTO principles and obligations, including a uniform trading regime, transparency of laws and regulations, non-discrimination and judicial review. Under its tariff commitments, China is committed to reduce its average tariff rate on textile and clothing articles by 33.7%, from an average applied rate of 17.1% in 2002 to 11.3% when all reduction commitments are implemented (OECD, 2002b). Moreover, all of China's tariffs are bound

against increases in the WTO and most of China's bound rates at the end of the implementation period are much lower than its applied tariffs in 2002, which means that China is effectively reducing its tariff protection over the period.[10]

47. Similarly, under its WTO services commitments, China has agreed to permit foreign suppliers to set up their retailing services through wholly-owned foreign enterprises by 11 December 2004 – upon its accession, foreign suppliers obtained the right to distribute goods that they produced in China without limitations. If these regulations are effectively enforced by that date, foreign retailing groups will then no longer be subject to geographical and quantitative restrictions in their retail distribution strategies in China, thereby providing considerable retailing opportunities in this large consumer market. Anecdotal sources estimate that the size of the Chinese affluent middle class hovers around 80 to 100 million people, which would be roughly equivalent to the combined population of France and the United Kingdom.

48. The WTO Protocol on the accession of China also contains a transitional product-specific safeguard mechanism that enables WTO Members to restrict imports originating from China when the latter causes or threatens to cause market disruption to domestic producers of textile and clothing products (Article 16). This transitional safeguard provision is valid for a period of 12 years after China's accession (or by December 2013). This provision recognises the potential market disruption in importing countries that would result from export surges from China. The WTO Report of the Working Party on the Accession of China (paragraph 242) also contains a textile safeguard provision that enables WTO Members to restrict imports from China when the latter believes that imports of Chinese origin of textile and clothing products are, due to market disruption, threatening to impede the orderly development of trade in these products. The China's textile safeguard provision is valid until the end of December 2008. The Unites States has invoked the China's textile safeguard provision and, following consultations with China, has restrained Chinese imports for knit textiles, dressing gowns and brassieres for a period of 12 months. In the post-ATC period, there is considerable anxiety among the worldwide textile and clothing community about the emergence of more competitive suppliers in China that may capture a high (if not a disproportionate) share of the economic benefits arising from the phasing out of quantitative restrictions. What the post-ATC might offer to China and countries competing with it may be illustrated by what happened in the import composition of Japan, a country that did not apply MFA restrictions. Between 1990 and 2002, the share of Japanese clothing imports originating from China soared from 31 to 79%.

49. Whether or not the WTO transitional safeguard provision or the China's textile safeguard provision will be invoked frequently by WTO Members remains an open question. However, based on the large consultation with US suppliers and retailers undertaken by the US International Trade Commission (ITC, 2004), it is anticipated that the WTO transitional safeguard provision will bring an element of uncertainty in the export capacity of Chinese suppliers to access foreign markets. Hence, the ITC argues that the ability of Chinese suppliers to expand export shipments in the post-ATC period will be tempered by the use by the United States and other WTO Members of the transitional product-specific safeguard mechanism contained in China' WTO Protocol of accession. Furthermore, the ITC argues that US importers will address this risk of sourcing from only one country by diversifying their sourcing networks with other low-cost country alternatives to China. This import diversification will be influenced by competitive cost factors in other supplying countries which themselves are influenced by market access opportunities offered under regional and preferential trade arrangements. This underscores the importance of preferential market access provided by developed countries to the least developed countries, some of which are highly dependent on clothing exports for their prosperity, *e.g.* Bangladesh and Cambodia (see Annex Table 2A.5).

50. It is not the first time that the world is witnessing the emergence of new competitive players in textiles and clothing. In the mid-nineteenth Century, much anxiety resulted from innovative production techniques developed in the United Kingdom and also immediately after World War II with then low–wage Japan and Korea. Both the industrial revolution and the expansion of the Japanese and Korean

economies have brought considerable adjustment in textile and clothing industries and, simultaneously, have stimulated world growth and offered broader trade opportunities. Spurred by China's strong growth prospects and the implementation of domestic reforms, increased market opportunities have already materialised and are expected to continue in the future for industrial and consumer products originating from both developed and developing countries. Driven by sustained high economic growth, Chinese total imports are now exceeding its exports. China's trade deficit reached USD 8.4 billion in the first quarter of 2004, fuelled by the country's growing need for raw materials and equipment.

51. In addition, as experienced in the past by the United Kingdom, Japan and Korea, high growth came along with increasing production and infrastructure bottlenecks, rising domestic wages and appreciating domestic currencies that chipped away at their competitiveness and left trade opportunities for more competitive producers. Throughout 2003, power blackout measures were imposed to limit Chinese electricity consumption, which have forced manufacturing plants to halve production temporarily. Power shortages are further exacerbated by bottlenecks in transportation infrastructure which are delaying the distribution of imported coal and oil. The emergence of infrastructure bottlenecks are raising questions about the reliability of Chinese suppliers in meeting tight delivery requirements in the just–in–time manufacturing sectors (see Box 5.2 in Part V).

52. The analogy between the after-war situation of both Japan and Korea with the present situation in China should take into account the huge untapped reservoir of low-skilled and low-wage labour in China that did not exist in the same magnitude in Japan and Korea. It means that even if the Chinese Yuan appreciates relative to other currencies, Chinese suppliers would be able to partly offset the effects of a stronger currency on their competitiveness by reducing domestic wages without incurring undue labour shortages. Nevertheless, there are pressures on Chinese Authorities to break the fixed parity between the Chinese Yuan and the US dollar and to let the Yuan appreciate. So far, the Chinese Authorities have resisted this policy shift but the presence of large accumulated foreign reserves (exceeding USD 435 billion in March 2004) is raising questions about the sustainability of the Yuan/US dollar fixed parity within currency market operators.

53. With about one of every two textile employees working for China's state-owned enterprises (SOEs) (Table 2.6), trading partners have sought commitments that the trading transactions of China's SOEs would comply with WTO principles and agreements.[11] In the clothing industry, the private firms' share of total clothing employment reached almost 90% in 2001, reflecting the relative ease of entry in this industry. Despite China's SOE commitments in the WTO, several competing suppliers argue that China's SOEs are not yet operating on a commercial basis which provide them with unfair competitive advantages in both domestic and export markets. On the basis of Chinese statistics (Table 2.6), more than 40% of textile SOEs operated at a loss in 2001 and the average loss represented the equivalent of 2.2% of SOEs' output. The privatisation of the large textile firms in China represents a politically-sensitive task for Chinese authorities whom are likely to carefully consider the job displacement consequences of any privatisation programme. Moreover, the employment paradigm for Chinese authorities must be placed within its overall context of integrating in urban regions the inflows of million job seekers that are seeking better conditions than in rural regions where they originate.

Table 2.6 State–Owned Enterprises in China, 2001

China	SOE's employment as % of total employment	SOE as % of total entreprise	SOE's output as % of total output	SOE operating at lost as % of total SOE	SOE losses as % of total SOE's output
Textile industry	49.4%	21.3%	35.7%	41.1%	2.2%
Natural fibers	48.4%	21.1%	31.1%	40.7%	2.4%
Preparation of fibers	53.2%	22.9%	36.6%	40.6%	2.4%
Finishing of textiles	29.2%	16.2%	16.7%	46.0%	3.2%
Made-up cotton articles	29.1%	20.8%	18.4%	35.4%	1.8%
Knitting textile	11.9%	9.8%	5.7%	46.2%	3.7%
Synthetic fibers	58.2%	22.7%	51.4%	43.8%	1.8%
Clothing industry	10.6%	8.2%	6.7%	35.6%	3.7%
Knitwear	21.0%	14.4%	13.0%	41.2%	3.9%
Garments and Others	8.4%	6.7%	5.2%	32.6%	3.6%
Equipment manufacturing	48.6%	29.6%	32.8%	39.0%	1.8%

Source: OECD calculations based on CNTIC (2001/2002), Report on China Textile industry Development.

54. In the more immediate future, export-oriented countries continue to fear heightened competitive pressure from Chinese textile and clothing suppliers, despite the emergence of bottlenecks in essential energy and transportation services. However, China's stellar economic performance, combined with its market opening measures, is offering improved trade opportunities in textile and clothing sectors, especially for natural and man-made fibres, related manufacturing equipment, and improved retail and marketing opportunities by the end of 2004. In the post-ATC period, Chinese suppliers will continue to exert considerable pressure on less competitive supplying countries to adjust domestic capacity towards more advanced processes and to diversify their economic activities. These market pressures call for domestic policies to facilitate structural adjustment and economic diversification through an emphasis on higher value-added production segments of the supply chain and diversification in other sectors and services.

F. Geographical Patterns of Trade Shaped by Trade Measures

55. The composition of the world largest textile and clothing exporters has changed considerably during the 1990-2002 period, as shown in Table 2.7. Export shares of textiles declined the most in the European Union, Japan, Switzerland and Hong Kong (China), and increased the most in China, the United States and India. The most dramatic change occurred in China, which became the world's second largest exporter, and both Japan and Switzerland whose world shares of textiles dropped by 1.6 percentage points. Nevertheless, Japan remains a very active player in the supply chain through the global sourcing operations of its large retail groups and as a major supplier of sewing machines.

56. On the import side, the European Union and the United States are the largest importing areas. Import shares have grown particularly in the United States, China, Mexico and some Eastern European and Mediterranean countries (Annex Table 2A.3). Textile exports from the European Union and the United States under respective outward processing programmes have weighed heavily on clothing production decisions, which in turn have created significant geographical patterns of trade in textiles and clothing. These programmes and their impacts are assessed in Section III.

57. The reconfiguration of the world clothing exports (also shown in Annex Table 2A.4) is marked by the emergence of China as the world's largest exporting country, ahead of the European Union (extra-regional exports). China's gains came mainly at the expense of middle- and high-income neighbouring countries that have reduced production capacity or reconverted in the management of triangular manufacturing by transferring parts of their production to low-wage countries. Three economies, Hong Kong (China), Chinese Taipei and to a lesser extent Korea, are involved in triangular manufacturing and

remain key world players in the supply chain, although their direct export shares of clothing indicate a considerably diminished importance. New low-wage clothing suppliers also emerged in East and South Asia, which had spare MFA quota allocations, and simultaneously in neighbouring countries to the European Union and the United States, which took advantage of preferential access in the form of free trade agreements or outward processing programmes.

Table 2.7 Leading Exporters of Textiles and Clothing, 1990–2002

Exporters	2002	2002 / 1990	Exporters	2002	2002 / 1990
Textiles		Percentage point changes in world share	**Clothing**		Percentage point changes in world share
EU (15)	34.2%	-14.5%	EU (15)	25.1%	-12.6%
extra-EU	*15.2%*	*0.7%*	*extra-EU*	*8.3%*	*-2.2%*
China	13.5%	6.6%	China	20.6%	11.6%
Hong Kong, China	0.6%	-1.5%	Hong Kong, China	4.1%	-4.4%
United States	7.0%	2.2%	Turkey	4.0%	0.9%
Korea	7.0%	1.2%	Mexico	3.9%	3.3%
Chinese Taipei	6.3%	0.4%	United States	3.0%	0.6%
Japan	4.0%	-1.6%	India	2.8%	0.5%
India	3.7%	1.6%	Bangladesh	2.1%	1.5%
Pakistan	3.1%	0.5%	Indonesia	2.0%	0.4%
Turkey	2.8%	1.4%	Korea	1.8%	-5.4%
Indonesia	1.9%	0.7%	Thailand	1.7%	-0.9%
Mexico	1.5%	0.8%	Romania	1.6%	1.3%
Canada	1.4%	0.7%	Dominican Republic	1.4%	0.7%
Thailand	1.3%	0.4%	Tunisia	1.3%	0.3%
Switzerland	0.9%	-1.6%	Philippines	1.3%	-0.3%

Source: WTO, International Trade Statistics 2003. Note: Data for India and Dominican Republic refer to 2001 instead of 2002.

58. Throughout the period, MFA quotas and trade preferences have played a prominent role in the reconfiguration of trade flows. As a result, Mexico increased its world export share by almost eight fold between 1990 and 2002 (see Annex Table 2A.4) and became the second largest supplier to the United States, behind China. Turkey also increased its world share during the same period and is now the second largest supplier to the European Union. Romania and the Dominican Republic, which were virtually absent from export markets in the 1980s, have by 2002 joined the group of the fifteen largest clothing exporters by taking advantage of preferential arrangements with, respectively, the European Union and the United States.

59. Despite the trade restrictiveness of quantitative restrictions, the OECD import share of clothing products originating from developing countries jumped from 40 to 65% between 1980 and 2000 (Annex Table 2A.9) and from 20 to 30% for textile imports (Annex Table 2A.8). The impact of MFA–driven triangular manufacturing, various free trade agreements, and outward processing programmes on OECD imports is visible in the variations of import shares of individual suppliers. They broadly parallel the changes in world export shares discussed above. During the last twenty years, the destination of OECD exports of textiles has followed two opposite trends. The share of exports moving within the OECD region increased during the 1980s and reached 80% in 1990. Afterward, this share gradually declined and reached 70% in 2001 (Annex Table 2A.6).

60. Three distinct geographical trade patterns have emerged. The Asian Pacific region centres on key supply chain players, *i.e.* Hong Kong (China), Chinese Taipei, Korea and Japan, and involves a network of sub-contract suppliers located in China and other low-income East Asian countries. In Europe, the

European Union has emerged as the region's supply chain manager and at the periphery the Central and East European Countries (CEEC) and Mediterranean countries as the outward processors. Finally, in North America, the United States is the supply chain manager and peripheral outward processors are found in Mexico and the Caribbean region.

61. Each exporting country has pursued its export interests on the basis of its own combination of factor endowments, cultural affinities, geographical proximity to large markets and preferential access networks. As an illustration, Annex Table 2A.5 gives the evolution in clothing export earnings for 33 countries for the period 1990–2002, and the evolution of the respective share in the country's total exports accounted for by clothing. It also identifies the countries that are benefiting from duty-free access to the European Union and the United States and qualifying countries under outward processing programmes in the European Union, the United States and Australia. The countries that have realised the largest proportional increase in their shares of clothing exports in total exports are listed in declining order. Jordan appears to have made the largest proportional gain by increasing its share in its total exports by a factor of 12.9 during the period 1990-2002, and Honduras' share increased by about five fold during the same period.

62. Among the 18 countries that have increased their clothing shares in total exports, all except three countries, Sri Lanka, Indonesia and Macau (China) have enjoyed preferential access under outward processing programmes or free trade arrangements to the markets of the European Union, the United States or Australia. Ten of those 18 countries now have export shares exceeding 30% of their total exports. Such a high level of export dependency on a single sector is not healthy and many of these countries are particularly vulnerable in the post–ATC with the reconfiguration of the global sourcing channels based on cost competitiveness, as opposed to quota allocations during the MFA period.

III. Trade Policy Measures

63. Trade policy measures have had a major impact on production decisions in textiles and clothing and on trade flows. MFA restrictions have contributed to the international fragmentation of the supply chain by accelerating the diversification of supply to the benefits of less competitive producers when quota–constrained suppliers sub–contracted clothing assembly processes in third low–cost countries. The scheduled elimination of quantitative restrictions at the end of December 2004 is challenging the global sourcing channels established during the MFA period and represents a systemic change in trade policies. In the meantime, stakeholders are reassessing their global sourcing channels not only on the basis of price competitiveness but increasingly on the dynamics of inter-firm networks that can react quickly and can meet the ever stringent specifications required by large retail groups in terms of production quality and social requirements.

64. The deadline for the quota elimination coincides with a key stage of negotiations under the Doha Development Agenda (DDA) where changes to existing WTO rules or new WTO disciplines to be agreed will also have an impact on international trade in the textiles and clothing. During these negotiations, WTO members have an opportunity to deal with remaining sources of trade protection and trade distorting measures with a view to establish a framework of multilateral disciplines that effectively improves competitive conditions in all economies and offers improved market opportunities.

65. Several decades of trade liberalisation in other industrial sectors have provided commensurate benefits to the world economy. Similar economic benefits would arise in tackling remaining trade restrictions affecting trade in textiles and clothing. Part VI reviews the economic literature on the impact of trade liberalisation reforms in these sectors and shows considerable variation in the expected annual welfare gains, ranging from USD 6.5 to 324 billion, or 0.02 to 1.49% of world GDP. In what follows, the remaining sources of trade protection and trade distorting measures in OECD and non-OECD countries are

assessed. The roles that regional trade agreements and other preferential trade arrangements are likely to play in the post–ATC period are also reviewed.

A. High Bound Tariffs are One Side of the Coin

66. Following the full implementation of the Uruguay Round commitments, bound rates in textile and clothing are high in both developed and developing countries and remain an important impediment to achieving greater production efficiency and the realisation of welfare gains (Annex Table A2.10). Bound tariffs for textiles and clothing average 9% in the Quad (versus 4.4% for all industrial products),[12] 12% in developed countries as a whole and 29% in developing and transition economies.[13] When tariff levels are distinguished for textiles, clothing and manufactured products, as shown in Table 2.8 for 38 selected countries, tariffs are systematically higher on textiles than on manufactured products, and tariffs imposed on clothing are higher than those on textiles. Annex Table 2A.10 shows a further breakdown of bound tariffs for five stages of the supply chain, beginning with raw agricultural products, vegetable fibres, man-made filament yarns, textiles, and finally clothing products. While there are no identical tariff structures among countries, those with the lowest tariffs exhibit escalating tariffs, whereas uniform tariff structures are found in countries applying the highest tariff levels.

67. There are advantages and disadvantages with both escalating and uniform tariff structures. The advantage of a uniform tariff structure is that it makes the tariff regime more transparent and relatively easy to administer. Its disadvantage is that the costs of tariffs imposed on inputs are further increased by manufacturer margins and domestic taxes that are ultimately born by consumers. Tariffs on inputs act as taxes on domestic production and hinder the competitiveness of domestic production that relies on imported inputs. The opposite can be argued in instances of escalating tariffs. However, the assessment of tariff structures can only be meaningful when all tariff reduction schemes are duly taken into account. The impact of bound MFN tariffs is moderated by various tariff reduction measures, including the use of applied tariffs at lower levels than bound duties, preferential trade agreements, and various forms of tariff relief programmes.

High Bound and Applied Tariffs Almost Everywhere

68. Applied tariffs in 1996 by stages of production are remarkably lower than bound tariffs for several countries, many of which are OECD countries, such as Korea, Mexico, Australia, Turkey, Iceland and Switzerland (Annex Table 2A.11). Lower applied rates often reflect unilateral tariff reduction programmes implemented to stimulate domestic competition and to speed integration efforts in the world economy. However, they are less predictable as they can be ratcheted up to bound levels whenever domestic suppliers consider competition conditions to be unbearable.[14] Despite unilateral liberalisation efforts, average applied tariffs on textiles and clothing remain high compared to average tariffs imposed on manufactured products for the overwhelming majority of countries (Table 2.8).

Table 2.8 Simple Average Tariffs, Selected Countries

Region	Country	Manufactures	Textiles	Clothing
OECD countries		6.2	9.4	16.1
	Australia	5.4	9.9	20.7
	Canada	4.9	10.7	18.4
	European Union	4.4	7.9	11.4
	Japan	2.9	6.5	11.0
	Korea	8.0	9.4	12.4
	Mexico	17.3	20.5	34.4
	New Zealand	3.1	2.4	13.7
	Turkey	5.9	8.6	11.8
	United States	4.0	9.1	11.4
Developing countries		13.5	18.1	23.0
Asia				
	China	9.6	9.7	16.1
	Chinese Taipei	6.4	8.3	13.1
	Hong Kong, China	0.0	0.0	0.0
	Indonesia	9.0	12.6	18.1
	Malaysia	9.9	16.7	19.6
	Philippines	7.4	10.7	19.2
	Singapore	0.0	0.0	0.0
	Thailand	16.1	18.7	39.7
South Asia				
	Bangladesh	22.1	30.2	..
	India	34.1	39.0	40.0
	Sri Lanka	8.0	3.4	11.0
Latin America				
	Argentina	16.1	20.1	22.9
	Bolivia	9.6	10	10.0
	Brazil	16.8	20	22.9
	Chile	9.0	9.0	9.0
	Colombia	12.1	18.0	19.9
	Costa Rica	4.8	8.3	13.8
	Dominican Republic	14.6	20.5	30.6
	El Salvador	6.9	17.0	23.9
	Jamaica	5.6	3.2	19.4
	Paraguay	13.7	19.5	22.4
	Peru	13.3	17.0	19.3
	Uruguay	14.7	20.1	22.9
	Venezuela	12.3	18.0	19.9
Africa				
	Algeria	24.1	35.3	44.5
	Egypt	22.3	42.0	39.7
	Morocco	28.2	38.2	49.6
	Tunisia	28.7	38.0	42.6
	Sub-Saharan Africa	16.8	21.8	34.5

Note: The tariff rates for the most recent year for which data was available; Manufactures are SITC 5-8 less 68; textiles (65); and clothing (84).
Source: UNCTAD (2002), World Integrated Trade Solution Database.

Tariff Escalation and Tariff Peaks

69. Another characteristic that differentiates bound and applied rates is that the uniform structure of tariffs has practically vanished for applied rates, except for countries that have adopted duty–free access in a comprehensive manner, such as Hong Kong (China), and Singapore. At one extreme, steep tariff escalation affords a high degree of effective protection and can effectively shield domestic products from foreign competition. At the other extreme, inverted escalation or de-escalation with higher tariffs on inputs than on finished products hinders the competitiveness of finished products that rely on imported inputs. The trade-offs vary for each country depending on its factor endowments, production specialisation on fibres, textiles or clothing and degree of competitiveness.

70. Large tariff escalation and thus high effective protection is revealed by the incidence of tariff peaks that are notable for textiles and clothing, as shown in Table 2.9 – drawn from a recent tariff study jointly made by UNCTAD and the WTO (2000). The tariffs used in this study were the final most–favoured nation (MFN) rates resulting from the Uruguay Round, or the most recent rates under applicable Generalised System of Preferences (GSP), or suspended MFN rates, whichever is lower.

71. Peak tariffs can be defined in various ways, such as three times the average tariffs on industrial products or above a fixed threshold rate. The UNCTAD/WTO study uses a 12% threshold rate, which is incidentally slightly below the 13.2% rate obtained by applying the three times rule for the Quad countries, *i.e.* 4.4% multiplied by three. Problems with tariff peaks are partly related to the fact that they are masked in measurements of average tariffs for an entire sector or for production segments and thus are less transparent. They are also harder to administer and prone to incorrect customs declarations and discretionary interpretations in customs administrations where integrity concerns prevail.

72. Among Quad countries and four other large trading countries, the highest incidence of tariff peaks in the textile and clothing sectors occurs in three developing countries where peak tariffs are concentrated in the 20-29% tariff range. There is no incidence of tariff peaks in Korea and very few in the European Union and Japan. In Canada and the United States, there is a large incidence in the 12-19% tariff range and, for both countries, tariff peaks in textiles and clothing account for more than 50% of their total peak tariffs.

Table 2.9 Distribution of Tariff Peaks in Textiles and Clothing

Country		Post-Uruguary Round MFN Rates*				Number of peaks	Share in total peaks
		12-19%	20-29%	30-99%	>=100%		
Korea	Textiles					0	0.0%
	Clothing					0	0.0%
EU	Textiles	3				3	0.2%
	Clothing					0	0.0%
Japan	Textiles	5			6	11	1.2%
	Clothing					0	0.0%
Canada	Textiles	177	7			184	31.9%
	Clothing	120	5			125	21.7%
United States	Textiles	184	25	1		210	23.0%
	Clothing	170	69	8		247	27.1%
Malaysia	Textiles	12	395	140		547	18.6%
	Clothing		235	3		238	8.1%
Brazil	Textiles	542	81			623	11.4%
	Clothing		238			238	4.5%
China (mfn 1998)	Textiles	181	219	292		692	16.1%
	Clothing		24	259		283	6.7%

Note*: Post-UR MFN rates or most recent GSP rates or suspended MFN rates, whichever the lower.
Source: UNCTAD and WTO (2000).

Tariff Relief Measures

73. Many countries have general provisions in their respective customs tariff laws that grant duty-free or reduced rates for machinery, raw materials or inputs, so as to encourage downward processing. The result of such practice is tariff escalation. For example in Australia, textiles are imported at duty-free or low rates under various by-laws, including the Tariff Concession Orders. The Australian Industry Commission estimated that over 60% of all textile imports entered duty-free under these by-laws in 1995–

96.[15] In Canada, with the implementation of NAFTA, duty drawback and remission programmes conditional on domestic production levels and sourcing requirements were terminated in 1997 but six non-performance–related remission orders due to expire on 31 December 2004 were introduced in mid–1997.[16] In India, duty–free imports of textile machinery are subject to an export obligation of six times the imported value to be realised over a fixed period of time.[17] Information about national duty-remission programmes applicable to textiles and clothing is sparse and obtaining updated information can be a time-consuming task. At the outset, finding more examples may not necessarily add much to the stated argument that such programmes exist and moderate the impact of high bound and applied tariffs.

Large Consumer Benefits Come with Tariff Liberalisation

74. New Zealand commenced a significant unilateral tariff reduction programme in several sectors in 1988 and is reaping large consumer benefits as a result. Tariffs on clothing dropped from a range level of 40–65% in 1988 to 19% in 1999 and tariffs on textiles dropped from 40 to 12.5% during the same period. The NZ Institute of Economic Research estimates that the typical New Zealand household gained NZD 1 ,140 in 1998 as a result of the tariff cuts in the cars, household appliances, shoes and clothing sectors.[18]

75. In Sweden, MFA restrictions were lifted in 1991 in the context of a deregulation package. However, restrictions were re-introduced in a slightly more stringent form in January 1995 when Sweden acceded to the European Union. During the interim period, import competition strengthened significantly and clothing prices fell by an estimated 8–10%.[19] The composition of imports changed dramatically following the elimination of MFA restrictions but did not change significantly after their re-introduction in 1995. The EU's share of clothing imports dropped from 65 to 45% between 1990 and 1994, and picked up to 46% in 1996. China was the main beneficiary of the liberalisation process with a gain of 16 percentage points in total Swedish clothing imports, followed by India with 2.5 percentage points gain and a minimal gain for Bangladesh. Shortly thereafter, China's share fell to 16.3% of total Swedish imports and India's share receded to 3.1%. It is Portugal that has lost the most with its import share falling by half from 16.8% in 1990 to 8.4% in 1996. The less dramatic trade impact following the re-introduction of MFA restrictions is partly explained by the prevailing weak macroeconomic environment in the mid-1990s. Arguably, Swedish clothing buyers had developed new business relations with Asian and East Asian suppliers during the interim period that contributed to keeping more stringent competitive conditions in the Swedish market after 1995. As noted earlier, Part VI provides a comprehensive review of the rich economic literature on the welfare gains associated with trade liberalisation reforms in textiles and clothing.

B. Preferential Trade Arrangements are Another

76. In parallel with the phasing out of MFA restrictions, a complex web of preferential trade arrangements has emerged. Some 250 regional trade agreements (RTAs) have been notified to the GATT/WTO as of June 2002, of which 129 were notified since 1995, and only five WTO Members at that time were not party to a RTA, *i.e.* China, Hong Kong (China), Japan, Macau and Mongolia, (WTO, 2002). RTAs are primarily Free Trade Agreements (FTAs) and Customs Union Agreements that provide for tariff- and quota-free trade among respective beneficiary countries. In 2002, it was estimated at 43% of world trade was covered under RTAs and this percentage will grow to 55% by 2005 if all announced RTAs are effectively implemented (OECD, 2002a). In addition, there are additional preferential arrangements of direct relevance to textiles and clothing, such as the Generalised System of Preferences (GSP) for developing countries and outward processing programmes (OPP) in which textile products are temporarily exported for final assembly into low-wage countries and are subsequently re-imported as clothing articles under preferential treatment. Examples of preferential trade arrangements offered by several economies are presented in Box 2.1.

Box 2.1 Preferential Trade Arrangements

The following examples of preferential arrangements concluded by the European Union, Japan and the United States give an indication of their diverging scope and the large number of trading partners that are beneficiary countries in respective arrangements.

The EU has gradually built a pan-European free trade area covering 31 countries that provides duty-free access for all manufactured products and since 2002 for duty- and quota-free trade for textiles and clothing, along with cumulative rules of origins.[20] Since March 2001, 49 least developed countries have gained duty- and quota-free access to the EU textile and clothing markets under the programme *Everything But Arms* (EBA). And, under the EU GSP programme, GSP benefits for textiles and clothing are generally limited to a 20% margin of the MFN rates.

Japan has now one free trade agreement with Singapore; another with Mexico will enter into force in January 2005 and negotiations are proceeding with Korea. Under the Japanese GSP regime, industrial goods, including textiles and clothing, originating from developing countries are generally reduced at half the applicable MFN rates and are admitted duty-free from LDCs. Japan has no country-specific outward processing programme. Japan has a general MFN provision to exclude the value of its goods sent abroad for further processing from the customs value of the returning products.

Within the Western Hemisphere, NAFTA entered into force in 1994 and was instrumental in spearheading Mexico as the world's fourth largest clothing exporter in 2001. Also in 1994, the process was launched to integrate 34 economies into the Free Trade Area of the Americas (FTAA) and to complete the negotiation by 2005. The FTAA could supersede a complex web of sub-regional free trade agreements concluded in the meantime. Since May 2000, the United States under the *African Growth Opportunity Act* (AGOA) provides growth opportunities for eligible Sub-Saharan Africa countries (38 in early 2003). Under the *Caribbean Basin Trade Partnership Act* (CBTPA), the United States provides growth opportunity for duty- and quota-free clothing imports made from US textiles for 14 eligible countries. Moreover, under the Andean Trade Promotion and Drug Eradication Act (ATPDEA) similar benefits are provided to Colombia, Peru, Bolivia and Ecuador.

Although both the AGOA and CBTPA provide for improved trade opportunities in many sectors for beneficiary countries, their textile and clothing provisions are structured in such a manner that makes them similar to outward processing programmes. However, the use of third country fabric is temporarily permitted for LDCs that are beneficiaries under AGOA until the end of September 2004.

Since January 2003, Canada provides duty-free access under all tariff items for imports from LDCs, except for outside of quota-tariff items for dairy, poultry and egg products. Canada also introduced multiple formula rules of origin for textile and clothing products originating from 48 LDCs that allows full cumulation of originating inputs from LDC or GSP beneficiary countries. Under the rules of origin, LDC imports must contain materials of LDC, GSP or Canadian origins that represent no less than 25% of the ex-factory price of the goods to confer origin.

Australia also undertook commitments to offer duty-free and quota-free access to all exports originating from LDCs as of July 2003.

77. Depending on the scope and depth of respective RTAs and preferential arrangements, they provide improved access for beneficiary countries and accordingly influence production, trade and investment decisions. Each arrangement is associated with an economic rent that is not available to non-participating countries. The emergence of regional patterns of trade in textiles and clothing mentioned earlier is partly attributable to these networks of preferential arrangements. Under NAFTA, Mexico became the second largest suppliers to the United States; Turkey became the second largest suppliers to the European Union under their customs union; and beneficiary countries under the Caribbean Basin Initiative have increased their share of total US imports from 11.9 to 33.2% between 1990 and 2001 (OTEXA, 2001).

78. As examined below, the scheduled elimination of bilateral quotas will reduce the attractiveness of outward processing programmes and, conversely, increase the relative attractiveness of other arrangements, such as RTAs and GSP regimes. The magnitude of economic benefits accruing under these arrangements varies greatly because of their differences in scope and respective regimes of rules of origin that confer preferential access.

Reduced Attractiveness of Outward Processing Programmes

79. Outward processing transactions involve the temporary export of textiles or pre-cut textiles to low-wage countries for final assembly and re-imports under preferential provisions, usually with customs tariffs imposed only on the value–added of foreign processing and partial or total exemption from MFA quotas. Preferential access is often conditional upon the use of textiles made in the OPP-initiator country. Recently, the tendency has been to offer duty-free entry for OPP transactions (Box 2.1).

80. For low-wage countries, the assembly of imported textiles into clothing is a simple form of industrial activity and an OPP will often act as a booster for their export-oriented strategies by giving them instant access to high–quality inputs and to foreign distribution networks. By being involved in the process of OPP exports, suppliers gain knowledge of working with international standards and meeting quality requirements, and may benefit from transfers of technology (Senior Nello).[21] OPP status for offshore centres can accelerate the process of knowledge accumulation and efficient management of the supply chain.

81. For developed countries, outward processing transactions strengthen the competitive position of domestic suppliers by enabling them to transfer the labour–intensive sewing activities in low-wage costs countries. However, domestic clothing suppliers are constrained in their procurement in instances where they are required to use domestic textiles. This may not be the most appropriate nor the least cost approach. It also provides a protected market for domestic textile suppliers, thereby impeding foreign competition from a significant share of the domestic textile markets. In 1995, outward processing trade accounted for 15% of the EU's external trade in textiles and 70% of transactions originated from CEECs. In the United States, OPP imports increased from less than USD 6 billion in 1994 to 20 billion in 1999, representing 24% of total clothing imports.[22]

82. Many countries have developed similar programmes. For example in Japan, there is a general provision to exclude the value of Japanese goods sent abroad for further processing from the customs value of the re-imported products.[23] This provision is applied on an MFN basis without country restrictions. In Australia, the assembly stage of clothing manufacturing is sub-contracted in China, Philippines, Vietnam and Indonesia on the basis of outward processing transactions.

83. Under normal circumstances, without the distorting influence of MFA quotas set on a bilateral basis, outward processing transactions would make economic sense if the cost savings associated with low-wage assembly and tariff reductions exceed the inherent additional costs of production fragmentation, namely: two-way shipments; longer and larger inventory; and added co–ordination is needed to manage the fragmented supply chain. Moreover, outward processing transactions would occur in the offshore centres where total logistical and transportation costs are the lowest. Comparing total logistical and transportation cost between offshore centres would indicate which offshore is better positioned to engage in OPP transactions. Furthermore, comparing the OPP–related cost with the logistical and transportation cost for competing imports from an integrated supplier, *i.e.* whose supply chain is not internationally fragmented, would indicate whether outward processing transaction are economically attractive relative to non-OPP transactions. Cost comparisons are shown in Table 2.10 for several offshore suppliers involved in US outward processing transactions and the OPP-related costs are compared with non-OPP transactions originating from China subject to the regular MFN duty rate.

Table 2.10 Cost Competitiveness under Outward Processing Programmes

(in % of import values)	Transit in Days [1]			Time, Freight and Duty Costs				Advantage
Country of origin	**Outbound from USA**	**Inbound for USA**	**Transit Days**	**Time factor 0.5% / Day**	**Freight Cost**	**Customs Duty**	**Total Cost**	**Relative to China**
CBTPA countries								
Dominican Republic								
Two-way shipments [2]	5	5	10	5.0%	3.4%	0.0%	8.4%	15.7%
MFN shipment		5	5	2.5%	1.7%	12.3%	16.5%	7.6%
Colombia								
Two-way shipments [2]	9	10	19	9.5%	3.4%	0.0%	12.9%	11.2%
MFN shipment		10	10	5.0%	1.7%	12.3%	19.0%	5.1%
AGOA recipients								
South Africa								
Two-way shipments [2]	34	25	59	29.5%	10.0%	0.0%	39.5%	*-15.4%*
MFN shipment		25	25	12.5%	5.0%	12.3%	29.8%	*-5.7%*
Kenya								
Two-way shipments [2]	62	61	123	61.5%	9.8%	0.0%	71.3%	*-47.2%*
One-way shipment [3]	n.a.	61	61	30.5%	4.9%	0.0%	35.4%	*-11.3%*
MFN shipment		61	61	30.5%	4.9%	12.3%	47.7%	*-23.6%*
Non-OPP recipient								
China								
MFN shipment		12	12	6.0%	5.8%	12.3%	24.1%	-

Note 1: The outbound and inbound periods are average seaborne shipping and customs clearance periods calculated by ShipGuide.com. For Mexico and Canada, the transit periods are estimates by the Secretariat for rail shipments and customs clearance.
Note 2: The average US customs duty on clothing imports was 12.3% m.f.n. in 2002. Under various OPP-type programmes, the USA grants duty-free entry on imports of clothing articles assembled abroad from components produced in the USA.
Note 3: Until the end of September 2004, duty-free entry is granted on clothing imports originating from AGOA's least developed countries that are assembled from third country textiles. The reported transit period is underestimated since no time period is factored in for the importation of textiles from third countries.
Source: USAID (2003) for the transit data based on ShipGuide.com; OECD Secretariat calculation for freight costs based on data from the U.S. Department of Commerce, Bureau of the Census; and Hummels (2000) for the time factor per day.

84. The OPP–related cost is the sum of: (1) the transit cost measured at the rate 0.5% of import values for each transit day which is the daily transit cost estimated by Hummels (2000); (2) the freight cost incurred in respective transportation routes; and (3) the relevant customs duties.[24] The last column measures the net cost advantage or disadvantage of respective countries relative to competing imports from China subject to the regular MFN duty rate. It shows that OPP transactions provide a net cost advantage of 15.7% for the Dominican Republic; 11.2% for Colombia; –15.4% for South Africa; and –47.2% for Kenya over competing Chinese imports. For geographically remote suppliers, such as South Africa and Kenya, two-way outward processing transactions are the least competitive transactions of all trade possibilities.

85. With distance and time acting as trade barriers, outward processing transactions designed to encourage the final assembly of clothing articles from imported textiles into low-wage offshore centres remain economically attractive only if the margin of preferential duty exceeds the difference between the OPP–related cost and the logistical cost incurred for competitive suppliers. In other words, outward processing transactions are only attractive for offshore centres that are in close proximity with OPP-initiator countries and proximity is a function of both geography and efficiency in transportation infrastructure.

86. In the post–ATC period, the inherent vulnerability of production fragmentation in remote offshore centres will be exposed and the latter will have the difficult task to compete with the most efficient and integrated suppliers. OPP recipients that have gradually developed their expertise are conscious of their

vulnerability and are requesting improved trade opportunities to assist them in competing with the most competitive suppliers. Most requests concern the negotiations of comprehensive RTAs with developed countries and/or improved access through more liberal rules of origin applied under GSP programmes. Both of these are discussed in the following sub-sections.

Trade Opportunities under Regional Trade Arrangements

87. Turkey and Mexico have benefited from, respectively, a customs union with the European Union and a free trade agreement under NAFTA. These arrangements have required deep integration commitments by Turkey and Mexico and created improved opportunities to their suppliers to move along the supply chain by focussing on higher value-added production segments. For Mexico, NAFTA prompted a qualitative transformation with the emergence of new production facilities in higher value-added activities in textile finishing, in pre–assembly and post-assembly activities (see Box 2.2). Moreover, the close proximity to the United States with road and rail access (see Part V) made it relatively easy and inexpensive to move manufacturing goods back and forth between the two countries. Despite NAFTA, the competitiveness of Mexican textiles and clothing was recently eroded when improved trade opportunities were offered by the United States under the Trade Development Act and by Asian competitors. As a result, Mexican textile and clothing machinery imports fell back to pre-NAFTA level in 2002, reflecting the prospective competitiveness of Mexican suppliers (Table 2.11).

Box 2.2 A New World Blue Jeans Capital Emerged in Mexico with NAFTA

Gereffi, Martinez and Bair (2002) have made an in-depth analysis of the North American apparel industry after NAFTA and argued that NAFTA has dramatically increased the export dynamism of the Mexican clothing industry and promoted the consolidation of clothing export-production centres. To illustrate this transformation, they concentrated their analysis of the Torreón region, which has been called "The New Blue Jeans Capital of the World". Between 1993 and 1998, Torreón's blue jeans production jumped from five hundred thousand pairs a week to four million pairs.

Several factors have contributed to this dynamism in producing blue jeans primarily for exports. Although not located in the immediate US border region, where most *maquiladoras* are prominent, the Torreón region is at about four hour drive to the US borders and has a long tradition of cotton textile production that began in the late nineteenth century. During the period of import-substitution that characterised the Mexican economy from the 1940s through the 1970s, the domestic jeans market was dominated by Torreón's suppliers and several had developed their own brands, *e.g.* Jesus and Medalla Gacela. To survive through evolving economic circumstances, Torreón's suppliers underwent significant transformation by moving from producers for the domestic market to *maquiladora* sub-contractors for US manufacturers, and later to *full-package* exporters with considerable backward and forward linkages to the local economy. This transformation was influenced by four major factors: (1) the peso devaluations; (2) the implementation of NAFTA; (3) the presence of new lead buyers, especially large retailers and brand marketers; and (4) the dynamism of the regional cluster of expertise.

The Mexican peso crises of 1982, 1985 and 1988 brought hyperinflation and forced jeans producers to redirect sales to the export markets. Although, the quality of their products was not up to international standards, they survived by assembling imported textiles as *maquiladora* sub-contractors for US manufacturers (under 807/9802 production sharing programmes or OPP). In the process, their manufacturing skills in designing, cutting, finishing and marketing remained idle as their activities concentrated on sewing. However, this increased dependency on US manufacturers has enabled Mexican suppliers to manufacture quality products and to deliver them in a timely fashion. The December 1994 peso crisis brought a devalued peso, almost one year after the entry into force of NAFTA, and further enhanced the attractiveness of Mexican production.

With NAFTA, the trade rules had changed which meant that all activities of the supply chain, not only sewing, could be performed in Mexico. With significant production cost differential between the United States and Mexico, a large number of US clothing firms relocated in Mexico, which resulted in the loss of 302,600 jobs in the United States and conversely the creation of 294,800 jobs throughout Mexico between 1995 and 2000. Quickly, new activities in the production of jeans destined for exports were performed in Mexico, including cutting, finishing and even distribution.

Box 2.2 A New World Blue Jeans Capital Emerged in Mexico with NAFTA (continued)

The wider trade opportunities under NAFTA also enticed US retailers and brand marketers who require low-cost full-package suppliers to complement the activities that they themselves carry out, *i.e.* design, distribution and marketing. These new lead buyers have brought new aspects that have transformed the production patterns. First, new lead buyers have required high-volume orders which have encouraged Mexican firms to expand their capacity. Second, Mexican suppliers were asked to produce higher value products. Finally, the large retailers and brand marketers did not want their names associated with alleged exploitative and unsafe working conditions in *maquiladoras*. As a result, they have imposed their codes of conduct on full-package suppliers which have prompted improved working conditions among Torreón suppliers.

Finally prior to NAFTA, the Torreón region had developed a diversified expertise and regional suppliers had demonstrated flexibility in adapting during difficult periods. Hence, a cluster of diversified expertise was in place to manage the integrated relationships between the Torreón cluster and lead buyers. While attracting the right kind of lead retailers, brand marketers and manufacturers to the Torreón regions was the prerequisite to move away from *maquiladora* production towards a full-package model, the dynamism of local entrepreneurship played a key role in reaping the opportunities that NAFTA have created.

As employment in the Torreón apparel suppliers grew from 12 to 65 thousand between 1993 and 1998, higher wages and labour shortages have encouraged some manufacturers to move their assembly operations to the southern part of Mexico in rural communities with few alternative sources of employment. While NAFTA has promoted the consolidation of regional clusters of textile and clothing expertise in Mexico, it further brought the *maquiladora* production model to rural and southern Mexico.

88. For Turkey, its customs union with the European Union entered into force in 1996 and paved the way for improved opportunities for further integrating the Turkish textile and clothing markets into the larger European markets. Between 1995 and 1998, textile and clothing machinery imports in Turkey almost doubled compared to the previous four year period, and even exceeded machinery imports by China in three consecutive years, 1996 to 1998 (Table 2.11). The enlarged competitive environment has allowed Turkey to build upon its established expertise and entrepreneurial skills. Between 1999 and 2001, macroeconomic imbalanced with high inflation rates in Turkey have had a dampening effect on the overall economy and in particular in the textile and clothing sectors, as reflected in lower levels of machinery imports.

Table 2.11 Textile and Clothing Machinery Imports, 1994–2002

(USD million)	Turkey	Mexico	China	World
2002	1 361	414	2 693	17 671
2001	594	508	2 051	17 948
2000	869	835	1 444	19 242
1999	498	782	958	17 399
1998	1 226	791	906	20 163
1997	1 823	778	1 645	22 888
1996	2 240	522	2 042	23 335
1995	1 503	349	2 146	24 240
1994	586	506	1 887	21 514

Source: UNCTAD.

89. The Turkish bilateral trade surplus in textiles and clothing with the European Union reached USD 13.6 billion in 2002, up from USD 9.1 billion in 1995, the year prior the customs union. In terms of the composition of the trade surplus, Turkey maintains a small trade surplus in bilateral textile products and a huge surplus in clothing products. Despite the removal of quotas on several products by the European Union in January 2001, as scheduled under the ATC, the resulting intensification of competition from China and other suppliers did not seem to displace Turkish exports to the European Union. On the contrary, Turkish clothing exports increased by 17.4% between 2000 and 2002, and its trade surplus increased from USD 10.7 to 13.6 billion during the period. In 2002, Turkey machinery imports nearly

doubled compared to 2001, reflecting improved macroeconomic conditions and must likely improved confidence about the prospects of Turkish textile and clothing industries.

90. Although production and trade opportunities are created under comprehensive RTAs, as attested in the cases of Mexico and Turkey, certain domestic factors have played instrumental roles for their sectors to reap these opportunities. Among these factors are: the ability to attract the right kind of lead retailers, brand marketers and manufacturers; a pre–existing cluster of expertise; a striving and vibrant entrepreneurship environment; and geographical proximity to minimise the transit time of shipments during transportation. A comprehensive RTA is a necessary but insufficient condition to promote trade flows and qualitative transformation in production. As shown in Table 2.13, Israel has a long-established FTA with the United States but Israeli imports represented less than one percent of total US imports in 2003 which was slightly more than imports originating from Egypt for which there is no bilateral FTA. In the post–ATC period, comprehensive RTAs can provide a useful policy framework to underpin the development of an integrated supply chain and to facilitate economic diversification strategies, but they don't necessarily imply competitiveness. Trade access is one important factor but the factors mentioned above are equally if not more important. As discussed in the following sub-section, the regimes of rules of origin vary significantly between preferential arrangements and hence the magnitude of benefits accruing to respective beneficiary countries.

Stringent Rules of Origin for Textile and Clothing Products

91. Rules of origin (ROOs) are a necessary part of free trade agreements to preserve the preferential treatment of trade for member countries – to avoid the problem of trade deflection where imports enter into the region through the member country whose import tariff is the lowest. Specific rules of origin are often applied for sensitive products, such as textile and clothing, which make it more difficult for suppliers to achieve the specified regional content. This creates an incentive for manufacturers to source inputs from regional suppliers and may act as a trade barrier on its own. By limiting the sourcing of inputs from regional partners, ROOs may encourage a vertical integration of the production chain which may not reflect the least cost opportunities to compete effectively in a globalised environment. A further problem with specific rules of origin is that the determination of regional content for yarns, textiles and final products requiring multiple components can become so burdensome and costly for suppliers that they prefer not to use the preferential arrangements. They also entail complex tasks for customs officials who are required to verify relevant documentation. The cost of the formalities needed to determine the origin of products was estimated to amount to about three percent of the value of imports (UNCTAD, 2003). Within the OECD area, there are two major regimes of rules of origin applicable to textiles and clothing: the EU pan-European system and the *yarn-forward* rules of NAFTA.

92. The EU pan–European system of diagonal cumulation of origin applies virtually uniform rules of origin protocols for member countries to some 50 FTAs. Annex II to the Rules of Origin Protocol contains, for each tariff heading, a harmonised list of processing required to be carried out on non-originating materials for the manufactured product to be granted originating status. The basic rules are that of the change in tariff heading at the 4-digit level of the Harmonised System (HS) of tariff classification, but for textiles and clothing the rules are supplanted by specific technical requirements to qualify for preferential access. Brenton and Manchin (2002) note that 86% of textile product headings provide for specific technical requirements to confer regional origin and 95% for clothing headings. For clothing products, the EU rules impose not only that the sewing of textiles takes place in the qualifying area to confer origin but in addition that the fabric itself is produced in the qualifying region.

93. Through the provisions of cumulation of origin implemented in 1997, distinct RTAs were merged into a pan-European network, including the EU and EFTA, the EU and CEECs, and the EFTA and CEECs. In contrast to the previously applied bilateral cumulation, diagonal cumulation implies that producers can

use imports from any country in the zone to produce an originating product. For example, a producer in Switzerland is now able to use Polish inputs to produce goods for exports to Germany. Prior to pan–European, the segmented regimes of rules of origin seriously impeded Swiss exports of textiles to the European Union as booming outward processing trade between the European Union and CEEC required EU–originating textiles (Nell, 1998). Despite the long-standing FTA between the European Union and Switzerland (initiated in 1972 and renewed in 1994) with the EU–EFTA FTA, outward processing transactions then required the temporary exports of EU-originating goods only and thus disqualified Swiss textiles. Diagonal cumulation has solved the Swiss problem. The Swiss example shows that diagonal cumulation expands the outsourcing possibilities of inputs and promotes the vertical integration of the production chains on a larger number of countries.

94. However, the non-use of the pan-European provisions by many clothing suppliers in Poland, Hungary, Bulgaria and Romania has led Brenton and Manchin (2002) to conclude that the costs of proving origin under the pan-European regime exceeded the tariff and administrative costs of export transactions under OPP. Despite duty- and quota-free access for these countries since 1997, 35% of EU clothing imports from Poland were still carried out under dutiable OPP in 2000 and similarly for Hungary (40%), Romania (34%) and Bulgaria (45%).[25] In 1999, OPP clothing imports still accounted for more than a quarter of EU total clothing imports (Stengg, 2001).[26] These examples show that there are financial costs associated with the use of specific rules of origin to confer origin under FTAs that exporters may then elect not to take advantage of any preferential access.

95. The European Union essentially applies the same technical requirements under its GSP regime for determining the origin of textile and clothing imports originating from GSP recipients. Under the EU GSP scheme, the cumulation of origin is permitted on four distinct regions of preference–receiving countries, namely: the Association of South-East Asian Nations (ASIAN); the Central American Common Market; the Andean Group; and the South Asian Association for Regional Cooperation (SAARC). Based on trade data shown in Table 2.12, there are two salient features of the EU GSP scheme. The first is that all textile and clothing imports are eligible for duty-free and quota-free imports, in contrast with the GSP schemes in the United States and Canada – but the latter expanded his GSP eligibility scheme to all textile and clothing imports from LDCs in 2003. The second is the low but increasing utilisation rate of actual imports receiving preferential rates to eligible imports, which reached 54% in 2002. The Japanese GSP scheme resembles the EU scheme with both 100% eligibility rate for textile and clothing imports and roughly similar utilisation rates (53%). Although there was no changes in the rules of origin requirement under EBA, the increase of almost ten percentage points in the utilisation rate in 2002 (54%) is explained by rising clothing exports originating from Bangladesh and Cambodia that met the requirement (UNCTAD, 2003). It is suspected that Cambodian and Bangladeshi suppliers are making adjustment in their procurement and production mix in anticipation for the 2005 ATC deadline. By learning to work with EU inputs, they will be better positioned in 2005 to take advantage of the margin of preferences that the EU GSP scheme offers which shall help them to compete with the more efficient and integrated suppliers in China and India.

Table 2.12 LDC Utilisation Rates of GSP Schemes in Textiles and Clothing, 2001

Country	T & C Imports	Dutiable Imports	Preferential imports	Eligibility rate	Utilisation rate
Canada	91.4	85.8	2.5	3.8%	2.9%
European Union	3 259	3 187	1 447	100%	45.4%
EU-EBA, 2002	3 648	3 424	1 847	100%	54.0%
Japan	54.5	47.5	25.2	100%	53.1%
United States	3 575	3 567	13.9	0.5%	0.4%

Source: UNCTAD (2003), various Tables.

96. The general NAFTA rules of origin define the required transformation primarily in terms of prescribed changes in tariff classification, except for certain goods, such as textiles and clothing, which are being subject to additional content requirements. The basic rules of origin are known as *yarn–forward*, which requires that textiles and clothing must be produced from yarn made in a NAFTA country to qualify for the duty-free status and one category of cotton fabric are subject to stricter rules known as *fibre–forward*. They are further supplemented with additional rules depending on the products, and derogations are provided for some non-NAFTA yarns and textiles, *i.e.* the special tariff preference-level provisions (TPLs).

97. Under various US preferential trade arrangements, specific content requirements are provided to confer origin and preferential access. Under CBTPA, duty-free treatment is granted to clothing articles assembled from US-made and -cut textiles and which textiles are manufactured from US yarns. The duty-free treatment is subject to annual volume caps and there are few exceptions that permit the use of third country materials. Under AGOA, the general rule requires the use of US materials but the use of regional materials is permitted for hybrid apparel and sweaters knit-to-shape from cashmere. Moreover, AGOA's LDC beneficiaries are allowed to use third country textiles under a special provision that expires at the end of September 2004. The United States also provides GSP treatment for eligible goods to developing countries and LDCs but the list of eligible textile and clothing products is narrow which explains that less than 1% of total textile and clothing from eligible countries qualify for GSP preferential access (Tables 2.12 and 2.13).

98. The recipient countries under CBTPA, AGOA and ATPDEA are more or less restricted in their procurement to the exclusive use of US-made yarns and textiles in the context of production sharing programmes in which the sewing activity is performed abroad, *i.e.* outward processing transactions. By contrast under NAFTA, Mexico and Canada suppliers have broader procurement choices in which they can use NAFTA–origin yarns and textiles for qualifying for the duty-free access and thus can perform basically all activities of the supply chain domestically. Thus, the textile and clothing trade opportunities under NAFTA are much broader than those offered under OPP-related preferential arrangements. For these reasons, the extension of NAFTA to any OPP recipient country would provide opportunities for these countries to move up the value-added chain and to diversify their manufacturing activities.

99. Historically, it has been argued by UNCTAD (2003) and also by Brenton and Manchin (2002) that the main explanation for the low utilisation rate was mainly caused by the inability of preference-receiving countries to fully exploit the available preferences when these are subject to strict origin requirements and related administrative requirements. But the review of the utilisation rate of actual imports receiving preferential rates to eligible imports under US preferential arrangements suggests that there are other contributing factors for the difficulties that traders encounter in taking advantage of the preferential access. Table 2.13 shows considerable variations in the degree to which beneficiary countries of respective US arrangements actually benefit from them.

100. The highest utilisation rates are found for Canadian and Mexican suppliers who secured duty-free entry for more than 95% of their exports. Almost a quarter of Canadian exports and 8.4% of Mexican exports qualified for duty-free entry under special tariff preference–level provisions (TPLs) which permit the use of non–NAFTA materials under certain conditions. For Mexico, a small and declining share of exports (3.3%) was still carried out under outward processing transactions in 2003.[27] The high utilisation rate under NAFTA reflects to some extent the built-in flexibility in the rules of origin requirements that permit the use of NATFA-origin materials and the conditional use of non–NAFTA materials. There are also other contributing factors, such as: the geographical proximity of the US market which enables for short turnaround delivery period; the increasing market integration of the three economies concerned with increasingly integrated transport infrastructure and customs border partnerships; and high rate of cross-ownerships of firms.

101. By contrast, the USA–Israel FTA has a lower utilisation rate (77.9%) in spite of having rather liberal rules of origin. These are based on substantial transformation provisions with 35% value-added content requirements which are considered easier to be met than the NAFTA *yarn-forward* provisions. But, the distance between Israel and the United States and the smaller clusters of Israeli textile and clothing expertise may lend themselves to fewer inter-firm relationships between the two countries and, in turn, fewer trade transactions satisfy the content requirements. As noted earlier, US imports from Egypt are slightly below imports originating from Israel in 2003 but there is no comprehensive FTA between Egypt and the United States. The attractiveness of Egypt partly stems from the quality of its cotton fibres and its related production expertise.

Table 2.13 US Textile and Clothing Imports under Preferential Trade Arrangements, 2003

Regions and Countries	Total Imports	Preferential Imports						Non-Preferential Imports	
	(in millions)	FTA duty-free	TPLs duty-free	9802	TDA 2000	GSP	% of Total	MFN dutiable	% of Total
Free Trade Agreements									
NAFTA	11,058.3	9,450.3	841.5	260.7			95.4%	506.6	4.6%
Mexico	7,940.8	7,259.3	67.0	260.7			95.5%	353.9	4.5%
Canada	3,118.3	2,191.0	774.5				95.1%	152.7	4.9%
USA-Israel	621.4	483.9					77.9%	137.5	22.1%
Preferential Arrangements									
CBTPA	9,676.3			1,064.2	6,247.8		75.6%	2,364.3	24.4%
Honduras	2,507.3			172.8	1,951.9		84.7%	382.6	15.3%
Dominican Republic	2,128.4			221.8	1,720.2		91.2%	186.4	8.8%
Guatemala	1,773.4			195.1	597.0		44.7%	981.3	55.3%
El Savador	1,758.0			293.5	1,105.6		79.6%	358.9	20.4%
Costa Rica	593.9			113.1	411.7		88.4%	69.1	11.6%
Nicaragua	483.9			8.8	149.2		32.7%	325.9	67.3%
ATPDEA	1,107.4			69.2	756.5		74.6%	281.7	25.4%
Colombia	538.9			67.6	261.5		61.1%	209.8	38.9%
Peru	516.1			0.0	452.6		87.7%	63.5	12.3%
AGOA	1,527.3			0.4	1,197.1		78.4%	329.8	21.6%
Mauritius	269.1			0.1	135.0		50.2%	134.0	49.8%
South Africa	253.4			0.0	126.6		50.0%	126.8	50.0%
Madagascar	196.3			0.0	186.3		94.9%	10.0	5.1%
Kenya	188.0			0.0	176.2		93.7%	11.8	6.3%
Swaziland	140.6			0.2	126.8		90.3%	13.6	9.7%
CBTPA+ATPDEA+AGOA	12,311.0			1,133.8	8,201.4		75.8%	2,975.8	24.2%
Generalised System of Preference									
Developing countries	34,072					249	0.7%	33,823	99.3%
Brazil	459					8	1.7%	451	98.3%
Egypt	558					0	0.0%	558	100.0%
India	3,556					91	2.6%	3,465	97.4%
Indonesia	2,334					10	0.4%	2,324	99.6%
Pakistan	2,201					19	0.9%	2,182	99.1%
Philippines	1,948					10	0.5%	1,938	99.5%
Thailand	2,062					41	2.0%	2,021	98.0%
Poland	66					0	0.0%	66	100.0%
Least Developed Countries	4,190					21	0.5%	4,169	99.5%
Bangladesh	1,868					18	1.0%	1,850	99.0%

Notes: TDA 2000 is the Trade Development Act of 2000; 9802 refers to imports under tariff heading for production sharing programmes that provides for preferential duty rates for articles assembled abroad from components produced in the USA; TPLs refers textile and clothing imports from Canada and Mexico that enter under special tariff preference-level provisions (TPLs) that permit the use of non–NAFTA materials. Total US imports of textiles and apparel reached USD 77 435 million in 2003.
Source: US Department of Commerce, Bureau of the Census. For GSP data, US ITC, Trade Dataweb.

102. Under AGOA, three countries, *i.e.* Madagascar, Kenya and Swaziland, have achieved high utilisation rate exceeding 90% in 2003, as they took advantage of the special LDC provision that permits

use of third country textiles. By contrast, the other AGOA countries, *i.e.* South Africa and Mauritius, have considerably lower utilisation rates (50%). Differences in utilisation rates are indicative of what is likely to happen to AGOA's LDCs when they will no longer be able to use this special provision as of October 2004. Nevertheless, as of January 2005, there will be no more bilateral quotas that would justify OPP transactions that are uneconomical due to long transit periods (see Table 2.10). In the post-ATC period, the assembly of imported textiles in remote offshore centres represents a very vulnerable business model that will have difficulties to compete with the integrated and competitive suppliers.

103. Under the CBTPA, the utilisation rates vary significantly between participating countries, with a high rate for the Dominican Republic (91.2%) and low rates for Guatemala (44.7%) and Nicaragua (32.7%). Geographical proximity and efficient transportation infrastructure are making it easier for Dominican Republic suppliers to engage in two–way outward processing transactions and hence to achieve content requirements that qualify for preferential access. For Nicaragua and Guatemala, their ownership structure with predominant Asian investors explains to a large extent their low utilisation rates. Essentially, Asian investors have selected these countries as offshore centres that rely on imported textiles originating primarily from Asia to assemble clothing articles that are destined to the US market. These investment projects were not exclusively intended to qualify under CBTPA and large shares of outputs are subject to MFN duties when entering in the United States. In the post–ATC period, the transportation infrastructure of the CBTPA beneficiaries will play a key role in maintaining the attractiveness of their OPP business models.

104. Elsewhere, Canada significantly expanded the product eligibility under its GSP system in favour of LDCs in 2003 and, in particular, granted duty-free entry to all textile and clothing imports that meet the 25% content requirement originating from any LDCs, GSP beneficiaries or Canada, *e.g.* basically excluding textiles from developed countries. The new rules of origin allow for full cumulation of originating inputs among LDC and GSP beneficiary countries. The measure has provided a real boost to LDC clothing exports in 2003, which have jumped from USD 110 million to 298 million in 2003, and captured 42.5% of the incremental total clothing imports in 2003.[28] Two countries, Bangladesh and Cambodia, were the main beneficiary countries which together have expanded their exports by 171 million (or 38.7% of total incremental clothing imports in 2003). The other main LDC beneficiaries were in declining order: Lesotho, Haiti, Maldives, Laos, Nepal, Madagascar, Malawi, Sierra Leone and Swaziland. Altogether, the LDC's share of total Canadian clothing imports more than doubled in 2003, jumping from 3.1 to 7.5%. While the new rules of origin have undoubtedly benefited LDCs, China nevertheless captured 38.4% of incremental total imports in 2003 which is slightly less than the combined benefits that accrued to LDCs.

105. The strong responsiveness of LDC exports to the Canadian trade opportunities is partly attributable to the inherent dynamism of the global textile and clothing industries in which production schedules can be quickly adapted to respond to new demands. It partly reflects the export constraining effect of MFA–quotas, with import growth occurring on non–constrained products and on constrained products from countries with spared or unfilled quotas, mainly from LDCs. There is also a size effect involved, in the sense that the Canadian market is relatively small compared to the US or EU markets, therefore production runs for products originally destined for other markets can be easily increased and the incremental production exported to Canada. In the post-ATC period, LDCs will encounter stiffer competitive conditions from the most competitive suppliers and, as a result, they may not be able to benefit to the same extent as they did in 2003 when quotas were still constraining the most competitive suppliers.

106. In the domestic market, the Canadian initiative has raised some controversy among national clothing manufacturers who claimed unfair conditions in competing with duty-free imports; they have to pay import duties on some of their input requirements (the problem of inverted escalation of tariffs or de-escalation). Moreover, domestic manufacturers have claimed that the new rules of origin are too loose

because the largest developing countries, such as China and India, reap huge benefits by shipping textiles to LDCs which were subsequently assembled in clothing products and later exported on a duty-free basis to Canada. In response to concerns and to a number of domestic plant closures, Canada introduced a series of new tariff cuts in early 2004 to address the problems caused by inverted tariff protection and simultaneously launched a programme designed to improve production efficiency for Canadian suppliers.

107. The above overview of rules of origin applied under various preferential trade arrangement shows considerable disparities among respective regimes of rules of origin and in the utilisation rates of respective arrangements. While rules of origin are necessary elements to ensure that the preferential trade actually benefits its targeted countries, overly restrictive or cumbersome rules may not provide meaningful access and result in an under-utilisation of preferential access schemes. By contrast, liberal rules of origin may not benefit the targeted group of countries as much as originally intended and the associated preferential access can invert the structure of tariffs with consequential negative problems for national manufacturers. Moreover, liberal rules of origin do not necessarily confer competitiveness. Inherent competitive factors explain which beneficiary countries of preferential arrangements are more likely to gain the most. The distance between remote trading partners entails long transit periods for shipments and the size of the cluster of expertise in beneficiary countries seems to matter. Finally, the identity of foreign investors also appears to influence the patterns of input procurement.

108. With the imminent demise of the ATC, LDCs are increasingly vocal about their post-ATC vulnerability and are formulating demands to access developed country's markets on improved preferential basis as a means to assist them in competing more effectively with the prime contenders, *i.e.* China and India. Recognising that there are virtually no productions of high quality textiles in LDCs for the time being, any preferential access arrangements granted to LDCs must take into account that they have to use competitive textiles originating from third countries to compete on export markets. In these circumstances, it seems inevitable that in providing preferential access to LDCs, there will be some collateral benefits for the suppliers of high quality textiles. In the post-ATC period, rules of origin provisions will be at the forefront of the trade policy agenda as demands from vulnerable offshore centres will become more insistent.

C. Trade Distorting Measures

109. There are concerns about the trade distorting impact of numerous measures imposed at the borders and anti-competitive practices. Considerable concerns are being voiced about counterfeiting and piracy in fashion products which is estimated to deprive owners and legitimate licensed holders of significant business opportunities and lost revenues. Another area of concern relates to the distorting impact of production and export assistance in several countries to cotton production. Under the Uruguay Round Agreement in Agriculture, WTO Members have agreed to discipline production assistance in agricultural products and have undertaken reduction commitments in respect of their total Aggregate Measure of Support (AMS). They have also undertaken to notify the WTO of detailed information on production assistance that enters in the calculation of the total AMS. On the basis of the latest WTO notifications, the following support levels were notified for cotton production. For 1999 (the most recent year for which AMS data are available), the cotton-specific AMS payments amounted to USD 2 353 million in the United States, EUR 623.7 million in the European Union and USD 55.4 million in Brazil.[29] India, Pakistan or Turkey, respectively the third, fourth and fifth largest world producers of cotton reported no cotton-specific AMS in 1999. The alleged trade distorting impact of the US subsidies was the subject of a formal complaint by Brazil to the WTO in September 2002, where the trade dispute was dealt with under the dispute settlement procedure. Brazil argued that the subsidies are not in conformity with the peace clause negotiated under the Uruguay Round Agreement on Agriculture that protects countries' commodity-specific domestic and export subsidies from WTO challenges and countervailing duty cases provided that they do not exceed their 1992 levels. The WTO dispute settlement report is expected in mid-June 2004.

110. Other non-tariff measures concern the imposition of specific levies, costly labelling and certification requirements, export restrictions of raw materials and semi–finished products, and export licenses.[30] Within the context of the DDA, WTO members have the opportunity to level the playing field by dealing with these trade distorting measures.

IV. Concluding Remarks

111. Trade policy measures have had a major impact on production decisions in textiles and clothing and on trade flows. MFA restrictions have contributed to the international fragmentation of the supply chain by accelerating the diversification of supply. This process worked to the disadvantage of the more efficient and quota-constrained suppliers, many of which sub–contracted clothing assembly in low-cost third countries. The Arrangement also benefited less competitive suppliers. The scheduled elimination of quantitative restrictions is challenging the global sourcing channels that were established during the MFA period and represents a systemic change in trade policies. In the meantime, stakeholders are reassessing their global sourcing channels not only on the basis of price competitiveness but increasingly on the dynamics of inter-firm networks that can react quickly and can meet the ever stringent specifications required by large retail groups in terms of production quality and social requirements.

112. In the post-ATC period, the textile industry in the OECD region is likely to face intensified competition from non–OECD countries that are investing in up-to-date equipment and upgrading quality and capacity to meet higher production standards. The textile industry will continue to be challenged by product proliferation particularly in the industrial applications, and by the necessity to respond much faster to rapidly changing market conditions without compromising on quality. The way in which the industry will innovate and adopt new technology will play a crucial role in defining the relative competitiveness of textile firms. Moreover, the continuing emphasis on the development of new materials in the non-clothing textile applications will likely increase the share of man-made fibres in total fibre demand.

113. With the imminent demise of quantitative restrictions, several low-cost countries that had excelled as offshore assembly centres because they had quota allocations are exposed to the inherent vulnerability of production fragmentation. Time factors act as important trade barriers for intermediary inputs involved in an internationally fragmented production process. There are trade-offs between low-wage cost and time factors, whereas time proximity to large consumer markets provides a competitive edge for succeeding in the highly competitive, time–sensitive and fashion-oriented clothing market. Moreover, the emergence of more competitive and integrated suppliers in China is exerting considerable pressure on the vulnerable offshore centres to adjust domestic capacity towards more advanced processes and to diversify their economic activities.

114. To move along the supply chain beyond the mere assembly stage of imported inputs into more advanced activities, vulnerable offshore centres need to shift their industrial cluster of expertise from manufacturing to services–related functions, such as design, material sourcing, quality control and logistics. To pursue these avenues, national suppliers need to both establish joint structures where they can share market knowledge and offer more integrated solutions to prospective buyers.

115. Retail distribution is becoming increasingly dominated by large and lean retail organisations in the main consuming countries that are moving toward greater product specialisation, brand name products and market segmentation. The large retail groups and brand name marketers are now expanding their successful distribution models worldwide. With their sheer market size, large retail groups collect market information about the latest trends in styles and tastes and this information-integration function gives them considerable leverage in dealing with suppliers. Nevertheless, there are benefits for offshore suppliers to work in close co-operation with large retail groups and brand marketers as suppliers learn to: (1) manufacture quality products; (2) apply the buyer's codes of conduct; and (3) deliver products in a timely

fashion. The development of business relationships between national clusters of expertise and the large retail groups and brand marketers is found to play an instrumental role in facilitating the qualitative transformation of the supply chain with backward and forward linkages for the local economy.

116. For experienced suppliers with the services-related functions of the supply chain, the remaining stages in the chain value are in the development of their brand name products, the establishment of their retail distribution networks and in promoting themselves as world's design and fashion hubs. This will require the development of new services-related expertise in designing, marketing, retailing, financing and gathering of market intelligence in foreign markets. This will require foreign investment flows originating from emerging economies to sustain this strategic move.

117. In the post–ATC period, when there will be no more quota considerations to influence production and trade decisions, the inherent vulnerability of production fragmentation in remote offshore centres will be exposed and the latter will have the difficult task to compete on the basis of quality, reliability and cost efficiency. With distance and time acting as trade barriers, preferential programmes designed to encourage the final assembly of clothing articles from imported textiles into low-wage offshore centres will only remain attractive to the extent that the margin of preferential duty exceeds inefficiency costs. In these new circumstances, outward processing programmes will provide cost advantages only to these offshore assembly centres that are nearest to the OPP-initiator countries. For geographically remote centres and nearby offshore centres with poor transportation infrastructure, outward processing transactions will not offer cost advantages over non–OPP transactions originating from competing suppliers. Offshore assembly centres are conscious of their vulnerability and are seeking improved market access to developed countries' markets to assist them in competing with the efficient and integrated suppliers.

118. In the context of NAFTA, Mexico has been able to promote the consolidation of its regional clusters of textile and clothing expertise and to move along the supply chain from the simple assembly of imported components, thereby bringing backward and forward linkages to the local economy. Turkey has also built upon its established expertise and entrepreneurial skills to increase its bilateral trade surplus in textile and clothing with the European Union in the context of their customs union. While the experience of Mexico and Turkey may serve as a role model for offshore centres that aspire to maintain an export–led strategy in the future, the analysis underscores the importance of a number of contributing factors that would maximise the trade opportunities created by regional trade arrangements. These factors are: the ability to attract the right kind of lead retailers, brand marketers and manufacturers; the pre-existence of a relevant cluster of expertise; a striving and vibrant entrepreneurship environment; and geographical proximity between regional members to minimise the transit time of shipments.

119. In the post–ATC period, rules of origin provisions that confer preferential access under Free Trade Agreements and GSP programmes are likely to be at the forefront of the trade policy agenda as demands from vulnerable offshore centres for improved access to developed countries' markets become more insistent as a means to assist them in competing more effectively with the prime contenders, *i.e.* China and India. While rules of origin are necessary elements to ensure that the preferential trade actually benefits its targeted countries, overly cumbersome rules lead to an under-utilisation of preferential access schemes and, conversely, liberal rules of origin are not benefiting the targeted group of countries as much as originally intended and can invert the structure of tariffs with consequential negative problems for the domestic processing industry. In respect of requests by the LDCs, developed countries may need to consider that there are virtually no domestic sources of high quality textiles within LDCs for the time being and, in order to compete on export markets, LDCs need to use the most competitive textiles. In these circumstances, it seems inevitable that in providing preferential access to LDCs, there will be some collateral benefits for the suppliers of high quality textiles. It also means that any improvement in the rules of origin under preferential trade arrangements will increase the competitive pressure on the domestic textile industry of developed countries.

120. There is a challenging perspective ahead in the quota-free period for all textile and clothing suppliers to adapt their production mix to meet ever–changing consumer requirements in terms of design, quality and prices while setting up efficient and competitive production processes. The brunt of the adjustment pressure falls on the suppliers themselves which are better placed to evaluate how to organise production methods, to procure high quality inputs and to shift the production mix on the basis of evolving market signals. For governments, the structural adjustment challenges rest on devising a coherent textile and clothing policy framework that strengthens the capacity of domestic producers to deal with rapid change and growing competition, and to capture more effectively trade opportunities that are being created through improved market access. This process involves: dismantling trade distorting measures; improving the regulatory environment and infrastructure in essential business services, supporting the emergence of qualified pools of expertise and the adaptability of the workforce; enhancing the business environment for SMEs; negotiating improved market access for textile and clothing products; and eliminating the obstacles to the establishment of retail distribution systems in developing countries.

121. The deadline for the quota elimination coincides with a key stage of negotiations under the Doha Development Agenda that may bring changes to existing WTO rules or introduce new WTO disciplines, and as such will also have an impact on international trade in the textiles and clothing. During these negotiations, WTO members have an opportunity to deal with remaining trade protection and trade distorting measures with a view to establishing a framework of multilateral disciplines that provides for both improved competitive conditions and enhanced market access opportunities across the globe.

NOTES

[1] The WTO ATC superseded the Multi-Fibre Arrangement regime of quantitative trade restrictions when it entered into force in January 1995 and provided the multilateral trade framework applicable for trade in textiles and clothing for all WTO members. The ATC provides for the elimination by 31 December 2004 of all forms of quantitative restrictions applied to trade in textile and clothing products, including those that originated from the MFA regime. The ATC phases itself out of existence at the end of 2004. For the purpose of qualifying the period when there will be no more quantitative restrictions applied to trade in textile and clothing products, the term "the post-ATC period" is used throughout this review.

[2] According to UNCTAD (2002, p. 54-58), the 20 most dynamic products have grown at an average annual rate of 12.9%, compared to an average annual growth rate of 8% for merchandise exports. Among these, there are four textile and clothing products: silk (SITC 261) with an average annual growth rate of 13.2%; knitted undergarments (846) at 13.1%; textile undergarments (844) at 11.9%; and knitted textiles (655) at 11.7%.

[3] WTO (2003), Tables IV.56 and IV.64.

[4] The non-clothing textile applications are often referred to as "technical textiles" which are loosely defined as textile materials and products manufactured primarily for their technical performance and functional properties rather than aesthetic or decorative characteristics. Technical textiles embrace a wide range of materials, processes and applications and share overlapping interests with other materials, such as chemicals, plastics, fibre-glass and various composite materials. Technical textiles are used in multiple industries, including furniture, automotive, health and hygiene, transportation, construction and environment.

[5] More detailed insights into technology and recent trends in the production process are analysed in Part IV.

[6] See Table 3.1 in Part III dealing with labour adjustment policies.

[7] Hummels (2000) has estimated that each day saved in shipping time is equivalent to a reduction of 0.5% in import tariffs. Limão and Venables (2001) have investigated the dependence of transport costs on geography and infrastructure and estimated that a 10 percentage point increase in transportation costs typically reduces trade volumes by approximately 20%. Radelet and Sachs (1998) have also compared transportation costs for 97 developing countries and estimated that the costs of freight and insurance for landlocked developing countries was on average 50% higher than for coastal economies.

[8] In India, the industry is based on a system of decentralised production, referred to as "reservation of garment manufacture for small-scale industry" that provides a series of economic advantages to small-scale labour-intensive firms. Verma (2002) argues that these domestic measures create deep distortions in which the Indian clothing could neither attain optimal economies of scale, nor produce international quality clothing products. In the same vein, Kathuria and Bhardwaj (1998) argue that India faces formidable domestic hurdles to meet international standards and competition. These include: the reservation system for the small-scale sector; restrictive labour law; limitations on foreign ownership of the garment industry; inefficiency in transportation and customs clearance systems; and a policy bias against synthetic fibres.

[9] Annex Tables 2A.1 and 2A.2 show, respectively for the textile and the clothing sectors, the value-added per employee, the annual wage and salaries per employee, the breakdown of total cost among the costs of input material, the costs of labour, and the operating surplus for over 30 countries.

[10] China's simple average applied tariff rate for all goods was 12.1% in 2002 and it is committed to reduce its average bound rate at a level of 9.8% when all tariff reductions are implemented by 2010 at the latest (OECD, 2002b).

[11] On import purchasing procedures of SOEs, China undertook to refrain from taking any measure to influence the quantity, the value, or the origin of goods purchased or sold by SOEs. On export transactions, China is required to provide full information on the pricing mechanism of its SOEs. Moreover, it undertook to phase out limitations on the right to trade within three years after its accession to products subject to designated trading rights which include certain wool products covered under HS 51 and certain acrylic filament yarns covered under HS 54 and 55 categories.

[12] WTO (2002B), pages 4 and 5.

[13] WTO (2001), page 29.

[14] An added complexity in dealing with bound and applied tariffs, is that some developing countries make incomplete consolidation of their tariff regime, *e.g.* they do not bind all their tariff lines, therefore there have no upward limits at which they can increase their tariffs. These situations make their tariff regimes unpredictable.

[15] WTO, TPRM of Australia, June 1998, page 67.

[16] These remission orders cover imports of children's blouses and shirts; women's and girls' knitted blouses and shirts; women's and girls' blouses and shirts; saris; women's and girls' ensembles; babies' snowsuits, coats and jackets; and rainwear. WTO, TPRM of Canada, November 1998, page 93.

[17] WTO, TPRM of India, March 1998, page 58.

[18] NZ Institute of Economic Research (1999), pages 4-5.

[19] "The Taste of Free Trade – the Forbidden Fruit – in Textiles and Clothing is Sweet", a report on the Swedish deregulation of quotas and a view on EU textile trade policy under ATC to the ITCB meeting in San Salvador, June 1997.

[20] The 31 pan-European members include the EU (15), ten CEEC countries: Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovenia and the Republic of Slovakia; and Cyprus, Malta, Turkey, Iceland, Norway and Switzerland. The pan-European regime of cumulative rules of origin permits parts and components produced in any country member to be treated as domestic components.

[21] Susan Senior Nello, "Progress in Preparing for EU Enlargement: The Tensions between Economic and Political Integration", University of Siena, page 13.

[22] WTO, Trade Policy Review of the United States, 2001, Geneva.

[23] Under Article 45 of the Cabinet Order for Enforcement of the Temporary Tariff Measures Law, the reduction from customs value is equal to the value of exported Japanese goods multiplied by 1.06.

[24] Part V discusses at length the logistical dimensions in the international movement of textile and clothing products and Table 5.2 compares the logistical and dutiable cost of textile and clothing shipments for a large number of countries.

[25] Brenton and Manchin further illustrate their argument about the costs of compliance to rules of origin by noting that the EU and Turkey have a customs union and implement a common external tariff that does not require rules of origin and as a result OPP transactions are negligible.

[26] The estimation was drawn for a report prepared in 2000 by l'Observatoire Européen du Textile et de l'Habillement (OETH).

[27] During the initial NAFTA implementation period, tariffs on bilateral trade between Mexico and the United States have maintained the attractiveness of OPP transactions that provided for duty-free entry. As bilateral tariffs were gradually eliminated over a seven-year period for textile and clothing products, the attractiveness of OPP waned. However, OPP are still used for transactions involving third country textiles that were first cut in the United States and then assembled in Mexico before re-exports to the United States. With the improvement in the availability of high quality textiles from domestic sources that qualify for NAFTA origin, Mexican suppliers have fewer commercial reasons to pursue OPP transactions.

[28] Trade Data Online, www.strategic.ic.gc.ca. Measured in Canadian dollars, Canadian clothing imports grew by a mere 0.5%. Preliminary import data for the first two months of 2004 indicate continuing strong import growth from LDCs.

[29] Respective WTO notifications: G/AG/N/USA/43; G/AG/N/EEC/38; and G/AG/N/BRA/18.

[30] For a comprehensive list of non-tariff measures applied on exports, readers should consult the WTO document TN/MA/W/25 and its addendum. These documents provide a compilation of submissions by WTO members of non-tariff measures affecting their exports that they wish to be addressed during the Doha negotiations.

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ANNEX A: TABLES

Annex Table 2A.1 Selected Characteristics of Textile Branches, Selected Years and Countries

Country	Latest year	Value added per employee	Wages and salaries per employee	Costs of input material and utilities	Costs of Labour	Operating surplus
		(current USD 1000)			(% in Output)	
OECD Countries (average)		**36.7**	**16.6**	**68.1%**	**17.2%**	**20.9%**
Australia	1997	36.1	21.8	66.8%	20.1%	13.1%
Belgium	1999	49.9	23.1	70.5%	13.6%	15.8%
Canada	1999	42.2	18.7	54.6%	20.2%	25.2%
Czech Republic	1998	6.1	3.1	69.9%	15.4%	14.7%
Finland	1999	48.2	23.2	57.0%	20.7%	22.3%
France	1999	39.0	21.9	71.1%	16.2%	12.7%
Germany	1999	42.4	26.8	65.7%	21.7%	12.6%
Italy	1998	45.0	18.0	70.9%	11.7%	17.4%
Japan	2000	57.9	15.7	57.0%	11.7%	31.3%
Korea	1999	42.7	11.0	55.6%	11.4%	32.9%
Norway	1999	40.4	25.7	61.3%	24.6%	14.1%
Mexico	1999	13.5	4.4	60.0%	13.0%	27.0%
Portugal	1998	15.1	6.8	69.7%	13.7%	16.7%
Slovak Republic	1998	4.2	2.4	68.5%	18.0%	13.5%
Spain	2000	25.3	13.3	68.7%	16.4%	14.9%
Turkey	1997	19.1	5.4	65.5%	9.7%	24.8%
USA	1999	60.0	24.4	57.1%	17.4%	25.4%
Non–OECD Countries (average)		**15.0**	**5.6**	**72.6%**	**14.2%**	**25.0%**
Bangladesh	1997	1.1	0.5	66.7%	15.0%	18.3%
Cameroon	1999	35.4	5.1	35.6%	9.3%	55.1%
Chile	1998	19.4	7.5	70.5%	11.4%	18.1%
Colombia	2000	16.4	3.7	54.0%	10.4%	35.6%
Egypt	1998	3.4	1.7	67.5%	16.0%	16.5%
El Salvador	1998	8.9	2.9	56.7%	13.9%	29.4%
Hong Kong, China	2000	33.1	18.0	72.0%	15.3%	12.8%
India	1999	2.8	1.0	81.2%	6.9%	11.9%
Indonesia	1999	4.2	0.7	68.7%	4.9%	26.4%
Jordan	1997	7.8	2.5	68.5%	10.0%	21.6%
Malaysia	1999	14.0	4.0	67.6%	9.2%	23.2%
Mauritius	1998	9.0	2.9	63.8%	11.7%	24.5%
Morocco	1998	6.4	3.0	65.5%	16.3%	18.2%
Russian Federation	1998	1.1	0.7	64.5%	24.2%	11.3%
Singapore	2000	34.2	16.2	68.3%	15.0%	16.7%
Sri Lanka	1999	2.9	0.6	54.5%	10.3%	35.2%
Tunisia	2000	21.1	8.2	65.5%	13.4%	21.0%
Uruguay	1999	17.6	9.4	66.5%	17.9%	15.6%
Vietnam	2000	1.6	0.7	76.6%	10.6%	12.8%

Source: International Yearbook of Industrial Statistics 2003, UN Industrial Development Organisation

Annex Table 2A.2 Selected Characteristics of Clothing Branches, Selected Years and Countries

Country	Latest year	Value added per employee	Wages and salaries per employee	Costs of input material and utilities	Costs of Labour	Operating surplus
		(current USD 1000)			(% in Output)	
OECD Countries		**27.71**	**13.67**	**66.7%**	**19.4%**	**20.6%**
Belgium	1999	40.9	22.4	77.3%	12.4%	10.3%
Canada	1999	30.5	15.1	53.1%	23.1%	23.8%
Czech Republic	1998	4.5	2.6	59.7%	23.7%	16.7%
Finland	1999	32.1	19.5	65.9%	20.7%	13.4%
France	1999	33.6	20.2	71.0%	17.4%	11.6%
Germany	1999	39.6	25.3	73.5%	16.9%	9.5%
Italy	1998	32.4	14.0	71.4%	12.4%	16.2%
Japan	2000	36.9	10.8	47.1%	15.5%	37.4%
Korea	1999	23.8	9.1	50.8%	18.8%	30.4%
Norway	1999	30.5	22.4	61.1%	28.6%	10.3%
Mexico	1999	9.3	3.2	60.3%	13.8%	26.0%
Portugal	1998	10.0	5.4	67.4%	17.7%	14.9%
Slovak Republic	1998	3.9	2.3	55.6%	25.7%	18.7%
Spain	2000	17.3	9.8	68.1%	18.2%	13.7%
Turkey	1997	15.6	4.1	67.3%	8.6%	24.2%
USA	1999	54.8	18.9	51.0%	16.9%	32.1%
Non–OECD countries		**8.5**	**3.8**	**64.5%**	**16.7%**	**24.7%**
Bangladesh	1997	0.9	0.4	75.4%	9.7%	15.0%
Cameroon	1999	2.6	0.9	50.7%	17.0%	32.3%
Chile	1997	25.2	7.9	51.3%	15.3%	33.4%
Colombia	1999	8.2	2.4	53.4%	13.5%	33.0%
Egypt	1998	4.8	1.1	56.4%	9.9%	33.7%
El Salvador	1998	5.1	2.5	30.7%	33.5%	35.7%
Hong Kong, China	1999	27.6	14.8	71.1%	15.5%	13.4%
India	1999	2.9	0.7	75.7%	6.4%	17.9%
Indonesia	1999	2.5	0.6	63.4%	8.5%	28.1%
Jordan	1997	4.7	1.8	58.4%	16.0%	25.6%
Malaysia	1999	6.4	3.1	66.1%	16.5%	17.4%
Mauritius	1997	5.0	2.6	64.2%	19.0%	16.8%
Morocco	1998	4.0	2.5	55.9%	27.9%	16.2%
Singapore	2000	17.6	11.0	75.6%	15.3%	9.1%
Sri Lanka	1999	2.3	0.7	54.1%	14.2%	31.8%
Tunisia	2000	6.6	3.3	71.4%	14.1%	14.6%
Uruguay	1997	8.0	3.4	62.2%	15.8%	22.0%
Vietnam	2000	1.8	0.7	60.2%	16.5%	23.2%

Source: International Yearbook of Industrial Statistics 2003, UN Industrial Development Organisation

Annex Table 2A.3 Leading Exporters and Importers of Textiles, 1980-2002

(% Share in World Exports and Values in USD billion)

	1990	2001	2002	2002 / 1990	% Change 2002	Value 2002
World value	104.33	146.98	152.15	Change in	3.5%	**(USD billion)**
% World Merchandise Exports	3.1%	2.5%	2.4%	World Share		
Exporters						
EU (15)	48.7%	35.1%	34.2%	-14.5%	0.9%	52.05
extra-EU	*14.5%*	*15.1%*	*15.2%*	0.7%	*4.3%*	*23.12*
China	6.9%	11.4%	13.5%	6.6%	22.2%	20.56
Hong Kong, China	2.1%	0.7%	0.6%	-1.5%	-7.0%	0.98
re-exports					*2.1%*	*11.40*
United States	4.8%	7.1%	7.0%	2.2%	2.0%	10.70
Korea	5.8%	7.4%	7.0%	1.2%	-3.2%	10.59
Chinese Taipei	5.9%	6.7%	6.3%	0.4%	-3.8%	9.53
Japan	5.6%	4.2%	4.0%	-1.6%	-2.7%	6.03
India	2.1%	3.9%	3.7%	1.6%	-10.4%	5.38
Pakistan	2.6%	3.1%	3.1%	0.5%	5.9%	4.79
Turkey	1.4%	2.7%	2.8%	1.4%	7.6%	4.24
Indonesia	1.2%	2.2%	1.9%	0.7%	-9.6%	2.90
Mexico	0.7%	1.4%	1.5%	0.8%	5.8%	2.21
Canada	0.7%	1.5%	1.4%	0.7%	0.9%	2.18
Thailand	0.9%	1.3%	1.3%	0.4%	2.2%	1.93
Switzerland	2.5%	1.0%	0.9%	-1.6%	-1.6%	1.42
Importers						
EU(15)	46.7%	31.7%	30.4%	-16.3%	-0.8%	46.21
extra-EU	*13.2%*	*11.7%*	11.3%	*-1.9%*	0.5%	*17.27*
United States	6.2%	10.5%	10.6%	4.4%	10.2%	17.00
China	4.9%	8.6%	8.1%	3.2%	3.9%	13.06
Hong Kong, China					-1.3%	12.02
retained imports	*3.8%*	*0.7%*	*0.4%*	*-3.4%*	*-38.7%*	*0.62*
Mexico	0.9%	4.1%	4.0%	3.1%	5.7%	6.37
Japan	3.8%	3.2%	2.8%	-1.0%	-4.6%	4.54
Canada	2.2%	2.6%	2.4%	0.2%	-0.1%	3.81
Korea	1.8%	2.1%	2.0%	0.2%	3.3%	3.17
Turkey	0.5%	1.3%	1.8%	1.3%	47.8%	2.84
Poland	0.2%	1.8%	1.7%	1.5%	4.4%	2.73
Romania	0.1%	1.4%	1.5%	1.4%	17.8%	2.37
United Arab Emirates	0.9%	1.2%	1.2%	-	-7.1%	1.69
Thailand	0.8%	1.0%	0.9%	0.1%	-2.5%	1.50
Russian Federation	-	1.0%	1.0%	-	3.3%	1.48
Australia	1.3%	0.9%	0.9%	-0.4%	13.1%	1.47
Morocco	0.3%	1.0%	0.9%	0.6%	-0.6%	1.39
Sri Lanka	0.4%	0.9%	0.9%	0.5%	0.1%	1.36
Bangladesh	0.4%	1.0%	0.8%	0.4%	-22.2%	1.16

Notes: Data for India and United Arab Emirates refer to 2001 instead of 2002 and 2000 instead of 2001.
Total exports exclude Hong Kong (China) re-exports. Data for the Russian Federation and United Arab Emirates include estimates. Imports for Australia and Canada are valued on FoB basis. Data for China, Mexico and Morocco include shipments through processing zones.

Source: WTO, International Trade Statistics 2003.

Annex Table 2A.4 Leading Exporters and Importers of Clothing, 1980–2002 Leading Exporters and Importers of Clothing, 1980–2002

(% Share in World Exports and Values in USD billion)

	1990	2001	2002	2002 / 1990	% change 2002	Value 2002
World value	108.13	193.69	200.85	Change in	3.7%	**(US billion)**
% World merchandise exports	3.2%	3.3%	3.2%	World Share		
Exporters						
EU (15)	37.7%	24.9%	25.1%	-12.6%	4.4%	50.45
extra-EU	*10.5%*	*8.1%*	*8.3%*	-2.2%	*5.6%*	*16.59*
China	8.9%	18.9%	20.6%	11.6%	12.7%	41.30
Hong Kong, China	8.6%	4.8%	4.1%	-4.4%	-10.3%	8.31
re-exports						*14.04*
Turkey	3.1%	3.4%	4.0%	0.9%	21.0%	8.06
Mexico	0.5%	4.1%	3.9%	3.3%	-3.2%	7.75
United States	2.4%	3.6%	3.0%	0.6%	-14.0%	6.03
India	2.3%	2.8%	2.8%	0.5%	-11.2%	5.48
Bangladesh	0.6%	2.2%	2.1%	1.5%	-3.0%	4.13
Indonesia	1.5%	2.3%	2.0%	0.4%	-12.9%	3.95
Korea	7.3%	2.2%	1.8%	-5.4%	-14.2%	3.69
Thailand	2.6%	1.8%	1.7%	-0.9%	-5.8%	3.37
Romania	0.3%	1.4%	1.6%	1.3%	16.9%	3.25
Dominican Republic	0.7%	1.5%	1.4%	0.7%	-5.8%	2.71
Tunisia	1.0%	1.3%	1.3%	0.3%	3.3%	2.69
Philippines	1.6%	1.2%	1.3%	-0.3%	9.5%	2.61
Chinese Taipei	3.7%	1.3%	1.1%	-2.6%	-11.6%	2.20
Importers						
EU (15)	52.6%	41.8%	42.3%	-10.3%	5.0%	84.88
extra-EU	26.2%	24.9%	25.4%	-0.8%	*5.7%*	*51.02*
United States	24.0%	34.3%	31.7%	7.7%	0.5%	66.73
Japan	7.8%	9.9%	8.4%	0.6%	-8.3%	17.60
Hong Kong, China						15.64
retained imports	*0.7%*	*1.0%*	*0.8%*	0.1%	*-16.3%*	*1.60*
Mexico	0.5%	2.0%	1.9%	1.4%	5.7%	4.06
Canada	2.1%	2.0%	1.9%	-0.2%	2.1%	4.01
Russian Federation	-	1.6%	1.8%		27.4%	3.86
Switzerland	3.1%	1.7%	1.6%	-1.4%	6.8%	3.45
Korea	0.1%	0.8%	1.0%	0.9%	33.0%	2.17
Australia	0.6%	0.8%	0.9%	0.2%	11.0%	1.82
Singapore	*0.3%*	*0.2%*	*0.3%*	0.0%	*17.7%*	*0.54*
United Arab Emirates	0.5%	0.7%	0.8%	0.3%	9.0%	1.55
Norway	1.1%	0.6%	0.6%	-0.4%	10.3%	1.36
China	0.0%	0.7%	0.6%	0.6%	6.4%	1.36
Saudi Arabia	0.7%	0.4%	0.4%	-0.3%	5.9%	0.86
Chinese Taipei	0.3%	0.5%	0.4%	0.1%	-10.5%	0.83

Notes: Shares in economy's total merchandise exports refer to latest year available.
For Egypt: The USA provides duty-free treatment for textiles and clothing made in qualifying industrial zones since March 1998. CBERA: Caribbean Basin Economic and Recovery Act; OGOA: African Growth Opportunity Act. CU96: Customs Union, 1996; EBA01: Everything but Arms, March 2001. CO-OP: Co-operation Agreement to be replaced by Euro-Mediterranean Agreements. Data for Cambodia and Domican Republic include estimates. Data for China, Costa Rica, Dominican Republic, El Savador, Malaysia, Mexico, Morocco and Philippines include exports from processing zones.
Source: WTO, International Trade Statistics 2002 and 2003.

Annex Table 2A.5 Clothing Exports in Selected Economies, 1980–2002

Country	Value (Million dollars)				Share in Economy's Total Merchandise Exports (%)		Free Trade Agreements (FTA)		Outward Processing Programmes (OPP)		
	1990	1995	2001	2002	1990	2002	USA	EU	USA	EU	Australia
Largest Increase in Export Shares 1990-2002											
Jordan	11	29	296	...	1.0%	12.9%	2001	CO-OP			
Honduras	64	299	505	475	7.7%	37.4%			CBERA		
Mexico	587	2,731	8,011	7,751	1.4%	4.8%	1994	FTA00			
Romania	363	1,360	2,780	3,251	7.3%	23.4%		FTA94	OPP 99	OPP	
Canada	328	1,016	1,943	1,988	0.3%	0.8%	1989				
Costa Rica	54	50	376	397	3.7%	7.6%			CBERA		
El Savador	184	700	1,725	1,841	31.6%	61.5%			CBERA		
Morocco	722	797	2,342	2,413	16.9%	30.4%		CO-OP		OPP	
Bangladesh	643	1,969	4,261	4,131	38.5%	67.8%		EBA01			
Cambodia	...	...	1,125	...	...	81.7%		EBA01			
Bulgaria	...	236	880	1,066	...	18.6%		FTA94		OPP	
Sri Lanka	638	1,758	2,441	2,326	33.4%	49.5%					
Dominican Republic	782	1,721	2,712	...	36.0%	50.9%			CBERA		
Pakistan	1,014	1,611	2,136	2,228	18.1%	22.5%			OPP 02		
Tunisia	1,126	2,322	2,601	2,688	31.9%	39.5%		CO-OP		OPP	
Indonesia	1,646	3,376	4,531	3,945	6.4%	6.9%					OPP
Macau, China	1,111	1,377	1,663	1,648	65.3%	70.0%					
Mauritius	619	808	860	949	51.9%	54.1%		EBA01	AGOA		
Declining Export Shares 1990-2002											
Philippines	1,733	2,420	2,384	2,611	21.4%	7.2%					OPP
China	9,669	24,049	36,650	41,302	15.6%	12.7%					OPP
EU (15) extra	11,338	14,939	15,719	16,592	2.1%	1.8%					
India	2,530	4,110	5,483	...	14.1%	12.4%					
Turkey	3,331	6,119	6,661	8,057	25.7%	23.3%		CU96			
Declining Export Values 1995-2002											
Thailand	2,817	5,008	3,575	3,369	12.2%	4.9%					
Korea	7,879	4,957	4,306	3,694	12.1%	2.3%					
Hong Kong, China	9,266	9,540	9,263	8,306	31.9%	45.5%					
Chinese Taipei	3,987	3,251	2,484	2,197	5.9%	1.6%					
United States	2,565	6,651	7,012	6,032	0.7%	0.9%					
Poland	384	2,304	1,949	1,915	2.7%	4.7%		FTA94		OPP	
Malaysia	1,315	2,266	2,071	1,963	4.5%	2.1%					
Israël	482	663	602	549	4.0%	1.9%	1985				
Jamaica	83	287	116	...	7.2%	9.5%			CBERA		
Egypt	144	253	239	...	4.2%	5.8%	1998				

Notes: Shares in economy's total merchandise exports refer to latest year available.
For Egypt: The USA provides duty-free treatment for textiles and clothing made in qualifying industrial zones since March 1998.
CBERA: Caribbean Basin Economic and Recovery Act; OGOA: African Growth Opportunity Act. CU96: Customs Union, 1996;
EBA01: Everything but Arms, March 2001. CO-OP: Co-operation Agreement to be replaced by Euro-Mediterranean Agreements.
Data for Cambodia and Domican Republic include estimates. Data for China, Costa Rica, Dominican Republic, El Savador, Malaysia, Mexico, Morocco and Philippines include exports from processing zones.
Source: WTO, International Trade Statistics 2002 and 2003.

Annex Table 2A.6 OECD Textile Exports by Destination, 1980–2001

OECD Exports	OECD - 24						OECD - 29		
Textiles	**1980**	**1985**	**1990**	**1995**	**2000**	**2001**	**1995**	**2000**	**2001**
Total Exports (*million USD*)	38,886	35,525	66,773	75,300	72,546	71,243	98,268	96,888	93,344
OECD *(% of total exports)*	73.4%	75.5%	80.0%	74.4%	72.1%	70.5%	68.8%	67.9%	67.2%
EU-15	57.6%	55.5%	61.3%	51.0%	42.2%	41.7%	47.0%	39.5%	39.8%
Greece	0.9%	1.2%	1.6%	1.1%	0.9%	0.9%	1.0%	0.8%	0.7%
Portugal	0.6%	0.8%	2.2%	2.2%	2.0%	2.0%	1.8%	1.7%	1.7%
Turkey	0.2%	0.3%	0.6%	1.1%	1.4%	1.3%	1.0%	1.4%	1.2%
Four Eastern European	1.4%	1.1%	1.5%	4.6%	5.4%	5.7%	4.2%	4.7%	5.1%
NAFTA	6.0%	10.0%	7.9%	9.9%	17.7%	16.6%	9.5%	17.3%	16.2%
United States	3.2%	6.7%	4.5%	5.3%	7.7%	7.5%	5.8%	9.4%	8.8%
Mexico	0.5%	0.5%	0.9%	1.4%	5.5%	5.0%	1.2%	4.4%	4.0%
Japan	1.4%	1.6%	2.5%	2.1%	1.3%	1.3%	2.3%	1.5%	1.4%
Korea	0.8%	1.2%	1.5%	1.8%	1.3%	1.2%	1.4%	1.1%	1.0%
Australia + New Zealand	2.0%	2.2%	1.3%	1.2%	0.9%	0.8%	1.1%	0.9%	0.8%
Non-OECD	26.2%	24.3%	19.1%	24.4%	26.4%	28.0%	29.8%	30.8%	31.6%
Hong Kong, China	2.4%	3.0%	2.6%	3.0%	2.8%	2.7%	5.2%	3.7%	3.3%
China	1.1%	1.5%	0.9%	3.1%	4.2%	4.2%	3.8%	5.4%	5.4%
Chinese Taipei	0.5%	0.8%	1.0%	1.1%	0.8%	0.6%	1.1%	0.8%	0.6%
Asian-6	1.7%	1.6%	1.7%	2.2%	1.9%	1.6%	3.0%	2.8%	2.5%
India	0.1%	0.2%	0.1%	0.2%	0.2%	0.3%	0.2%	0.3%	0.4%
Bangladesh	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.3%	0.3%	0.3%
Pakistan	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Vietnam	0.0%	0.0%	0.0%	0.2%	0.4%	0.4%	0.5%	0.7%	0.7%
Africa	6.1%	4.0%	4.1%	4.4%	4.5%	4.9%	4.0%	3.9%	4.4%
Morocco	0.4%	0.5%	1.1%	1.4%	1.6%	1.7%	1.2%	1.3%	1.4%
Tunisia	0.6%	0.6%	1.0%	1.5%	1.7%	1.9%	1.3%	1.4%	1.6%
Non-OECD Eastern Europe	0.4%	0.5%	0.4%	2.2%	3.1%	3.6%	1.8%	2.5%	3.0%
Russian Federation	0.0%	0.0%	0.2%	0.6%	0.5%	0.7%	0.7%	0.6%	0.8%
Non-OECD America	2.8%	1.9%	1.4%	2.3%	2.8%	3.6%	3.1%	3.6%	4.1%
MERCOSUR	0.6%	0.2%	0.3%	0.7%	0.7%	0.5%	1.0%	0.9%	0.7%
Rest of the World	9.2%	9.1%	4.1%	1.6%	1.1%	1.1%	2.6%	2.4%	2.5%

Note: OECD-29 = all present OECD Members except the Slovak Republic.
OECD-24 = OECD 29 except Mexico, Czech Republic, Hungary, Poland and Korea
Asian-6 = Brunei, Indonesia, Malaysia, Philippines, Singapore and Thailand.
Non-OECD Eastern Europe = Albania, Bulgaria, Romania and Slovenia.
Textile products defined in SITC Revision 2, category 65.
Source: OECD International Trade Statistics.

Annex Table 2A.7 OECD Clothing Exports by Destination, 1980–2001

OECD Exports	OECD - 24						OECD - 29		
Clothing	**1980**	**1985**	**1990**	**1995**	**2000**	**2001**	**1995**	**2000**	**2001**
Total Exports (*million USD*)	19,615	20,415	47,683	60,460	61,606	60,970	74,772	82,983	81,547
OECD *(% of total exports)*	87.7%	89.2%	91.0%	84.6%	81.7%	82.3%	86.4%	85.1%	85.4%
EU-15	70.5%	64.5%	70.3%	60.3%	55.3%	55.9%	57.6%	50.4%	51.6%
Greece	0.3%	0.4%	0.9%	0.9%	1.1%	1.1%	0.8%	0.9%	0.9%
Portugal	0.1%	0.2%	0.8%	1.4%	1.7%	1.9%	1.1%	1.3%	1.4%
Turkey	0.0%	0.0%	0.1%	0.1%	0.4%	0.3%	0.1%	0.3%	0.3%
Four Eastern European	0.4%	0.3%	0.7%	2.2%	1.8%	2.0%	1.9%	1.5%	1.7%
NAFTA	5.5%	13.1%	7.9%	9.7%	15.4%	14.9%	14.2%	24.8%	23.7%
United States	3.8%	11.0%	5.7%	6.0%	9.6%	9.6%	11.0%	20.1%	19.4%
Mexico	0.9%	0.8%	0.9%	2.4%	4.2%	3.6%	1.9%	3.2%	2.8%
Japan	1.9%	1.6%	4.0%	5.1%	3.1%	3.1%	6.6%	3.6%	3.4%
Korea	0.0%	0.1%	0.2%	0.8%	0.5%	0.7%	0.6%	0.4%	0.5%
Australia + New Zealand	0.4%	0.4%	0.4%	0.6%	0.5%	0.4%	0.5%	0.4%	0.4%
Non-OECD	12.2%	10.8%	9.0%	15.3%	18.1%	17.4%	13.4%	14.7%	14.3%
Hong Kong, China	0.6%	0.8%	1.1%	1.6%	1.1%	1.3%	1.4%	0.9%	1.0%
China	0.0%	0.0%	0.1%	0.2%	0.2%	0.2%	0.2%	0.3%	0.4%
Chinese Taipei	0.0%	0.0%	0.3%	0.6%	0.5%	0.5%	0.6%	0.4%	0.4%
Asian-6	0.2%	0.3%	0.4%	0.5%	0.3%	0.3%	0.5%	0.3%	0.3%
India	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bangladesh	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Pakistan	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Vietnam	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Africa	3.1%	1.4%	1.1%	1.5%	1.8%	1.7%	1.3%	1.4%	1.4%
Morocco	0.0%	0.1%	0.2%	0.3%	0.6%	0.6%	0.2%	0.4%	0.4%
Tunisia	0.4%	0.2%	0.4%	0.6%	0.6%	0.7%	0.5%	0.5%	0.5%
Non-OECD Eastern Europe	0.2%	0.1%	0.2%	0.8%	1.5%	1.8%	0.7%	1.2%	1.4%
Russian Federation	0.0%	0.0%	0.0%	1.5%	1.4%	1.8%	1.4%	1.2%	1.4%
Non-OECD America	2.8%	2.1%	2.5%	5.2%	7.6%	5.8%	4.3%	6.1%	4.7%
MERCOSUR	0.5%	0.0%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Rest of the World	4.2%	5.7%	2.8%	2.2%	2.2%	2.4%	1.9%	1.8%	2.0%

Note: OECD-29 = all present OECD Members except the Slovak Republic. OECD-24 = OECD 29 except Mexico, Czech Republic, Hungary, Poland and Korea
Asian-6 = Brunei, Indonesia, Malaysia, Philippines, Singapore and Thailand. Non-OECD Eastern Europe = Albania, Bulgaria, Romania and Slovenia.
Clothing products defined in SITC Revision 2, category 84.
Source: OECD International Trade Statistics.

Annex Table 2A.8 OECD Textile Imports by Origin, 1980–2001

OECD Imports	OECD - 24						OECD - 29		
Textiles	**1980**	**1985**	**1990**	**1995**	**2000**	**2001**	**1995**	**2000**	**2001**
Total Imports (*million USD*)	35,835	34,618	69,482	76,014	73,476	70,247	89,792	91,391	87,543
OECD *(% of total exports)*	80.3%	78.4%	79.3%	73.2%	69.3%	68.9%	72.8%	70.7%	70.7%
EU-15	60.9%	58.9%	61.9%	52.8%	44.4%	44.1%	51.6%	42.9%	43.0%
Greece	1.2%	1.2%	0.7%	0.5%	0.4%	0.4%	0.4%	0.4%	0.4%
Portugal	1.5%	1.9%	1.8%	1.9%	1.8%	1.9%	1.6%	1.6%	1.6%
Turkey	0.8%	1.3%	1.7%	2.0%	3.2%	3.5%	1.8%	2.8%	3.1%
Four Eastern European	0.7%	0.4%	0.5%	1.9%	2.6%	3.0%	1.9%	2.5%	2.8%
NAFTA	7.9%	5.8%	5.9%	8.1%	11.2%	10.9%	9.2%	15.0%	14.6%
United States	6.9%	4.7%	4.5%	5.3%	6.1%	5.7%	6.8%	10.8%	10.3%
Mexico	0.3%	0.3%	0.6%	1.2%	2.3%	2.3%	1.0%	1.9%	1.9%
Japan	3.1%	4.6%	2.6%	2.0%	1.9%	1.7%	2.5%	2.1%	1.9%
Korea	2.5%	3.0%	2.8%	3.1%	3.7%	3.4%	2.8%	3.4%	3.2%
Australia + New Zealand	0.4%	0.6%	0.4%	0.6%	0.5%	0.6%	0.6%	0.5%	0.5%
Non-OECD	19.5%	21.5%	20.5%	26.1%	30.1%	30.9%	26.4%	28.8%	29.1%
Hong Kong, China	1.4%	1.4%	0.9%	0.6%	0.7%	0.7%	0.5%	0.6%	0.6%
China	3.0%	4.6%	4.2%	6.7%	8.7%	9.3%	7.3%	8.4%	8.9%
Chinese Taipei	1.4%	2.4%	2.3%	2.3%	2.6%	2.3%	2.6%	2.6%	2.3%
Asian-6	1.3%	1.7%	2.2%	3.5%	3.6%	3.5%	3.5%	3.6%	3.4%
India	2.6%	2.1%	2.2%	3.6%	4.6%	4.7%	3.5%	4.3%	4.3%
Bangladesh	0.6%	0.5%	0.3%	0.3%	0.3%	0.4%	0.3%	0.3%	0.3%
Pakistan	1.3%	1.7%	2.3%	2.9%	3.1%	3.3%	2.9%	2.9%	3.0%
Vietnam	0.0%	0.0%	0.0%	0.1%	0.2%	0.2%	0.1%	0.2%	0.2%
Africa	1.5%	1.5%	1.3%	1.4%	1.3%	1.4%	1.4%	1.1%	1.2%
Morocco	0.3%	0.2%	0.2%	0.2%	0.1%	0.2%	0.2%	0.1%	0.1%
Tunisia	0.2%	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Non-OECD Eastern Europe	0.3%	0.3%	0.2%	0.6%	0.6%	0.7%	0.6%	0.5%	0.7%
Russian Federation	0.0%	0.0%	0.0%	0.3%	0.2%	0.2%	0.3%	0.2%	0.2%
Non-OECD America	2.3%	2.7%	1.8%	1.2%	1.0%	1.0%	1.1%	1.1%	1.0%
MERCOSUR	1.7%	2.0%	1.2%	0.8%	0.6%	0.6%	0.7%	0.5%	0.6%
Rest of the World	1.5%	0.1%	1.2%	1.5%	2.3%	2.1%	1.4%	2.1%	1.9%

Note: OECD-29 = all present OECD Members except the Slovak Republic.
OECD-24 = OECD 29 except Mexico, Czech Republic, Hungary, Poland and Korea
Asian-6 = Brunei, Indonesia, Malaysia, Philippines, Singapore and Thailand.
Non-OECD Eastern Europe = Albania, Bulgaria, Romania and Slovenia.
Textile products defined in SITC Revision 2, category 65.
Source: OECD International Trade Statistics.

Annex Table 2A.9 OECD Clothing Imports by Origin, 1980,2001

OECD Imports	**OECD - 24**						**OECD - 29**		
Clothing	**1980**	**1985**	**1990**	**1995**	**2000**	**2001**	**1995**	**2000**	**2001**
Total Imports (*million USD*)	34,676	42,152	100,735	135,541	164,701	165,699	143,892	176,043	177,826
OECD *(% of total exports)*	61.7%	53.8%	52.3%	40.7%	35.0%	34.4%	42.6%	36.8%	36.2%
EU-15	45.7%	36.6%	36.3%	24.7%	17.6%	17.6%	42.6%	36.8%	36.2%
Greece	2.9%	1.8%	2.0%	1.1%	0.5%	0.6%	25.8%	18.4%	18.5%
Portugal	1.9%	2.5%	3.7%	2.6%	1.5%	1.5%	1.0%	0.5%	0.6%
Turkey	0.3%	1.7%	3.6%	4.0%	3.9%	4.1%	2.5%	1.5%	1.5%
Four Eastern European	1.8%	1.0%	1.4%	3.1%	2.4%	2.5%	3.1%	2.4%	2.5%
NAFTA	3.4%	1.9%	2.2%	4.7%	7.6%	7.0%	5.7%	8.9%	8.2%
United States	2.2%	0.7%	1.2%	1.7%	1.0%	0.8%	2.9%	2.6%	2.4%
Mexico	0.8%	0.7%	0.7%	2.2%	5.4%	5.0%	2.1%	5.1%	4.7%
Japan	1.1%	1.5%	0.4%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Korea	8.1%	10.2%	7.8%	3.4%	2.8%	2.5%	3.2%	2.7%	2.3%
Australia + New Zealand	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Non-OECD	38.2%	46.1%	47.6%	59.2%	65.0%	65.6%	57.3%	63.1%	63.7%
Hong Kong, China	13.5%	14.4%	9.2%	6.9%	5.9%	5.4%	6.6%	5.7%	5.2%
China	2.7%	5.1%	9.8%	17.9%	20.5%	20.9%	17.4%	20.0%	20.5%
Chinese Taipei	6.1%	8.0%	3.9%	2.3%	1.8%	1.6%	2.2%	1.7%	1.5%
Asian-6	3.6%	5.2%	7.2%	8.2%	8.2%	8.0%	7.9%	7.9%	7.7%
India	2.0%	1.9%	2.6%	3.4%	3.0%	3.0%	3.3%	2.9%	2.9%
Bangladesh	0.0%	0.4%	0.8%	1.9%	2.8%	2.9%	1.8%	2.7%	2.8%
Pakistan	0.2%	0.5%	0.9%	1.2%	1.2%	1.2%	1.1%	1.1%	1.2%
Vietnam	0.0%	0.0%	0.0%	0.6%	0.9%	0.8%	0.6%	0.9%	0.8%
Africa	2.0%	2.1%	3.7%	4.5%	4.3%	4.7%	4.5%	4.3%	4.7%
Morocco	0.4%	0.6%	1.4%	1.6%	1.4%	1.5%	1.6%	1.4%	1.5%
Tunisia	1.1%	0.8%	1.3%	1.5%	1.4%	1.6%	1.7%	1.5%	1.7%
Non-OECD Eastern Europe	1.2%	1.1%	0.6%	1.8%	2.4%	2.9%	1.7%	2.3%	2.8%
Russian Federation	0.0%	0.0%	0.0%	0.2%	0.3%	0.3%	0.2%	0.3%	0.3%
Non-OECD America	1.7%	2.4%	2.9%	5.0%	6.7%	6.6%	4.7%	6.4%	6.3%
MERCOSUR	0.7%	0.7%	0.5%	0.2%	0.1%	0.1%	0.2%	0.1%	0.1%
Rest of the World	3.1%	2.9%	2.7%	2.1%	4.2%	4.1%	1.8%	3.8%	3.7%

Note: OECD-29 = all present OECD Members except the Slovak Republic.
OECD-24 = OECD 29 except Mexico, Czech Republic, Hungary, Poland and Korea
Asian-6 = Brunei, Indonesia, Malaysia, Philippines, Singapore and Thailand.
Non-OECD Eastern Europe = Albania, Bulgaria, Romania and Slovenia.
Clothing products defined in SITC Revision 2, category 84.
Source: OECD International Trade Statistics.

Annex Table 2A.10 Bound Tariffs in Textiles and Clothing, Post-Uruguay Round

Country	Raw Agricultural Products		Vegetable Fibres		Man-Made Filaments Yarn		Products Made of Fabric		Clothing	
(HS numbers)	(HS 50.04-.07)		(HS 51-53)		(HS 54-55)		(HS 56-60 + 63)		(HS 61-62)	
Bound rate	Average	Maximum	Average	Maximum	Average	Maximum	Average	Maximum	Average	Maximum
European Union	0.00	0.00	5.10	8.00	6.29	8.00	7.91	12.00	11.51	12.00
Japan	0.00	0.00	4.24	12.53	6.27	8.10	5.65	14.20	9.23	13.40
Switzerland	0.00	0.00	2.91	10.80	4.57	15.10	4.79	20.00	5.96	15.90
Norway	0.53	0.70	6.12	12.00	7.35	13.10	7.69	13.70	11.06	13.70
Slovak Republic	0.38	0.70	4.96	10.80	5.64	17.00	8.08	31.50	9.04	16.40
Czech Republic	0.38	0.70	4.96	10.80	5.64	17.00	8.12	31.50	9.04	16.40
Iceland	0.00	0.00	1.18	11.50	3.31	6.50	14.22	28.00	20.51	21.00
Canada	0.00	0.00	8.13	14.00	10.89	14.00	13.12	18.00	17.46	18.00
United States	0.61	2.43	5.98	15.22	10.01	17.78	5.70	18.80	10.72	26.40
Hungary	3.75	6.00	5.89	10.00	6.11	17.41	8.17	44.00	11.35	13.00
Poland	2.50	5.00	10.33	38.00	8.55	12.00	14.10	26.30	18.00	18.00
Malaysia	5.00	5.00	13.23	30.00	18.02	30.00	23.74	40.00	20.87	31.00
Philippines	10.00	10.00	21.91	30.00	24.57	30.00	30.90	50.00	30.00	30.00
Korea	27.53	51.00	12.08	30.00	13.24	30.00	21.42	30.00	28.31	35.00
Australia	0.45	0.94	12.68	42.75	16.80	40.31	15.23	52.79	39.20	89.30
Argentina	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Mexico	20.00	20.00	34.54	50.00	35.00	35.00	34.93	40.00	35.13	50.00
Venezuela	40.00	40.00	35.46	40.00	35.00	35.00	32.13	35.00	35.00	35.00
Brazil	35.00	35.00	35.34	55.00	35.00	35.00	34.78	35.00	35.00	35.00
Indonesia	40.00	40.00	39.94	40.00	40.00	40.00	40.00	40.00	40.00	40.00
New Zealand	0.00	0.00	3.19	30.00	6.48	20.00	19.11	42.50	43.94	313.50
Colombia	70.00	70.00	38.91	99.00	34.61	35.00	36.60	40.00	40.00	40.00
Romania	18.50	60.00	39.90	270.00	34.89	35.00	27.15	35.00	20.43	35.00
Tunisia	62.00	62.00	60.21	62.00	49.85	60.00	51.82	60.00	60.00	60.00
Thailand	63.25	226.00	23.89	30.00	30.00	30.00	30.05	35.00	30.60	100.00
Turkey	18.48	19.50	51.36	150.00	88.34	150.00	68.46	200.00	99.22	100.00
India	100.00	100.00	89.17	160.00	75.20	100.00	83.25	100.00	100.00	100.00

Note: Post Uruguay Round bound tariff rates; only tariffs with *ad valorem* equivalents are included.
Source: CD-ROM Tariffs and Trade, OECD Query and Simulation Package, OECD Trade Directorate 2003 .

Annex Table 2A.11 Applied Tariffs in Textile and Clothing Products, 1986

Country	Raw agricultural products		Vegetable fibres		Man made filaments yarn		Products made of fabric		Clothing	
(HS numbers)	(HS 50.04-.07)		(HS 51-53)		(HS 54-55)		(HS 56-60 + 63)		(HS 61-62)	
Applied rate	Average	Maximum	Average	Maximum	Average	Maximum	Average	Maximum	Average	Maximum
Iceland	0.00	0.00	0.00	0.00	0.00	0.00	3.98	10.00	14.59	15.00
Korea	3.50	8.00	6.91	8.00	7.93	8.00	8.00	8.00	8.00	8.00
European Union	0.80	2.50	6.43	14.30	8.83	10.10	9.36	21.10	12.59	13.40
Japan	1.56	6.25	5.81	16.00	7.82	10.85	6.96	17.90	12.29	14.50
Turkey	3.75	6.00	8.09	17.00	10.33	11.00	11.68	15.00	13.85	14.00
Slovakia	1.58	2.90	5.43	11.50	6.17	18.80	8.71	33.60	9.59	17.20
Czech Republic	1.58	2.90	5.43	11.50	6.17	18.80	8.75	33.60	9.59	17.20
Hungary	5.08	8.90	11.26	15.00	9.26	15.00	12.12	20.00	10.14	20.00
Norway	0.45	0.60	8.82	18.40	11.12	21.00	11.29	22.70	16.96	22.70
United States	1.13	4.50	7.94	20.45	13.05	18.85	9.05	22.40	13.80	29.66
Canada	0.00	0.00	10.50	19.00	14.33	19.00	17.05	23.60	22.67	24.50
Switzerland	0.00	0.00	3.92	28.80	6.10	27.10	6.71	52.72	8.74	28.62
Brazil	4.00	4.00	14.48	18.00	16.44	18.00	18.20	20.00	20.04	30.00
Argentina	4.00	4.00	14.66	18.00	16.65	21.00	18.12	20.00	21.45	28.00
Malaysia	0.00	0.00	10.45	30.00	13.53	20.00	19.48	30.00	19.96	30.00
Colombia	7.50	10.00	16.36	20.00	17.40	25.00	18.46	20.00	20.00	20.00
Poland	6.70	11.70	13.07	20.00	10.88	17.70	19.91	30.00	26.60	26.60
Australia	0.00	0.00	11.84	24.00	15.70	25.00	13.59	37.00	32.60	37.00
Mexico	10.00	10.00	13.76	15.00	14.11	15.00	20.72	35.00	35.00	35.00
Indonesia	5.00	5.00	15.48	27.50	17.60	25.00	21.49	30.00	28.22	30.00
Romania	5.00	5.00	16.08	25.00	20.59	25.00	26.21	40.00	30.00	30.00
New Zealand	0.00	0.00	1.06	21.00	3.21	14.00	10.92	26.25	39.60	219.35
Thailand	7.50	10.00	20.55	42.50	25.66	30.00	34.63	45.00	44.71	100.00
India	1.25	5.00	91.82	160.00	97.68	175.00	97.07	100.00	100.00	100.00

Note: Applied tariff rates in 1996; only tariffs with ad valorem equivalents are included.
Source: CD-ROM Tariffs and Trade, OECD Query and Simulation Package, OECD Trade Directorate 2003.

PART III. TRADE-RELATED LABOUR ADJUSTMENT POLICIES

I. Introduction

1. During the last decade, OECD countries have gradually liberalised trade in the textile and clothing sectors in accordance with their international commitments. Although liberalisation yields economy-wide benefits, the opening of markets to international competition puts pressure on labour markets and can result in both temporary and permanent hardships for displaced workers in the process. The prospective elimination of the quantitative restrictions covered under the WTO Agreement on Textiles and Clothing (ATC) has already brought major adjustment, challenging the global sourcing channels that were formed over decades of trade restrictions.[1] As a result, there is considerable anxiety among textile and clothing workers about the future of their jobs.

2. Although trade policy continues to affect economic outcomes in these sectors, mainly through relatively high import tariffs and preferential trade arrangements, the labour policy challenge in the post-ATC period is likely to become more prominent. How and what kinds of labour adjustment programmes for displaced workers would be appropriate for governments to fulfil their redistribution role, hence contributing to social cohesion? Most OECD countries have already established diverse programmes to deal with displaced workers' needs. In non–OECD countries, displaced workers tend to rely on less sophisticated social safety networks, and family solidarity is often the main mechanism of assistance. Due to difficulty in gathering detailed information on non–OECD countries, this paper focuses on policies and programmes of some OECD countries.

3. This Part is structured as follows. Section II examines the linkages between international trade and labour adjustment. It stresses the difficulty in disentangling import competition from other causes of job displacement and emphasises the public policy role of providing assistance to displaced workers. The third section discusses the main characteristics of displaced workers in the textile and clothing sectors in OECD countries, while the fourth describes and analyses recent developments and policy reforms in labour adjustment programmes in some OECD countries. Finally, concluding remarks are offered in the last section. An appendix also describes the main characteristics of unemployment insurance programmes in France, Germany, Japan, the United Kingdom and the United States.

II. International Trade and Labour Adjustment

4. Although liberalisation yields economy-wide benefits, the opening of markets to international competition puts pressure on labour markets that can result in both temporary and permanent hardships for displaced workers. Moreover, these negative consequences tend to be highly concentrated by industry, by location and by worker demographics. Accordingly, the gains from trade tend to be unevenly distributed throughout the economy with both winners and losers.

A. Adverse Labour Effects

5. Workers can be adversely affected by increased import competition, falling export sales and shifts in production in varying degrees. Workers employed by the domestic import competing industry are considered front line or "primary" workers. Workers who produce inputs for the domestic competing industry are considered "secondary" workers. Tertiary workers are those who provide goods and services to primary and secondary workers and their families, but not directly to the industries for which they work. For example, in the case of clothing imports, workers who produce men's pants are considered primary

workers. Workers who produce zippers are considered secondary workers and those employed by the restaurants and retail stores in the community where the clothing and zipper producers are located are considered tertiary workers.

6. In the example above, primary workers are most likely to face job loss due to increased import competition. Depending on the state of the economy, it may take some time for those workers to find new jobs. Furthermore, if they finally find a new job, the new salary may be less than what they earned before they were laid-off. Secondary workers may experience similar losses, although the probability of being laid off may be less than that for primary workers, especially if they have a diversified set of consumers and/or production line. Likewise, the tertiary workers may experience similar losses, but also to a lesser degree than for primary and secondary workers.

7. Plant closures resulting from severe competition from abroad are likely to have serious implications for the entire community, beyond the hardships for workers employed by the firm. If a community's economy is highly dependent on a certain firm or industry, as well as the inputs necessary for producing that good, then the adjustment burden will also be experienced by local workers in retail sales and other services. In addition, the loss of a large plant can erode a community's tax base, thereby leaving no one untouched by the closure.

8. In larger communities and during times of economic prosperity, the adjustment burden – although still present – may be less pronounced. In those cases, negative consequences of a single plant closure may be concentrated on the primary workers and may not affect the broader community. In either event, some workers may lose their jobs. They may have to go without a salary for several weeks or months while they try to find new jobs. In addition, depending on their skills and experience, workers may have to accept jobs at lower salaries than they received in previous jobs. The mere threat of moving production facilities overseas is often used as a means of keeping wages low and reducing workers' health insurance and pension benefits.

Table 3.1 Net Job Losses in Textiles and Clothing between 1970 and 2000

Country	Textiles	Clothing	Total loss	Total loss %	Employment Levels in 2000
France	-337,000	-238 000	-575 000	72.9%	241 000
Germany	-333 000	-262 000	-595 000	67.6%	285 000
Japan	-997 000	-140 000	-1 137 000	66.4%	576 000
United Kingdom	-486 000	-248 000	-724 000	73.7%	258 000
United States	-585 000	-531 000	-1 116 000	49.0%	1 161 000
Total	-2 738 000	-1 419 000	-4 147 000	62.2%	2 521 000

Source: Extract from Annex Table 3A.1.1

9. Table 3.1 shows that textile and clothing employment in France, Germany, Japan, the United Kingdom and the United States fell by more than four million between 1970 and 2000. This *net* number of job losses masks the actual *gross* job losses and gains during this period (see the following section on creative destruction of jobs). The largest drop in terms of employment level and percent of textile and clothing employment occurred in Japan and in the United Kingdom respectively. Job losses occurred in each of the three decades covered but with less intensity during the first half of the 1990s for all countries (Annex Table 3A.1.1). Although Japan did not apply quantitative restrictions, its percentage of employment losses is marginally lower than Germany and slightly lower than France and the United Kingdom – three countries that have applied MFA restrictions to smooth out the adjustment.

10. A longer historical analysis provides a better appreciation of textile and clothing employment in Japan. It should be recalled that the Short-Term Arrangement Regarding International Trade in Textiles (STA) and the Long-Term Arrangement Regarding International Trade in Cotton Textiles (LTA) came into force in 1961 and 1962 respectively to protect the most advanced countries from the then low-cost production from Japan, Hong Kong (China) and other developing countries. Internal factors, such as wage pressure from competing industrial activities in Japan and the appreciation of the Yen, have steadily eroded the competitiveness of Japanese textile and clothing firms (the same is also true for Hong Kong, China). The rise and fall of the Japanese textile and clothing industries illustrates the importance of the macroeconomic factors, *e.g.* exchange rate, and aggregate labour supply and demand conditions as determining factors for sectoral activities.

B. The Broader Picture

11. Changes in textile and clothing employment over the last 30 years have not occurred in a vacuum. In many economies, the decline in textile and clothing employment occurred against the backdrop of broader employment declines throughout the manufacturing sector and an intensified process of globalisation of industrial activities. For example, total non-farm employment in the United States increased by more than 55 million between 1974 and 2000, which is equivalent to 70.9% increase in employment (Table 3.2).[2] During this period, employment in manufacturing and mining fell by almost two million, and employment in service-related industries, such as transportation, wholesale and retail trade, finance, insurance, real estate, construction, government and services, increased by 57 million.

Table 3.2 Changes in US Employment by Sectors, 1974-2000

Sector	Employment change 1974 to 2000	
	('000)	%
Total manufacturing (see Table 3)	-1 604	-8.0%
Mining	-154	-22.1%
Transportation	2 306	48.8%
Wholesale trade	2 500	56.2%
Finance, Insurance and Real estate	3 428	82.6%
Construction	4 633	11.5%
Government	6 532	46.1%
Retail trade	10 798	86.1%
Services	27 016	20.1%
Total	55 455	70.9%

Source: US Department of Labour

12. There were also considerable employment developments within the manufacturing sector over the same period. Fourteen of the 20 manufacturing industries experienced declines in total employment, amounting to more than 2.5 million jobs (Table 3.3). These job losses were somewhat offset by an increase in employment of approximately one million workers in the remaining six manufacturing industries. Almost half of the manufacturing job losses were concentrated in textiles and clothing. In fact, the two largest employment declines occurred in the textile and clothing industries.

Table 3.3 Changes in United States Employment in Manufacturing Industries

Sector	Employment change 1974 to 2000	
	('000)	%
Clothing	-729	-53.5%
Textiles	-434.5	-45.0%
Primary metal industries	-390.4	-30.3%
Paper	-239.9	-26.8%
Leather	-200.9	-74.1%
Industrial machinery	-109.2	-4.9%
Stone, clay and glass	-94.4	-14.0%
Fabricated metal products	-93.2	-5.7%
Petroleum	-70	-35.5%
Miscellaneous mfg industries	-69.7	-15.4%
Tobacco	-42.8	-55.5%
Instruments	-40.2	-4.5%
Chemicals	-26.5	-2.5%
Food	-21.7	-1.3%
Transportation equipment	8.8	0.5%
Electronic equipment	59.8	3.6%
Furniture	69.6	14.2%
Lumber and wood	103.8	14.3%
Rubber	273	37.0%
Printing and publishing	436.2	39.3%

Source: US Department of Labour

13. These data suggest that, at least in the United States, the decline in textile and clothing employment coincided with a decline, or at least a slowdown, in overall manufacturing employment. Other industrialised countries also experienced a similar shift out of manufacturing and into services-related industries, resulting in considerable changes in labour demand and supply over the last 30 years.

C. Creative Destruction of Jobs in Textiles and Clothing

14. While evidence points to considerable net job losses in advanced countries, import competition has also brought new dynamism, resulting in the creation of new jobs in the same sectors with different specialisation. In many ways the textile and clothing industries have re–invented themselves with the adoption of improved textile technologies and new organisational structures in the clothing industry. One such example occurred in Italy, where textile employment increased by 20 000 between 1995 and 2000 (Annex Table 3A.1.1). In Japan, Korea and the United States, job losses were accompanied with production shifts towards faster growth production segments, such as: industrial and house furnishing applications in the United States; the finishing of textiles in Korea; and made-up textile articles in Japan (Annex Table 3A.1.2).

15. Levinsohn and Petropoulos (2001) discuss the process of creative destruction in the textile and clothing industries. They document a substantial level of entry into the US textile and clothing industries and a high job creation rate from the early 1970s to mid–1990s. They find that many jobs disappeared but new and higher paying jobs simultaneously replaced some of those lost. Despite strong import competition, they concluded that these industries are good examples of creative destruction in which the surviving firms have emerged stronger, while the less productive plants have exited.

16. In comparing the behaviours of globally and non-globally engaged US firms, Lewis and Richardson (2001) reveal that plants with investment links to foreign plants have higher productivity than typical plants without such linkages. Similarly, a typical assembly–line worker in a plant that exports or outsources abroad earns more than an otherwise comparable assembly–line worker in a plant that does neither. They also find that the global commitment through imports of inputs, capital goods inputs, and finished products induce significant productivity gains that more than offset the losses of those workers and firms that are displaced by imports. Against the background of these rewards, their policy suggestions are to encourage the global integration of firms and to minimise the burden on those firms that have not made that choice.

D. The Many Causes of Job Loss

17. The effects of international trade and globalisation on labour markets have been the focus of considerable debate and analytical research. One of the most interesting and in-depth analyses of the labour adjustment induced by import competition and globalisation is by Lori Kletzer (2001a). Her work shows that import competing workers have reasons to be anxious about the prospects of losing their jobs, because those who lose their jobs experience large and persistent earning losses. But, she also discovers that earning losses are experienced by all displaced manufacturing workers, irrespective of the causes of their job loss, *e.g.* import competition and/or technological change. While she agrees that there is a need for political recognition of trade-related adjustment problems, her research supports the needs for broad labour adjustment programmes for all displaced workers irrespective of the causes of job displacement.

18. In the same vein, Fields and Graham (1997) studied the re–employment experiences of displaced workers in the textile and clothing sectors to determine both if the unemployment experience was significantly different for these and other sectors, and to relate these findings to possible adjustment costs resulting from trade liberalisation initiatives for the United States. They conclude that textile and clothing workers displaced due to mass lay-offs or large plant closures do not represent a special case, different from workers losing their jobs due to similar circumstances in other industries. Although they find that displaced textile and clothing workers who find new jobs in different sectors experienced a somewhat longer period of unemployment than displaced workers in other sectors, they tended to find jobs in higher wage sectors. They also argue that although the case could be made for pursuing policies to alleviate the hardships of older workers in the textile and clothing sectors, "industry-specific protection from imports does not appear to be an effective way to assist classes of laid-off workers who might experience extraordinary difficulty due to lay-off".[3]

19. In a review of the empirical literature on the effects of international trade on the US labour market, Blancflower (2000) concludes that globalisation "did not appear to be the main, or even one of the major, causes of the labour market changes that occurred in the USA or elsewhere since the 1970s".[4] Other influential factors included: skill-biased technological changes; immigration; declining unionisation; declining real minimum wages; and reductions in the supply of college-educated workers. Although noting the dramatic changes in labour markets that occurred during the previous decades, Blancflower stresses technology as an important factor in explaining the shift in the demand away from the less skilled jobs.

E. Labour Adjustment as a Public Policy Issue

20. Unlike capital, there are significant barriers to the free movement of labour. At the international level, most countries have restrictions on immigration. Within an economy, labour mobility is restricted more by natural factors than laws. There are significant financial, economic, social and psychological costs associated with the movement of labour.

21. There are three rationales for government action on labour market adjustment. The first one is economic: labour market policies and programmes may enable a more efficient allocation of resources. In the area of international trade, devoting some resources to ease the adjustment burden may help facilitate more trade liberalisation, which may result in significant gains for the entire economy. The second is political: politicians tend to avoid policies, like trade liberalisation, that might harm employment. One way to make these kinds of policy decisions more palatable to politicians is to make a commitment to assist those workers and communities adversely affected by the policy. The third is equity: there are costs and benefits to most government policies, including trade policy. For example, trade liberalisation may help some people and hurt others. In these cases, there is an argument that those people benefiting from a specific policy should be asked to assist those people hurt by that same policy.

22. The absence of policies and programmes designed to respond to trade-related dislocations may result in the imposition of broader measures to protect an industry from increased import competition. The costs to the economy associated with these measures will most likely be greater than the cost of providing assistance to those workers who might lose their jobs without them. Part VI presents a review of quantitative studies of the welfare gains from complete trade liberalisation in textiles and clothing and shows the estimated annual global benefits ranging from USD 6.5 to 324 billion. Moreover, the trade policy community has recently begun paying closer attention to the social and economic consequences of international trade. Policy makers from all countries, regardless if they have a constitutional democracy or parliamentary system, are being asked to think about the labour market adjustment issues related to trade liberalisation.

23. Industrialised countries are not alone in attempting to face the new realities associated with trade policy. Policy makers from developing countries are increasingly being asked to consider the domestic consequences of trade liberalisation. The emergence of China as a major exporter has made this concern very real. Countries where low wages have played an important role in their export strategy are now learning that they can be out-competed on price (see Parts II and V). Most of these countries do not have any kind of sophisticated social welfare system. Furthermore, many of these low-wage countries have very restrictive labour laws, making it extremely difficult to fire workers.

24. It is becoming clear that all countries, regardless of their level of development, must begin to address the social and economic consequences of trade liberalisation. In recent years, there has been a tendency for policy makers to call for international cooperation to address commonly shared challenges by many countries. Examples include AIDS, poverty and environmental issues. By contrast, responding to the pressures associated with trade liberalisation, despite the fact that all countries around the world face these pressures, continues to be seen primarily as a national responsibility. For example, despite the fact that workers in many developing countries will benefit from the removal of quantitative restrictions, the responsibility of assisting adversely affected workers and communities falls more directly on the formerly protected economies, *i.e.* the United States, the European Union and Canada, and those developing countries that have built an export–led strategy based on MFA quota allocations. There is considerable anxiety in the world wide textile and clothing community about the emergence of more competitive and integrated suppliers, particularly in China, that may capture a disproportional share of the economic benefits arising from the phasing out of the ATC.

25. Against this background of closer international integration, the systemic shift towards services-related activities and the phasing out of quantitative restrictions, the main policy challenge for policy makers is to secure the benefits from liberalised trade and investment while, simultaneously, minimising the resulting adjustment burdens on adversely affected workers and communities. In order to achieve this goal, governments must transfer some of the benefits of trade and investment enjoyed by the vast majority of people to help offset some of the costs incurred by those adversely affected by import competition. The main goal of any labour adjustment programme should be re-employment, either returning to their previous

jobs or finding new jobs, as soon as possible, with minimal disruption in earnings. These programmes should also aim at minimising the economic and social impact of plant closures on communities. Therefore, the overall policy challenge is to devise ways to meet the social goals in a cost-efficient and least trade distorting manner.

III. Characteristics of Displaced Workers

26. As mentioned in the previous section (Table 3.1), a change in *net* employment is only one aspect of the labour adjustment story. The data presented are *net* figures and do not provide any insight into the actual number of job losses and gains. The issue of *net* versus *gross* changes in employment gets to the heart of the burdens associated with labour market adjustment. Many workers do not (and some may argue, cannot) move freely from job to job, due to skill requirements, location, family responsibilities and wage and benefit differentials. In some cases, the labour market is segmented in effect. Thus the existence of a job opportunity alone does not erase the adjustment burden.

27. In order to fully appreciate the burdens of labour market adjustment, it is important to develop a deeper understanding of the individual workers who are forced to adjust to changes in the labour market for which detailed labour data are required. Until recently, the United States was the only country that surveyed displaced workers in order to gain some insight into the adjustment process.[5] In addition to providing more information about the displaced workers by age, sex, marital status, and education, these data also enable a deeper understanding of the adjustment burden facing workers. The data include information on the industry from which the worker was separated, his/her pre-separation wage, tenure, and length of unemployment. Identical workers are surveyed over time in order to get some information on the adjustment process, *e.g.* if the worker is re-employed and if he/she has experienced any income loss. Therefore, the availability of these surveys has facilitated the analysis of labour adjustment developments in the United States.

28. Lori Kletzer (2001a) undertook one of the most ambitious studies of displaced workers, which includes an in-depth analysis of the adjustment process and the costs of adjustment for displaced workers. Box 3.1 presents a summary of her major findings.

Box 3.1 Job Loss from Imports: Measuring the Costs, Kletzer (2001a)

Similar to manufacturing workers displaced for other reasons, import-competing displaced workers are older, less formally educated, and more tenured than displaced non-manufacturing workers. Generally, these are not the characteristics of workers who succeed in training programmes.

For many workers, import-competing job loss is very costly, due to difficulties finding new employment at a level of pay similar to the old job. Two-thirds of re-employed workers earn less on their new job than they did on their previous job, and one-quarter experience earnings losses in excess of 30%. The average earnings loss is more modest, but still sizeable at 13%. The distribution of earnings loss is very similar to that found for all workers displaced from manufacturing jobs for other reasons.

Import competition is associated with low re-employment rates because the workers vulnerable to rising imports experience difficulty in gaining re–employment, based on their individual characteristics. The characteristics that limit the re-employment of import-competing displaced workers are: low educational attainment; advancing age, high tenure, minority status; and marital status. Workers with high tenure and/or low skill may confront serious skill-related adjustment problems, along with having rusty job search skills.

For most workers, the costs of job loss occur as re-employment earnings losses. Less formally educated workers experience the greatest difficulty maintaining earnings. More generally, re-employment earnings losses rise with age, fall with education, and rise with job tenure. Workers with these characteristics appear to need the most help.

Re-employment in manufacturing minimises the earnings losses (on average). An advantageous outcome for production workers with manufacturing-specific skills is to stay employed in manufacturing. Earnings losses are reduced by re-employment in the old industry. Re-employment in services is associated with the largest earnings losses. There may be little retraining associated with these moves.

29. More recently, Kletzer carried out additional calculations focusing on displaced workers in the textile and clothing sectors for the period 1993 to 2001. These data are presented in Tables 3.4 to 3.7. Data are presented for four groups of displaced workers: those previously employed in clothing and textiles; other import-sensitive industries; and all other manufacturing industries.[6]

30. Table 3.4 presents the basic demographic characteristics of displaced workers and shows that displaced workers from the clothing and textile industries represent only 11% of all surveyed displaced workers. Although there does not appear to be any discernable difference in age between the four groups, there is a higher prevalence of women and minorities in the textile and clothing industries. This finding can play an important role in the adjustment process, since women tend to be second wage earners in many families, and are thus less likely to relocate in order to take a new job.

Table 3.4 Demographic Characteristics of Displaced Workers

Sector	Share	Age (in years)	Female	Minority	Married
Clothing	8%	39.47	75%	46%	56%
Textiles	3%	38.36	54%	35%	69%
Other Import–sensitive	34%	39.61	36%	24%	63%
Other Manufacturing	55%	39.11	31%	21%	61%

Source: Unpublished calculations by Lori Kletzer.

31. Table 3.5 shows that displaced workers from textile and clothing industries are twice as likely to have less than a high school education, relative to other dislocated workers. At the other end of the education spectrum, displaced textile and clothing workers are much less likely to have attended college than other displaced workers. This finding supports the widely held perception that textile and clothing workers are low skilled.

Table 3.5 Education Characteristics of Displaced Workers

Sector	Less than high School	High School grade	Some College	College or more
Clothing	34%	40%	21%	6%
Textiles	23%	40%	30%	7%
Other Import–sensitive	11%	37%	30%	23%
Other Manufacturing	14%	38%	30%	18%

Source: Unpublished calculations by Lori Kletzer.

32. Table 3.6 provides further insight into the jobs from which workers were separated. It appears that all four groups of displaced workers were separated from full-time (FT) jobs. Textile workers tend to have the longest average job tenure (approximately ten years), almost twice as long as workers displaced from the clothing industry. In fact, of the four groups, displaced workers from the clothing industry experienced the shortest average job tenure. On the other hand, approximately 80% of the workers displaced from the clothing industry were employed for more than ten years. This is considerably higher than for other displaced manufacturing workers. Data in the last two columns compliment earlier findings concerning the level of education. According to these data, there is a higher probability that displaced workers from the clothing and textile industries will be operators and a lower probability that they will have a craft. Both of these findings support the conclusion that the textile and clothing industries tend to require low-skill work.

Table 3.6 Tenure Characteristics of Displaced Workers

Sector	Displaced from FT Job	Job tenure (years)	Tenure less than 10 years	Craft	Operator
Clothing	94%	5.59	19%	8%	76%
Textiles	97%	9.64	36%	11%	63%
Other Import-sensitive	97%	7.33	28%	21%	35%
Other Manufacturing	95%	6.96	26%	17%	42%

Source: Unpublished calculations by Lori Kletzer.

33. Table 3.7 provides some insights into workers' pre-separation earnings. Displaced textile and clothing workers earned significantly less than other displaced manufacturing workers. It is particularly interesting to note that the mean earnings for displaced textile and clothing workers are much less than mean and median earnings for displaced workers from other import-sensitive industries. Approximately one-quarter of displaced clothing workers had earnings of less than USD 200 a week. This is considerably higher than the percent of textile workers (9%) and the percent of all other displaced workers (5%) earning less than USD 200 a week. This suggests that in addition to being primarily low-skill industries, textile and clothing also tend to pay low wages.

Table 3.7 Earnings and Replacement Rates of Displaced Workers

Sector	Mean Earnings USD	Median Earnings	Earnings less than USD 200/week	Earnings greater than USD 800/week	Wage Replacement Rate
Clothing	247.31	201.58	26%	3%	56%
Textiles	346.37	283.09	9%	4%	63%
Other Import-sensitive	529.96	420.44	5%	22%	69%
Other Manufacturing	471.37	383.89	5%	18%	69%

Source: Unpublished calculations by Lori Kletzer.

34. Overall, the preceding tables suggest that displaced workers from the textile and clothing industries tend to have low level of education, low skills (and thus earn low wages), and are predominantly women and minorities (including minority women). All of these characteristics make it more difficult for workers to adjust to changes in the labour market. Therefore, it is not surprising that the probability of re–employment within the two–year survey period is significantly lower for workers displaced from the clothing industry and somewhat lower for workers displaced from the textile industry than for workers displaced from other manufacturing industries.

IV. Labour Market Adjustment Policies

35. This section sets out a framework for analysing labour market adjustment policies and programmes in major industrialised countries. This framework may also assist policy makers in developing countries, as they consider options for responding to labour market adjustment burdens in their countries. Labour adjustment policies are only one part of a country's overall set of policies designed to respond to each country's unique economic and social conditions. They tend to be classified into three major sets of categories: (1) preventive and reactive; (2) direct and indirect; and (3) targeted and general.

A. Classification of Labour Adjustment Policies

36. In the first category, the *preventive* measures are put in place primarily to *avoid* dislocations and typically take the form of protecting an industry and its workers from foreign competition or some other economic development. The *reactive* measures are put in place in *response* to dislocations. They usually

take the form of assisting workers during their period of unemployment and can include unemployment insurance, job search assistance and training.

37. Specific measures within these two major types of policies can also be qualified in terms of their effects. The *direct* measures aim at addressing the immediate workers' needs. They are sometimes referred to as "active" labour market policies. Examples of direct labour market programmes for unemployed workers include financial assistance during the period of unemployment, job search assistance and training. The *indirect* measures are steps taken which have an indirect effect on workers, in particular, and on the labour market, more generally. For example, raising a customs tariff on one particular product or group of products will likely have an indirect effect on the workers who produce those goods. In this case, the increased tariff may assist an industry facing foreign competition and prevent, or at least postpone, worker displacement from the industry.

38. The third major classification deals with the scope and reach of the labour market programmes and policies. The *targeted* measures tend to be highly focused on assisting either one or a limited group of industries and its workers. A government subsidy to a particular industry is an example of a targeted measure. The *general* measures are designed to assist all industries and/or workers without discrimination or preference. Table 3.8 shows some examples of direct and indirect, targeted and general labour market policies and programmes.

Table 3.8 Classification of Labour Market Adjustment Policies

Measures	Direct	Indirect
General	Unemployment insurance, training and job search assistance for all displaced workers.	Macroeconomic, exchange rate and tax policies; across the board trade policy measures *e.g.* an import surcharge.
Targeted	Special assistance for a particular group of workers *e.g.* workers who lose their jobs due to increased import competition.	Industry subsidies and preferential tax treatment, tariffs, quotas and other industry–specific trade policy measures.

39. Direct adjustment programmes traditionally have focused on providing financial assistance to unemployed workers through unemployment insurance. Over the last few years, there has been a shift in emphasis toward re–employment services, like training and job search assistance. Recent reforms in Germany, Japan and the United States have gone beyond job search assistance to include re-employment incentives, like wage subsidies.

40. Direct programmes in most countries also tend to be general in nature and designed to assist all unemployed workers, regardless of worker characteristic, industry of origin, or cause of dislocation. The US Trade Adjustment Assistance (TAA) programme is an example of a targeted and direct programme. Under TAA, additional assistance beyond the traditional unemployment insurance system is offered to workers adversely affected by increased import competition and shifts in production.

41. Macroeconomic policies – monetary and fiscal policies – although not exclusively designed to affect labour markets, can have a significant impact on them. These policies are therefore classified as general and indirect labour adjustment policies. One example would be the macroeconomic policies

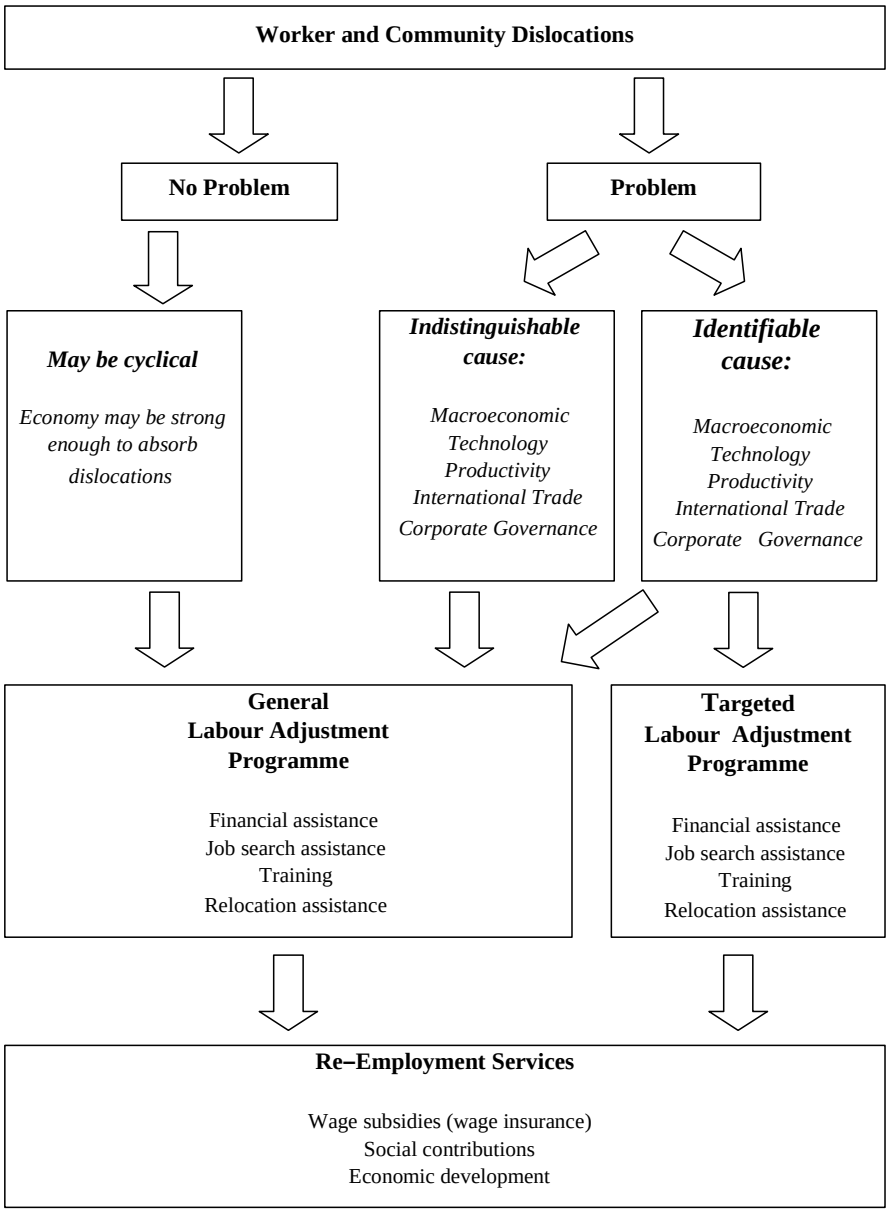
implemented in the United States during most of the 1990s, which resulted in a significant expansion in total employment. The growth in job creation reduced some of the adjustment burden that some workers have experienced as a result of losing their jobs.

42. Exchange rate policies may also be seen by some as another example of general economic policies that have an indirect effect on labour market adjustment. The strong appreciation of the US dollar against the major trading currencies during the first part of the 1980s intensified competition on the US tradable-goods sector, resulting in a loss of export market overseas and a significant increase in imports. This burden has more recently shifted to Japan and somewhat to Europe, as the values of the Yen and the Euro have appreciated against the US dollar.

43. Since it is difficult to trace the direct impact of macroeconomic and exchange rate policies on labour markets, these policies tend to get ignored in discussions of labour market adjustment policies and programmes. In addition, these policies are difficult to fine-tune. On the other hand, the macroeconomic environment is extremely important in determining the extent of the adjustment burden and the speed by which workers can move between jobs. For example, job search assistance is enhanced if an economy is creating large numbers of jobs.

44. The most traditional examples of direct and preventive policies are industry subsidies, tax preferences and various kinds of trade policy measures. These measures tend to target a particular industry or group of industries, but they can also be designed to affect an entire economy. A schematic representation of labour market adjustment policies and programmes is shown in Figure 3.1.

Figure 3.1 Main Phases in Labour Market Adjustment Policies and Programmes



B. Unemployment Insurance

45. The most common form of labour market adjustment programme throughout the world is unemployment insurance. Developed in the early part of the 20th Century, unemployment insurance programmes have become a central part of the social safety net in most industrialised countries and more recently in some developing countries. As a general rule, unemployment insurance programmes provide some financial assistance to workers during their period of unemployment. The programmes tend to be financed through payroll taxes paid by employers and employees. For the most part, unemployment insurance programmes provide assistance to workers who involuntarily lose their jobs without cause. In rare cases, such as Japan, workers who voluntarily leave their jobs may also be eligible for assistance.[7]

46. Table 3.9 presents recent unemployment rates for France, Germany, Japan, the United Kingdom and the United States. Japan has traditionally experienced low unemployment rates, although that has been changing in recent years. During the 1990s, the Japanese unemployment rate has more than doubled. Of the five countries France has experienced the highest unemployment rates and the United States the most stable unemployment rates.

Table 3.9 Standardised Unemployment Rates

Country	1990	1995	2000
France	8.6%	11.4%	9.3%
Germany [1]	4.8%	8.2%	7.9%
Japan	2.1%	3.1%	4.7%
United Kingdom	6.9%	8.5%	5.4%
United States	5.6%	5.6%	4.0%
Total OECD	na	7.4%	6.3%

Note 1: Replacement rate is the percentage of the previous wage received by workers. For 1990 the unemployment rate is only for the former West Germany.
Source: OECD Employment Outlook 2002.

47. Comparative information concerning the unemployment insurance programmes in five industrialised countries is presented in Tables 3.10 and 3.11. More detailed information about the assistance programmes provided in each of these countries is found in Annex B. There is a wide variance among unemployment insurance programmes in these countries. Major differences occur in the amount and duration of financial assistance paid to unemployed workers. This reflects an ongoing debate over the potential disincentives of providing financial assistance to unemployed workers.

48. Some people argue that unemployment insurance should operate as any other type of insurance programme – workers pay a premium to insure themselves against the possibility of losing their job. Where that occurs, this argument goes; workers would be entitled to compensation. This position is balanced against those who argue that providing financial assistance to unemployed workers might serve as a disincentive for finding a new job. This group argues that generous assistance to unemployed workers prolongs the duration of unemployment, thereby causing moral hazard.

Table 3.10 Unemployment Insurance Provisions

Country	Replacement Rate	Minimum Payment USD	Maximum Payment USD	Duration (months)
France	75%	8 214	60 184	60 [1]
Germany	60%		30 890	12 [1]
Japan	80%		20 209	10
United Kingdom	Flat rate		4 084	6
United States	50%	4 524	15 600	6

Notes: Replacement rate is the percentage of the previous wage received by workers; and the relevant exchange rates are mentioned in Appendix II.
Note 1: Both France and Germany provide addition assistance once UI is exhausted.
Source: OECD Employment Outlook 2002.

Table 3.11 Brief Summary of Unemployment Insurance Programmes in Five Countries

Country	Qualifying period	Duration of benefits	Replacement rate	"Fallback" programmes	Comments
France	5 alternative ways to qualify for different benefit durations, depending on work history in the last 3 years	4 months to 33 months, depending on employment history and age	57 to 75 % of previous earnings (no maximum); benefit rate falls after an initial jobless period.		
Germany	12 months in the last 3 years	156 to 832 days, depending on age and employment history	67 % of previous net wage (60 % for workers without children)	57 % of previous net wage (50 % without children) Means tested: unlimited duration	12 week waiting period for quitters
Japan	26 weeks of work in past year	90 to 360 days; increases with age, years worked and full time status	50 to 80 %, depending on age and rate of pay, to a maximum	Universal welfare, unlimited duration	Some restrictions on quitters
United Kingdom	2 years continuous employment	6 months	Flat rate cash benefits (48.25 Pounds in 1996) per week.	Means tested unemployment assistance, based on household income; unlimited duration	Unemployment assistance is more generous that UI, especially if no other earners in the household. Unemployment assistance can include full rent and property tax subsidies
United States	26 weeks of work in past year	26 weeks (plus 13 weeks extended benefits in cases of high unemployment)	50 to 70 % to a maximum Average replacement rate 30 to 40 %	Means-tested welfare benefits available to single parents only Lifetime limit of 5 years	Very low take up rate; quitters are disqualified; and benefits are taxed as income

Source: The author's summary based on available information

49. Programmes in each of the five countries covered fall along the spectrum of this debate. Following recent reforms, the United Kingdom provides the lowest amount of financial assistance to its unemployed workers. The US programme is next. Both the United Kingdom and the United States provide initial financial assistance for only six months, the shortest duration among the five countries analysed.[8] France, Germany and Japan are at the other extreme, providing more financial assistance for longer periods of time. The Japanese unemployment insurance programme is the closest to a true "insurance" programme, in that all unemployed workers are eligible for assistance, regardless if their separation was voluntary or not. The French programme appears to be the most generous.

C. Training Programmes

50. Next to unemployment insurance, training is probably the second most prevalent aspect of direct or active labour market adjustment programmes in industrialised countries. In some countries, like Germany, providing training to unemployed workers is part of a comprehensive policy of training and vocational programmes. Other countries employ a mix of private and training schemes.

51. Training programmes fall into two broad categories: providing basic skills in language and math to those with low educational attainment; and providing specific job-related skills. Deficiencies in basic skills are particularly present in the case of workers in traditional low skill manufacturing jobs, like in the textile

and clothing industries. Many workers in these industries have less than a high school education. The lack of basic skills adds a burden onto an already arduous adjustment process when these workers face the need to find a new job.

52. In recent years, there have been efforts to engage the private sector more in the provision of specific job-related skill training. In Germany, tax credits are used to encourage firms to hire and train new workers. In the United States, in recent years, there has been a shift from government-provided training to government-financed privately-provided training. Workers are given what amounts to vouchers, which they can use to finance approved training.

53. Analysing training programmes is severely limited by the lack of data concerning who gets trained, for what, at what cost, and how useful the training is in helping the worker find a new job. Despite the lack of useful empirical research on the effectiveness of various training schemes there is evidence that on-the-job training tends to be more efficient than classroom training. Accordingly, government-sponsored training programmes have moved more in that direct in recent years.

54. Table 3.12 presents a comparison of expenditures on training and unemployment insurance in the five countries. France and Germany spend the most on training and unemployment insurance. This is due to a combination of ambitious training programmes, generous assistance and relatively higher unemployment rates than experienced in the other countries. In relative terms, the cost of the rather generous assistance in the Japanese programme is offset in part by the lower incidence of unemployment. The United States appears to spend the least amount on assisting its unemployed workers among the five countries. A similar pattern exists regarding expenditures on training. France and Germany spend the most among the five countries. The low percentage for Japan is primarily due to its low unemployment rate. The United Kingdom and the United States spend relatively less on training on their unemployed workers than the other countries.

55. It is interesting to note the gap in expenditures on training between France and Germany at one extreme and Japan, the United Kingdom and the United States at the other. Training programmes in France and Germany do not appear to be a substitute for unemployment compensation, but rather a compliment to it. There is also no evidence that training somehow reduces the adjustment period, and thus the need for more unemployment compensation. In fact, it some cases, training may actually prolong the adjustment process, but may also prevent workers from experiencing long-term income losses as a result of their job loss.

Table 3.12 Expenditure on Training and Unemployment Compensation, 2000

Country	Training	Unemployment Compensation
	(% of GDP)	(% of GDP)
France	0.22%	1.38%
Germany	0.34%	1.89%
Japan	0.03%	0.55%
United Kingdom	0.04%	0.56%
United States	0.04%	0.30%

Source: OECD Employment Outlook 2002

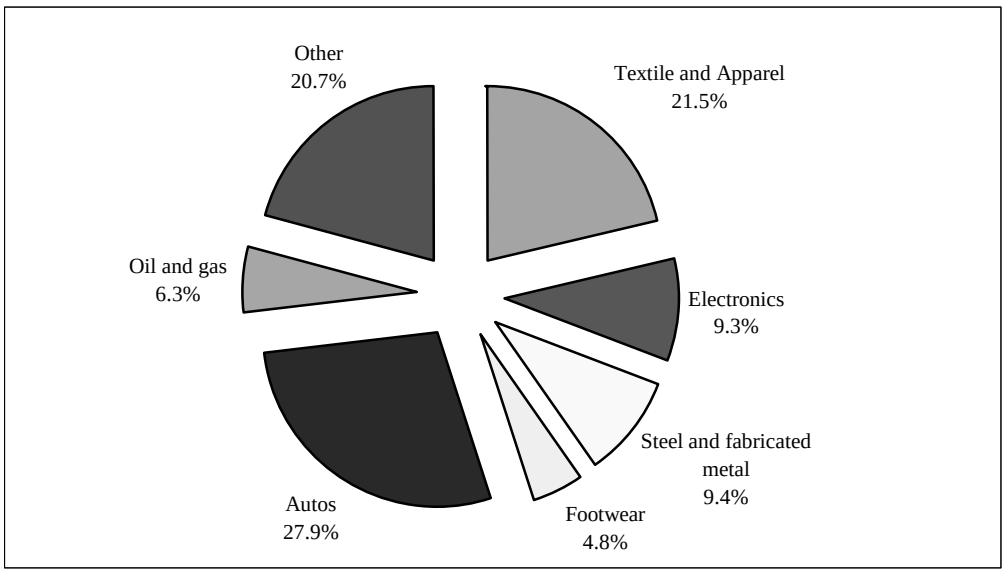
D. Trade Adjustment Assistance

56. As mentioned above, unemployment insurance programmes in most industrialised countries are designed to assist all unemployed workers, regardless of industry, worker demographics or cause of dislocation. The most significant exception to this general framework is the TAA programme in the United

States. By comparison, more generous labour market adjustment programmes in most other industrialised countries somehow lessen the need for special programmes for workers from a specific industry or whose job loss can be traced to a specific cause, *i.e.* import competition. The absence of targeted trade-related labour programmes in other industrialised countries may also be a reflection of the inherent difficulty to isolate the trade cause of worker dislocations from other causes, *e.g.* technological changes, productivity gains, and shifts in labour demand and supply.

57. The Trade Expansion Act of 1962, which provided President Kennedy with the authority to enter into GATT negotiations, established the TAA. Initially, the programme was designed to provide extended financial assistance, beyond the traditional 26 weeks of unemployment insurance, to workers who lose their jobs due to an increase in imports. Very few workers received assistance during the programme's first 12 years, due in large part to rigid eligibility criteria. In 1974, Congress eased the eligibility criteria and expanded the assistance to include training.[9] Since 1975, over three million American workers have been certified as eligible for assistance under TAA, and approximately 1.9 million workers have received assistance.

Figure 3.2 TAA Participants by Industry, 1975 to 1999



Source: US General Accounting Office (2001)

58. Throughout the history of the programme, workers from the steel, auto, textile and clothing industries comprised a large majority of TAA participants between 1975 and 1999 (Figure 3.2). Based on more recent data, between January 2002 and July 2003, a little more than 23% of the petitions, representing close to 28% of eligible workers, were from the textile and clothing industries (Annex Table 3B.5.2).

59. Under the programme, workers who enrol in training can currently receive up to 78 weeks of financial assistance, beyond the standard 26 weeks of unemployment insurance. In addition, workers can receive job search and relocation assistance. The financial assistance is considered an entitlement whereby Congress must appropriate sufficient funds to provide payments to all eligible workers. Training is a *capped* entitlement by which Congress fixes the total amount of funds appropriated for training, but every eligible participant is entitled to enrol in some government-sponsored training.[10] TAA also provides funds for job search and relocation assistance, although not many workers request this assistance.

60. With the approval of the North American Free Trade Agreement (NAFTA) in 1993, Congress established a separate programme for workers who lose their jobs from industries facing increased imports from and/or relocates production to Canada and Mexico. Assistance provided to workers under the NAFTA–TAA programme was almost identical to that provided under the general TAA programme, but there were some differences in coverage. In addition to covering workers who lost their jobs from import-competing industries, NAFTA–TAA provided assistance to workers who lost their jobs due to shifts in production to Canada and Mexico. In addition, some secondary workers, who lost their jobs because they worked for suppliers or downstream producers for firms that faced increased import competition from Canada or Mexico, received assistance. Annex Table 3B.5.4 shows the characteristics of workers who received assistance under TAA and NAFTA–TAA in 1999 and 2000.

61. In August 2002, President George W. Bush signed the Trade Act of 2002, granting him the authority to enter into multilateral and bilateral trade negotiations. The Act also included the most extensive reform and expansion of the Trade Adjustment Assistance, since the programme was established (Box 3.2). These new TAA provisions must now be fully enacted and the necessary funds appropriated to enable the reformed programme to operate. With its broader scope, the TAA annual budget is estimated to triple over the next few years.

Box 3.2 Some of the Key TAA Reforms in 2002

Secondary workers: TAA eligibility criteria were expanded to include workers who lose their jobs from plants producing parts that are inputs into import-competing final goods. Some of these workers were already covered under NAFTA–TAA. This provision could result in a doubling in the number of workers eligible for assistance.

Refundable tax credit for health insurance: Workers are eligible to receive an advance of 65% of a refundable tax credit to help offset the cost of maintaining health insurance for up to two years.

Shift in production: TAA eligibility criteria were expanded to include workers who lose their jobs due to shifts in production to those countries which have bilateral agreements with the United States or "where there has been or is likely to be an increase in imports...."

Wage insurance: Workers over 50 years old and earning less than USD 50,000 a year may be eligible to receive 50% of the difference between their old and new wage for up to two years, if the new wage is lower than the old wage.

NAFTA-TAA and TAA: NAFTA-TAA and TAA were harmonised and combined.

Training appropriation: Congress doubled the legislative cap on training appropriation, from USD 110 million to USD 220 million a year. Congress also has to agree to the actual annual appropriation for training.

Extended income maintenance by 26 weeks: Workers enrolled in training may be eligible to receive income maintenance for up to two years. This constitutes an increase of the previous limit by 26 weeks.

Increased in job search and relocation assistance: The assistance was updated for inflation.

TAA for farmers: A programme was established to provide assistance to farmers and fishermen when the international price of a commodity falls more than 20% below the previous five-year average.

Increased funds for TAA for firms: Congress raised the appropriation cap on this very small programme that provides loan guarantees to firms for the purpose of retooling and responding to international competition.

62. One of the key issues regarding TAA is the mechanism by which a worker's job loss can be traced to increased imports. The TAA law sets out a rather sophisticated process for making this determination. A group of workers, or some organisation acting on behalf of a group of workers, like a firm or union, may petition the US Department of Labour. Based on the petition, the Department of Labour initiates an investigation into the circumstances of the lay-offs.

63. In the case of increased import competition, there are three criteria: (1) a significant number or proportion of the workers in such workers' firm have become or are threatened to become totally or partially separated; (2) sales or production of such a firm have decreased absolutely; and (3) imports of like products or those that are directly competitive with articles produced by the workers' firm contributed importantly to the total or partial separation or threat thereof, and to the decline in sales or production.

64. The US judicial courts have interpreted "contributed importantly" to mean that increased imports, although one of several factors contributing to the decline in production, sales and employment, must be at least as important as all the other factors. In other words, another factor cannot be more important than the increase in imports.

65. In 2002, TAA eligibility was expanded to include workers that lose their jobs due to shifts in production. Here too, the legislation sets out three criteria for making this determination: (1) a significant number or proportion of the workers in such workers' firm have become or are threatened to become totally or partially separated; (2) sales or production of such firm have decreased absolutely; and (3) a shift in production of like articles or directly competitive with articles produced by such workers' firm contributed importantly to the total or partial separation or threat thereof, and to the decline in sales or production.

66. Since the programme was only expanded in 2002 to cover eligibility under the shift in production criteria, the courts have not yet had an opportunity to provide their interpretation of the legislation. It is fair to assume that none of these determinations will be clear cut and easy to make. Moreover, workers have the right to appeal the Department of Labour's initial determination. They can also take their complaints to the US Court of International Trade.

67. The inherent difficulties associated with determining the cause of a job loss, *i.e.* increased imports or shift in production, will now be compounded by the inclusion of secondary workers. The 2002 law defines secondary workers as workers employed by supplier firms, downstream producers, and firms that provide contract services who are separated or threatened with separation if their separation is due to a loss of business with a firm where workers have been certified as eligible to apply for trade adjustment assistance.

68. Difficulties associated with identifying the cause of displacement, together with the issue of providing different unemployment and re–employment services based on that cause of displacement, have led many policy analysts to recommend to implement broad labour adjustment programmes for all displaced workers regardless of the causes of job displacement.[11] In an overview paper of the Globalisation Balance Sheet project undertaken by the Institute for International Economics, Richardson (2003) stresses the emerging consensus that policies should: "(1) move away from specific industry-and-job-based relief and towards worker empowerment; (2) move toward education and skill-building experience, including on-the-job training; and (3) move toward insurance programmes that preserve an individual's lifetime earnings potential". [12]

69. At the outset, it appears that the TAA is a reflection of the unique way of granting trade negotiating authority to the US President in which political compromises are simultaneously reached on many trade-related considerations, including the means for offering some kind of compensation for workers adversely affected by trade. The ultimate priority for any labour market adjustment programme should be its effectiveness in assisting workers to find new jobs, as soon as possible, with the least amount of permanent income loss. Since the United States is the only country with a targeted programme devoted to workers adversely affected by trade, there is insufficient evidence to test the effectiveness of this approach.

E. Other Labour Adjustment Measures

70. Labour market adjustment policies and programmes in most of the industrialised countries are currently undergoing reform. This reform is being motivated by three factors. First, many industrialised countries have been experiencing high unemployment rates that coincide with long periods of unemployment. Second, the high incidence of unemployment has raised the cost of maintaining generous unemployment insurance systems. Third, there is an ongoing debate over the effect of unemployment assistance on prolonging unemployment. Proponents argue that generous assistance serves as a disincentive to work, prolonging the period of unemployment and exacerbating a country's unemployment rate. Although there is limited empirical evidence to support the argument, it has gained attraction in countries with high unemployment, like Germany and the United Kingdom.

71. In general, reforms of labour market adjustment programmes are proceeding on the basis of three principles. First, direct financial assistance has been reduced in an effort to address the disincentive argument – weekly amount of financial assistance has been reduced in France, Germany and the United Kingdom. Second, there has been a shift in emphasis from unemployment compensation to re-employment assistance. Third, in providing re–employment assistance, efforts have been made to improve the management and coordination of services. There has been an effort to make unemployment assistance programmes more "customer friendly" in each of the five countries analysed. Job seekers work with re-employment counsellors, who assist in identifying and obtaining new employment. In some cases, workers are required to actually sign a "contract" with the counsellors, formalising their job search plans.

72. In recent years, the policy focus concerning unemployment assistance in the United States has also shifted toward re-employment services. The idea of a "one-stop shop" for unemployment assistance – inspired by the German system – was further developed and promoted by the United States. In recent years, Japan has established "Hello Work" centres, similar to the one-stop job assistance centres in the United States. On the other hand, it is interesting to note that the United States has not followed the other large industrialised countries in reducing direct financial assistance. The United States periodically extends the provision of unemployment insurance during periods of prolonged high unemployment.

73. Probably the most creative innovation in unemployment assistance over the last few years is the introduction of "wage insurance". Both Germany and the United States (under TAA) have recently introduced a limited version. Under the US programme, workers who are older than 50 and who earned less than USD 50 000 at their previous job, may be eligible to receive half of the difference between their new and old wage, if their new wage is less than their previous wage. This programme is aimed at reducing one of the major barriers to re-employment. It is also hoped that workers would get on-the-job training at their new job, which tends to be more effective than government-financed classroom training.

V. Concluding Remarks

74. Available analytical work on the impact of globalisation and international trade on labour adjustment suggests that workers who lose their jobs due to increased imports or shifts in production do not appear to be different than other displaced workers. Similarly, their adjustment process does not appear to differ significantly. Trade-related displacement may suggest the need for labour market adjustment policies and programmes, but not necessarily a special response.

75. It is getting increasingly difficult to isolate the causes of worker displacement. Technological change, productivity gains, increased import competition and shifts in production can all contribute to job losses. This difficulty has led many policy analysts to oppose targeted labour market adjustment policies and programmes for special groups of workers *e.g.* workers who lose their jobs due to increased imports or shifts in production, and instead put into place broad labour adjustment programmes for all displaced

workers. This issue is likely to remain prominent in the foreseeable future with the intensification of international relations among countries, spurred by improved technological developments.

76. In place of the debate over special versus general labour market adjustment policies and programmes, more effort needs to be made to determine which interventions are more effective than others. Most of the industrialised countries are attempting to improve the coordination of their unemployment benefits and employment services. There has been an effort to make the process more "customer-friendly".

77. There has been increasing reliance on training as part of the toolbox of labour market adjustment programmes. Many workers coming out of traditional low wage manufacturing industries lack basic language and math skills, thereby preventing them to acquire the specific skills required in the new jobs being created. The shift in structure of the labour market in the industrialised countries has also resulted in gap between the skills that workers needed in their old jobs and those demanded by their future jobs. Governments are employing various subsidies and tax incentives to encourage training and skill enhancement.

78. One creative innovation in recent years is the advent of wage insurance. Although somewhat similar to existing wage subsidy programmes, wage insurance is designed for those workers whose new wage is lower than their previous wage. By subsidising some portion of the difference in new and previous wages, it is hoped that workers will be encouraged to take a new job sooner. It is also hoped that new employers will provide the worker with on-the-job training, which has proven to be more effective and cheaper than government-financed classroom training. Germany and the United States have recently introduced limited programmes for older workers.

79. It is also important to see labour market adjustment policies and programmes within the context of a country's broader social safety net. The best example is the issue of health care in the United States. The United States is one of the few industrialised countries without universal health care. Since employers provide health insurance and pensions for many workers, when those workers lose their jobs, they and their families also face losing their health insurance and pensions. One way to reduce the "special-ness" of TAA would be to provide the new health insurance tax credit to all unemployed workers, regardless of the cause of displacement.

80. With few months before the scheduled elimination of the ATC, there is considerable anxiety in the world wide textile and clothing community about the emergence of more competitive and integrated suppliers, particularly in China, that may capture a disproportional share of the economic benefits arising from the phasing out of the ATC. In particular, several developing countries that had excelled as offshore assembly centres, due in part to their MFA quota allocations, will be exposed to the inherent vulnerability of international production fragmentation in the post-ATC period. Therefore, developing countries are certainly not exempt from labour pressures derived from changes in international trade and investment.

81. In some ways, developing countries are at a disadvantage, as many of them do not have well developed social safety nets already in place. On the other hand, the wealth of experience in the industrialised countries may provide developing countries, particularly the most advanced ones, with important lessons from which to develop their own labour market adjustment policies and programmes. International financial institutions might also help them overcome the resource constraints associated with developing a response to issues related to structural adjustment.

82. In stark contrast to the amount of resources being devoted to labour market adjustment measures, governments do not collect the data necessary to determine the effectiveness of these programmes. More information about the experience of displaced workers and the effectiveness of the various elements in

labour market adjustment programmes could make an important contribution to reforming existing programmes and developing new ones. The technology exists for such data collection; governments need to see better data collection as a priority and commit sufficient resources for doing so.

83. Finally, it needs to be stressed that a sound and dynamic macroeconomic environment is the most important factor in addressing labour market pressures. The main objective is for workers to be employed in high skilled and high wage jobs. All of the labour market adjustment policies and programmes discussed in this paper are only effective if they result in workers finding new employment.

ANNEX A: TABLES

Annex Table 3A.1.1 Job Losses in Textiles and Clothing in Six Countries, 1970-2000

Country	France			Germany			Japan		
(,000)	Textiles	Clothing	Total	Textiles	Clothing	Total	Textiles	Clothing	Total
1970	451	338	789	501	379	880	1 349	364	1 713
1975	364	304	668	357	288	645	1 093	467	1 560
1980	297	272	569	320	227	547	776	437	1 213
1985	na	na	na	246	170	416	706	459	1 165
1990	150	143	293	229	143	372	634	488	1 122
1995	131	139	270	261	122	383	491	375	866
2000	114	100	214	168	117	285	352	224	576
1970-2000	-337	-238	-575	-333	-262	-595	-997	-140	1 137
% change	-74.7%	-70.4%	-72.9%	-66.5%	-69.1%	-67.6%	-73.9%	-38.5%	-66.4%

Country	United Kingdom			United States			Italy		
(,000)	Textiles	Clothing	Total	Textiles	Clothing	Total	Textiles	Clothing	Total
1970	625	357	982	1 113	1 164	2 277			
1975	511	346	857	996	1 065	2 061			
1980	351	277	628	986	1 150	2 136			
1985	259	237	496	840	887	1 727			
1990	227	203	430	829	807	1 636			
1995	188	173	361	842	724	1 566	332	274	606
2000	149	109	258	528	633	1 161	352	206	558
1970-2000	-476	-248	-724	-585	-531	-1116	20	-68	-48
% change	-76.2%	-69.5%	-73.7%	-52.6%	-45.6%	-49.0%			

Source: United Nations Yearbook of Industrial Statistics; Bureau of Labour Statistics, US Department of Labour and Cline (1990)

Annex Table 3A.1.2 Employment in Textiles and Clothing, by Production Segment

Textile and Clothing Employment		Employment (Thousands)		Segment as % of total employment	
	China	2000	2001	2000	2001
	Textile industry	4,211.5	4,244.3		
	Natural fibers	3,782.7	3,808.6	89.7%	89.8%
	Preparation of textile fibers	3,057.8	3,081.9	72.6%	72.6%
	Finishing of textiles	379.8	379.2	8.9%	9.0%
	Made-up cotton articles and cordage	299.2	303.1	7.1%	7.1%
	Knitting textile industry, excluding knitwear	45.9	44.5	1.0%	1.1%
	Synthetic fibers	428.8	435.7	10.3%	10.2%
	Clothing industry	2,871.9	2,664.5		
	Knitwear	499.4	476.1	17.9%	17.4%
	Garment textile industry and others	2,372.5	2,188.3	82.1%	82.6%
	Equipment manufacturing industry	165.3	164.2		
NACE	**The European Union**	1996	2000	1996	2000
17	**Total Textile**	1165.961	1,110.1		
171	Preparation and spinning of textile fibres	150.857	128.6	12.9%	11.6%
172	Textile weaving	178.526	176.0	15.3%	15.9%
173	Finishing of textiles	114.584	112.6	9.8%	10.1%
174	Made-up articles, except apparel	128.729	126.6	11.0%	11.4%
175	Other textiles	177.235	176.4	15.2%	15.9%
176	Knitted and crocheted fabrics	47.969	50.5	4.1%	4.5%
177	Knitted and crocheted articles	188.85	142.3	16.2%	12.8%
18	**Total Clothing**	1136.559	1,025.0		
181	Leather clothes	13.427	10.4	1.2%	1.0%
182	Other wearing apparel and accessories	959.303	803.6	84.4%	78.4%
183	Dressing and dyeing of fur	14.7	13.6	1.3%	1.3%
JSIC Rev. 10	**Japan**	1994	2000	1994	2000
1700	**Textiles**	517.7	352.4		
1710	Spinning, weaving and finishing of textiles	217.5	130.4	42.0%	37.0%
1711	Preparation of textile fibres; weaving of textiles	133.9	76.2	25.9%	21.6%
1712	Finishing of textiles	83.6	54.2	16.2%	15.4%
1720	Other textiles	139.1	114.5	26.9%	32.5%
1721	Made-up textile articles, except apparel	78.2	64.5	15.1%	18.3%
1722	Carpets and rugs	9.3	7.2	1.8%	2.1%
1723	Cordage, rope, twine and netting	10.3	8.5	2.0%	2.4%
1729	Other textiles, nec	41.2	34.3	8.0%	9.7%
1730	Knitted and crocheted fabrics and articles	161.1	107.4	31.1%	30.5%
1800	**Wearing apparel and fur**	407.0	223.7		
1810	Wearing apparel, except fur apparel	406.0	223.0	99.8%	99.7%
1820	Dressing and dyeing of fur; articles of fur	1.0	0.7	0.2%	0.3%
1900	**Leather and articles; footwear**	82.7	58.9		
1910	Leather and articles of leather	35.9	24.3	43.4%	41.3%
1911	Tanning and dressing of leather	11.1	8.4	13.5%	14.3%
1912	Luggage, handbags & the like, saddlery & harness	24.8	15.9	29.9%	27.0%
1920	Footwear	46.8	34.5	56.6%	58.7%

Annex Table 3A.1.2 Employment in Textiles and Clothing, by Production Segment (continued)

Textile and Clothing Employment		Employment (Thousands)		Segment as % of total employment	
SIC	**Korea**	1990	2000	1990	2000
1700	**Textiles**	355.2	232.2		
1710	Spinning, weaving and finishing of textiles	269.3	154.7	75.8%	66.6%
1711	Preparation of textile fibres; weaving of textiles	219.7	95.8	61.9%	41.3%
1712	Finishing of textiles	49.6	58.9	14.0%	25.4%
1720	Other textiles	46.1	46.2	13.0%	19.9%
1721	Made-up textile articles, except apparel	24.4	27.2	6.9%	11.7%
1722	Carpets and rugs	1.1	1.0	0.3%	0.5%
1723	Cordage, rope, twine and netting	7.5	4.9	2.1%	2.1%
1729	Other textiles, nec	13.2	13.1	3.7%	5.6%
1730	Knitted and crocheted fabrics and articles	39.8	31.3	11.2%	13.5%
1800	**Wearing apparel and fur**	240.4	152.5		
1810	Wearing apparel, except fur apparel	234.6	150.1	97.6%	98.4%
1820	Dressing and dyeing of fur; articles of fur	5.8	2.4	2.4%	1.6%
1900	**Leather and articles; footwear**	217.1	52.9		
1910	Leather and articles of leather	37.5	19.4	17.3%	36.7%
1911	Tanning and dressing of leather	20.2	10.3	9.3%	19.4%
1912	Luggage, handbags & the like, saddlery & harness	17.3	9.1	8.0%	17.2%
1920	Footwear	179.6	33.5	82.7%	63.3%
SIC	**The United States**	1970	2002	1970	2002
22+239	**Total Textile**	1,136.8	619.8		
22	Textile mill products	974.8	431.8	85.7%	69.7%
221	Broad woven fabric mills, cotton	212.1	49.5	18.7%	8.0%
222	Broad woven fabric mills, synthetics	100.1	45.9	8.8%	7.4%
223	Broad woven fabric mills, wool	36.6	5.3	3.2%	0.9%
224	Narrow fabric mills	29.6	16.2	2.6%	2.6%
225	Knitting mills	254.1	89.1	22.4%	14.4%
226	Textile finishing, except wool	83.8	50.1	7.4%	8.1%
227	Carpets and rugs	57.4	62.9	5.0%	10.1%
228	Yarn and thread mills	130.9	65.1	11.5%	10.5%
229	Miscellaneous textile goods	70.3	47.7	6.2%	7.7%
239	Miscellaneous fabricated textile products	162	188	14.3%	30.3%
2391	Curtains and draperies	32[a]	16.6	2.8%	2.7%
2392	House furnishings, nec	47[a]	46.9	4.1%	7.6%
2396	Automotive and apparel trimmings	31.3[a]	57.3	2.8%	9.2%
231-8	**Total Clothing**	1,108.4	322		
231	Men's and boys' suits and coats	119	15.2	10.7%	4.7%
232	Men's and boys' furnishings	374.9	105.7	33.8%	32.8%
234	Women's and misses' outerwear	424.3	150.3	38.3%	46.7%
235	Women's and children's undergarments	116.7	13.7	10.5%	4.3%
236	Girls' and children's outerwear	73.5	9.6	6.6%	3.0%
238	Fur goods, and misc. apparel and accessories	65.5[a]	27.5	5.6%	8.5%

Note: [a] 1972 instead of 1970.
Due to confidentially rules, NACE 3-digits are aggregated in one or several categories in some EU member states.

Source: For Japan and Korea, OECD Structural Statistics for Industry and Services Database;
For China, OECD calculations based on CNTIC (2001/2002), Report on China Textile Industry Development;
For the USA, U.S. Bureau of Labour Statistics, National Employment, Hours, and Earnings Data; and
For the EU, EURATEX data.

ANNEX B: COUNTRY SPECIFIC SYSTEMS

I. The French Unemployment Insurance System

1. The French unemployment insurance system is probably the most generous among the five countries. The programme consists of two parts: unemployment insurance, financed by employer and employee contributions, and a "solidarity scheme" financed by the state. Workers who involuntarily lose their jobs and have made contributions to the system are eligible to receive assistance under the programme. The level of assistance is based on the worker's previous earnings. Workers who exhaust their unemployment insurance, have difficulty finding employment or are near retirement, may be eligible for assistance under the solidarity scheme.

2. The French unemployment insurance system is unique as it is managed by a combination of private organisations, including numerous employers' associations and trade unions. At the national level, this organisation is called Unedic, and it is responsible for setting the overall policy for the programme. At the local level, the joint organisation is called Assedic, and it is responsible for administering the programme. Annex Table 3B.1.1 presents the basic elements of the unemployment insurance programme and the solidarity scheme.

Annex Table 3B.1.1 The French Unemployment Insurance and Solidarity Scheme

Group	Unemployment Insurance	Solidarity Scheme
Management	The "Social Partners" through Unedic	The State
Assistance	Earnings related assistance, for a limited period of time	Fixed amount of assistance for an unlimited period
Financing	Employer and employee contributions	State budget
Target population	Workers who have involuntarily lost their jobs	Workers who have exhausted UI; hard to re-employ; and older
Administering	Assedic	Assedic

Source: Assedic (2003)

3. Currently, total contributions for unemployment insurance equal 6.4% of payroll, up to a maximum equal to 8½ times the minimum wage, or USD 1 044.45 (except otherwise noted EUR 1=USD 1.10). The employer share is 4% of payroll and the employee's share is 2.4% of payroll. It is interesting to note that among the five countries surveyed, France is the only one where the employer's contribution to unemployment insurance is larger than the employee's.

4. Workers applying for unemployment assistance, are asked to sign a "Return to Employment Aid Plan" (PARE), committing them to actively seek re-employment. Companies with less than 1 000 employees must provide workers with a PARE as a form of advance notification of job termination. This allows workers to file for unemployment insurance and begin meeting with the employment service, even before their last day of work.

5. Once workers meet with representative from the National Agency for Employment (ANPE), they are asked to develop and sign a "Personal Action Plan" (PAP). The plan outlines the type of jobs the

worker is seeking as well as the worker's request for training. The local Assedic office monitors the worker's progress in achieving the goals set forth in the PAP. If the worker remains unemployed after six months, he or she may be asked to develop a new plan. If the worker remains unemployed after 12 months, the local Assedic may provide a subsidy to a prospective employer.

6. Workers who sign a PAP are eligible to receive: (1) unemployment insurance for the entire duration of eligibility; (2) a mobility grant equal to travel expenses up to USD 2 086.70; (3) a training grant covering part of the costs for tuition, travel and accommodations during training; and (4) a special grant for those unemployed for more than 12 months. Workers can receive the special grant for up to three years, at a declining scale (40% of gross salary during the first year, 30% of gross salary during the second year and 20% of gross salary for the remaining third year).

7. The French unemployment insurance system also provides assistance to workers who leave their jobs in order to follow a spouse who moves for professional reasons. Another unique aspect of the French unemployment insurance programme is that workers younger than 50 can continue to receive financial assistance for a maximum of 18 months *after* re-employment. This is designed to help workers who take temporary or part-time jobs while they continue to look for full-time employment or workers who have lost their major employment, although they maintain a secondary job. In order to be eligible, the current salary can not be greater than 70% of the worker's pre-lay off income.

8. Annex Tables 3B.1.2 to 3B.1.4 provide more details about the French unemployment insurance programme. Annex Table 3B.1.2 presents information on the amount of assistance workers receive and Table 3B.1.3 presents information on the duration of that assistance. Annex Table 3B.1.4 provides information on re-employment benefits.

Annex Table 3B.1.2 Unemployment Insurance Assistance

Monthly Gross Earnings	Initial Assistance	Social Contribution USD
Less than USD 1 089.44	75% of salary	
Between USD 1 089.44 and USD 1 193.39	Minimum assistance 27.24 per day	
Between 1 193.39 and 1 970.30	40.4% of gross daily earnings plus USD 11.17 per day	3% of previous earnings (for pension)
Between USD 1 970.30 and USD 10 700.80	57.4% of gross daily earnings	11.25% of assistance, if above USD 33

Source: Assedic (2003).

Annex Table 3B.1.3 Duration of Assistance

Duration of previous employment	Duration of assistance
6 months within the last 22 months	7 months
14 months within the last 24 months	23 months
Between the age of 50 and 57 and over 27 months within the last 36 months	36 months
Above 57 years old, 27 months within the last 36 months and 100 quarters of contributions to retirement pension	42 months

Source: Assedic (2003)

Annex Table 3B.1.4 Re–Employment Benefits

Gross Salary and other income	Amount of assistance while working	Example
During the first six months of new employment		
Level of monthly earnings equal to or less than half the guaranteed minimum wage *i.e.* USD 668.32	Full amount of assistance	Before taking a new job, assistance was USD 447.48 per month. Assuming the monthly salary from the new job equals USD 419.23, the worker will continue to receive the full amount of unemployment insurance, in addition to his/her new salary.
Level of monthly earnings is greater than half the guarantees minimum wage *i.e.* greater than USD 668.32	40% of unemployment insurance assistance, in excess of USD 668.32	Before taking a new job, assistance was USD 447.48 per month. Assuming the monthly salary from the new job equals USD 838.48, the worker will receive USD 379.41 per month of unemployment insurance, in addition to his/her new salary.
During the following six months		
All levels of earnings	Unemployment assistance will be reduced by 40% of gross earnings.	Before taking a new job, assistance was USD 447.48 per month. Assuming the monthly salary from the new job equals USD 838.48, the worker will receive USD 112.09 per month of unemployment insurance, in addition to his/her new salary.

Source: Assedic (2003)

9. Annex Table 3B.1.5 presents data on the minimum amount of daily assistance under unemployment insurance, the solidarity scheme and early retirement programmes. The programmes are designed so that a worker can move through all three, if necessary. For example, an older worker who has difficulty finding a new job may initially receive unemployment insurance. If the worker has not found a new job by the end of the benefit period, he or she may be eligible to continue receiving assistance under the solidarity scheme. Workers may be eligible for an early retirement pension, if they are older than 57 and if they have made at least 100 quarterly contributions to the national pension fund.

Annex Table 3B.1.5 Minimum Daily Assistance

Programme	Minimum daily assistance
Unemployment insurance	
Minimum assistance	USD 27.24
Fixed amount	USD 11.17
Solidarity allowance	
Allowance for special categories of job seekers	USD 10.51
Specific solidarity allowance	USD 14.92
Increased allowance	USD 21.42
Retirement-equivalent assistance	USD 32.19
Early Retirement	
Minimum amount	USD 29.58
Minimum gradual early retirement	USD 14.78

Source: Assedic (2003)

II. The German Unemployment Insurance System

10. The German unemployment insurance programme is one of the oldest in the world. Until recently, it was also one of the more generous programmes. It is similar to others, in that it is financed through a payroll tax paid by employers and employees. The Federal Employment Office (Bundesanstalt fur Arbeit), an independent government agency, administers the programme. The German unemployment insurance system has recently been the focus of much attention as its reform is at the centre of Chancellor

Schroeder's Agenda 2010. A commission established by Chancellor Schroeder and chaired by Peter Hartz, CEO of Volkswagen, developed most of the reform proposals.

11. Until recently the German unemployment insurance system consisted of three parts: (1) "Unemployment Money" (Arbeitslosengeld), based on previous wages and financed exclusively through payroll taxes, provided assistance to workers for 12 to 32 months; (2) "Unemployment Assistance" (Arbeitslosenhilfe), was means tested and financed exclusively though expenditures from the Federal budget. Workers could receive unlimited Unemployment Assistance once they exhausted their Unemployment Money; and (3) "Social Assistance" (Sozialhilfe), based in family assets and is financed exclusively through expenditures from state budgets, was available to workers who were not eligible for Unemployment Assistance.

12. Although there is limited direct empirical evidence of the relationship, many people have argued that the potential for significant government assistance for an almost unlimited period contributed to the high rate of long–term unemployment in Germany. Table 3B.2.1 provides a comparison of long-term unemployment rates in the five large industrialised countries. Long-term unemployed as a share of total unemployed in Germany is in fact higher than in France, Japan, the United Kingdom and the United States. It is also substantially higher than the average for all OECD countries.

Annex Table 3B.2.1 Long-term Unemployed as a Share of Total Unemployed

Country	1990		1998		2001	
	>6 months	>1 year	>6 months	>1 year	>6 months	>1 year
France	55.5%	38.0%	64.3%	44.2%	57.2%	37.6%
Germany	64.7% *	46.8% *	69.6%	52.6%	67.6% **	51.5% **
Japan	39.0%	19.1%	39.3%	20.9%	46.2%	26.6%
United Kingdom	50.3%	34.4%	47.3%	32.7%	43.6%	27.7%
United States	10.0%	5.5%	14.1%	8.0%	11.8%	6.1%
Total OECD	44.6%	30.9%	48.6%	33.4%	41.8%	27.5%

Note: * Only covers West Germany
** Data for 2000
Source: OECD Employment Outlook 2002

13. Reducing the duration of unemployment assistance and tightening the eligibility requirements were among the major objectives of the Hartz Commission. The following is a list of the Commission's recommendations, as well as a comment on implementation. They are listed in order of their appearance in the Commission's report to the Chancellor.

A. Creation of Job Centres: Combine Unemployment Insurance offices, currently financed by the Federal government, and Social Assistance offices, currently financed by the state governments. The Federal government would fully finance the new combined office. Another recommendation was to organise the job centres by region, not according to political jurisdictions. The government did not adopt these recommendations.

B. Rapid response activities: Workers would be required to register for unemployment insurance as soon as they were notified of potential lay-off. Workers could gain access to all job search tools, like national job opening database. Workers could also take off work in order to search/interview for a new job. Workers would not receive income assistance until they were officially unemployed. The government adopted this proposal and it was implemented on 1 July 2003.

C. Accepting job offers ("neue Zumutbarkeit"): Under this proposal, all unemployed workers would have to accept new job offers, taking geographic mobility factors into account. If the first offer is refused, the worker's unemployment assistance could be stopped for four to 12 weeks. During this time, the workers could get social assistance if he/she met the eligibility criteria. After one year, workers must be willing to accept a job offer *anywhere* in Germany. Refusing a second job offer could result in forfeiting further unemployment assistance. In that event, a worker could continue to receive social assistance, if he or she was eligible. These proposals were adopted by the government and have already been implemented.

D. Education and training of young people: This recommendation deals with alternative means of financing training. One option calls for a new apprenticeship programme for young workers based on a credit system. Individuals would have an account, which they could use to finance their training. The government rejected these proposals, since training is not compulsory under the unemployment insurance system.

E. Incentives for hiring older workers:

Wage insurance for older workers: Workers over 55 can be eligible for a government subsidy of 50% of the difference between the old and new wages for up to 12 months. Similar to unemployment insurance payments, workers would receive a monthly transfer in the amount of the wage subsidy. The government has adopted this proposal. The wage insurance system has been implemented and a few workers are already receiving assistance.

Early retirement: The Commission proposed allowing workers over 55 to receive the full amount of unemployment assistance in a lump sum. In the end, the government did not adopt this proposal.

Develop incentives to hire older workers, e.g. reducing social contributions, more flexibility in application of labour laws, permit short-term contracts.

F. Unemployment benefit reform

Unemployment Money (Arbeitslosengelt): The Commission proposed to reduce the maximum length of assistance from 32 to 18 months for older workers. The level of assistance would be linked to previous wage – 67% of previous wage if worker has children, 60% if not. The length of assistance would depend on age. Workers less than 45 years old would be eligible for 12 months of assistance. Workers over 55 years old could receive assistance for up to 18 months.

Unemployment Money is financed through a social contribution of 6.5% of wages, split equally between employees and employers, up to the first USD 5 610/month.

Unemployment Assistance (Arbeitslosenhelfe): The Commission proposed harmonising Unemployment Assistance and Social Assistance. Workers would continue to be eligible for Social Assistance if they remained unemployed after their unemployment money expired, but the level of assistance would be set at the current level of social assistance. The commission also recommended tightening the means tests for Social Assistance. Workers must be available for work, including temporary jobs, or training, and must accept new job offers, in order to continue receiving assistance.

G. Incentives to employers for hiring and retaining workers: the Commission recommended proposals designed to reward companies – possibly by reducing social benefit contributions – employers that hire unemployed workers and retain their existing workers. This proposal included some kind of experience rating for hiring. The government has not yet acted on these proposals.

H. Temporary job placement agencies (PSA): Beginning January 2004, workers can enter into temporary contracts with job placement agencies (PSA). PSAs are responsible for paying wages and making social contributions for workers, regardless if he/she receives a placement or not. If a temporary assignment turns into a permanent job offer, the hiring company takes on the responsibility of paying wages and social contributions directly. Workers must be willing to accept short-term contracts with PSAs. If a temporary job does not become permanent, a worker can re-enter the unemployment insurance system.

I. "Ich AG": This proposal aims at encouraging self-employment. Self-employed workers would be eligible for government assistance, including lower taxes and simplified accounting requirements. Self-employed workers could also receive up to three years of unemployment assistance, if he or she is not generating income. Self-employed workers can not hire others, except for family members. The government adopted this proposal and it is being implemented.

J. Promotion of Low Wage Jobs: The Commission recommended developing preferences for low wage jobs. Workers making less than USD 440 would not have to pay any social benefit contributions. Employers would be paid a lump sum payment of 25% of wages, which includes all taxes and social contributions. For wages between USD 440 and USD 880, workers would pay some social benefit contribution and the employer would pay the full 21% of wages. Above USD 880 workers and employers would pay full social benefit contributions and taxes. The government also adopted this proposal.

K. Reorganisation of the Federal Employment Service: The Commission recommended reorganising the Federal Employment Service to be more like a private company rather than a government authority. Federal Employment Service workers would have contracts similar to private employees, not government workers. The government has not yet adopted this proposal.

L. Clusters and competence centres: The proposal was to combine economic development, regional planning and employment functions. The government rejected this proposal.

M. Tax incentives for hiring unemployed workers (capital for work): Firms hiring unemployed workers would be eligible to borrow up to USD 110 000 for each worker, at a reduced interest rate, from the Credit Anstalt. The government would subsidise the lower interest rate. The firm would only need to secure half the loan, and the Federal government would guarantee the other half. The government adopted this proposal.

14. These steps are probably the most ambitious set of reforms undertaken by any country in recent years. The German unemployment insurance system, once considered one of the most generous programmes, is becoming more similar to programmes in most industrialised countries.

15. One of the major criticisms of these reforms is that they will do little to reduce the high rate of German unemployment. The connection between the amount of unemployment assistance and the unemployment rate in Germany has primarily been based on anecdotal evidence. The critics also argue that the reform of the Federal Employment Office and the unemployment insurance system will do little to create additional jobs in Germany. There seems to be an assumption implicit in this reform effort that increasing the supply of workers actively seeking employment will somehow increase the demand for those workers.

16. Reforming the unemployment assistance programme alone does little to help create new jobs. The Chancellor's Agenda 2010 includes little direct assistance for economic development. More importantly, a large share of German employment remains under collective wage setting agreements. Inflexible German

wage-setting policies may make it difficult for the increase in labour supply to translate into lower wages, which in turn might encourage more job creation.

17. An important aspect of the reformed German unemployment insurance system is the interaction between the unemployed and Federal Employment Office counsellors. These counsellors are responsible for assisting workers in their job search. They are also responsible for enforcing the new rules that dictate that assistance can be terminated if a worker is not willing to accept a job, regardless of the wage offered or its location. The ultimate success of most of the recently implemented reforms lies with these counsellors.

18. The conventional wisdom is that Germany is the paragon of training. Based on the data presented in Table 10, Germany spends ten times more on training that Japan, the United Kingdom and the United States. It appears that most of that money is devoted to apprenticeship programmes and active worker training. Training is not considered an "entitlement" as part of the German unemployment assistance programme. Training funds are available on a "first come, first served" basis. If funds are available, unemployed workers can take one course per year. Courses tend to be short. Federal Employment Service counsellors are the primary "gate keepers" for training.

19. Health insurance is not an issue for the unemployed since German law requires that everyone have health insurance. Employers are responsible for paying health insurance premiums for their employees. The Federal government subsidises health insurance premiums for unemployed workers. This serves as an incentive for unemployed workers to register with the Federal Employment Office.

20. In addition to providing unemployment assistance, the German system has several incentives for hiring new workers. Companies that hire unemployed workers are eligible for a reduction in the amount of social contributions they are required to make. In addition, companies may be eligible to receive up to four months of salary for a worker during his or her initial probation period.

III. The Japanese Unemployment Insurance System

21. Until recently, Japanese labour market adjustment policies could be characterised as predominately preventative measures. These measures were primarily subsidies to firms in order to prevent or postpone worker layoffs. Recent macroeconomic developments in Japan have increased pressures on firms forcing the government to reduce its reliance on programmes that forestall adjustment and expand programmes that assist in the adjustment process.

22. The following is a list of various preventative Japanese labour market adjustment programmes: (1) Industry Assistance; (2) Employment adjustment subsidy (koyo chosei joseikin); (3) Labour movement employment-stability subsidy (rodo ido koyo antei joseikin); (4) Labour movement ability-development subsidy (rodo ido noryoku kaihatsu joseikin); and (5) Lifetime ability-development subsidy (shogai noryoku kaihatsu kyuhukin).

23. Like the other five large industrialised countries, the primary reactive labour market adjustment programme in Japan is unemployment insurance, known as Employment Insurance (EI). As a rule, the Japanese unemployment insurance system covers all workers under the age of 65, except for those workers employed by the government and in the ship building industry. In order to be eligible for assistance, EI contributions must be made on behalf of the worker, and the worker must be employed for at least six months during the year previous to job separation. Worker must register at a government-sponsored placement office in order to receive EI.

24. The Japanese unemployment insurance scheme covers any worker separated from his or her job, regardless of the reason for the separation. Workers who voluntarily leave their jobs can be eligible for EI

assistance. In fact, one unofficial estimate suggests that currently only one-third of workers receiving assistance under EI were involuntarily laid off from their jobs.

25. Until recently, EI assistance was set at between 60 and 80% of a worker's previous wage (50 to 80% of previous wages for workers between the age of 60 and 64), subject to a maximum amount. Workers receive payments for 90 to 360 days, depending on age, years of EI coverage and work status (full-time).

26. A combination of very liberal eligibility requirements, the amount of payments andthe length of payments made the Japanese system one of the most generous unemployment insurance schemes among the industrialised countries. On other hand, the Japanese economy experienced a very tight labour market for much of the last 30 years. During the 1980s and the beginning of the 1990s, the Japanese unemployment rate remained between 1 to 2%. Few workers left their jobs voluntarily or involuntarily and few workers received assistance under the EI programme.

27. All of this has changed over the last decade. The Japanese unemployment rate has been increasing since 1993. The added demand on EI has almost completed depleted any reserves accumulated from previous years. The EI trust fund is currently facing a serious financial crisis. This has prompted the Japanese government to institute some reforms in the EI system.

Annex Table 3B.3.1 Level of Assistance under the Japanese Unemployment System

Age	Upper Limit of Daily Wages	Upper Limit of Daily Basic Allowance
up to 29	USD 108.83	USD 54.42
30 to 44	USD 120.92	USD 60.46
45 to 59	USD 133	USD 66.5
60 to 64	USD 128.83	USD 57.98

Note: USD 1.00 =YEN 110
Source: Japanese Ministry of Health, Labour and Welfare (2003)

Annex Table 3B.3.2 Benefits for Workers below 60 Years of Age

Amount of daily wage	Benefit rate
USD 17.67 to USD 34.83	80%
USD 34.83 to USD 101.08	50% to 80%
USD 101.08 to USD 133.00	50%

Source: Japanese Ministry of health, Labour and Welfare (2003)

Table 3B.3.3 Duration of Assistance for Unemployed who lose their Jobs as a Result of Bankruptcy or Dismissal

Age	< 1 year	1 to 4 years	5 to 9 years	10 to 19 years	> 20 years
less than 30	90 days	90 days	120 days	180 days	Na
30 to 34	90 days	90 days	180 days	210 days	240 days
35 to 44	90 days	90 days	180 days	240 days	270 days
45 to 59	90 days	180 days	240 days	270 days	330 days
60 to 64	90 days	150 days	180 days	210 days	240 days

Source: Japanese Ministry of Health, Labour and Welfare (2003)

Annex Table 3B.3.4 Duration of Assistance for Unemployed

Age	< 1 year	1 to 4 years	5 to 9 years	10 to 19 years	> 20 years
For Ordinary Unemployed					
all ages	90 days	90 days	90 days	120 days	150 days
For Workers Hard to Re–employ					
less than 44	150 days	300 days	300 days	300 days	300 days
45 to 64	150 days	360 days	360 days	360 days	360 days

Source: Japanese Ministry of Health, Labour and Welfare (2003)

IV. The UK Unemployment Insurance System

28. The UK unemployment insurance has also recently undergone significant reform, making it considerably less generous than programmes in France, Germany, Japan, and the United States. In contrast to some other countries, in the United Kingdom, firms are required to notify workers well in advance of any potential lay-off. Employers must also provide severance pay to qualified workers. Workers qualified for redundancy rights are eligible to the following notice of potential job loss: (1) minimum of one week for each year of service, up to a maximum of 12 weeks; and (2) employers must provide severance pay based on length of service and previous weakly earnings [up to a maximum of USD 341.25 (1GBP =USD 1.625)] –Age 18 to 21, half a week's pay for each year of service; Age 22 to 40, one week's pay for each year of service; and Age 41 to 60, one and a half week's pay for each year of service. The maximum severance package is USD 10 237.50, approximately one-third annual average earnings.

29. The British Job Seekers Assistance (JSA) has two components: (1) contribution-based unemployment insurance (UI); and (2) non–contribution, means tested unemployment assistance (UA). Workers earning above USD 102.38 per week must make contributions to the UI system. In order to receive UI, workers must have been employed for two years prior to separation. In 1996, the duration of UI payments was reduced from 12 to six months. After exhausting UI assistance, workers can apply for the means-tested UA programme. Eligibility for UA is based on family income, not the worker's previous income. Workers with children may be eligible for additional assistance.

30. JSA is based on being unemployed, and is not related at all to the cause of displacement. There is no special assistance for workers whose job loss may be associated with changes in international trade. There are also no special provisions for workers from specific industries. One objective in recent reforms to JSA was to make assistance less attractive and this encourages people to return to work sooner.

Annex Table 3B.4.1 Amount of Unemployment Insurance Assistance

Age	Weekly Amount
16 to 17	USD 53.46
18 to 24	USD 70.28
Above 25	USD 88.81

Note: GBP 1 = USD 1.625

V. The US Unemployment Insurance System and TAA programme

31. The US unemployment insurance programme is mandated by the Federal government and administered by the States. Although there are many similarities across the various State programmes, it is as if the United States has 50 different unemployment insurance programmes. The Federal Unemployment Tax is 0.8% of the first USD 7 000 of gross payroll, split evenly between employers and employees.

Contributions are experience-rated, *i.e.* some portion of the contribution is based on past experience with the unemployment insurance system.

32. The weekly benefit amount is based on some portion of an individual's wage, and is set by the States. Benefits vary widely by state. In 2000, the average benefit was approximately USD 200 per week. Minimum weekly benefits ranged from zero in New Jersey to USD 102 in Rhode Island. Maximum weekly benefits ranged from USD 133 in Puerto Rico to USD 646 in Massachusetts.

33. Data presented in Annex Table 3B.5.1 suggest that the average replacement rate has tended to be about 35% of average weekly wages over the last 30 years. Replacement rates vary not only across States, but also among individual recipients. Workers with higher previous wages tend to experience lower wage replacement rates. The inverse is true for workers with lower incomes.

Annex Table 3B.5.1 Unemployment Insurance Assistance

Year	UI Average Weekly Benefit		Recipiency rates *
	Nominal dollars	Ratio to Average Weekly Wage	
1970	USD 50.31	35.7%	43.0%
1975	USD 70.23	37.1%	49.2%
1980	USD 99.66	36.6%	43.3%
1985	USD 128.14	35.3%	30.8%
1990	USD 161.56	36.0%	35.2%
1995	USD 187.29	35.5%	34.0%

Note * Percentage of unemployed receiving unemployment insurance
Source: BLS, US Department of Labour, ET Handbook Number 394

34. The duration for receiving unemployment insurance also varies by State. The minimum duration ranges from four weeks in Oregon to 26 weeks in 12 States. Federal law sets the maximum duration at 26 weeks, but the maximum duration for Unemployment Insurance is 30 weeks in Massachusetts and Washington. Extended Benefits (EB), equal to 13 additional weeks of unemployment insurance, may be triggered when the unemployment rate remains high over a period of time. In 1992, the US Congress established an optional trigger for an additional seven weeks. Very few states have adopted this new trigger.

35. The initial 26 weeks of unemployment insurance is financed fully by employer and employee contributions to the UI Trust Fund. Half of the additional 26 weeks of extended benefits is funded as a direct expenditure of the Federal government. The other half is financed out of the UI Trust Fund. Extended Benefit levels are identical to those under the initial 26 weeks of unemployment insurance.

36. The following three Annex Tables provide more detailed information about TAA and NAFTA–TAA participants.

Annex Table 3B.5.2 TAA and NAFTA–TAA, 2002 to July 2003

TAA	Number of Certifications		Employees covered by Certifications	
	unit	%	unit	%
All Industries	3 606	100%	376 428	100%
Clothing	563	15.6%	69 150	18.4%
Textiles	281	7.8%	35 436	9.4%
Textiles and Clothing	844	23.4%	104 586	27.8%

Source: US General Accounting Office (2001)

Annex Table 3B.5.3 TAA Services by Participant

TAA Services	1995	1996	1997	1998	1999	2000	Total
Total Workers Certified	**118 837**	**166 310**	**165 898**	**153 804**	**227 650**	**145 112**	**977 611**
Basic Allowance							
Recipients	25 641	32 856	3 4158	26 241	36 910	32 368	18 8174
Average USD	4 270.5	3 889.7	4 332.81	4 542.51	4 310.48	5 564.14	4 483.62
Additional Allowance USD							
Recipients	5 856	7 132	15 215	7 736	8 166	10 010	54 115
Average USD	7 103.83	6 113.29	3 522.84	6 489.14	62 08.67	7 472.53	5 811.7
Training							
Recipients	28 645	32 971	26 865	25 235	32 120	24 106	16 9942
Average USD	2 126.03	2 077.58	3 104.41	3 166.24	3 029.27	4 322.58	2 908.05
Job Search Assistance USD							
Recipients	927	752	520	289	314	359	3161
Average USD	323.62	398.94	384.62	346.02	318.47	278.55	347.99
Job Relocation Assistance USD							
Recipients	1 678	940	875	473	771	731	5 468
Average USD	1 668.65	1 914.89	1 942.86	1 691.33	1 297.02	1 504.79	1 682.52
Total services in millions USD	215.1	242	286.9	250.2	308.2	360.3	1 662.7

Source: US General Accounting Office (2001)

Annex Table 3B.5.4 Profile of TAA and NAFTA-TAA Participants, 1999 and 2000

Characteristics	TAA and NAFTA–TAA Participants	Total US Workforce
Male	36%	53%
Female	64%	47%
Average age	43	NA
Limited English proficiency	12%	NA
Average pre–lay off wage	USD 12.13/hour (at separation)	USD 13.36/hour (production worker)
Average new wage	USD 10.31	NA
Median job tenure	7 years (at separation)	3.5 years
Education		
Less than High School	25%	10%
High School Graduate	55%	32%
Some post High School	17%	28%
College Graduate	4%	30%

Source: US General Accounting Office (2001)

NOTES

[1] The WTO ATC superseded the Multi-Fibre Arrangement (MFA) regime of quantitative trade restrictions when it entered into force in January 1995 and provided the multilateral trade framework applicable for trade in textiles and clothing for all WTO members. The ATC provides for the elimination by 31 December 2004 of all forms of quantitative restrictions applied to trade in textile and clothing products, including those that originated from the MFA regime. The ATC phases itself out of existence at the end of 2004. For the purpose of qualifying the period when there will be no more quantitative restrictions applied to trade in textile and clothing products, the term "the post-ATC period" is used throughout this review.

[2] The United States is taken in an example given the data availability over a sufficiently long period of time.

[3] Field and Graham (1997), page 156.

[4] Blancflower (2000), page 54.

[5] The future of the Bureau of Labour Statistics (BLS) is actually in doubt. By contrast, in light of the significant reforms of its labour market assistance programmes, Germany is beginning an ambitious effort to survey its displaced workers.

[6] For an explanation of the import-sensitive industries, see Kletzer (2001a).

[7] One Japanese official unofficially estimated that only one-third of those currently receiving UI were involuntarily separated from their jobs.

[8] The United States has a programme of extended assistance in times of high unemployment. Workers who exhaust their unemployment insurance in the United Kingdom can be eligible for assistance under the country's welfare programme.

[9] The eligibility criteria were liberalised, so that imports had to "contribute importantly" to job loss. In other words, the increase in imports had to only be one of several contributing factors to the job loss.

[10] By contrast, the Workforce Investment Act (WIA) -- the programme that provides assistance to dislocated workers regardless of cause – is not an entitlement. Workers only receive training if there are adequate funds available. Most States exhaust training funds under WIA well before the end of the year, denying workers the ability to enrol in training. In addition, States can deny training, if it is determined that a worker can find a job, which pays a subsistence wage.

[11] See in particular: Richardson (2003), Kletzer (2001a), Field and Graham (1997), Blancflower (2000).

[12] Richardson (2003), page 12.

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PART IV. TECHNOLOGY AND INNOVATION

I. Introduction

1. This Part focuses on recent trends in applied technology in textile and clothing sectors and reviews innovation and technology diffusion approaches in OECD countries. Section II provides a global perspective in the production and trade of textile and clothing machineries. Section III summarises the recent technological changes in the transformation stages of fabrics into final clothing products. It outlines the productivity gaps between the various production stages and highlights the opportunities for fragmenting the supply chain on the basis of comparative advantages. Section IV examines various policy approaches undertaken by OECD countries in promoting innovation and innovative clusters in the T&C sectors. It also outlines the best practices in innovation policies. Finally, concluding remarks are offered in the last section. Annex B provides details about the main production stages involved in the fabrication of clothing products.

II. Technology and Trade in the Textile and Clothing Industries

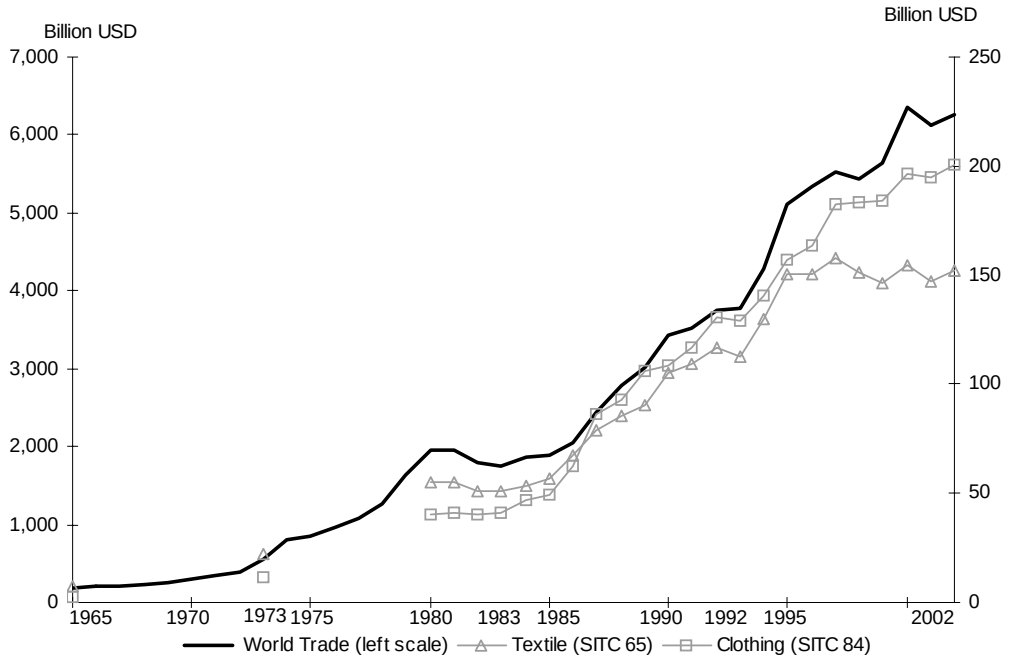
2. In the very beginning, it was an act of a monopolist which produced clothes for the earth's original inhabitants, as God was said to have created robes to clothe Adam and Eve (Genesis, Part 3, Verse 21). But to attribute the difficulties the textile and clothing (T&C) industry has been subjected to in recent decades to this monopolist would be far from correct. Of course, there have not only been normal growth patterns with all their consequences, but in particular there have been the deviations from normally-agreed trade rules in most OECD countries which led to the introduction of numerous non-tariff barriers on T&C products (on top of above average tariff rates), including the Multi-fibre Arrangement (MFA). The MFA quantitative restrictions are due to be eliminated by the end of 2004.[1] While there is no question that trade policies have influenced the innovation, technology and investment policies of T&C companies in OECD and non-OECD countries during the last decades, this document does not attempt to filter out how such policies were accordingly influenced.

3. Early on, the growth of textile exports exceeded clothing exports, at least until the 1980s. Then the exports of T&C products expanded roughly in line with the growth in total world trade (Figure 4.1). Toward the mid-1990s, however, textile exports levelled off as their production was shifted closer to where clothes were being produced or rather as new textile producing locations were established in countries with clothing production. This was particularly the case in China where in recent times the expansion of the T&C industry is being driven by its accession to the WTO and in particular by the coming of a quota free exports at the end of 2004. It is interesting to note, however, that – despite these developments – exports of T&C machinery are not expanding at all (Figure 4.2). As a matter of fact, exports of textile and clothing machinery have actually been on the decline with one major exception: namely those destined to China (Figure 4.3). The dollar amount of T&C machinery imported by China had reached the level of USD 5 billion in 2003, an increase of over 200% compared to 1999. This could well lead to the establishment of stronger textile and clothing clusters consisting of enterprises and expertise, which could then induce production beyond what could be inferred from given capital stocks.

4. If there is one industry which has continued to serve as a motor of industrialisation over the centuries and across countries, or rather as a key driver of exports, then it has been the textile and clothing industry (TCI) (Deane 1965: 84–88). Initially, this was spawned by the inception, invention and finally the production of commercially viable textile and clothing machinery (TCM) and then later on by adequate access to such machinery imports. In the past, it can be shown that there was often a symbiotic relationship between an efficient and creative TCM production and a competitive TCI, which played a key role in

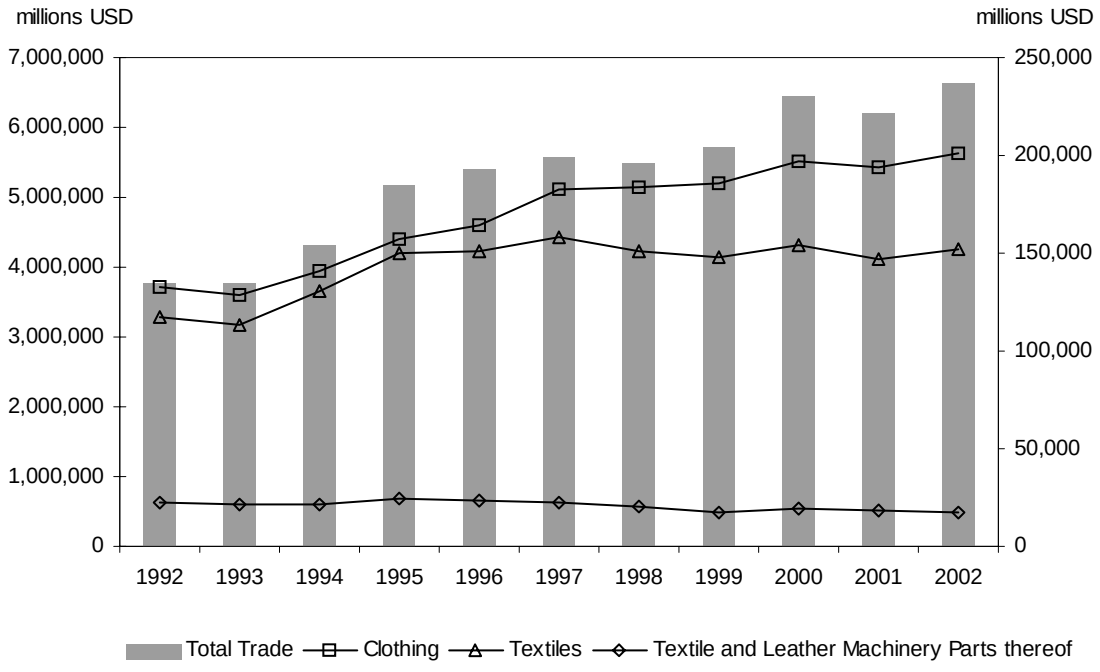
jointly ensuring the international competitiveness of textile and clothing products being produced and exported. In recent times, such a symbiosis has faded if not disappeared.

Figure 4.1 World Exports in USD Billion, 1965–2002



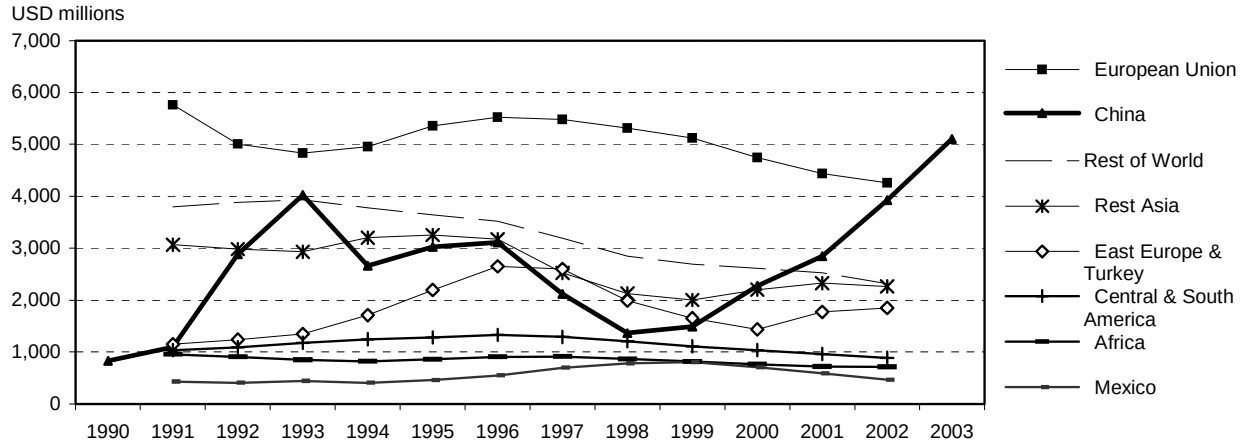
Source: WTO Annual Report, various issues.

Figure 4.2 Total Merchandise Exports (left Scale), Exports of Textile and Clothing Products and Textile and Clothing Machinery, 1992–2002



Source: Own calculations based on UNCTAD tabulations.

Figure 4.3 Textile and Clothing Machinery Exports to Major Regions/Countries (USD Million)



Source: WTO Annual Report and own calculations based on UNCTAD and Chinese customs data. Data for China for the entire year 2003 are estimated on the basis of the first ten months in 2003.

5. A case in point is the sewing machine industry in Germany, which competed very well in international markets as long as it could draw on the productive feedback of a viable clothing industry. However, once the ability to test prototypes of machines around the corner or down the street at a clothing producing company was no longer given, sewing machines from Germany began to lose market shares.[2] An obviously highly productive symbiosis still exists in Germany with respect to the production of industrial grade needles. Germany dominates world markets and commands on average a share of roughly 60%. The symbiosis which exists in this case includes needle manufacturers, the steel industry, the clothing industry and the sewing machine industry. And this is probably a symbiotic relationship that doesn't need as much direct interfacing as in the case of sewing machines.

6. Thus the initial inventions in England, *i.e.* spinning jennies and then mules, helped maintain its early leadership in the textile industry from the 18th into the second half of the 19th century until it was succeeded by more productive US ring spinning innovations (Sandberg 1970: 120–140), which dominated well into the 20th century. With similar developments taking place in the production *i.e.* weaving of clothes, labour inputs per unit of output in these two central processes in transforming semi-processed/semi-manufactured inputs to manufactured products have been reduced to a fraction of their initial values (Figures 4.4a and 4.4b).

7. However, the above merely describes the steps in producing intermediary inputs to be used for the most part in producing clothes. The story of technological changes in the clothing industry is one which reads much slower than in the case of the textile industry. As could be seen in Figure 4.4a, numerous technological advances had already taken place in the textile industry by the mid 19th century, and – in the case of spinning – these had actually decreased working hours for a kilogram of yarn by over 90%. As concerns the clothing industry, which is basically focused around the sewing process, it was not, however, until the mid 19th century that commercially viable ideas were just beginning to emerge. Up until then, numerous attempts on both sides of the Atlantic never made it to the market.

Figure 4.4a Working Hours per Unit Output in Spinning and Weaving since 1750

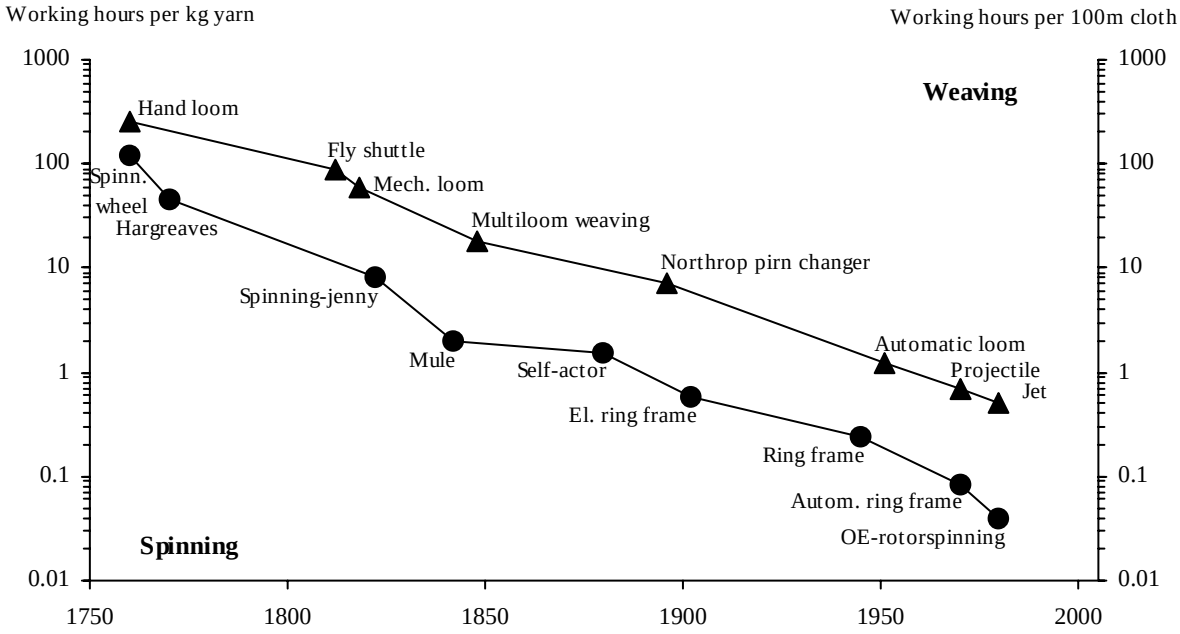
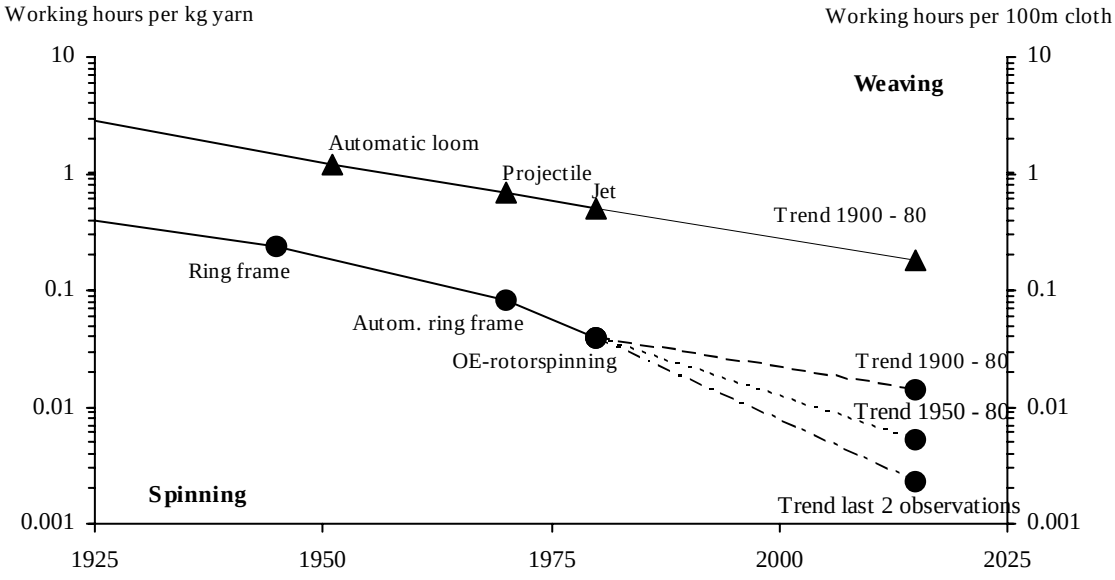


Figure 4.4b Working Hours per Unit Output in Spinning and Weaving since 1925



Source: Adapted from Hartman (1993: 66); own calculations.

8. The first successful patent for a machine that used thread from two different sources was granted in the United States to Elias Howe in 1846.[3] However, it was left to Isaac Singer to commercialise the process in the early 1850s (even if he was later found guilty of infringing upon Howe's patent), to redesign the needle position to up and down movements and to install a foot treadle instead of a hand crank. By the early 20th century, electrically powered sewing machines were in wide spread use and since then major technical advances in the clothing industry (which would embody significant major shifts to permit wide-scale replacement of labour inputs by capital equipment), have not occurred.

9. As a matter of fact, in the core production process, sewing techniques do not basically differ from those which prevailed following integration of the sewing machine into the production process during the course of the last century. The labour-intensive character of the production process back then still dominated and in hardly any other major industry are labour inputs coupled with such small amounts of physical capital equipment as in the clothing industry.[4] The basic reason for this is the nature of the production process itself, where two dimensional materials, *i.e.* cloth of non-stiff or rather soft/limp nature, are subjected to a series of individual labour-intensive handling/assembly steps, culminating in the formation of a product which then fits/drapes a three dimensional human body. While some steps in the upstream end of the clothes manufacturing process *e.g.* Computer-Aided Design (CAD), or rather some particular clothes have been adapted to more capital-intensive methods, *e.g.* jeans, the process as a whole remains disjointed.

10. This disjointed character of the clothing manufacturing process and its implications for the labour intensity of production has been the driving force behind the shifts in locations within countries but in particular between countries with differing relative endowments of labour and capital. In this sense, it might be considered to be no different than other products incorporating inputs whose degree of labour intensity has meant that they are assembled in locations minimising their labour costs. The major difference, of course, is that the degree of labour intensity of the entire production process means that it is not only parts of the process which are being shifted to other countries rather the entire manufacturing process is being relocated.

11. Given the fact that the textile complex employed roughly two million workers in the European Union and about a million in the United States in early 2000, the importance of being able to assess the potential of changes in technology in this industry, which could help preserve these jobs in the locations where they are now, or alternatively at least in the same countries, or preserve as many of them as possible, can hardly be denied. The characteristics of displaced workers in the textile and clothing sectors are reviewed in the Part III. This Part also examined the linkages between international trade and labour adjustment and recent developments and reforms in labour adjustment programmes in some OECD countries.

12. What are the characteristics that shape the exports of the textile and clothing machinery industry? Table 4.1 gives an overview of the 43 industries which constitute the machinery and transportation sector. It lists the shares of the top four exporters from industrialised countries (column labelled “top 4”) in that given industry. It lists the share attributed to the largest exporting country, followed by a letter which designates the actual country with the largest share. It also shows for a given year the share of all industrialised countries in total world exports of the given industry. The table reveals that the TCM industry has remained one of the highest concentrated industries over the 20 year period. The share of the top four exporting countries has only slipped slightly since 1981 and there are just three other industries which have higher shares, as opposed to 15 in 1981. With respect to the country with the highest share it remained even closer to the value in 1981 and was exceeded by only nine other countries in 2000, as opposed to 22 in 1981.

Table 4.1 Concentration in World Machinery and Transportation Equipment Exports, 1981–2002

SITC groups	IC export concentration (%)[a]								
	1980/81			1989/90			2001/02		
	Top 4	Top IC[b]	All ICs	Top 4	Top IC[b]	All ICs	Top 4	Top IC[b]	All ICs
713	71.6	28.2 U	92.7	59.0	17.8 J	90.1	54.9	17.9 U	84.2
714	78.9	36.3 U	96.7	75.6	33.9 U	96.3	70.8	29.7 U	94.4
716	65.5	20.5 U	86.2	57.5	18.3 D	84.2	39.1	12.1 D	68.5
718	50.4	20.3 D	86.6	66.1	25.8 D	82.5	44.8	16.3 D	77.7
721	61.1	27.9 U	90.9	54.1	18.8 U	92.0	55.1	18.4 D	90.2
722	75.8	33.9 U	92.0	71.8	23.2 D	89.5	59.9	18.8 D	90.4
723	71.6	42.8 U	91.3	60.7	25.5 U	89.8	58.5	26.4 U	85.9
724	**67.5**	**25.9 D**	**86.6**	**71.2**	**28.0 D**	**87.9**	**63.2**	**23.7 D**	**81.5**
725	55.6	25.1 D	96.1	53.7	24.4 D	94.3	53.8	24.6 D	93.5
726	75.1	34.5 D	97.2	68.0	37.1 D	97.0	62.5	36.7 D	94.8
727	56.6	18.5 U	85.5	57.0	18.2 D	92.6	53.4	19.8 D	89.7
728	61.8	23.3 D	89.2	65.1	23.8 D	89.5	62.4	17.9 D	88.4
736	66.6	26.7 D	90.3	63.7	25.3 D	88.7	63.1	20.9 J	86.9
737	61.8	19.4 U	88.2	57.9	20.7 D	92.0	54.1	17.0 D	86.6
741	68.0	23.1 J	95.9	57.2	16.2 U	91.6	45.7	15.0 U	76.5
742	64.7	21.4 U	93.5	62.3	27.2 D	95.2	56.4	22.3 D	87.1
743	63.4	23.4 U	95.5	59.2	19.9 D	91.9	52.3	17.1 U	84.2
744	60.4	18.6 U	95.4	56.0	21.0 D	90.1	46.2	16.3 D	85.9
745	63.5	26.0 D	82.8	63.7	29.1 D	94.0	59.8	24.3 D	89.6
749	60.0	23.0 D	93.5	58.3	24.6 D	90.0	52.0	18.6 D	80.6
751	73.1	44.7 J	89.8	66.1	35.3 J	84.6	39.0	12.3 D	65.2
752	66.6	39.0 U	94.8	63.3	23.9 U	77.4	33.2	10.7 U	53.7
759	72.1	43.8 U	92.5	48.2	23.5 U	80.6	37.6	12.2 J	55.7
761	65.3	36.5 J	83.2	43.3	14.9 D	60.3	24.8	12.6 J	37.3
762	63.1	54.1 J	68.8	31.0	21.8 J	42.3	22.2	6.1 J	34.3
763	86.1	76.0 J	90.2	67.5	58.2 J	72.9	41.8	34.1 J	52.3
764	59.0	25.4 J	80.7	55.7	27.4 J	79.0	34.7	9.9 G	64.2
771	59.3	20.6 J	85.7	49.3	17.0 D	73.4	30.9	10.7 D	56.8
772	61.6	20.0 D	88.2	62.5	21.0 D	88.3	48.2	15.1 D	70.4
773	56.8	21.3 J	87.9	47.6	16.7 U	79.3	30.1	11.6 U	52.2
774	72.9	34.7 U	97.3	72.7	25.0 U	98.5	68.0	29.1 U	94.0
775	59.1	17.9 D	83.1	54.3	21.3 D	79.3	39.0	14.5 D	57.3
776	60.0	29.3 U	71.2	57.9	22.7 U	66.5	44.1	17.4 U	57.3
778	61.1	18.6 J	88.8	60.4	20.7 J	86.4	46.5	17.1 J	68.4
781	72.7	31.8 J	97.1	66.1	24.8 J	95.2	57.4	22.0 D	86.0
782	70.5	31.0 J	94.7	64.6	23.4 J	95.9	50.8	16.2 C	79.2
783	68.5	32.1 D	92.1	60.0	21.4 D	94.6	50.1	21.1 D	82.3
784	66.5	27.8 U	93.5	65.2	21.5 D	89.9	54.2	18.1 U	84.6
785	84.7	68.9 J	88.5	71.3	44.6 J	72.1	54.0	32.2 J	70.3
786	56.1	25.7 D	81.1	53.7	23.7 D	68.7	40.8	22.2 D	60.5
791	67.1	19.6 F	77.1	58.0	19.0 D	76.7	44.0	17.1 D	75.5
792	82.9	53.8 U	95.0	77.9	48.1 U	96.5	75.5	37.3 U	94.7
793	57.6	39.5 J	81.5	55.2	21.4 J	73.7	38.6	20.7 J	58.0

Note: SITC 724 is machinery for the textile and clothing industry.

[a] % share in total world exports of given group. In case of all IC's data refer to 1980/81 and 1989/90 and 2001/02 –

[b] Letters behind shares designate following countries: C = Canada; F = France; D = Germany; G = Great Britain (United Kingdom); J = Japan; U = USA.

Source: Own calculations based on UNCTAD (1992: Table 4.3A and 2002 4.2A) and unpublished UNCTAD sources, respective tables. See Annex Table 4A.1 for description of groups.

Table 4.2 Shares, Changes in Shares and Yearly Growth Rates for SITC Product Groups, 1980–2002

SITC (Rev.2)	Share in total SITC 7 exports			Change in shares			Growth rates	
groups	1980/81	1989/90	2001/02	89/90-80/81	01/02-89/90	01/02-80/81	80/81 - 89/90	89/90 - 01/02
Total								
713	3.2	3.2	3.0	-0.0	-0.2	-0.2	8.3	6.4
714	1.6	2.1	2.4	0.5	0.2	0.8	11.0	8.1
716	1.5	1.1	1.3	-0.4	0.2	-0.2	6.8	8.5
718	0.4	0.3	0.2	-0.1	-0.1	-0.2	3.7	5.0
721	1.2	0.8	0.5	-0.4	-0.3	-0.7	3.4	2.7
722	1.4	0.6	0.3	-0.8	-0.2	-1.1	-1.5	2.5
723	3.4	1.6	1.2	-1.8	-0.4	-2.2	1.5	4.2
724	**2.1**	**1.8**	**0.8**	**-0.3**	**-1.0**	**-1.3**	**6.1**	**-0.5**
725	0.5	0.6	0.3	0.1	-0.3	-0.2	8.9	-0.4
726	0.7	1.0	0.6	0.3	-0.4	-0.1	10.1	1.8
727	0.5	0.5	0.2	-0.0	-0.2	-0.3	7.2	1.0
728	3.3	3.3	2.7	0.0	-0.6	-0.6	8.3	5.0
736	2.5	2.0	1.2	-0.5	-0.9	-1.3	5.8	1.9
737	0.7	0.6	0.4	-0.1	-0.2	-0.3	6.3	2.2
741	2.4	2.1	1.7	-0.3	-0.4	-0.7	7.2	5.0
742	1.2	1.1	0.9	-0.1	-0.2	-0.3	6.8	5.2
743	1.8	1.8	1.7	0.0	-0.1	-0.1	8.3	6.7
744	2.3	2.1	1.6	-0.2	-0.5	-0.7	6.5	4.3
745	1.7	1.5	1.0	-0.2	-0.4	-0.7	6.1	3.6
749	3.3	3.2	2.8	-0.1	-0.4	-0.5	7.9	5.8
751	1.3	0.9	0.4	-0.4	-0.5	-0.9	5.3	0.1
752	2.7	5.2	6.8	2.5	1.7	4.1	16.7	9.8
759	2.0	3.9	5.2	1.9	1.2	3.2	17.4	9.7
761	1.1	1.0	1.2	-0.1	0.2	0.1	11.1	8.9
762	1.2	0.5	0.5	-0.7	0.1	-0.7	6.7	8.2
763	1.4	1.1	1.1	-0.3	-0.0	-0.3	9.5	6.9
764	4.4	4.5	8.0	0.1	3.5	3.6	10.6	12.7
771	0.8	0.8	1.2	-0.0	0.4	0.4	11.0	11.2
772	2.8	3.1	3.4	0.3	0.3	0.6	9.8	7.9
773	1.2	1.1	1.5	-0.1	0.4	0.3	9.1	10.4
774	0.6	0.8	0.7	0.2	-0.1	0.1	10.9	6.0
775	1.8	1.6	1.6	-0.2	-0.0	-0.2	8.7	6.9
776	3.0	4.0	8.8	1.0	4.8	5.8	14.8	15.0
778	3.0	3.2	3.6	0.2	0.4	0.6	9.2	8.2
781	12.3	15.6	13.5	3.3	-2.0	1.2	10.0	5.7
782	4.8	3.5	2.4	-1.3	-1.1	-2.4	5.0	3.5
783	0.8	0.7	0.6	-0.1	-0.0	-0.2	6.5	6.4
784	7.0	7.3	6.2	0.3	-1.1	-0.8	8.7	5.5
785	1.3	0.7	0.8	-0.6	0.0	-0.5	5.6	7.7
786	0.8	0.5	0.5	-0.3	-0.0	-0.3	5.9	6.7
791	0.7	0.4	0.4	-0.3	0.0	-0.3	3.3	7.8
792	5.6	6.6	5.0	1.0	-1.6	-0.6	10.8	4.4
793	3.5	1.9	1.9	-1.6	0.0	-1.6	4.9	7.2

Source: Own calculations and sources noted in Table 4.1. See Annex Table 4A.1 for description of product groups.

III. Insights into Technology and Trends in the Textile and Clothing Industries

A. The Clothing Applications of Textiles

13. Without going into the specifics for all types of materials and for and every operation, the production of textile and clothing products covers the following spectrum of activities:

- Basic inputs
  - Gins
  - Bailing equipment
  - Cards
  - Frames
- Textile production
  - Production of filaments, fibres and yarns
    - Filament and fibre producing equipment
    - Twisters/winders
    - Spinning frames
    - Doffing machines/devices
    - Winding and reeling machines
  - Weaving preparation and machines
    - Creels, warping and beaming machines
    - Rapier, air/water jets, shuttle looms, circular looms
  - Knitwear and hosiery production
    - Beam warping machines
    - Circular knitting machines
    - Printing machines
    - Flat knitting machines
  - Washing, bleaching, drying etc
    - Washings machines
    - Yarn/fabric dyeing machines
    - Printing machines
    - Inspecting machines
- Clothing production
  - Designing
  - Pattern making
  - Grading
  - Nesting and Marking
  - Cutting
  - Sewing
  - Inspecting
  - Pressing
  - Packaging
- Post-clothing production
  - Inventory
    - Transportation

14. On the upstream end of the above list, progressing from raw materials to a finished woven or knitted garment, involves perhaps the two most capital-intensive steps, namely spinning and weaving. Given the advances achieved over the last decades (see Figures 4.4a and 4.4b), the prevailing production frontiers permit speed, quality and flexibility in a manner which would have been unheard of 50 years ago. While the degree of physical capital-intensity has made the textile sector one of the more capital intensive among

manufacturing sectors, the human capital-intensity required to operate new equipment has increased less, given the embodied-intelligence software already included in these new equipment. Annex II provides details about productivity changes that have occurred in the main production stages going from fabrics and into a finished clothing product. It also provides some insights into the area of technical textiles, which are not otherwise covered in this paper, given that their production processes and uses are so widely different than those ending up as clothes or home furnishings.

15. One particular parameter which cannot yet be significantly changed is the width of fabrics. Specifically, if the width of a fabric could be adapted to optimally fit the design when grading, nesting and marking are carried out, this would greatly improve the utilisation of the fabric. This would yield even greater returns in top-of-the-line garments, as these currently have much lower fabric utilisation rates. Another parameter which needs to be shifted is the one set by the cutting machines, as high-ply lays still present problems. Finally, while the quality of needles has been improved to the extent that under certain constraints a 10 to 20% increase in productivity can be achieved vis-à-vis the situation some decades ago, there are likewise constraints set by the quality (strength) of threads. There are no major problems in downstream of the sewing activities, with the exception of not being able to compress clothes into an optimal weight/volume form for shipping.

16. Although the importance, *i.e.* number of persons employed for a given output, of each of these stages in the production process differs in accordance with the type of product and the length of production runs, it is generally accepted that the assembly stage, *i.e.* sewing, accounts for up to 80% of total labour costs. However, were the shares in valued added to be calculated, the higher wage/salary levels of the upstream activities would become evident. It may thus hardly be surprising to determine that the major changes in technology to date have occurred upstream from sewing. But it would nonetheless be incorrect to assume that higher relative labour costs were the sole factor for major technological breakthroughs to have occurred in this area; it was also the simple fact that technological constraints faced particularly in sewing and other downstream activities were more binding.

17. In order to determine what trends in applied technology mean for the location of the textile and clothing industry, it is instructive to move back to the post World War II period in Europe. It was at that point in time when Swiss and German firms began to dominate weaving technology and then later in the area of spinning. It was particularly in Germany and Switzerland, where the full picture of how important activities in the production of inputs can be followed in line with the global T&C production process (Box 4.1).

Box 4.1 The Essence of Globalisation in the Textile Machinery Sector at the Micro Level

In the mid-70s, Schlafhorst was a company producing numerous winders (accounting for about 50% of total sales), cotton drawing and ring-spinning frames as well as warping and hosiery machines. It had numerous production units in Germany, employing roughly 4000 employees, and had experienced a continual drop in sales throughout the decade. In the late 70s, it introduced a technologically-advanced spinning frame, culminating five years of research. It ran at faster speeds, produced finer yarn counts and was equipped with a full range of automatic devices. The labour–saving potential dovetailed perfectly into the restructuring of textile mills in industrialised countries which were under considerable competitive pressure from textile mills in developing countries (DC).

Simultaneously, Schlafhorst decided to eliminate eight production lines and to focus production only on spinning equipment and cone winders. With a view to offer fully integrated spinning process, it acquired the ring spinning firm "Zinser". Combined together, Schlafhorst became the world leader in spinning equipment. In late 1980s, due toeconomic difficulties, Schlafhorst was taken over by "Saurer", a Swiss equipment firm specialised in embroidery, quilt stitching and twisting machines. After acquiring Schlafhorst, Saurer's world share in spinning frames approached 50%.

To secure an adequate share in the fast-growing China/Asian markets, Saurer decided to establish ties with Chinese textile machinery manufacturers. As a result, the Saurer's group has noticeable expanded activities in China and other parts of Asia and these ties now form a crucial part of the company's global activities. This underscores the importance of ensuring that technological advances are interfaced and tested with textile firms operating under real world conditions. At the outset, the consolidation process combined with establishment of ties with Chinese machinery manufacturers has paved the way for spinning frames produced in Germany to be exported to new export destinations. In 2002, more than 60% of German-made spinning frames were exported in non-OECD countries.

18. What has occurred on the technology side over the past quarter century has had a major impact on the location of the textile and clothing industries. But the technology pattern was also reflected in the structure of textile and clothing machinery industry. That is, newer technologies led to a stronger departure from the traditional practices where textile companies would maintain large in-house stock of machinery and components (Landes 1970, p. 184). In other words, textile companies began to concentrate all the more on just producing and selling textiles and clothing.[5]

19. It must be stressed that the continuing concentration of TCM in OECD countries is a result of the evolving multifaceted technological demands which could be best met by drawing on state-of-the-art technical and scientific knowledge readily accessible in OECD countries, where an effective interface with textile and clothing manufacturers could be established (see the following section).[6] This refers in particular to the textile industry where technical progress has not been restrained nearly as much by the physical properties of the intermediary inputs as in the case of the clothing industry.[7] This effective interface was further accelerated by ever higher quality demands and more rapid fashion changes, which implied more effective production controls and a greater degree of flexibility. Hence, being successful in exporting textile and clothing products in OECD countries became an increasing function of quality. The level of quality demanded was often only attainable by employing capital equipment, their embodied technologies and the essential components from OECD countries.[8] This applied to the upstream end of the textile manufacturing process, *e.g.* spinning, as well as to the sewing process to a lesser degree.[9]

20. This brief overview has highlighted why the TCM industry has a tendency to become more concentrated in OECD countries and why the use of such equipment is a precondition for being a successful exporter. What does this imply vis-à-vis factors shaping trade and trade policies? Given the above constellation, it can hardly be surprising that non-OECD countries continued making inroads in the area of clothing for items where the production process was subjected to physical constraints vis-à-vis substituting capital for labour.[10] Consequently, by the turn of the century, the share of clothing exports originating in non–OECD countries had increased by 20% to over 50% and the share of textile exports originating from non–OECD countries had expanded by over a third to more than 40% of total world textile exports.[11]

21. At the same time that the clothing and textile industries were becoming more a domain of non-OECD countries, accordingly they captured an increasing share of TCM imports but not the machinery production. It should be emphasised that out of all 3–digit categories within the seven series of the SITC classification system, the share of TCM exports destined for non-OECD countries not only exhibited the largest increase over the 80s, but by 1990 it revealed the largest share among all 43 major categories of machinery and transport equipment. In other words, TCM producers rapidly became confronted, more than any other machinery exporters, with the necessity to sell to new customers, often in new markets.

22. Accompanying this international shift in the demand for capital equipment from OECD to non–OECD countries was a definite shift in seeking new production locations for this equipment, primarily in Asian countries. This was most evident in the course of the 1980s for most of the machinery and transportation equipment categories. However, at the end of the 1980s, exports of textiles and clothing machinery were still dominated to a large extent by OECD countries (Table 4.1). In the course of the 1990s, the share of TCM exports to OECD countries dropped slightly as non-OECD countries increased their own production and exports of such machines. But the OECD TCM's export share did not drop nearly as much as in most other machinery categories. While the three major European producers of machinery heavily concentrated their shipments on the European continent, Japan had already begun the process of winding down its domestic industry and used its locational advantage to supply the fast growing Asian markets.[12]

23. Having examined the TMC industry from an international trade viewpoint and touching on the micro level of adjustment (Box 4.1), it would seem useful now, before moving on to innovation policies enacted in individual OECD countries, to focus briefly on how the entire T&C complex adjusted to the numerous parameter shifts over the past decades. Germany, as the leading exporter of T&C equipment as well as having been a major exporter of T&C products, would be an excellent country to highlight. Table 4.3 reveals how the large employment shifts out of the clothing industry, followed by shifts out of the textile industry were then traced to a lesser degree by the T&C machinery industry, while mechanical engineering as a whole could maintain its share or exhibited fewer employment losses during the 1993 and 2001 period. In clothing manufacturing, the employment and the number of establishment have disappeared in equal proportion and left unchanged the number of employees by establishment during the period. In other manufacturing industries, such as textiles, the number of employees by establishment dropped significantly implying productivity increases. Obviously the question must be asked, as noted above, about the point at which industries can no longer compete because the economic environment no longer provides the necessary input and this is when governments are confronted with the decision about the appropriate policies should be.

Table 4.3 Germany's Employment in Manufacturing Industries, 1993-2001

	Employees (1 000s)			**Annual percentage change**		
	1993	1997	2001	93-97	97-01	93-01
Manufacturing	8 035.2	6 494.6	6 641.1	-5.18	0.75	-2.35
Mechanical engineering	1 084.8	1 014.6	1 030.8	-1.66	0.53	-0.64
Textile/clothing machinery	51.3	44.9	36.1	-3.28	-7.05	-4.31
Textiles	193.6	143.3	129.8	-7.25	-3.25	-4.88
Clothing	153.2	92.1	67.3	-11.95	-9.93	-9.77
	Employees by Establishment					
Manufacturing	75.3	69.3	64	-2.05	-2.6	-2
Mechanical engineering	96.3	98.6	88	0.59	-3.73	-1.12
Textile/clothing machinery	162.3	144.8	118.6	-2.81	-6.43	-3.84
Textiles	61	43.6	40.7	-8.05	-2.26	-4.93
Clothing	34.7	39.4	35	3.23	-3.89	0.1

Source: Own calculations based on Statistisches Bundesamt, Fachserie 4, Reihe 4.1.2, various years.

B. The Non-Clothing Applications of Textiles or Technical Textiles

24. As noted in paragraph two, at the beginning, there were just skins serving as robes, blankets or rugs. But it probably did not take too long before the potential of natural fibres, *i.e.* cotton, flax, jute, silk and sisal, was discovered, opening up new possibilities by turning them into cloth and then clothing (needles began to be used some 20,000 years ago). Finally, some time later they were turned into what would be called today technical textiles. While the Chinese, some three millennia before Christ, were already using silk for industrial purposes, the Romans are known to have used woven fabrics and meshes to "stabilise marshy ground for road building which are early examples of what would now be termed geo-textiles and geo-grids"(Byrne, 2000: p. 1).

25. But what are precisely technical textiles? That is, where does the spectrum for textiles and clothing end and where do technical textiles begin? The Textile Institute (1994) in the United Kingdom has adopted the following definition: "technical textiles are those textile materials and products manufactured primarily for their technical and performance properties rather than their aesthetic or decorative characteristics".

26. In essence, this boils down to the basic philosophy of the Bauhaus architectural principles "Form follows Function". But here the definitional difficulties begin, as a hiking jacket may be made entirely of specially designed technical textile fibres (Function), but it still is meant to look chic and fashionable (Form). Which comes first in this case is obviously in the eye of the beholder. Hence, a precise delineation between textile/clothing products and technical textiles cannot be made. The problem is all the more complicated knowing how rapidly and differentiated new products are being developed. Whatever the case, referring to technical textiles can be best achieved by either referring to the application groups used at the major fairs organised by the Messe Frankfurt or to the products produced. While the latter is based on the properties of the product, *e.g.* non-woven, technical fabrics, etc., the former illustrates the areas in which the products are actually used, such as: Agrotech, Bondtech, Buildtech, Geotech, Hometech, Medtech, Mobiltech, Packtech, etc.

27. It is estimated that technical textiles are growing at roughly twice the rate of textiles for the clothing industry, where growth rates amounted to about 2% in recent years. In areas like ecological protective textiles geo-textiles or protective textiles the growth rate could be even 200% or more than for the traditional clothing sector. Technical textiles now account more than half of total textile production. Their growing importance is likewise reflected by the globalisation of activities to support such industries.

Hence, one of the world's largest fair organisers "Messe Frankfurt" now carries out five fairs worldwide, *i.e.* in Frankfurt, Atlanta, Moscow, Sao Paulo and Shanghai, focusing only on technical textiles, as opposed to just two fairs some 12 years ago in Frankfurt and Osaka.

28. If focus is drawn to non-woven products, the growing importance of this sector, which accounted for about 25% of technical textile production in 2000, can be clearly demonstrated by examining the participation of machinery manufactures at the ITMA fairs (International Textile Machinery Association) in the 1991 and 2003 – ITMA fairs are only held every four years. Whereas in 1991, it was difficult to locate technical textiles machinery exhibitors, there was an entire hall dedicated to such equipment in 2003. Somehow, this does not do justice to the expansion of the technical textiles industry, since machinery for specific industries are usually exhibited at dedicated industrial fairs. This development underlines that the application potential of technical textiles is rapidly expanded.

29. There can be no question that the textile industry is undergoing a major shift in the direction of technical textiles. So far, this shift has been widely associated with industries in industrialised countries. Whereas numerous developing countries can or almost can copy the quality of thread/yarn and woven fabrics produced up to now in industrialised countries, the processes involved in technical textiles are for the moment to a large degree beyond what many developing countries can achieve.

30. The obvious question then is: will the production processes now prevailing in the technical textiles sector continue to be maintained in the industrialised countries? Or, will the same pattern out-migration to developing countries be repeated as in the case of the textile and clothing industries? For sure, many of the processes involved in producing technical textiles are human- and physical-capital intensive. They have often been generated by the same type of intersectoral co-operation and research as was evidenced in the past in the textile and clothing machinery industry with the textile and clothing industries.

31. But over time, new processes become standardised and technology flows to developing countries, where universities have already been connected to global developments, thereby permitting these industries to spawn as well. Whenever major industries shift to or expand production in developing countries, it is only a matter of ever shorter periods of time that inputs are produced there as well. Time, after all (see Hummels, 2001) is becoming an ever more important factor in maintaining competitiveness. Hence the question remains as to the degree to which the production of technical textiles can be maintained in industrialised countries via a research base which transcends sectors and is linked ever more to research institutions. To answer this question, additional research needs to be carried out on what drives the technical textile industry. But if the migration continues, it could happen even faster than before, since back then the textile industry failed to migrate as fast as the clothing industry due to MFA-related quotas applied on textile and clothing products in industrialised countries.

IV. Innovation Systems in OECD Countries

A. Economic and Innovative Performance of Textiles and Clothing

32. As noted earlier, over two centuries ago textiles together with the iron industry were the main drivers of the industrial revolution. The mechanical loom, the substitution of cotton for wool, and, last but not least, the steam engine as a device for converting heat into work emerged as the core elements of the cotton mill. All this paved the way for the factory system, which expanded all the more when sewing machines were introduced in the course of the mid-nineteenth century.

33. The role that textile and clothing production now plays in the industrialisation process of developing countries is far more differentiated than it was some 30 years ago when the MFA regime was instituted. It is in particular the clothing industry, where time-tried technology is interfaced with low-labour cost, which

still gives developing countries a competitive edge in world markets. But the situation today is more complicated than in the past, as time factors are now playing a far more crucial role in determining competitiveness (Hummels, 2001). Even with the edge, the more developed countries need to climb the technology ladder, either with product or with process innovations in order to stay competitive.

34. With the imposition of MFA quotas and the ever wider application of quotas that followed, it is obvious that the textile and clothing producers in OECD countries understood that they would be increasingly subjected to competitive pressures, stemming also from technological challenges in the rapidly expanding developing countries. Nevertheless, they were not able to prevent a significant down-sizing of jobs in this industry. On average, the employment share of textiles and clothing in total manufacturing declined by one third over the past two decades (Table 4.4). There are no exceptions from this trend, as even relatively labour-rich countries, such as Greece, Mexico and Portugal, had to face shrinking employment shares of textiles and clothing between 1980 and 2001.

35. Although there are considerable technology and factor-intensity differences between textiles and clothing industry,[13] the relative decline of both sub-sectors was quite similar for the OECD as a whole. None of the countries has been able to escape declining employment shares in textiles, whereas the corresponding shares of clothing increased in Greece, Italy and Portugal, and fell in the remaining countries. By and large, relative employment reduction in textiles was most distinct in the major textile and clothing producing countries, and relative employment reduction in clothing was most distinct in countries where the share of both sub-sectors in total employment is rather low.

Table 4.4 Employment Share of Textiles and Clothing in Total Manufacturing of OECD Countries (%)

Country	Textiles and clothing			Textiles			Clothing		
	1980	1990	2001	1980	1990	2001	1980	1990	2001
Australia	8.6	8.3	6.8	2.5	3.4	2.9	5.1	4.9	3.4
Austria	11.7	9.1	5.3	6.0	4.8	3.2	5.7	4.3	2.1
Belgium	13.2	11.9	8.5	7.4	7.0	6.8	5.8	4.9	1.7
Canada	8.9	7.9	6.1	3.0	2.5	2.0	5.9	5.4	4.1
Denmark	7.1	5.6	2.9	3.1	2.8	1.8	4.0	2.8	1.1
Finland	11.3	6.8	3.6	4.2	2.5	1.7	7.1	4.3	1.9
France	11.0	8.5	5.4	4.9	3.9	2.9	6.1	4.6	2.5
Germany	7.6	5.2	2.8	4.3	3.0	1.8	3.3	2.2	1.0
Greece	30.5	28.8	22.1	17.8	14.5	6.6	12.7	14.3	15.5
Italy	17.3	16.5	14.6	11.7	7.9	8.0	5.6	8.6	6.6
Japan	15.4	12.4	7.6	7.2	4.5	2.7	8.2	7.9	4.9
Korea	30.9	22.0	14.7	19.5	11.8	7.7	11.4	10.2	7.0
Mexico	18.4	16.1	16.6	7.7	7.3	7.1	10.7	8.8	9.5
Netherlands	5.0	3.9	2.7	3.3	2.4	1.9	1.7	1.5	0.8
Norway	5.2	3.1	2.6	3.5	2.3	1.9	1.7	0.8	0.7
Poland	–	–	12.7	–	–	–	–	–	–
Portugal	31.1	31.2	28.0	18.4	15.3	11.5	12.7	15.9	16.5
Spain	13.4	11.8	9.7	6.9	5.1	4.3	6.5	6.7	5.4
Sweden	3.9	2.7	1.7	2.0	1.7	1.1	1.9	1.0	0.6
United Kingdom	10.9	9.9	8.8	5.2	4.6	4.1	5.7	5.3	4.7
United States	10.4	9.1	5.9	4.8	4.6	3.5	5.6	4.5	2.4
OECD average	13.6	11.5	8.8	7.2	5.6	4.2	6.4	5.9	4.6

Notes: Clothing includes leather. Instead of 2001, Belgium and Germany refer to 2000, Australia, Norway, Portugal and Sweden to 1999, Mexico and United Kingdom to 1997, and Korea to 1996. In 1980 and 1990, Germany only refers to West Germany. OECD average
Source: OECD(a).

36. As ever, more developing countries expanded exports of T&C products throughout the last two decades; and locations close to the European Union (*e.g.* Eastern Europe) and the United States (*e.g.* Mexico and Caribbean) proved to be very attractive for T&C production. And the speed of downward adjustment in textiles and clothing has accelerated from the 1980s to the 1990s. This demonstrates that structural change in this industry is far from being completed and can be expected to continue in the future.

37. Structural adjustment pressures mainly result from changes in the international division of labour. Export and import shares in textiles and clothing are high, international investment activities are expanding and sub-contracting (largely in the form of outward processing trade) plays a dominant role (see Matthes 2002; Grömling and Matthes 2003). In such a global setting, economic performance within countries crucially depends on the ability of domestic producers to gain a competitive edge.

38. A well-established concept for measuring the sectoral performance of countries in the international division of labour is the concept of "revealed comparative advantage" (RCA). Balassa (1965) argued that the comparative advantage of a country in a specific industry should be revealed by a positive balance in international trade, normalised by the total trade balance of the country. In order to get an unbounded and symmetric measure, the formula originally proposed by Balassa was modified as follows (Klodt, Maurer 1995):

$$RCA_i^j = \ln(x_i^j / m_i^j : \sum_i x_i^j / \sum_i m_i^j) \cdot 100 \cdot$$

39. Where x and m denote exports and imports; i and j denote industries and countries. This index, which is limited to a range between plus and minus infinity, is positive for those industries where country j displays a revealed comparative advantage and negative for industries with a revealed comparative disadvantage. Trade in textiles is covered by SITC positions 26 and 65, trade in clothing is covered by SITC position 84 (United Nations, 1986).

40. Of the 28 countries where comprehensive trade data are available, 13 showed a comparative advantage in textiles and clothing in 2001, whereas 15 countries showed a comparative disadvantage (Table 4.5). With 15 positive and 13 negative RCA-coefficients the picture is quite similar for 1991. According to this concept, the most competitive countries in textiles and clothing are Belgium, Greece, Italy, Korea, Mexico, Portugal, Turkey, China, Hong Kong (China) and Chinese Taipei.

Table 4.5 Revealed Comparative Advantages of OECD Countries in Textiles and Clothing

Country	Textiles and clothing		Textiles		Clothing	
	1991	2001	1991	2001	1991	2001
Australia	75	27	77	79	-128	-183
Austria	5	-24	5	7	-3	-58
Belgium	29	33	52	44	-20	15
Canada	-100	-50	-109	-65	-106	-39
Czech Republic	61	16	44	-16	74	61
Denmark	6	-7	-38	-24	50	9
Finland	-47	-69	-67	-41	-22	-104
France	-9	-28	-26	-10	9	-46
Germany	-22	-27	2	9	-46	-64
Greece	62	22	-68	-33	200	60
Hungary	50	15	-91	-105	162	111
Ireland	-2	-63	-15	-19	11	-106
Italy	92	72	11	33	194	106
Japan	-39	-104	4	17	-208	-340
Korea	123	119	81	101	233	128
Mexico	-38	22	-49	-103	-74	114
Netherlands	-17	-19	-24	5	-5	-34
Norway	-171	-182	-118	-112	-232	-261
Poland	47	-5	-48	-123	146	146
Portugal	90	54	-50	-19	250	130
Spain	-45	-22	-48	-19	-68	-34
Sweden	-95	-67	-69	-36	-113	-93
Turkey	206	141	62	32	560	364
United Kingdom	-25	-72	-44	-43	-7	-99
United States	-74	-119	10	-172	-145	-189
China	110	133	-3	6	394	367
Hong Kong, China	42	36	-19	-9	96	69
Chinese Taipei	134	171	54	128	1,323	1,266

Note: For Revealed comparative advantage definition see text. Instead of 1991, Belgium, Czech Republic and Korea refer to 1993, Poland and Hong-Kong China to 1992. Chinese Taipei 2001 data refers to 1999.
Source: Own calculations based on OECD(b).

41. Comparative advantage looks different, however, when textiles and clothing are analysed separately. In 2001, there are only six countries with a positive RCA-coefficient in both industries (Belgium, Italy, Korea, Turkey, China and Chinese Taipei) and nine countries with a negative coefficient in both industries (Canada, Finland, France, Ireland, Spain, Norway, Sweden, United Kingdom and the United States). As a rule of thumb, positive RCA-coefficients for textiles tend to dominate in relatively capital-rich countries, whereas positive coefficients for clothing are found in relatively labour-rich ones.

42. In addition to factor intensity, historical and cultural roots matter. Carpets from Belgium and fashion from Italy are cases in point. It is probably no accident that the famous case study used by Paul Krugman (1991: 59-61) to illustrate path dependencies in the "new economic geography" (bedspreads from Georgia) is taken from textiles and clothing.

43. The sign of the comparative position of most countries in textiles and clothing has not changed over time. There is a general trend, however, of deterioration in the position of advanced countries and a

corresponding improvement in the position of Mexico, China and Chinese Taipei. The export opportunities of Mexico have been enlarged by the preferential access to the United States and Canadian markets granted under NAFTA. While the performance of China cannot be explained by its WTO accession, it only acceded at very end of 2001. The situation is different in the central and east European countries which obtained access to EU markets after the signing of the Europe Agreements.[14] While these countries may have been interested in expanding exports to the EU in industries other than textiles and clothing, it can be expected that most of them will become net importers of textiles and clothing in the near future.[15]

44. It has repeatedly been shown both theoretically and empirically that the competitive position of producers from advanced countries on world markets is closely related to the technology intensity of their products or production processes. However, technology intensity not only depends on appropriate business strategies of firms, but also on the technological potential of the respective industry. As compared to other manufacturing industries, this potential seems to be largely exploited in textiles and clothing. Consequently, R&D intensity of textile and clothing industries is quite low throughout the OECD area (Table 4.6). Today, the countries with the highest R&D intensity are Ireland (where the R&D intensity in textiles and clothing is almost as high as in manufacturing on average), Finland, Japan, Belgium and Germany.

Table 4.6 R&D Intensity of OECD Countries, 1990–2000

	Textiles and clothing		Total manufacturing	
Country	1990	2000	1990	2000
Belgium	1.2	2.2	5.2	6.6
Canada	0.7	1.0	3.4	4.0
Denmark	0.4	0.9	4.2	5.9
Finland	1.1	2.4	4.7	8.8
France	0.4	0.9	7.0	7.0
Germany	1.5	2.0	6.7	7.4
Ireland	2.0	2.8	2.7	3.3
Italy	0.0	0.1	2.9	2.1
Japan	1.6	2.1	7.3	7.6
Korea	0.6	0.9	5.2	4.5
Netherlands	0.7	1.3	5.5	5.7
Norway	0.9	1.9	5.1	4.3
Spain	0.1	0.6	2.0	2.1
Sweden	1.5	1.1	8.7	12.3
United Kingdom	0.3	0.4	5.9	6.1
United States	0.6	0.5	8.5	8.3
OECD area	0.9	1.4	5.3	6.0

Notes: Intensity refers to Direct R&D expenditures as a percentage of gross output. Textile and clothing includes leather. OECD average is an unweighted average. Ireland and Italy 1990 refer to 1991. Belgium 1990 refers to 1992. Germany and Korea 1990 refer to 1995. Canada and Norway 2000 refers to 1997. Ireland, Japan and Sweden 2000 refer to 1998. Denmark, France, Korea, Netherlands, Spain and United Kingdom 2000 refer to 1999.
Source: OECD (c).

45. Nevertheless, the research intensity of textiles and clothing has substantially been increased in almost all OECD countries over the past decade. This is the case not only in absolute terms, but also relative to total manufacturing. With Ricardian trade theory in mind, where relative technology levels determine comparative advantage, one might expect that those countries with the highest relative increase in R&D intensity should exhibit the most pronounced improvement in their RCA indices. In order to check this hypothesis, an index was calculated which measures the change in R&D specialisation by the ratio of

relative R&D intensity of textiles and clothing in 2000 divided by the corresponding relative R&D intensity in 1990 (calculated from Table 4.6). When the resulting coefficient exceeds unity, the respective country has increased its R&D specialisation in textiles and clothing over time. Change in comparative advantage was measured by the difference between the RCA-coefficients of 2001 and 1991 (calculated from Table 4.5). Positive differences indicate an improved international competitiveness and negative ones indicate deterioration.

46. According to these calculations, the most significant increase in R&D specialisation took place in Spain (Table 4.7). Spain has also substantially improved its trade performance in textiles and clothing as measured by the RCA concept. This observation supports the Ricardian trade model. On the other hand, Sweden was able to improve its trade performance even more, although the R&D intensity of textiles and clothing was reduced not only in relative, but even in absolute terms. France and Norway have increased their R&D specialisation, but lost ground in international competitiveness. All in all, there is no significant correlation between the development of R&D specialisation and trade performance for the countries covered in Table 4.6. Therefore, it does not follow that more money for industrial research and development would more or less automatically lead to improved competitiveness on world markets.

47. The major reason for the weak relationship between technological specialisation and trade performance is the fact that most innovations in textiles and clothing are created in other industries. New materials are mainly developed in the chemical industry and new processes are developed in the machinery industry. As discussed in detail in section II, these industries substantially contribute to improving the technological sophistication of textiles and clothing.

48. As a result, the technological competitiveness of producers of textiles and clothing largely depends on their ability to adopt new products and processes developed elsewhere. Therefore, the major focus of innovative activities within these industries lies on technology transfer. The main features of these activities for major OECD countries are surveyed in the following sub-section.

Table 4.7 R&D Specialisation and Trade Performance of Textiles and Clothing

Country	R & D Specialisation	Change in Comparative Advantage
Belgium	1.44	4
Canada	1.21	50
Denmark	1.6	-13
Finland	1.17	-22
France	2.25	-17
Germany	1.21	-5
Ireland	1.15	-61
Japan	1.26	-65
Korea	1.73	-4
Netherlands	1.79	-2
Norway	2.5	-11
Spain	5.71	23
Sweden	0.52	28
United Kingdom	1.29	-47
United States	0.85	-45

Notes : The R&D specialisation is the ratio of percentage change in textile and clothing R&D intensity shares between 2000 and 1990 to same ratio for total manufacturing, e.g. for Belgium: ((2.2/1.2) / (6.6/5.2)) = 1.44. Change in comparative advantage is measures by the difference between the RCA-coefficient of 2001 and 1991, for Belgium: 33 – 29 = 4.
Source: Own calculations based on Tables 4.5 and 4.6.

B. Innovation and Technology Diffusion Approaches by Country

49. What follows is a survey of the most important research institutions engaged in textiles and clothing in OECD. The survey focuses on those countries where this industry substantially contributes to total manufacturing output and employment (see Table 4.4). As discussed in the previous section, the major focus of these institutions lies on innovation-oriented consulting and on technology transfer from chemicals and machinery. Furthermore, research institutions often have close links to specialised university departments. The focus in this area is also on technology transfer from university research to innovative activities in the textile and clothing sectors.

50. The innovation and technology diffusion approaches in OECD countries largely concentrate on supporting such research institutions. By contrast to popular high-tech industries, such as microelectronics and aerospace, specific research and innovation programmes are rare and almost no specific government institutions or public budgets for the textiles and clothing industry are available. Instead, innovation policy can be characterised as a hybrid system of private and public research institutions. Understanding the innovation system of this industry therefore requires an understanding of the network between private firms and semi-private research institutions. As textiles and clothing is a mature and traditional industry, these networks often have deep historical roots.

51. As a further common denominator, the research institutions usually are geographically scattered and highly diversified in their innovative activities. Usually, there is an absence of any central coordination by the government, but most institutions are rather independent in defining the aim and scope of their activities. In most countries, their work is supported by national employer organisations and certain supra-national institutions.

52. Corporate and individual members from over 90 countries are represented by the Textile Institute (www.textileinstitute.org), which has its headquarter in Manchester, U.K., and provides various technical and market-related information for textiles, clothing and footwear. However, it is not engaged in own research activities, and its information capacities are basically limited to library services.

53. The most important supra-national institution at the European level is EURATEX (www.euratex.org), which is a non-profit trade organisation dedicated to the promotion of the European textile and clothing industry. It is located in Brussels. Its members are national textile and clothing associations from 24 European countries, including seven associations from new EU member states, as well as from Turkey and Morocco. In the area of research and development it concentrates on the provision of information about European R&D policies and funding opportunities, European research institutions and relevant research and technology developments, and on the coordination, promotion and support of European R&D projects. In addition, EURATEX supports the industry in defining commercial strategies, in developing an integrated environmental strategy and in defending intellectual property rights against counterfeiting and piracy. A number of bulletins, position papers and newsletters are released which contain relevant information about market trends, new technologies and policy initiatives for its members.

54. The second major European institution is TEXTRANET (www.textranet.org), located in Paris, which has been established by national textile research and technology organisations from the European Union and EFTA. It is engaged in promoting cooperation of technical centres in different countries especially in those areas where an intense exchange of information is required or where large financial funds are needed for individual projects. It has set up data banks on textile technology and is promoting research projects on specific themes. These projects are executed at national technical centres which are selected and coordinated by TEXTRANET. These activities mainly serve the needs of small and medium sized enterprises which would be unable to afford such projects on their own. A further goal of

TEXTRANET is to avoid duplication and scattering of research efforts by improving communication and coordination of national research and technology institutions.

55. In addition, there are a number of smaller European institutions with limited or no own R&D facilities. Examples are Eurocotton (Committee of the Cotton and Allied Textile Industries of the EU) in Brussels, Interlaine (Committee of the Wool Textile Industry in the EU) in Brussels, ECA (European Carpet Association) in Brussels, ETAP (European Association for Textile Polyolefins) in Brussels, Aertel (European Ribbon, Braid and Elastic Fabric Association) in Gent, or EUROCORD (European Federation of Wire Rope Industries) in Paris.

Belgium

56. The major research institution of the Belgium textile industry is Centexbel (www.centexbel.be) with 120 staff members. It is a private organisation which engages in developing and promoting technological innovation and providing information and training about technological trends and new applications. It has three branch offices in Brussels, Zwijnaarde (near Gent) and Herve. In yarn engineering, for instance, Centexbel concentrates on extrusion and thermo-mechanical processes, on crystal structure and thermo stability characteristics, and on improving the quality and processability of synthetic yarns. Further topics, among others, are microbiology and hygiene, flax and carpet technology, and standardisation, certification, patents and testing.

57. Technical information for the textile industry is also provided by Febeltex (www.febeltex.be), the employer organisation which represents about 500 textile companies.

Czech Republic

58. Based on the long historical tradition of Bohemian textiles, Inotex (www.inotex.cz) is both a producer of textiles, dyes and textile machinery and a provider of standardisation and technical assistance to the Czech textile industry. It was founded in 1992 as a successor to the Research Textile Finishing Institute. Since 1993, it also runs a scientific-technical park called the Centre of Textile Technology and Education.

France

59. The Institut Français Textile-Habillement (French Textile and Apparel Institute, www.ifth.org) carries out general interest missions and provides a variety of services for the French textile and clothing industry. It has 350 staff members who are working in 13 sites spread over the country. Research projects financed both from private contracts and from public funds are concerned with fibres, structures and composites, measurement and control systems, design and production processes, training tools, and the exchange of information. Among others, fire resistance, manufacturability, comfort of clothing, and microbiological properties are analysed. IFTH supports research projects of private firms by consulting, training and the publication of scientific and technical documents. Furthermore, the services of IFTH include certification of products and companies, and participation in French and international standardisation commissions.

60. Technological consulting, promotion and training is provided by Espace Textile (www.espacetextile.com) set up by French textile companies, by the Fédération Française des Industries Diverses de l'Habillement (www.lamode=francaise.org), the Fédération Nationale de l'Habillement (www.federation-habillement.fr), the Federation de l'Ennoblissement Textile (www.textile.fr/fet), and the Fédération Française des Industries Lainière et Cotonnière (www.fedcoton-laine.com).

61. Research and innovation activities of the French textile and clothing industry strongly benefit from a number of public schools and universities. The most important ones are ENSAIT (Ecole Nationale Supérieure des Arts et Industries Textiles), ENSITM (Ecole Nationale Supérieure des Industries Textiles), ESIM (Ecole Supérieure des Industries et de la Mode), ESITE (Ecole Supérieure des Industries Textiles), ESIV (Ecole Supérieure des Industries du Vêtement), and ESTIT (Ecole Supérieure des Techniques Industrielles et des Textiles).

62. To a certain extent, innovative activities of the French textile and clothing industry are coordinated by its employer organisation, the Union of Textile Industry (www.textile.fr). Besides that it is mainly concerned with lobbying and training initiatives.

Germany

63. Research and innovation activities in German textiles and clothing are coordinated by the Forschungskuratorium Textil (Textile Research Council, www.textil-online.de/forschung). Members are the German employer organisation Gesamttextil (www.textil-online.de) and a number of technical and regional associations. Further members are the Deutsche Institute für Textil- und Faserforschung (German Institutes for Textile and Fibre Research) at the University of Stuttgart (www.uni-stuttgart.de), the Textilforschungszentrum Aachen at the Technical University of Aachen (www.rwth-aachen.de), the Deutsches Textilforschungszentrum (German Textile Research Centre) at the University of Duisburg (www.dtnw.de), the Hohenheimer Institute (www.hohenstein.de), the Textilforschungsverbund Nord-Ost, which covers five research institutes in eastern Germany, and four smaller individual institutes in Krefeld, Bremen and Münster. One of these is the STFI (Sächsesches Textil Forschungs Institut; www.stfi.de) which is specialised in technical textiles, non-wovens, geotextiles, environmental applications and protective clothing.

64. The Deutsche Institute für Textil- und Faserforschung at the University of Stuttgart split up into three separate institutes which are conducting research projects on chemical fibres, polymers and spinning (Institut für Chemiefasern, www.uni-stuttgart.de/icf), on weaving, spinning and texturing (Institut für Textil- und Verfahrenstechnik, www.itv-denkendorf.de), and on dyeing and composite materials (Institut für Textilchemie, www.uni-stuttgart.de/itc). These three institutes employ about 100 scientists and engineers and their research projects are typically carried out in cooperation with and co-financed by private firms.

65. The same applies to the three institutes of the Textilforschungszentrum Aachen, which are working on quality assessment of yarn, on weaving, on technical and medical textiles, on recycling, and on new materials (Institut für Textiltechnik, www.ita.rwth-aachen.de), on carpets and carpet processing (Deutsches Teppich-Forschungsinstitut, www.tfi-online.de), and on chemical, physical and biological properties of wool and wool processing (Deutsches Wollforschungsinstitut, www.dwi.rwth-aachen.de).

66. The Deutsches Textilforschungszentrum at the University of Duisburg (www.dtnw.de) specialises on innovation in textile processing.

67. The final major German research institutes are the ones at Hohenheim (www.hohenstein.de), which are conducting public-private projects mainly on product and design innovations in garment (Bekleidungsphysiologisches Institut), on testing and certifying textile materials (Forschungsinstitut Hohenstein), and on cleaning of textiles and apparel (Forschungsstelle Textilreinigung).

68. All in all, the German innovation system is characterised by close links between specialised university institutes and private companies which cooperate in numerous co-financed projects.

Greece

69. In the decades leading up to its EU membership, Greece had a tradition of being a location for outward processing trade with other European countries. Since this type of trade basically aims at circumventing tariff barriers, it spawned only limited research activities of its own. Since the accession of Greece to the EU, outward processing trade is less attractive and Greece has to rely upon its own technological base.

70. The major institution for providing scientific and technological services to private companies in textiles and clothing is the Clothing Textile and Fibre Technology Development Company (CLOTEFI, www.etakei.gr), which was founded in 1986. It is a non-profit organisation under the supervision of the Ministry of Development's General Secretariat for Research and Technology.

71. CLOTEFI's activities include: product testing and quality control; troubleshooting which referred to quality problems and technology implementation; pilot studies to simulate industrial processes in lab scale; and designing and implementing research projects on behalf of the European Commission or the Greek government.

Hungary

72. The central textile engineering and testing institute of Hungary is INNOVATEXT (www.innovatext.hn), which was founded in 1949. Its services to private firms include laboratory tests and site inspections, assistance with the distribution of self-developed branded products, scientific and technical information, and special training courses. In addition, services on quality control and standardisation, environmental protection and textile recycling are provided. It participates in several international research projects commissioned by the EU.

Italy

73. The innovation landscape in Italy is marked by a number of regionally and sectorally specialised firms providing research assistance to textile and clothing producers. An example is the Como Textile Company (www.textilecomo.com) which offers training and communication services and technical consulting to firms in the Como District. Another example is Tecnotessile (www.tecnotex.it) which carries out R&D projects on the behalf of private firms, offers consultancy support for the application for European and national R&D funds, and helps to meet the requirements of quality and environment standards. A similar institution for the Emilia Romagna region is ASTER (Agenzia per lo Sviluppo Tecnologico dell' Emilia Romagna; www.aster.it), although it is not specialised on textiles and clothing, but offers assistance to innovation activities of various other industries, too. Within the same region, CITER (Centro di Informazione Tessile dell' Emilia Romagna; www.citer.it) offers a variety of information services about technological and fashion trends in textiles and clothing.

74. CENTROCOT (Centre Tessile Cotoniers e Abbigliamento; www.centrocot.it) runs its own laboratories for material and product testing which are open to any Italian textile and clothing producer. Its research activities concentrate on the promotion of joint research projects of small and medium-sized firms and academic institutions. In addition, Centrocot offers certification and quality control services.

75. The activities of these and many other smaller research institutions are linked to corresponding research departments at universities (for instance the Politecnico di Torino) and to the network of the Italian National Research Council (www.cur.it) which constitutes the major public organisation for the support of scientific and technological research in Italy.

Korea

76. In Korea, the main industry association is the KOFOTI (Korean Federation of Textile Industries; www.kofoti.or.kr) which was founded in 1967. It aims at strengthening the competitiveness of the Korean textile industries and to be the leading organisation of the Korean textile industries. It is engaged in organising trade fairs, in lobbying and public relations activities regarding government regulation and trade policy, runs a fashion information library, and offers information about national and international market trends.

77. Another major institution is the Korea Chemical Fibers Association (www.kcfa.or.kr) which represents 14 member companies from chemical fibre production. It aims at representing the interests of member companies and at providing various services for the support of technological development, productivity improvement and product quality.

78. These two institutions, however, do not carry out own research projects. The most important Korean institutions with own research facilities for textiles and clothing are KTDI (Korean Textile Development Institute; www.textile.or.kr) and KATRI (Korea Apparel Testing and Research Institute; www.katri.re.kr). Both institutions are private non-profit organisations and are running research laboratories and testing facilities. They give technological support to private firms and offer certification services. In addition to these institutions, the Korean government has launched the "Milano Project", which aims at developing the Daegu region into a "worldwide textile and fashion Mecca" by linking fashion, design and clothing industries with the local weaving and dyeing industry (www.milano.daegu.kr). The project, which splits up into 17 specific plans, offers special support to research and development in design and apparel and in yarn, dyeing, fabrication, textile machinery and synthetic fabrics. The project started in 1999. The total project volume of 680 billion won (equivalent to about 500 million USD) is covered by the central government (54%), private enterprises (28.5%) and the local government (7.5%).

Portugal

79. In Portugal, the major institution for the support of research and innovation in textiles and clothing is CITEVE (Technological Centre for the Textile and Garment Industries of Portugal; www.citeve.pt). It is a non-profit company which offers consulting and technological assistance to Portuguese companies. Its laboratories are specialised on quality control, environmental certification and defects analysis. Furthermore, its laboratories are also able to provide services on laboratory equipment calibration and on textile conditioning and storage. CITEVE is divided into nine technology transfer units with a range from dying, printing and finishing over technical textiles to health and safety in work.

80. A major area of technological activity is the support of Portuguese firms in their application for research projects financed by the European Commission. Furthermore, CITEVE offers technical assistance in training and participates in the public debate of industrial policy issues.

Spain

81. AITEX (Instituto Tecnológico Textil; www.aitex.es) is a private non-profit organisation for the promotion of innovation and technological development in the Spanish textile industry. It offers support to private firms in several technological areas such as improving the water resistance of fibres and disposes of own laboratories and research staff.

82. The major academic research institution for textiles and clothing is INTEXTER (Institute of Textile Research and Industrial Cooperation; www.ct.upc.es/intexter) at the Universitat Politècnica de Catalunya at Barcelona. It offers technical assistance, material analyses and tests, quality control and standardisation services, education and training, and runs own research projects. These are carried out in nine different

laboratories which are specialised on the control of environmental contamination, the physiochemistry of dyeing, physical textile parametry, textile polymers, textile mechanical systems and processes, surfactants and detergency, textile chemistry technology, special and knitted fabrics, and environmental toxicology. Many of the individual research projects are commissioned by the European Commission under its BRITE/EURAM, ESPRIT or CRAFT programmes.

Turkey

83. Despite the high importance of clothing for the Turkish economy, institutions for the promotion of research and innovation in this industry are rare. The interests of this industry are mainly articulated by ITKIB (Istanbul Textile and Apparel Exporters' Association) (www.itkib.org.tr) which is engaged in organising trade fairs, providing databank for the clothing sector, and representing its member companies in dealing with the Turkish Government and at the international level. It also operates a quality control and research laboratory. Another representative institution is TCMA (Turkish Clothing Manufacturer's Association; www.tgsd.org). As a member of IAF (International Apparel Federation) and EURATEX, it represents the clothing industry, organises trade fairs and provides data. A major focus is to fully exploit the advantages of the customs union with the European Union.

84. Regarding the innovation system of the Turkish clothing industry, it would seem to have a large development potential. The main research and innovation institution is TUBITAK-TRC (The Scientific and Technical Research Council of Turkey – Textiles Research Centre). It was founded in 2001 and conducts research activities in cooperation with the industry and related universities. The Department of Textile Engineering of the Agean University (www.ege.edu.tr) carries out research and development activities and pilot projects. Textile engineering education is also offered in the Istanbul Technical University (www.tekstil.itu.edu.tr). Most recent research projects are carried out for SMEs. Turkey posses a rich human capital base for the manufacturing of clothing, but national firms lack appropriate joint facilities for material testing and development. Likewise, they have only limited access to consulting services for improving market research and marketing strategies. If such a strategy would be pursued, Turkish manufacturers might be able to earn higher prices for their products on world markets.

The United States

85. Rich information about the US textiles and clothing industry is collected and disseminated by OTEXA (Office of Textiles and Apparel; www.otexa.ita.doc.gov), which belongs to the Department of Commerce. Although not directly engaged in research and innovation, it informs about trends in international trade and trade policy which might help to design sustainable innovation strategies. Moreover, it administers basic research projects of the National Textile Center and the Textile and Clothing Technology Center.

86. The National Textile Center (www.ntcresearch.org) is a research consortium of eight universities, which gets its research funds from the US Congress. Its research projects are concerned with chemical systems (dyeing, finishing, waste reduction), fabrication of fibres, management systems (innovations in production, distribution and consumption applications), and material science (natural and synthetic polymers and fibres).

87. Another university-related institute is Clemson Apparel Research (http://car.clemson.edu) at Clemson University, South Carolina. It is dedicated to the support of the sewing industry, but is also active in textiles and related materials research and applications. A further field of activity is manufacturing and supply chain optimisation. Its core facility is a model plant which produces military garment for the Department of Defence. Research activities are concentrated upon the development of supply chain

execution software, mass customisation software and software for colour inventory management, cost-benefit analysis, and computer-aided design and production.

88. Similar research institutions are the School of Polymer, Textile and Fiber Engineering (www.tfe.gatech.edu) at the Georgia Institute of Technology, the Department of Textile Engineering (www.eng.auburn.edu/department/te) at Auburn University, and the School of Textiles and Materials Technology (www.philau.edu/schools/tmt) at Philadelphia University.

89. In addition, there are several more research institutions which carry out projects for private firms and which are linked to universities. An example is the Institute of Textile Technology (www.itt.edu) at the North Carolina State University. Its research services include a Textile Analysis and Troubleshooting Laboratory which provides chemical testing and defect analysis.

90. By contrast, the Textile and Clothing Technology Corporation (www.tc2.com) and the Textile Research Institute (www.triprinceton.org) are independent from universities. The former one is a joint non-profit company of more than 200 textile and clothing producers all over the United States and is mainly concerned with mass customisation technologies. The most prominent project in this area is related to 3–D body measurement, which assists retailers and customers to select the appropriate size of clothing. The latter one is a joint non-profit company of about 30 corporate member firms and is specialised on materials testing and the development of innovative fibres, films and porous materials.

91. Innovation and marketing activities of private firms are further supported by various trade organisations such as the American Apparel and Footwear Association, the American Fiber Manufacturers Association or the National Cotton Council, although these institutions do not dispose of own research facilities.

The United Kingdom

92. Research and innovation activities of textiles and clothing in the United Kingdom are dominated by non-profit research companies established by private member firms. The most important one is the British Textile Technology Group (www.bttg.co.uk) at Manchester, which offers a variety of standardisation and testing services and is also engaged in the development of innovative materials and production technologies. Its research fields are related to fire protection, testing of technical textiles, new carpet and floor covering technologies, certification of equipment and products, and innovation in spinning and non–woven.

93. Furthermore, several British universities have strong expertise in textiles and clothing, above all the University of Manchester Institute of Science and Technology (www.umist.ac.uk. It offers research and technology translation, executive training and consultancy for private customers from the textile and clothing industry. In addition, collaborative research is promoted by a subsidiary of this university, the UMIST Venture Ltd which is dedicated to facilitate the start-up of new companies which are able to commercially exploit the results of academic research. It should be noted, however, that this venture capital company is open not only for textiles and clothing, but for any other industry.

C. Towards Best Practice in Innovation Policies

94. History matters also in industrial policy. Different countries have different historical backgrounds of industrial development and thus differ with respect to optimal policy support for specific industries such as textiles and clothing. However, there are some general lessons which can be drawn from cross-country experience.

95. Firstly, there seems to be no fundamental lack of invention and innovation. It would not be appropriate for governments, therefore, to launch large-scale basic research projects on textile and clothing technologies outside of horizontal industrial research schemes based on public-private co-funding mechanisms. Although the textile and clothing industries can be considered to be mature, they use technological innovations that are largely generated in other industries, above all in chemicals and machinery. These technology suppliers are well able to sufficiently provide product and process innovations for textiles and clothing without financial support from public research programmes. While governments may stimulate collaboration innovation processes in the fields of dissemination and technological transfer, such approaches should not distort market-oriented innovation programmes.

96. Secondly, technology transfer between technology suppliers and technology users plays a pivotal role for the technological performance of textiles and clothing. It seems appropriate, therefore, that all countries surveyed above are concentrating their innovation policies on this topic. Nevertheless, this approach should probably be strengthened, because enriched opportunities of modern information and communication technologies for the dissemination of advanced technological knowledge are not fully exploited yet. Such a policy would require complementary public funding in order to provide financial incentives for innovators to pass proprietary technological knowledge to imitating firms.

97. Thirdly, many SMEs are often facing substantial difficulties in the marketing of their products, because they lack a widely recognised reputation for high product quality. Governments could support marketing activities by promoting certification agencies and common brand-names. At present, government activities in this area are mainly concentrated on sponsoring fairs and exhibitions.

98. Finally, governments should keep in mind that in the long run innovative capacities basically depend on the availability of suitable human capital. Therefore, a sound education and qualification system seems much more important for sustainable technical progress than public innovation programmes. This applies not only to textiles and clothing, but to any other industry.

V. Concluding Remarks

99. Applied technologies in the T&C industries over the past decade, as in earlier periods, have assumed a differentiated path. While the textile industry can point to numerous improvements and innovations which should allow it to roughly extend its secular productivity trend, the clothing industry can only point to various improvements in the disjointed process of sewing together a garment. As a matter of fact, today's sewing techniques in the core production process do not basically differ from those that were used 100 years ago, and the labour–intensity character of the production process remains the norm. In hardly any other major industry are labour inputs coupled with such small amounts of physical capital equipment. While the gap between weaving and spinning productivity could be widening to the advantage of spinning, the mixed selection of highly differing processes up front and downstream from the actual sewing process makes it difficult to judge how large the overall changes in productivity will be. If the technology path in the textile industry can be viewed as a rather straight highway, then the path traced by the clothing industry is best pictured as a road heading up productivity peaks and then down into valleys of low productivity, with hardly an option to shift into a higher gear.

100. Perhaps the automobile industry and its computer-controlled, just-in-time, automated production process can serve as an example for the clothing industry. After all, when the automobile industry was just in its nascent years, it was Henry Ford who saw the potential to turn the piecemeal production process into a production line. By changing the production parameters so radically and introducing the production line where the myriads of pieces come together to form the final product, he opened up a new era, which now has been again subjected to major shifts with state-of-the-art production structures.[16] Could such a quantum change be enacted in the textile and clothing industries?

101. The answer is probably not. Given the above description of the clothing industry, there would seem to be little potential to massively shift the productivity of the sewing process; there might, however, be major developments in otherwise bonding pieces of cloth together to form clothes. While the efforts currently being undertaken in the sewing process will eventually change productivity, over the medium run these, results are bound to be more in the line of automating certain sewing operations, such as sleeve assembly, rather than the entire production line. And when the latter is finally achieved, it will probably tend to be meant more for long production runs, involving large volumes of standardised articles, rather than short runs dictated by quickly changing fashions.

102. Where matters concern the exports of the textile and clothing machinery industry over the last 20 years, the four main exporting countries, *i.e.* Germany, Italy, Japan and Switzerland, were quite successful in retaining their relatively large share of the sector's worldwide exports. However, in the 1990s the TCM industry was the only machinery industry that has experienced negative growth rates. This, combined with the very strong import growth of textile and clothing machinery in China in recent years, foreshadow where more textile and clothing exports in the future will be coming from. These factors may lead to the establishment of stronger textile and clothing clusters in China, consisting of more enterprises and higher expertise.

103. The review argues that the role that textile and clothing production now plays in the industrialisation process of developing countries is far more differentiated than it was some 30 years ago. While low-labour cost still gives developing countries a competitive edge in world markets, time factors are now playing a far more crucial role in determining international competitiveness. Nonetheless, to remain competitive, developed countries are forced to climb the technology ladder, either with product or with process innovations.

104. In most countries, intensified research efforts could not prevent a decline in the employment share of textiles and clothing in total manufacturing employment since the early 1980s. The share of textiles declined in all countries reviewed and the share of clothing declined everywhere except in Greece, Italy and Portugal. The trade data show that structural adjustment pressure in the OECD area does not result from a decline of world markets, but largely from the rapid expansion of Chinese exports of textiles and clothing. As the integration of China into the world economy continues, OECD countries will have to face intensified competition on world markets and structural adjustment pressures within their domestic economies in the future.

105. The review finds a weak relationship between technological specialisation and trade performance for OECD countries as measured by the difference between the Revealed Comparative Advantage (RCA) indices for 2001 and 1990. The major reason for this weak relationship stems from the fact that most innovations in textiles and clothing are created in other industries. New materials are mainly developed in the chemical industry, and new processes are developed in the machinery industry. As a result, the technological competitiveness of producers of textiles and clothing largely depends on their ability to adopt new products and processes developed elsewhere. Therefore, the major focus of innovative activities within these industries lies on technology transfer.

106. In turning to the developments across OECD countries, it was shown that the landscape of innovative activities in textiles and clothing are highly scattered across most of the countries surveyed. As a rule, there are no central institutions that coordinate the individual research agendas, with Korea as the only exception. It is difficult to assess whether this bottom-up type of organisation is advantageous or disadvantageous. It may result in parallel research and missed opportunities for synergies, but it may also promote institutional competition as a discovery procedure.

107. Despite the lack of central coordination, the enriched opportunities of networking and information exchange via the internet are increasingly exploited by research and innovation-oriented institutions. Most of them are offering electronic information services and provide contacts to other institutions within and beyond national borders. In many countries, research collaboration between universities and private firms play a dominant role. This form of public-private partnership is well established especially in the United States and Germany. In France, Italy and the United Kingdom, by contrast, joint research is mainly carried out in joint companies established by private firms and backed by financial contributions from government. Again, it is difficult to assess which type of joint research is more beneficial. Each of them can be said to have its own historical roots and its own specific merits.

108. Among the research topics of the institutions surveyed above, textiles clearly dominate over clothing. This relationship obviously reflects different technological potentials and different expected marginal returns from research and development. The promotion of joint research and innovation activities in textiles and clothing is undoubtedly difficult for SMEs to achieve. Especially in textiles, a substantial part of research and development is carried out by large companies from the chemical industry, and these companies do not have to rely on joint research institutions. Any approach to promote public-private research institutions in textiles and clothing can be regarded to a large degree, therefore, as an approach to promote the business opportunities of SMEs. For instances, this might be applied by Turkey. If such a strategy would be successfully implemented, Turkish manufacturers might well be able to earn higher prices for their products on world markets. Subsequently, if such a strategy yielded a reward, may be it could be appropriately instituted in other countries.

109. As industrial policies have to take into account country specific path dependencies as well as indigenous industrial structures, it is hard to identify a one-size-fits-all policy approach for supporting innovation in T&C industries. Nevertheless, four general lessons are drawn in this paper. First, there is no substantial lack of inventions and innovations in this industry. Governments should therefore refrain from launching large-scale basic research programmes for textiles and clothing. Second, governments are right in putting the emphasis on technology transfer and the diffusion of innovations. This approach could be developed further by better exploiting the potential of modern information and communication technologies for the dissemination of technological knowledge. Third, reputation increasingly becomes a key factor of competitiveness. Governments could support the creation of reputation especially of SMEs by the promotion of quality certification and common brand-names. Lastly in the long run, the technological performance of industries basically depends upon the stock of human capital. Therefore, education and qualification policy should be regarded as the most important precondition of technological success, not only in the textile and clothing industries, but also in any other industries.

NOTES

[1] It is worthwhile to recall the situation in Germany in the mid 1800s, when Prussia complained to the Zollverein about the South German cotton spinners and their persistence with respect to "assistance and their disregard for the interests of other industries and of consumers"(Henderson 1959: 184).

[2] This is not saying, however, that this was only factor which caused the demise of some German sewing machine manufacturers.

[3] While Howe introduced the lockstitch, it was James Gibbs who produced the first single thread chain-stitch (1857)

[4] In a study assessing the impact of industrialisation policies on trade performance (Spinanger, 1987), where the factor intensities of 28 industries in six countries (*i.e*. USA, Malaysia, Chinese Taipei, Singapore, S. Korea, and The Philippines) over a ten year period were examined, it could be determined that the clothing industry was the only industry which consistently had the lowest physical capital intensity (fixed assets/employee) and the lowest human capital intensity (wages/employee).

[5] A particularly relevant point applies to preparing textiles for the sewing process. Whereas before such activities would be carried out entirely in house, they can now be totally outsourced: beginning with the selection of the fabric down to the cutting of the patterns and then the bundling for the assembly in the in-house sewing process. This obviously carves down the activities of a clothing company to the "core competence." It also supports competitiveness of SMEs, as they no longer need to maintain underutilised expensive capital stock.

[6] This interface between the textile industry and the textile machine industry would continue to play an important role, from which both parties profited. It was not only the synergetic effect from approaching the problems from different directions; it was also the ability to test machines under true working conditions before they came on the market.

[7] Technological shifts, however, can shorten the replacement life cycle of equipment. "Twenty years ago, 15 years was considered to be the normal life of textile equipment. Today it is no more than ten years, and for some technologies, such as texturising, the useful life of the equipment can even be shorter." See Hartmann [1993, p. 67].

[8] Knowing that countries like India and China do produce considerable and even increasing amounts of TCM, it is likely that most of such equipment is used to produce products for domestic markets or for other developing countries. However, given the crucial interface between the TCM industry and the T&C industry, the existence of an inherently competitive T&C industry bears the potential to spawn a future competitive base for exportable TCM if the other essential inputs can be drawn on. Since this is already beginning to happen, the question is: When will they become actual competitors for OECD countries?

[9] In a study dealing with the textile and clothing industries in Germany, companies interviewed often noted that when contracting for work to be done offshore, they stipulated which machines should be used to produce the required quality output. Some companies, in particular those having offshore processing operations carried out in Eastern Europe, even provided the necessary machines (on a lease or joint-venture basis). Whichever arrangement applied, the machines were from OECD countries [see Spinanger, Piatti, 1994]. In a study of Hong Kong (China)'s clothing industry, a similar, albeit less direct stipulation of machinery inputs could be established. That is, those companies setting up operations in other Asian countries tended to use the same equipment as in Hong Kong (China), and this was usually from OECD countries [see Spinanger, 1994].

[10] There are two reasons behind the higher growth rates for textile products from non-OECD countries over the last two decades. First of all, they began to acquire all the faster, the new generation of textile machines in the course of the first half of the 1980s, increasing thereby productive capacities and the quality level of output. Secondly, in

the course of the decade stronger competition in export markets meant that effective labour cost differentials began to play an ever greater role even in such highly capital-intensive production processes. This is reflected, for instance, in the strategy of major textile companies in OECD countries, which have begun to outsource certain products from non-OECD countries. What this means in the case of Morocco and Tunisia, where numerous German, French and other EU companies have operations, is easy to portray: mill operations can be carried out on 35% more days/year than in Germany, while wages are at only 8 to 17% of German levels. Hence companies outsource "greige away from Europe and into the lower-cost countries, like Tunisia, in order to focus efforts in Europe on finishing, where the real addition to value-added is." Interview with President and CEO of Dominion Textiles, one of world's top 20 textile companies, see Textile Asia (November, 1992, p. 22).

[11] This refers to the 25 largest exporters of textile and clothing products respectively in 2001.

[12] The differential is even more convincing if the growth rate of TCM exports to Asian countries is compared with that to European countries over the period 1983-91: 23.0% vs. 13.1%. Japan's exports throughout the decade and across all categories is almost diametrically opposed to the other three major suppliers which usually exhibited a strong IC concentration, whereas Japan's overall shares of TCM exports destined for non-OECD countries averaged 60% and exceeded 70% in 1991, the shares of the other three suppliers were usually 50% lower even if somewhat higher in the second half of the period.

[13] Whereas the clothing industry can probably be considered to be the most labour intensive and least human capital intensive industry (see Spinanger, 1988), the textile industry in OECD countries is one of the most capital intensive.

[14] Even before these agreements, the European countries east of the EU had been widely profiting from offshore production legislation, which permitted EU countries to ship EU textiles to these countries, where they would be turned into clothing products. They would then be reshipped to the EU and duty would only be applied to the value added produced outside the EU.

[15] On the trade effects of eastern EU enlargement, see Klodt (2003). Based on the trade effects of the Europe Agreements and on a comparison to previous enlargement rounds, it is argued there that new patterns of trade specialisation will not show up in the future, but have already been achieved in the past.

[16] For the Ford company by 1914 (just four years after starting the production line), this meant that 13 000 workers were producing 260 000 cars, while the rest of the industry employed 66 350 workers to make 286 000 cars.

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ANNEX A: TABLE

Annex Table 4A.1 Description of 3–Digit SITC (Rev.2) Categories in Section 7, Machinery and Transport Equipment 2000

Divisions/categories	Description
71	**Power Generating Machinery and Equipment**
713	Internal combustion piston engines, and parts
714	Engines and motors, non-electric
716	Rotating electric plant and parts
718	Other power generating machinery and parts
72	**Machinery Specialized for Particular Industries**
721	Agricultural machinery and parts
722	Tractors fitted or not with power take-offs
723	Civil engineering and contractors plant and parts
724	**Textile and Leather Machinery and Parts**
725	Paper and pulp mill machinery, machinery for manufacture of paper
726	Printing and bookbinding machinery, and parts
727	Food processing machines and parts
728	Machinery and equipment specialized for particular industries
73	**Metalworking Machinery**
736	Machine-tools for working metal or metal carbides, and parts
737	Metalworking machinery, and parts
74	**General Industrial Machinery and Equipment, N.E.S. and Parts, N.E.S.**
741	Heating and cooling equipment, and parts
742	Pumps for liquids, liquid elevators, and parts
743	Pumps, compressors, fans and blowers
744	Mechanical handling equipment, and parts
745	Other non-electrical machinery, tools, apparatus, and parts
749	Non-electric accessories of machinery
75	**Office Machines and Automatic Data Processing Equipment**
751	Office machines
752	Automatic data processing machines and units thereof
759	Parts of and accessories suitable for 751, 752
76	**Telecommunications and Sound Recording and Producing**
761	Television receivers
762	Radio-broadcast receivers
763	Gramophones, dictating and sound recorders
764	Telecommunications equipment, and parts
77	**Electrical Machinery, Apparatus and Appliances, N.E.S., and Parts thereof,**
771	Electric power machinery, and parts thereof
772	Electrical apparatus such as switches, relays, fuses and plugs
773	Equipment for distributing electricity
774	Electric and radiological apparatus, for medical purposes
775	Household type, electrical and non-electrical equipment
776	Thermionic, cold and photocathode valves, tubes, and parts
778	Electrical machinery and apparatus, n.e.s.
78	**Road Vehicles (Including Air-Cushion Vehicles)**
781	Passenger motor cars, for transport of passengers and goods
782	Motor vehicles for transport of goods materials
783	Road motor vehicles, n.e.s.
784	Parts and accessories of 722, 781, 782, 783
785	Motorcycles, motor scooters and invalid carriages
786	Trailers and other vehicles, not motorized
79	**Other Transport Equipment**
791	Railway vehicles and associated equipment
792	Aircraft and associated equipment, and parts
793	Ships, boats and floating structures

Source: United Nations (1975: 65 – 83).

ANNEX B: THE CLOTHING PRODUCTION PROCESS

1. The production process from the designing of a collection to the pressing and packaging of finished clothing products encompasses a wide range of distinct activities and each has a distinct composition of capital and labour. To better appreciate the production specificity of each stage and the technological progress made in recent years, the following section provides technological details about the main production stages involved in the fabrication of clothing products.

Designing

The current state-of-the-art CAD systems for this step of the production process have one major weakness: they have difficulty to simulate accurately how all types of cloth drape a body.

2. The designing of clothes can be a very human-capital intensive process, which incorporates all the more differentiated factors in a given design, the greater the fashion content is. At one end of the spectrum, there is the designing of standard clothing items, where the fashion content is close to zero; the designing share in this case would amount to no more than a technical description of standardised inputs. At the other end there is the haute couture, where the creative and highly individual designing activities can represent a sizeable portion of the final sales price. It is at this end of the spectrum where the use of CAD systems has greatly increased the productivity of individual designers. The ability to design with a light pen on a screen in full colour, with essentially fewer limitations posed than a piece of paper and coloured drawing utensils, incorporating also a wide range of structuring and patterning options implies that the trial and error process *i.e.* creative mistakes can be shortened considerably before the "creation" is considered to be completed. The setting up of a fashion collection for the usual season is simplified; quick additions thereto are easily accomplished by merely retouching/modifying in the computer system those fashion items which are proving to be more popular.

3. The system, of course, has an even greater potential, since the on-screen, full-colour patterned cloth can be off printed in the pre–selected width to ensure that the visual conception interfaces with two dimensional reality on a textile fabric. Likewise, the colour and material input demands can be sent off on-line to the respective producers of these intermediary inputs to have them checked through vis–à–vis the technical feasibility as well as price, production and delivery specifications. Hence, almost the entire time-consuming and human-capital intensive range of activities located in front of the so-called pre-assembly process can be enormously simplified and accelerated through computed-aided design (CAD).

4. The current state-of-the-art CAD systems for this step of the production process have one major weakness: they have difficulty to simulate how all types of cloth drape a body. Although this possibility is slowly approaching, actually with known materials it is coming very close to reality already. The basic reasons for this weakness can be found in the inherent characteristics of clothes: these fit/drape individuals in a manner which depends on the kind of material, thickness thereof, patterns thereon and fashion demands. Thus, while portraying a snug-fitting, cotton t-shirt on a computer-generated individual can be assumed to present no problems for existing PC/micro–based systems, a long flowing gown, incorporating different types of materials, patterns and cuts, could not be portrayed. In the former case, the snug-fitting t–shirt could be portrayed in the same manner as shoes are designed: the mirror image of the side already 3–D designed can be used to create the missing side. In essence, both in designing a shoe as well as a snug-fitting t–shirt, the final product is basically nothing more than an extension of the outer surface of the computer-generated foot or torso. However, the further a piece of clothing is removed from the outer surface of a normed torso, the greater the number of parameters which have to be taken into consideration.

Thus in the case of the gown it would require information on so many individual parameters that currently only a mainframe computer would have the capacity to handle the task. Given the prices of such systems today, they would seem to be economically viable only for the largest companies. As computers become more powerful and faster, this constraint will only be eliminated to the extent that the myriads of properties of the materials being used can be correctly captured and portrayed.

Pattern Making

The impact of technology in this area can be expected to be all the greater in the future, the more standardised the individual steps are. Small size firms will be able to benefit by outsourcing their pattern making requirements.

5. Pattern making in the clothing industry is the art of transforming a finished design for a three dimensional piece of clothing into two dimensional cloth segments which, when reproduced, are capable of being assembled in a production process into any number of replicas of the original, one-off model. Two basic functions must thereby be fulfilled. First, and most obvious, the pattern structure must not detract from the original design (fashion constraint). Second, the pattern must be able to be structured in a manner which allows it to be adapted to a production process given time and cost constraints. To ensure that both of these functions are fulfilled, highly-paid skilled personnel are employed using powerful computers and interactive software. Despite the interconnections between these two steps, a separate examination of each facilitates the portraying and understanding the technological implications of the pattern-making process.

6. Dissecting a designed clothing product into segments which then, when reassembled, blend into the overall design requires knowledge about the manifold attributes of cloth, when sewn or otherwise combined with the same or other types of cloth to wrap around, drape or otherwise fit a human body or part thereof in a certain manner. Beyond this, the structure of the material, the type of patterns imprinted on it and the other specifications of the design, *e.g.* type of pockets, number of fasteners, etc., all present demands which are currently best fulfilled by skilled individuals. In larger companies, this is accomplished with a CAD system supporting the skilled individuals allowing them to more efficiently dissect – on a screen, using simple commands – a piece of clothing into manageable components. Although computers can automatically assist when standard procedures are applied to certain parts of a piece of clothing, *e.g.* collars, cuffs, and seams, if products are only nominally changed or if one-material products with simple lines, *e.g.* jeans, are to be produced, they have yet to assume tasks where optical and sensorial attributes must also be taken into consideration.

7. Once a pattern has been created for a given designed piece of clothing that fulfils the fashion constraint, then the downstream production specifications must be met. This means that each production step necessary to assemble the individual parts into the final product must then be defined and estimates of production costs evolved from there have to be made. Since the lead-time for new fashions is quite short, tight time constraints prevail so that investment in new product-specific equipment is basically excluded. As the technical capabilities of a given equipment are known and since the sequence as well as the demands of certain steps are either dictated by the nature of the product and/or have evolved out of past experience (and are thus available from computer data bases), this task – given a computer-based production planning system – can be reduced to filling in the gaps with guesstimates. Here again only the larger companies have installed such systems.

8. The output of all these calculations is a set of figures on the material, labour and capital costs of production, plus the time-frame necessary to produce a given amount of output. Likewise, this set of figures is used to set up production schedules and map out material flows from the incoming fabrics to the outgoing packaged final products. The impact of technology in this area can be expected to be all the greater in the future, the more standardised the individual steps are. Small size firms will be able to benefit

by outsourcing their pattern making requirements. However, given the similarity of production processes in clothing factories, there is obviously room for inter-firm production planning services, particularly if an overall strategy is being pursued to attempt to improve the competitive position of the national industry.

Grading

The once tedious and time-consuming process of grading each new piece is now reduced to a computer software package.

9. After the use of CAD systems in connection with most aspects of pattern making, their application to the pre-assembly process will be tested in an automatic manner in adding on the necessary fabric leeways for seams, hems and the like. Since grading (that is the production of different sized patterns from an initial size pattern to correspond to the entire spectrum of norm sizes) is a similar procedure, state-of-the-art CAD systems permit virtually instantaneous grading, be it for European/US or any other set of human size specifications. The once tedious and time-consuming process of grading each new piece is now reduced to a computer software package, where standard grading factors are included which can also be accordingly modified with individual firm or fashion parameters.

Nesting and Marking

Today state-of-the-art CAD systems perform the structuring of an entire marker on whatever size fabric.

10. On line as well in a CAD system, the pre-assembly layout process is now in the final step before the actual fabric is integrated. At this point the graded patterns consisting of *n* pieces per size for *m* sizes now have to be arranged, *i.e.* nested, in such a manner on a master pattern sheet, *i.e*. on a marker, that they cover as much of the fabric as possible. Whereas in the past, each and every piece of a pattern had to be hand placed, nested and marked on a pattern sheet (marker), today state-of-the-art CAD systems perform the structuring of an entire marker on whatever size fabric. Such systems allow cloth to be utilised, depending on the type of fabric, well over 90% with time savings of over 50% vis-à-vis original systems and a 5% reduction in material losses. Today, such jobs can be easily outsourced, including the necessary fabrics needed.

11. Since material costs represent a major share of the final product price and since fabric wastage has little reusable value, this aspect is quite important in improving the competitive edge. The prevailing computer systems, aside from assisting the operator in moving around the individual pattern pieces, nesting them and creating multiples of given nesting structures across the width or length of the marker, provide tolerance checks as concerns the distance between the individual pieces vis-à-vis the cutting system specifications. Such checks ensure that costly mistakes are not made in trying to squeeze as many pattern segments as possible out of the fabric, thereby nesting them closer than cutting tolerances allow.

12. What these systems cannot do is to replace highly skilled workers, who have developed over the years a feeling for how to nest and structure sloopers, by software packages, which can take *n* x *m* number of pattern pieces and optimise their nesting across and down a given marker. These jobs are being deskilled in the sense that they can almost be replaced by software. Soon perhaps, there will be no individuals who once knew the secrets of this trade. Not only will the brut power and speed of PCs/micros have to be expanded, they will also have to be combined with a certain degree of human intelligence capabilities. Utilisation beyond perhaps 95% for normal products and may be 80% for high fashions point will only be possible if individual pattern components become more congruent, the size of individual components increases, fabric dimensions are adjusted to specific nesting structures and, in particular, weaving/knitting

techniques are developed which would allow individual pattern components to be produced almost without wastage.

Cutting

Cutting still require skilled labour, particularly as the quality of the work performed provides the entire basis upon which the clothing items are produced.

13. Beginning with the cutting process, the actual fabric enters the pre-assembly path in the clothing industry, being delivered on rolls of discrete widths between 36 and 88 inches, containing the length of fabrics necessary to produce the required number of specific clothing items (the length of a production run for a given item is a function of fashion content and price). The fabric is then carefully unrolled, being inspected thereby for flaws, cut into specified lengths as dictated by the marker (whereby they rarely exceed 30 meters long for practical purposes); precisely laid out and stacked in what is called a lay. On top of a lay for a given production run, where the number of fabric layers is mainly dictated by the type of cutting equipment and type of fabric, the marker off-printed by the CAD and compute-assisted methods (CAM) is placed or rather the marker information in the CAD/CAM system is interfaced directly with the cutting system.

14. All the above described steps still require skilled labour, particularly as the quality of the work performed provides the entire basis upon which the clothing items are produced. Inroads have been made here not only in particular in ensuring that the cutter does not damage the fabric and the individual pieces being cut out of a deep piled lay are completely identical. Since cutters are among the best paid workers in a clothing factory, the automation and consequent deskilling of this step implies a considerable reduction in wage costs both directly and in terms of shortened training periods. At the same time, productivity increases and wastage is decreased considerably.

15. As important as the automation of the cutting process itself might be in terms of improving the competitive position of a larger company today, it stands alone when compared with the labour-intensive tasks on both sides of it. Particularly, the bundling and tagging of the individual pattern components from the lay for the sewing process is an area where much progress has been made in introducing CAM. However, the constraints being placed here are those mentioned earlier, namely the fact that we are dealing with limp pieces and not hard components (as exists in the automobile industry).

Sewing

Totally automated procedures have made only minor inroads in sewing. Among other things, productivity improvement can be attributed to better needles.

16. As mentioned at the outset, the core production process in the clothing industry is sewing. It is where automated procedures have made only minor inroads. Given this fact and in light of the expressed intention to keep this overview brief, it does not seem to be a fruitful approach to attempt to go through the various steps where more progress has been made. Rather, it probably suffices to state that aside from certain particular parts of the sewing process or some materials or some very specific clothes, all those ideas developed over the course of the last two decades with respect to totally automated sewing systems have lead to little more than the conclusion that it will not happen in the near future.

17. There were two basic approaches which were adopted to attempt to solve the manifold difficulties involved: (1) the global strategy was chosen by the Japanese in order to develop an automated clothing factory; and (2) the marginal approach was adopted in the United States and Europe with the intent to either initially automate a certain segment (the United States) or concentrate on certain particular problems (the European Union).

18. By far the most ambitious project is the Japanese Automated Sewing System which was officially initiated in 1982 by the Ministry of Economic and Trade and Industry (METI) and launched in January 1983 in the form of an Association of Technology Research of Automated Sewing System. The goal of this project was to create an automated clothing production system which could efficiently manufacture clothes even if produced in small lots to satisfy the manifold consumer tastes. The time-frame of the project foresaw a factory going on-stream in 1989. Despite a rather generous funding (figures differ, but probably USD 100 million will have been spent by then) and periodic optimistic statements, the vision of having textiles enter one side of a factory virtually void of workers and clothes coming out on the other side could not be realised as planned. It was primarily the insurmountable difficulties connected with the 3-D sewing technology, as well as the handling of fabrics, which caused the project to be so far behind projected deadlines. Partial results could be seen at numerous IMBs (World Fair for Apparel Production Technology and Textile Processing), but the project did not come up to the cut and has disappeared from the headlines.

19. In the United States back then, with more than 21,000 establishments of which 70% employed less than 50 workers and 25% less than five workers, the thrust of the research on automating the clothing manufacturing process concentrated on one specific task, the benefits of which were expected to have implications for manifold facets of clothing production. Beginning in 1979 this project, which is organised under the Textile/Clothing Technology Corporation (TC²), set out to increase labour productivity after having established that US clothing manufacturers, given equal quality and service inputs, can compete with foreign imports on a price basis. With funding equally shared between the industry and the Department of Commerce, TC² was supported by a coalition of producers' organisations and unions. Research efforts were directed towards that part of the assembly operation which assumes the greatest amount of time (75%) and hence induces the most labour costs: handling. This conclusion seemed all the more justified knowing that 130 years of research had been invested in perfecting sewing technologies and that sewing speeds of 10 000 stitches per minute were already possible in the late 80s.

20. The task which was chosen to research and automate was the sleeve of a man's suit. This sub-assembly step was selected because it embodied a full range of problems encountered throughout the assembly process, *i.e.* sewing inseams, folding cuffs, tacking vents and sewing outseams. It also placed strict demands on aligning the seams and adjusting sleeve sub-components in a manner that a smooth mating at the shoulder end of the sleeve is achieved.

21. The fabric handling transporting problems were solved using foam-backed, parallel moving belts, which clamp down on the entire surface of the fabric. The fabric, held by the belts, was fed to the perpendicularly positioned sewing machine mounted on a plate which was designed to rotate around the needle position. The parallel, also interlocking moving belts, opened up immediately prior to the intended stitch position. With a series of other belts, the machine could move one ply of fabric with respect to the other. Having thus been successful in computer-controlled transporting and sewing fabrics with high quality stitch results, the following step consisted of aligning the edges of the next seam.

22. This was accomplished through using a robot fitted with a vision system geared to recognise the free edges of the fabric to be joined. This having been done, the pieces were then fed through the above described sewing unit. Instead of carrying out this process step by step on different units, the entire system was built into one unit, with the clothing component moving back and forth between the vision system, robot and sewing machine.

23. Obviously the success of this project depended on its adaptability to accept other clothing sub-components of pre-cut nature. This meant that software had to be developed to guide the equipment through the same steps as if experienced sewing machine operators were on the job. The technology rested in the hands of the Singer Company, which received it from Draper Laboratory, the institution responsible for developing it for TC². It too failed to achieve the necessary commercial viability.

24. It cannot be forgotten that the essence of the sewing process is, as it was a century ago, focused on the needles' ability to flawlessly transport a thread through pre-cut pieces of fabric so as to join them in a prescribed manner into the desired type of apparel. But unlike a century ago, the speed with which needles penetrate fabrics, as well as the wide range of fabric strengths complement the ever-present danger of needles being snagged in the fabric (and damaging the fabric) when pieces are being rapidly repositioned and the threads cut. It is obviously of paramount importance to select the correct needle as it has been determined that considerable savings in avoiding machine downtimes are possible. It might also be noted that through the investment made in producing better needles, an increase in productivity of roughly 10% to 20% has been achieved over the last 20 years with respect to sewing jeans (based on interviews with needle producers).

25. Finally, the analogy to sewing pieces of fabric together to produce a garment can be found in turning yarn into garments. In the past, wool sweaters would have to be stitched together from knitted flatware. Now, a complete sweater (simple pattern) can be produced in 30 minutes, while it would take two hours if done by a manual knitting machine. However due to its high cost (roughly USD 7 per sweater), the use of such machines will be limited to the higher end of the market, there is roughly a 300% cost differential with manual knitting machine.

Inspecting, Pressing and Packaging

Technological innovations have been important in the pressing process.

26. On the downstream side of the clothing production process, technological innovations have been important in the pressing process and to some extent to operations coupled with "repairing" rejects from the inspection process. Although the finishing process (as these three steps are called) is all the more important, the higher the value of the final product is, it is the key interface between the reputation of a company out in the market and the production process. Money saved here, thus leading to lower quality output will be fed back to the company via prices and hence cut profits. Obviously, there is a trade off at this point in the process between thoroughness and speed. However, if the production process is functioning correctly then the number of rejects will be small and the production line output will not end up in a bottleneck. An indication of an increase in rejects means that certain parts of the process are not tracking, this should be picked up in the process itself, *i.e.* at a point before additional time and material costs are wasted.

27. Pressing units have been devised which are highly automated and ensure a high quality finish. As expensive as these machines are (they use inflatable bags or flexible dummies over which the garments are placed), they are proving their worth not only by speeding up the process but also by being able to rectify certain types of garment defects. While these were initially limited to installation in high income countries, in the meantime they are found particularly in those operations dealing with higher quality apparel.

Throughout the Production Process from Designing to Packaging

28. The development of CAD systems interfaced with a modern telecommunications network has made possible to de-link human capital-intensive activities from the locations where the purely labour-intensive production activities can take place, without sacrificing necessary information linkages. Thus, already some almost twenty years ago there existed Trans-Pacific links between design studios on the West Coast of the United States and manufacturing operations in Hong Kong, China. The labour-intensive core of the clothing manufacturing process that still remains in industrialised countries is now being widely tapped by the microelectronic inroads. That this process will continue and a greater migration of certain other services will likewise be induced, as noted in the Economic Report of the President of February 2004, is highly probable. Assuming other factors to be equal, such a migration will only be limited by the

availability of adequate infrastructure, in whatever continent that might be. It will be further enhanced as telecommunication links become even less expensive and the necessary software to deal with fashion issues comes on the market.

29. Aside from transportation costs, which are always a factor keeping least-cost production locations be they within or between countries from being tapped, the access to qualitatively acceptable inputs could well be a barrier restricting locational shifts particularly between continents. Since the close and often long-standing links between the textile and clothing industries are considered by some to be especially important to ensure that demanding up-market customers can be satisfied, this type of barrier may prove to be less binding for the wide range of medium priced products, where textile producers in the Newly Industrialised Countries are approaching or already have reached production standards in industrialised countries. Obviously the implications for textile producers in industrialised countries cannot be overlooked. The above mentioned competitive considerations about the availability of adequate infrastructure in telecommunications and transportation are reviewed in the Part V.

PART V. BUSINESS FACILITATION

I. Introduction

1. In preparation for the market liberalisation initiated by the WTO Agreement on Textiles and Clothing (ATC), countries involved in the textile and clothing supply chain should prioritise their policy agenda on the basis of an analysis of their competitive strengths and weaknesses.[1] The new competitive environment may be such that exporting countries will have to consider changes in production methods, specialising in specific sub-segments of the supply chain, shifting production segments towards higher value-added articles and diversifying into other industrial activities. Although the prime responsibility for adjustment falls on the firms themselves because they are better placed to evaluate how to react to evolving market signals, governments have a support role to play in establishing a coherent policy and regulatory framework that strengthens the capacity of the private sector to deal with the new competitive environment.

2. In the post-ATC period, there will be neither quantitative restrictions nor MFA-related guaranteed market access to mask the vulnerable situation of national suppliers whose international competitiveness are hampered by: inefficient domestic regulatory regimes; obsolete infrastructure in essential business services; cumbersome customs procedures; and other distorted market structures. Exporting countries will have to address their competitive vulnerability if they aspire to maintain an export-led development strategy in textiles and clothing. For net importing countries, their suppliers will be exposed to strengthened competitive pressure and retail groups will have greater liberty in sourcing products on a global basis. Hence the net importing countries also have to reassess their competitive strengths and weaknesses with a view to implementing measures that improve the overall economic environment, taking into account both their producing and consuming interests.

3. Achieving greater policy synergies among distinct policy areas that impact the competitive position of national firms is in essence the purpose of a business facilitation agenda. This Part highlights the policy and regulatory dimensions which have an impact on the cost competitiveness of national firms and it complements the policy areas already covered in the previous Parts.

4. Policy makers generally recognise the need for pursuing a business facilitation agenda in which domestic regulations and sectoral programmes are updated to keep pace with technological development and to meet the expectations of dynamic firms in their quest for growth opportunities in both domestic and foreign markets. For the purpose of this project, the scope of the business facilitation agenda includes trade-related regulatory and policy issues in: logistical dimensions in the international movement of goods; essential services that are key inputs for industrial activities, *e.g.* electricity, telecommunications and water; customs procedures or trade facilitation; standards harmonisation dimensions; and small- and medium-sized enterprise (SME) dimensions. It follows that this scope of business facilitation is much broader than the definition of trade facilitation which focuses more directly on customs-related issues.[2] Trade facilitation is hereby considered as a subset of business facilitation.

5. This Part is structured as follows. Section II highlights the overarching business environment where trade in textiles and clothing is taken place. It underscores the importance of a sound and dynamic macroeconomic environment to facilitate the process of structural adjustment and the redeployment of resources to other productive areas. Section III discusses logistical dimensions in the international movement of goods and Section IV examines customs facilitation dimensions. Section V emphasises the benefits of modern and efficient electricity and telecommunications services for underpinning the competitiveness of domestic textile and clothing firms. Section VI examines the trade implications of

standards heterogeneity in textiles and clothing and also highlights the importance of nurturing a culture of entrepreneurship to support the textile and clothing sectors where SMEs are predominant. Finally, concluding remarks are offered in the last section.

II. The Overarching Environment in Textiles and Clothing

6. The elimination of quantitative trade restrictions is occurring in an increasingly globalised world economy, where production and marketing activities depend on business decisions that reflect competitive opportunities around the world. Trade policy measures have had a major impact on production and investment decisions in textiles and clothing and on trade flows (see Part II). In particular, MFA restrictions have contributed to the international fragmentation of the supply chain by accelerating the diversification of supply to the benefits of less competitive suppliers where quota-constrained suppliers sub-contracted clothing assembly into third low-cost countries. The scheduled elimination of quantitative restrictions at the end of December 2004 marks the end of the dependency of these sectors on a derogative trade regime.

7. Trade liberalisation heightens the pressure on firms to adapt their production mix to meet ever-changing consumer requirements in terms of design, quality and prices, while implementing efficient production methods that minimise production costs. However, their adjustment may be hampered by various domestic obstacles, including: the lack of backward linkages to national high-quality fabrics; unreliable or obsolete port infrastructure, transportation systems, telecommunications and electricity networks; inefficient customs procedures; and distorted market structures.

8. The textile and clothing sectors are characterised by multiple suppliers who exert hardly any influence on market prices. In this environment, the cost of inefficiencies resulting from deficient or obsolete regulations or essential services is ultimately born by affected firms. These pressures squeeze operating margins and may in some cases make it impossible to support an export-led development strategy based on textile and clothing production.

9. Many studies have recently assessed the trade benefits of facilitation measures that include streamlined regulatory environments, deeper harmonisation of standards, and conformance to international regulations.3 Wilson, et al. (2002) have estimated the trade impact for APEC members of reductions in indicators of facilitation efforts encompassing port logistics, customs procedures, domestic regulatory environment, standards harmonisation, business mobility, e–business activity and administrative transparency. They estimated that bringing the below-average APEC members half-way to the APEC average indicators would increase intra–APEC trade by about USD 280 billion, of which half of that gain would come from the improvement of port logistics.4 This scenario analysis of improvements in facilitation-related efforts halfway to the average performance was extended beyond the APEC region in a study by Wilson, Bagai and Fink (2003). This study suggests that such improvement in port efficiency, customs environment, regulatory environment and services sector infrastructure would increase trade among 75 concerned countries by USD 377 billion, which would be equivalent to an increase of 9.7% of trade for the concerned countries. These studies imply that business facilitation measures complement trade liberalisation initiatives and improve the international competitiveness of national suppliers.

10. The recently released report by the International Trade Commission (2004) also underscores the importance of infrastructure and proximity to markets as major competitive determinants for textile and clothing suppliers. In particular, it stresses the following competitive factors: short shipping times and the frequency of maritime services; the reliability of infrastructure in telecommunications, electricity and water services; and the accessibility to high-quality fabrics. Since several exporting countries rely on imported fabrics, the accessibility to high–quality fabrics is itself influenced by the reliability and efficiency of transportation infrastructure and customs procedures.

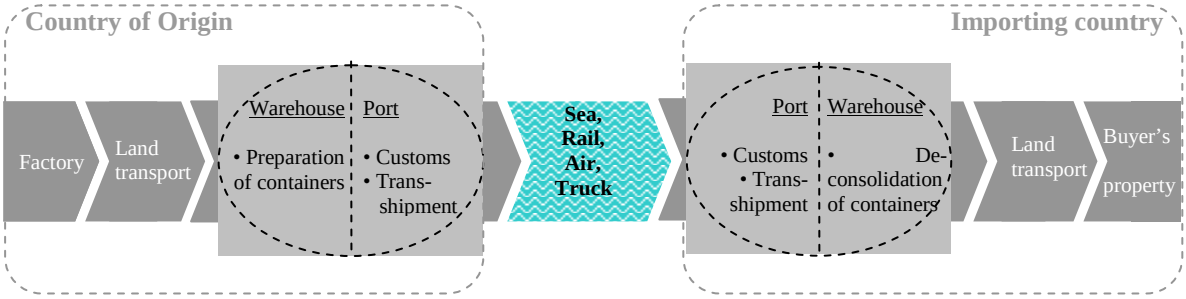
11. The overall macroeconomic environment in which market adjustment initiatives take place is probably the most influential policy area for promoting structural adjustment and it can not be ignored by policy makers. A sound and dynamic macroeconomic environment that aims at sustaining non-inflationary economic growth sets the background for low inflation and low nominal interest rates and, in turn, facilitates the financing of operating capital by firms and stimulates investment in updated equipment. Obtaining financial credits at reasonable rates is a widely shared concern among SMEs, which are prevalent in the textile and clothing industries, and it underscores the importance for government to pursue sound macroeconomic policies and to foster competitive conditions among financial institutions.

12. Moreover, as mentioned in Part III on labour adjustment policies, a sound and dynamic macroeconomic environment is the most important factor in addressing labour market pressures. Labour adjustment programmes and policies are only effective if they result in workers finding new employment. There is strong evidence to attest that real economic growth and, in turn, net employment creation is stimulated in a low-inflationary environment. The pursuit of sound macroeconomic policies fosters market adjustment to change in the competitive environment and facilitates the redeployment of affected resources to other productive sectors without having to revert to costly trade protection measures for taxpayers and consumers. Against this background, pursuing a business facilitation agenda complements other government actions at the macroeconomic and microeconomic levels, *i.e.* trade, labour adjustment and innovation, and brings benefits that go well beyond the textiles and clothing industries.

III. Logistical Dimensions in the International Movement of Goods

13. There is little information on the apportionment of world trade by mode of transport. This is partly due to the integrated nature of transportation chains, involving more than one mode to complete door-to-door shipments. A typical door-to-door journey for containerised international shipments involves the interaction of approximately 25 different stakeholders, generates 30–40 documents, uses two to three different transportation modes and is handled in 12–15 physical locations (OECD, 2003a). There is also considerable reluctance among shippers to release price and route information that might be used by competitors. To illustrate the integrated nature of transportation chains, Chart 5.1 shows a simplified representation of the transportation chain for traded goods in containers.

Chart 5.1 Transportation Chain for Traded Goods in Containers



14. Freight costs and modes of transportation for international shipments of textile and clothing products are not generally available even though international freight costs and insurance charges are included in the dutiable value of imports in several countries. However, based on detailed trade data by mode of transport for US imports of textile and clothing products in 2003 (Table 5.1), seaborne transport is found to be the dominant transportation mode accounting for 83% of total US imports, followed by rail with 12.4%, air (3.2%) and trucks (1.4%). Table 5.1 also shows the average shares of freight cost in percentage of the concerned import values for each mode of transport. It reveals that on average transportation by rail is the least expensive mode, with freight cost accounting for 0.7% of the concerned

import values; whereas it costs on average 11.1% for air freight services; 4.7% for transportation by trucks; and 4.5% by seaborne vessels.

Table 5.1 US Imports of Textiles and Clothing by Mode of Transport, 2003

	Air	Rail	Seaborne	Truck	Total
% of Imports by mode [1]					
North and Central Americas	0.1%	53.0%	41.0%	5.9%	
Other countries [2]	4.1%		95.9%		
Total	3.2%	12.4%	83.0%	1.4%	
% Freight cost / import value					
North and Central Americas	6.9%	0.7%	2.1%	4.7%	1.5%
Other countries	11.1%		4.5%		5.9%

Note 1: The mode of transportation is one by which the imported merchandise entered the U.S. port of arrival from the last foreign country. The North and Central American countries are: Canada, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Mexico.
Note 2: Shipments that were originally attributed to rail and truck for imports from countries other than North and Central Americas were reallocated on a *pro rata* basis of 20% for air and 80% for seaborne transport.
Source: Secretariat calculation based on data from the U.S. Department of Commerce, Bureau of the Census.

15. The average freight cost by mode of transport masks considerable differences at the country level, which are explained by various factors, including the distance involved, the geography, the regularity of freight services, the competitive conditions in respective transportation routes, and the composition of imported goods (standard versus fashion articles). Annex Table 5A.1 provides detailed freight costs by country of origin and by mode of transport. It shows that freight costs by seaborne vessels vary within a range of 1.7% for shipments originating from the Dominican Republic and up to 6.4% for shipments originating from Pakistan. The cost range for air shipments is considerably wider, ranging from 3.7% for the Dominican Republic; 14.5% for China; 24.8% for Pakistan; and a hefty 41% for Cambodia.

16. The US data by mode of transport highlights the importance of maritime and rail transportation for trade in textile and clothing products, which together accounted for 95.4% of total US imports in 2003. More importantly, the data underscore the importance of efficient transportation infrastructure and competitive conditions in transport modes to underpin the competitive position of textile and clothing suppliers. With low-cost railroad access to the US textile and clothing markets, Mexican and Canadian suppliers benefit from a cost advantage over Asian suppliers, whose shipments must be transported by sea or air. Strictly on the basis of freight cost differential between countries (hereby ignoring differential in transit time and customs duty), Mexican shipments transported by rail to the US market have a 5.2% cost advantage over similar imports originating from China and shipped on seaborne vessels (Annex Table 5A.1).

17. The economic literature on the impact of transportation on trade of manufactured products illustrates the tyranny of time and distance for countries that aspire to sustain an export-led strategy. Hummels (2000) estimates that each day saved in shipping time is equivalent to a reduction of 0.5% in import tariffs: lengthy shipping times impose inventory-holding and spoilage costs on shippers. Verma (2002) has estimated that Indian firms have suffered a 23% cost disadvantage in shipping containers of clothing products from Mumbai or Chennai to the east coast of the United States in 2002 relative to similar container shipments originating from Bangkok, Thailand due to delays and inefficiencies in Indian ports; and 37% cost disadvantage relative to Shanghai, China.

18. The ITC (2004) quotes shipping data obtained from US retailers that show that the shipping time to the west coast of the United States generally average: from 12 to 18 days from Chinese Taipei, Hong Kong

(China) and China; as much as 45 days from some member countries of the Association of South East Asian Nations (ASEAN); and from two to seven days (for east coast delivery) for the countries covered under the Caribbean Basin Economic Recovery Act (CBERA). The ITC argues that shipping time and the frequency of maritime services can make geographically distant locations competitive from a shipping standpoint. In the country assessment section of the ITC report concerning the competitiveness of the Philippines, it is noted that certain restrictions on domestic cabotage, *e.g.* shipments must be transported on domestic carriers, have the effect of increasing shipping costs and discouraging investors from locating projects on remote islands of the Philippines that have otherwise significant potential for export-led projects. It further noted that prevailing high cargo handling fees imposed in the Philippines and its limited containerised cargo handling capacity are contributing to slow ship turn-around time, i.e. the total time that a vessel spends at a port, from when it enters until it exits.

19. Radelet and Sachs (1998) have compared transportation costs for 97 developing countries and estimated that the costs of freight and insurance for landlocked developing countries were on average 50% higher than for coastal economies. The higher shipping costs reflect several factors, including: the higher proportion of transit by land, which tends to be more expensive than maritime transportation[5;] the extra cost of trans-shipment between inter-modal transportation media; bureaucratic costs of crossing at least one additional border; and the absence of coordinated road infrastructure and customs facilities among concerned countries.6 Their work suggests that high shipping costs can essentially eliminate more remote countries from international competition and that policy emphasis should be placed on cutting red tape in port operations and to expedite customs clearance.

20. Limão and Venables (2001) have investigated the dependence of transport costs on geography and infrastructure for over 100 countries, including both developed and developing countries, and estimated that a ten percentage point increase in transportation costs typically reduces trade volumes by approximately 20%. They have calculated that in 1995 landlocked countries on average had an import share in GDP of 11%, compared with 28% for coastal economies. They also estimated that poor infrastructure accounted for 40% of predicted transportation costs for coastal countries and up to 60% for landlocked countries. Their work shows the relative importance of infrastructure in determining transportation costs and highlights the priority that should be placed on policies in support of investment in transportation infrastructure.

21. With a view to evaluate the costs involved in the international movement of textile and clothing products, Table 5.2 compares the total logistical and dutiable costs involved in shipping textile and clothing products to the US market from various exporting countries under various trade arrangements. The total cost is the sum of: (1) the transit cost measured at the rate 0.5% of import values for each transit day (Hummels, 2000); (2) the freight cost incurred in respective transportation routes (Annex Table 5A.1); and (3) the applied customs duties which vary on the basis of the prevailing preferential trade arrangements. The last column gives an indication of the total cost advantage or disadvantage of respective countries relative to competing imports from China subject to the regular MFN duty rate.

22. For example, the total cost for a trade transaction involving one-way shipment of clothing articles originating from Mexico that qualify for duty-free entry under NAFTA amounts to 1.6% of the import value of the shipment, *i.e.* 1% for two days of transit plus 0.6% for rail freight cost. If the same clothing articles were imported directly from China on seaborne vessels, the total cost would be 24.1% (6% for transit time, plus 5.8% for freight cost, plus 12.3% for customs duty). In this case, Mexico enjoys a cost advantage of 22.5% over similar articles that would originate from China. More than half of this cost advantage is attributed to Mexico's preferential access under NAFTA, about a quarter to freight cost advantage and the other quarter to the time factor due to shorter transit period. The total cost advantage for Mexico over China would be even larger for clothing articles that are subject to higher customs duties: the maximum US duty on clothing products is 32.5% (see Table 5.5).

23. The Chinese transit period by seaborne transport is just a few days behind the transit period for countries located near the United States, such as Colombia. This underscores that the reliability of transportation infrastructure and efficiency in customs procedures complement each other in minimising total transit time and can make geographically-remote countries more competitive from a logistical point of view.

Table 5.2 Transit, Freight and Duty Cost on US Imports of Textiles and Clothing

(in % of import values)	Transit in Days [1]			Time, Freight and Duty Costs				Advantage
Country of origin	Outbound from USA	Inbound for USA	Transit Days	Time factor 0.5% / Day	Freight Cost	Customs Duty [2]	Total Cost	Relative to China
Mexico								
Two-way shipments	2	2	4	2.0%	1.2%	0.0%	3.2%	20.9%
One-way shipment		2	2	1.0%	0.6%	0.0%	1.6%	22.5%
Canada								
Two-way shipments	2	2	4	2.0%	1.8%	0.0%	3.8%	20.3%
One-way shipment		2	2	1.0%	0.9%	0.0%	1.9%	22.2%
Dominican Republic (Puerto Plata-Port Everglade)								
Two-way shipments [2]	5	5	10	5.0%	3.4%	0.0%	8.4%	15.7%
MFN shipment		5	5	2.5%	1.7%	12.3%	16.5%	7.6%
Colombia (Cartagena-Miami)								
Two-way shipments [2]	9	10	19	9.5%	3.4%	0.0%	12.9%	11.2%
MFN shipment		10	10	5.0%	1.7%	12.3%	19.0%	5.1%
China								
MFN shipment by **Sea**		12	12	6.0%	5.8%	12.3%	24.1%	-
MFN shipment by **Air**		2	2	1.0%	14.5%	12.3%	27.8%	-
Hong Kong, China (to Long Beach)								
Two-way shipments	18	12	30	15.0%	6.2%	12.3%	33.5%	*-9.4%*
MFN shipment		12	12	6.0%	3.1%	12.3%	21.4%	2.7%
South Africa (Cape Town-New York)								
Two-way shipments [2]	34	25	59	29.5%	10.0%	0.0%	39.5%	*-15.4%*
MFN shipment		25	25	12.5%	5.0%	12.3%	29.8%	*-5.7%*
Kenya (Nairobi-New York)								
Two-way shipments [2]	62	61	123	61.5%	9.8%	0.0%	71.3%	*-47.2%*
One-way shipment [3]		61	61	30.5%	4.9%	0.0%	35.4%	*-11.3%*
MFN shipment		61	61	30.5%	4.9%	12.3%	47.7%	*-23.6%*

Note 1: The outbound and inbound periods are average seaborne shipping and customs clearance periods calculated by ShipGuide.com. For Mexico and Canada, the transit periods are estimates by the Secretariat for rail shipments and customs clearance. For China, the transit period for air shipments is an estimate made by the Secretariat.
Note 2: The average US customs duty on clothing imports was 12.3% MFN in 2002, see Table 5.5. Under various OPP-type programmes, the USA grants duty-free entry on imports of clothing articles assembled abroad from components produced in the USA. Note 3: Until the end of September 2004, duty-free entry is granted on clothing imports originating from AGOA's least developed countries that are assembled from third country fabrics. In this case, the reported transit period is underestimated since no time period is factored in for the importation of fabrics from third countries.
Source: USAID (2003) for the transit data based on ShipGuide.com; OECD Secretariat calculation for freight costs based on data from the U.S. Department of Commerce, Bureau of the Census; and Hummels (2000) for the time factor per day.

24. Table 5.2 shows the total cost for trade transactions incurred on the basis of outward processing programmes (OPP) that require two-way shipments: pre-cut fabrics are shipped to offshore centres for final assembly and are re-imported on a duty-free basis in the United States as finished clothing articles. It also shows the net cost advantage or disadvantage of OPP transactions over competing imports from China subject to the regular MFN duty rate. On the basis of these comparisons, OPP transactions provide a net cost advantage of 15.7% for the Dominican Republic; 11.2% for Colombia; -15.4% for South Africa; and -47.2% for Kenya over competing Chinese imports. With distance and time acting as trade barriers, OPP transactions designed to encourage the final assembly of clothing articles from imported fabrics into low-

wage offshore centres remain economically attractive only if the margin of preferential duty exceeds the difference between the OPP-related cost and the logistical cost incurred for competitive suppliers.

25. For Dominican Republic suppliers, duty-free OPP transactions enable them to take advantage of their geographical proximity and to compete more effectively with Mexican suppliers in the US market. However, for geographically-remote suppliers, such as South Africa and Kenya, duty-free OPP transactions offer no net cost advantages. In fact, OPP transactions are the least competitive transactions of all trade possibilities. Even for Kenyan suppliers that can temporarily use third country fabrics for duty-free OPP transactions, these transactions offer no net cost advantages.[7] These results demonstrate that the cost effectiveness of OPP transactions diminishes as the transit period increases, with obvious negative consequences for suppliers that are located in geographically–remote locations. The trade policy implications of these cost comparisons in the post-ATC period are discussed in Part II.

26. Total logistical and dutiable costs would vary if other modes of transport would be used for comparison purposes. For air shipments, even if air freight cost is more expensive than seaborne freight cost (see Annex Table 5A.1), the shorter transit period would partially or completely offset the added freight cost involved and, accordingly, modify the cost competitiveness among suppliers. However, for some countries like Pakistan and Cambodia, their air freight costs are very high and air shipments may not improve their competitiveness. In the absence of more detailed data on transit period for air shipments, it is not possible to make reliable country comparisons. For China, assuming that the transit period would be two days, air shipments instead of seaborne would increase the total cost by only 3.7 percentage points (27.8% instead of 24.1%). Given this small cost differential, Chinese suppliers should be more or less indifferent as to whether they should use seaborne or air transportation modes for their exports to the United States. Hence, it is quite likely that air freight services could capture an increasing share of total trade in textiles and clothing as competitive improvements are been made within the air freight industry.

27. The above data on logistical cost incurred in the international movement of textile and clothing products underscores the importance of efficient port infrastructure, reliable and competitive modes of transport and efficient customs procedures for maintaining a competitive edge in the highly competitive, time-sensitive and fashion-oriented textile and clothing markets. Although the above discussion has focused on US textile and clothing imports because of the availability of detailed trade data by mode of transport, it is assumed that the related policy and regulatory considerations are equally relevant for other countries. The following sub-sections examine some of the policy issues in respect of promoting greater efficiency in port infrastructure and competitive conditions in maritime and rail shipping.[8] Moreover, in the aftermath of the 11 September 2001 World Trade Centre attacks, concerns about potential transportation disruption caused by terrorist attacks have become more prominent and are also discussed below. Customs-related procedures are discussed in the following section dealing with customs facilitation dimensions.

A. Greater Efficiency in Port Infrastructure

28. Given the importance of seaborne transportation for trade in textiles and clothing, efficiency (or lack thereof) in port infrastructure can have a significant effect on the international competitiveness of national firms. A variety of studies on port infrastructure point to the types of support role governments can play in promoting sound investment in port infrastructure.[9] The objectives of government policy may include, for example: (1) vesting autonomy and financial responsibility to the port authorities themselves;[10] (2) encouraging private sector participation; and (3) promoting services competition in the delivery of various port services, *e.g.* pilotage, towing, loading, handling and other ancillary services, that may operate in monopoly or near monopoly conditions within the confines of port facilities.

29. Another area of government action relates to the various administrative and inspection tasks carried out directly by customs authorities, and directly or indirectly in the enforcement of national

regulations in the fields of environment, sanitary inspection, tax collection, and security requirements. The lack of co-ordination among all service providers in ports could result in unnecessary delays in cargo movements, as measured by the ship turn-around time. The ship turn-around time is an indicator of port efficiency and should be regularly monitored by stakeholders.[11] Improved co-ordination among concerned service providers should be identified as a priority area for port authorities with the view of minimising unnecessary delays for vessels without compromising on law enforcement requirements. Current energy shortages in China referred to in Box 5.2, which are partly compounded by bottlenecks in transportation and port infrastructure, underscore the importance of efficient port infrastructure for the just-in-time manufacturing sectors.

30. The government policy agenda that nurtures greater efficiency in port infrastructure is rather broad and brings benefits that go well beyond the textile and clothing sectors. Ultimately, governments should assess their policy framework and port infrastructure with a view to strengthening the support role of government policies and regulations by: (1) encouraging sound investment in infrastructure modernisation projects by stakeholders; (2) setting up a competition-enhancing environment in various port services; and (3) better integrating the enforcement of national laws and regulations, *e.g.* customs procedures, taxation, sanitary and environment protection, with other services providers in ports.

B. Competition Conditions in Maritime Shipping

31. The advent of containerised transportation in the mid-1960s brought profound changes to the international transportation of goods. Trans-shipment of goods between transportation modes was greatly facilitated, ships became larger and more specialised, and significant investment in port infrastructure was made. Together, these developments have brought considerable productivity gains and downward pressures on transport costs. Concurrently, the globalisation of industrial activities, spurred by improved market access and declining telecommunications costs, has multiplied the trade opportunities and resulted in added demand for international transportation services.

32. Maritime transportation in 40–foot containers is the dominant transportation mode for the increasing world trade in textiles and clothing between distant assembly operations from consumption regions. For decades, concerns were raised about the competition restraining practices among shipping lines and port terminal operators. The principal organisational feature of the liner sector has been the ability of operators to enter into a variety of co–operation arrangements and agreements which in most other sectors would contravene competition laws. These organisational arrangements have traditionally taken the form of liner conferences, *e.g.* co–operation arrangements that limit capacity and set common rates. More recently, new forms of co-operation, such as consortia and strategic alliances, have emerged with the advent of containerisation and new independent operators and, as a result, have eroded the control of these conferences.

33. These organisational arrangements have elicited strong and opposite reactions between carriers and shippers. With, on one hand, carriers arguing that these practices are necessary to prevent destructive competition in maritime services. On the other hand, shippers remain unconvinced of the benefits of price-fixing and consider that these arrangements lead to abuses of power and freight rates above what they would otherwise be in a fully competitive market. Despite perennial disputes, "governments of all major trading nations have continued to provide carriers with exemptions from national anti-trust statutes governing price and capacity fixing".[12]

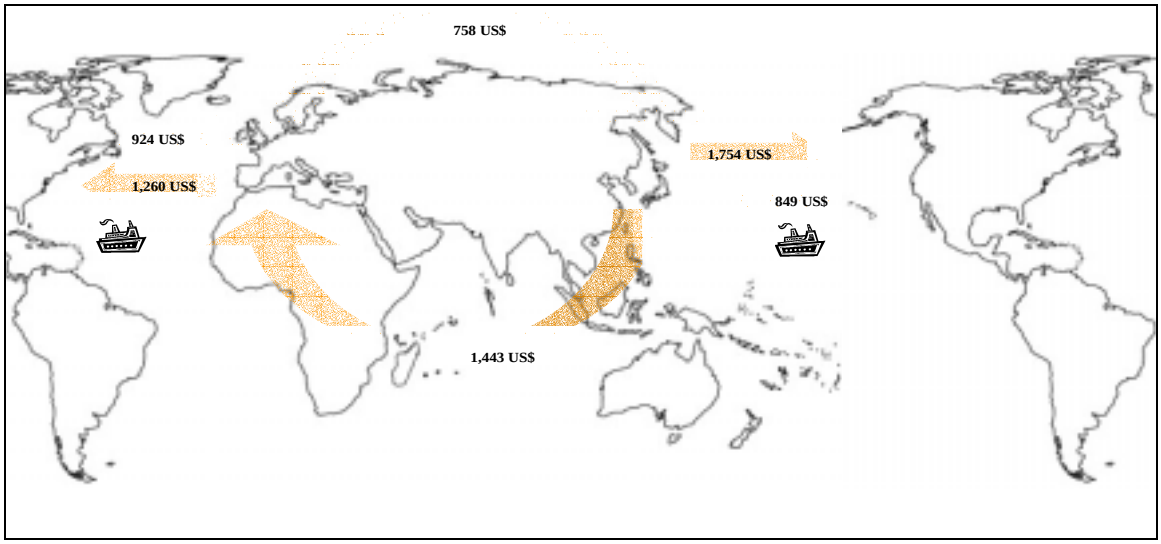
34. A recent OECD study (2002a) examined the rationale and impacts of the various co-operation arrangements and recommended that "limited anti-trust exemptions not be allowed to cover price-fixing and rate discussions". It further offered three principles that countries could use to guide future reassessments of the validity of anti-trust exemptions for price fixing, rate discussions and capacity

agreements between competitors in the liner shipping sector. The three principles are: (1) shippers and carriers should always have the option of freely negotiating rates, surcharges and other terms of carriage on an individual and confidential basis; (2) shippers and carriers should always be able to contractually protect key terms of negotiated service contracts, including information regarding rates, and this confidentiality should be given maximum protection; and (3) carriers should be able to pursue operational and/or capacity agreements with other carriers as long as these do not confer undue market power to the parties involved.

35. The average freight rates per twenty-foot equivalent unit (TEU) in 2001 for eastbound and westbound maritime shipments over the three main shipping routes, *e.g.* Asia-Europe, Asia-North America, and Europe-North America, are shown in Chart 5.2; it is assumed that they also reflect the freight rates applied to textile and clothing shipments. The striking feature of these shipping costs is that all routes display price imbalances between their eastbound and westbound directions, which lead to an oversupply of capacity in the weak trade direction in order to provide adequate service on the strong direction. These cost differences are explained by: (1) the rapid industrialisation of the Asia-Pacific region; (2) the different composition of the products transported, *e.g.* higher values of traded goods originating from Asia; and (3) different competitive conditions prevailing on shipping routes.

36. The rate imbalance on the Europe-North America route is considerably smaller than the imbalances on the two Asian routes. This is partly due to the passage of the United States Ocean Shipping and Reform Act in 1998 that granted shippers and carriers the rights to enter into confidential contracts without prior notice and thus undermined the dominance of conference tariffs. It is estimated that less than 10% of the USA-Europe traffic now takes place directly under conference terms.[13]

Chart 5.2 Freight Rates per TEU, 2001



Notes: Information sourced from six major liner companies. All rates are all-in, including the inland intermodal portion, if relevant. All rates are average rates of all commodities carried by major carriers. Rates to and from the USA refer to the average for all three coasts. Rates to and from Europe refer to the average for North and Mediterranean Europe. Rates to and from Asia refer to the whole of South East Asia, East Asia and Japan/South Korea.
Source: Containerisation International's Freight Rate Indicators.

C. Competition Conditions in Freight Shipping by Rail

37. As shown in Table 5.1, rail haulage is the second most important mode of transport for transporting imports of textile and clothing products in the United States in 2003, exceeding air freight by a considerable margin (12.4% versus 3.2%). The re-regulation of US railroad rate setting, under the Staggers Rail Act of 1980, is widely credited for the renewal of the US rail industry and the tangible benefits that it

brought to shippers between 1981 and 2002: inflation-adjusted rail rates declined by 60%; productivity increased by almost 200%; train accident declined by nearly 70%; and railroad firms have invested over USD 320 billion in their rail infrastructure (AAR, 2004). This Act has removed most barriers to commercial management of railroads but granted the Surface Transportation Board the authority to set maximum rates and to take action if it finds anti-competitive behaviour or market power abuse.

38. As US rail companies have responded to the re–regulation of railroad rate setting, productivity gains per employee between 1983 and 1992 have allowed railways to compete with trucks and barges for the first time in decades; and railways have also recaptured the movement of bulk commodities from trucks and have developed long distance trailer-on-flat car/container–on–flat car routes (OECD, 1997). Under the new regulatory framework, rail haulage in the United States has maintained its market share of total freight at about 41% during the period 1970 and 2000 (Table 5.3) – thereby keeping pace with an expansion of the total freight market of more than 90%. During the same period, the share of total freight carried by rail in the European Union fell from 20% to 8% and to 7.8% in 2001. The breakdown of freight transport by mode is shown in Table 5.4 for five regions in 2000 and reveals very high shares of total freight carried by rail in Russia and China, *e.g.* two former centrally-planning economies, and a low rail share for Japan.

Table 5.3 Rail Transport in the EU and the USA, 1970-2001

Billion tonne-kilometre	**1970**	**1980**	**1990**	**2000**	**2001**	**2000 / 1990**
European Union (15)	282	290	255	250	242	-2.0%
United States	1,117	1,342	1,510	2,140		41.7%
% of Total Freight						
European Union (15)	20.0%	14.6%	11.0%	8.0%	7.8%	
United States	41.5%	39.1%	38.2%	41.3%		

Note: US rail, Class 1 railways (approximately 90% of rail freight traffic). Total freight covers rail, road, inland water, pipeline and sea.

Source: EUROPA, Energy & Transport: Figures and Main Facts (annual), based on data from U.S. Department of Transport and Eurostat.

Table 5.4 Freight Transport in Five Regions, 2000

Billion tonne-kilometre	**EU-15**	**USA**	**Japan**	**China**	**Russia**
Rail	250	2,140	22	1,362	1,373
Road	1,378	1,667	313	597	23
Sea (domestic/intra-EU)	1,270	414	242		165
Inland waterways	125	527	-		65
Oil pipeline	85	843			1,916

Note: US rail, Class 1 railways (approximately 90% of rail freight traffic).
Source: EUROPA, Energy & Transport: Figures and Main Facts (annual), based on data from U.S. Department of Transport, Eurostat, Japan Statistics Bureau, Goskom STAT (Russia) and National Bureau of Statistics of China.

39. Within the European Union, the implementation of the single European market has required Member States to reduce state involvement and to increase the competitive power of the railway companies by: introducing commercial financial management; separating the infrastructure accounts from the operating business; and providing access to the infrastructure for third parties. Apart from payments for public service and specific funding for infrastructure provision, the railways were required to finance their operational activities without state subsidisation. Although some reforms were undertaken in Sweden, Germany and the United Kingdom, it was found that these initiatives had not increased competition in international rail services by the mid–1990s (OECD, 1997).

40. With a view to revitalise the EU railways, the European Commission has adopted the so–called first railway package of reforms in 2001 to break down national barriers and to speed up the introduction of market forces into the international rail transport.[14] In early 2002, a second railway package was unveiled that aimed at speeding up the implementation of the first package and extended the reform process to national freight services. This package provides for improved safety, greater interoperability and establishes the European Agency for Rail Safety and Interoperability. In March 2004, the European Council and Parliament reached an agreement that provides for the full market opening for international freight services by 1 January 2006 and for all freight services by 1 January 2007.

41. Campos and Cantos (1999) have assessed the railway deregulation and privatisation experiences in eight countries and concluded that the regulation of the railway sector should remain simple and flexible to protect its share of transportation markets.[15] The worldwide rail industry has experienced a deep restructuring process, varying from simple reorganisation measures to more comprehensive restructuring, involving private participation and vertical separation of infrastructure from services where the ownership of facilities is fully separated from other rail functions. They argue that the regulatory framework should be governed by principles that foster competition and market mechanisms, wherever possible. Moreover, their review shows that important increases in efficiency can be achieved without having to fully privatise the industry.

42. In the large US textile and clothing markets, national suppliers as well as Mexican and Canadian suppliers benefit from meaningful cost advantages over overseas suppliers because they can use striving rail services as their main mode of transport. This example suggests that similar rail-related cost advantages could be achieved in the large EU textile and clothing market for national suppliers and those located in land-adjacent countries. Furthermore, fostering competition and market mechanisms in domestic regulatory framework for rail in countries that are less advanced in their railroad re-regulation would likely bring tangible cost competitive advantages to their national suppliers of textile and clothing products.

D. Vulnerability in Transportation Systems

43. World trade is dependent on efficient and secured transportation systems and great strides have been made in recent years to render these systems as open and frictionless as possible in order to spur even greater economic growth. New security requirements are affecting the cost of transporting goods across borders, through both higher direct costs and longer delivery times. This openness that has allowed transportation systems to become more efficient also renders them vulnerable to terrorist attacks that could potentially disrupt or shut them down. Targeted attacks could result in port closures and significant disruption in the supply of essential materials that would have numerous indirect adverse impacts.

44. In the aftermath of the 11 September 2001 World Trade Centre attacks, the US air transportation system was shut off for several days and the US-Canada land borders were severely disrupted resulting from the tightening of security measures. The slowdown in customs clearance and border crossings had a major impact on just-in-time manufacturing sectors and led to several factory shutdowns on both sides of the border, especially in the automobile industry (Andrea and Smith, 2002). These dramatic events have led governments to reassess the vulnerability and risks of their transportation systems and to strengthen their security dispositions throughout the entire transportation system. They have implemented various new customs initiatives and strengthened border cooperation among customs administrations with the aim of bringing back close to normal border crossings.[16]

45. Under the auspices of the International Maritime Organisation (IMO) – the UN body responsible for developing the common regulatory framework for international maritime transport – new security measures were negotiated that have resulted in the adoption of the International Ship and Port Safety (ISPS) Code which enacts changes to the Convention on the Safety of Life at Sea (SOLAS) to become

effective in July 2004. Moreover, the United States has enacted the American Maritime Transportation Security Act of 2002 which mainly adopts the security-related provisions of SOLAS and the ISPS Code. This act also includes several new measures, such as the requirement for transportation security cards for port personnel; new secure seafarer identification papers; and the development of a system of foreign port security assessments.

46. The implementation of new security-related measures comes with additional costs for carriers in terms of various security assessment procedures, the training of staff and expenditures in security-related equipment. More careful background checks are required from incoming carriers, the transportation of hazardous materials is more closely regulated, insurance rates were raised and security surcharges were added. These security-related measures involve additional costs and make transit periods more unpredictable.[17] As suggested by the transit data shown in Table 5.2, small variations in transit periods of textile and clothing shipments due to delays caused by new customs security measures can modify the relative cost competitiveness among suppliers. In particular, new security measures may have a disproportional impact on small developing countries which may not be covered under recently signed border co-operation agreements between large trading partners.

47. An OECD study has estimated the initial burden imposed on ship operators to be at least USD 1 279 million and 730 million per year thereafter.[18] While the study notes the difficulties in estimating some port-related security costs, it stresses that these costs are still substantially below those that might result from a major attack. Moreover, many security-related measures bring benefits that go beyond the protection against terrorist attacks due to further progress in implementing integrated Information Technology (IT) systems. These benefits result from "reduced delays, faster processing times, better asset control, decreased payroll, fewer losses due to theft, and decreased insurance costs".[19] Furthermore, it is anticipated that these improvements have the potential to change long-established practices and can lead to shorter vessel turn-around times and accelerated customs clearing measures.

48. Even though a trade-off between security and efficiency of border crossings is unavoidable in the short term, it is likely that this trade-off can be reduced in the medium term. In implementing new security measures, governments should not lose sight of the beneficiary effects of smoothly functioning transportation systems. New security measures could be subject to risk-management analysis to ensure that they address the most critical risks. The additional costs can be minimised by furthering co-operative approach between stakeholders both in the design and the implementation phases. Efforts could be devoted at enlarging the country coverage of those border agreements recently signed between large trading partners with a view to avoiding potentially negative impact on trade flows originating from developing and least developed countries.

IV. Customs Facilitation Dimensions

49. In the post-ATC period, trade in textile and clothing products will benefit from the elimination of a series of MFA-related controls but trade will nevertheless remain vulnerable to customs-related inefficiencies given the way in which the supply chain is internationally fragmented. In the aftermath of the 11 September World Trade Centre attacks, many exporting countries have expressed concerns over the compliance cost implications resulting from the enforcement of more stringent security and safety measures. Also, there are considerable disparities among countries in the number of tariff lines that are used for classifying textile and clothing products for trade purposes under the Harmonised System of classification and some countries have more simplified tariff structure than others.

A. Streamlined Border Treatment for Textiles and Clothing

50. In the post–ATC period, trade in textile and clothing products will benefit from a streamlining of its specific border treatment. Traders will be spared from bureaucratic arrangements involved in obtaining MFA-related export permits or visa in the exporting country. These bureaucratic arrangements differ among export countries. Some exporting countries have set up highly-automated and transparent issuance process and most traders have learned to deal with them without undue costs. However, other exporting countries have less transparent procedures, *e.g.* discretionary power, and their traders stand to benefit in the post-ATC period from the elimination of these bureaucratic arrangements. The magnitude of this cost saving should be proportional to the level of bureaucratic difficulties currently encountered in obtaining MFA export permits.

51. On the import side, customs officials in formally-constrained importing countries will no longer have to review the export permits for accuracy and completeness. The latter typically involves the verification of: (1) the specific quota category number; (2) the quantity; (3) the trader signature; (4) the accuracy of the permit number; (5) the validity period of the permit; and (6) the declared merchandises to ensure that they match the shipment concerned and in particular their origin. It is only after these verifications are completed and charged against the appropriate quota (category and country) that the shipment is released from customs to the importer. Consequently, the elimination of MFA–related controls is expected to translate into: (1) fewer bureaucratic arrangements for traders; (2) faster customs clearance for concerned shipments; and (3) fewer customs verification tasks in both the formerly-concerned exporting and importing countries.

B. Inefficient Customs Procedures Undermine Export-led Strategies

52. Cumbersome and outdated customs procedures may prevail in some countries, which have nothing to do with MFA procedures, and therefore act as non-tariff barriers on their own rights. Moreover, in the aftermath of 11 September attacks, new customs security measures can cause significant customs clearance delay if these measures are not implemented promptly. Significant cost overruns and production schedule delays are incurred when shipments are held in customs warehouses due to inefficient customs procedures or lack of coordination among concerned border services providers. The internationally fragmented supply chain in textiles and clothing is particularly vulnerable to customs-related inefficiencies since this process involves the crossing of at least two borders – first when imported inputs enter the country where the final assembly is taken place and, second, when the final product is imported in the country of final consumption.

53. In particular, inefficiency in customs procedures and opaque border regulations can seriously undermine export-led strategies that rely on imported inputs for a significant share of their production. Similarly in large net-consuming regions, cumbersome import procedures adversely affect the operations of national producers and retailers that rely on imported products. Even though great strides have been made in OECD countries in modernising customs systems, through risk-management principles, industrial partnerships and advanced technology, continuing emphasis on customs modernisation is the right policy direction to underpin the competitiveness of national firms. In many developing countries, the emphasis on customs modernisation may need to be strengthened given the adverse impact on national textile and clothing firms that are caused by inefficient customs procedures. The three examples, shown in Box 5.1, illustrate this point.

Box 5.1 Adverse Impacts of Customs Delays on Textile and Clothing Production

Sri Lanka

In examining the interplay between customs procedures and e-commerce, Mann, Eckert and Knight (2000) refer to the case of one Sri Lankan clothing firm which failed to win a long-term contract due to input shipments held up in the local port. The firm obtained a performance-testing contract from a major retail chain in Europe which had to be completed within 72 hours. While the firm had successfully downloaded the specification order from electronic applications and assembled the shipment in advance of the deadline, the shipment was held up in the local port due to red tape. The missed deadline resulted in the loss of a long-term contract for clothing items of higher value-added content than previous orders filled by Sri Lankan firms.

Madagascar

The diagnostic study undertaken in 2001 for Madagascar under the Integrated Framework for Trade-Related Technical Assistance (Integrated Framework 2001) highlights the constraints imposed by the inefficient functioning of customs on the low-labour cost manufacturing activities, such as clothing. It is reported that customs clearance is the subject of considerable complaints: incoming or outgoing textile and clothing containers would take on average four to five days to clear. One major clothing exporter estimated that reducing clearance times to one day would be equivalent to a 3 to 5% cost savings.

Bangladesh Customs Reform

With more than 75% of Bangladesh total exports accounted for by clothing in 2001, Bangladesh has a strong interest in pursuing a comprehensive customs reform programme which is carried out with support by the World Bank and the World Customs Organisation. In an interim implementation review, Draper (2001) stresses some of the progress was made in modernising customs procedures and identifies some risk factors that are still challenging Bangladesh reformers. Some of his recommendations include: (1) setting up a coalition of reformers and potential beneficiaries of reforms to move the reform process forward; (2) providing training and appropriate financial incentives for professional work; (3) proceeding with additional tariff simplification programmes; and (4) pursuing the equipment modernisation and automation to further reduce the potential for discretionary interventions.

54. In a recent OECD study (2003b), customs reform in various developing countries was examined with a view to deepen the understanding of the costs and benefits of trade facilitation measures. While the study does not focus on any particular sector, it provides useful reminders for textile-dependent developing countries to pursue their customs modernisation and reform process. The study highlights the importance of correctly identifying problematic customs areas that need to be addressed as a first step – one of the common causes of failed reform is inadequate or insufficient initial analysis or diagnosis. Moreover, complexities in cross–border trade often owe less to the applicable regulatory framework than to implementation approaches that were developed over the years. A fair number of procedural burdens could thus be simplified by focusing on human resource policies in customs authorities.

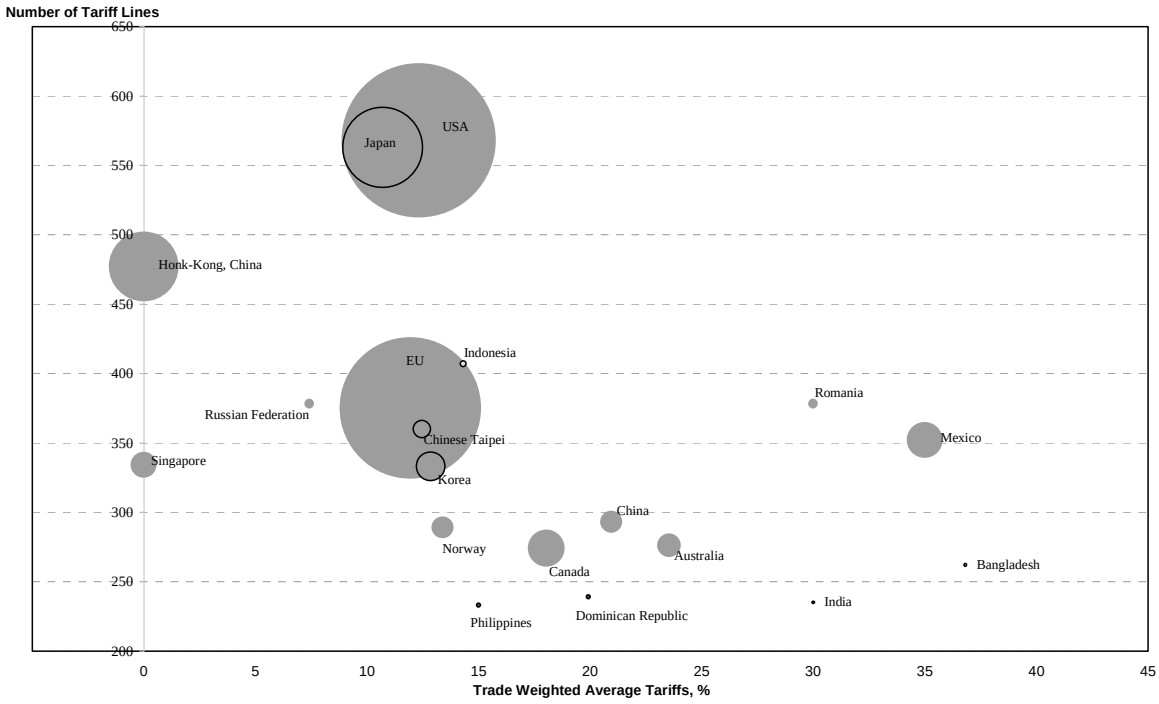
55. Operational problems may also have a number of interrelated causes that need to be addressed comprehensively in order to ensure the success and sustainability of reform programmes. Comprehensiveness and coherence are essential factors for success, although each and every reform project is subject to capacity constraints that may not favour exhaustiveness. For instance, investments in infrastructure facilities and equipment will not reduce commercial transaction costs unless operations related to foreign trade are free from unnecessary institutional or physical interference. Finally, the OECD study (2003b) acknowledges that the adoption of efficiency-enhancing measures in customs procedures brings tangible benefits for the trading communities in terms of reduction in customs clearance times and reduction in undue transaction costs.

C. Customs Tariff Simplification

56. Another dimension of customs facilitation relates to the classification of textile and clothing products for trade purposes. The Harmonised System (HS) of classification is widely applied among WTO Member countries and it offers a harmonised structure of product headings that are defined at two, four and six digit levels. The actual tariff lines are defined at eight and ten digit levels and each WTO Member has certain flexibility in specifying the content of its relevant tariff lines. Corresponding tariff rates are set up in accordance with each country's binding commitments. The result is that some countries define fewer

tariff lines than others and also set a simpler structure of tariff rates than others, which makes their tariff regime more transparent and relatively easier to administer. Moreover, the multiplicity of tariff lines with different tariff rates makes the system prone to incorrect or fraudulent customs declarations by traders and also provides more opportunities for discretionary interpretations by customs officials in countries where integrity concerns prevail.

Chart 5.3 Average Applied Tariffs and Number of Tariff Lines for Clothing Products



Notes: Trade weighted average tariffs for the most recent year available. Country circles are proportional to the corresponding country's share of world clothing imports. To present this graph within reasonable proportions, it has not been possible to include the country circles for Turkey and Thailand.
Source: World integrated Trade Solution, WITS.

57. Tables 5.5 and 5.6 compare the structure of tariff lines and their applied tariff rates for the most recent year available for several economies for clothing and textile products respectively. The economies are ranked in increasing order of their tariff rate dispersion as measured by the standard deviation. For clothing products (Table 5.5 and Chart 5.3), considerable disparity exists in the number of tariff lines, with 990 tariff lines for Turkey and only 233 for the Philippines to cover the same HS 61 and 62 headings. For textile products (Table 5.6 and Chart 5.4), the number of tariff lines is considerably larger than for clothing products, hovering between 613 for Singapore and 2,834 for Morocco. The standard deviation indicators are generally higher on textiles than on clothing products for most economies, with the exception of the Russian Federation, the United States, Thailand and Australia. This suggests higher prevalence of tariff peaks on textiles rather than on clothing products. Part II discusses the issues of tariff escalation and peaks.

Table 5.5 Structure of Customs Tariffs on Clothing Products

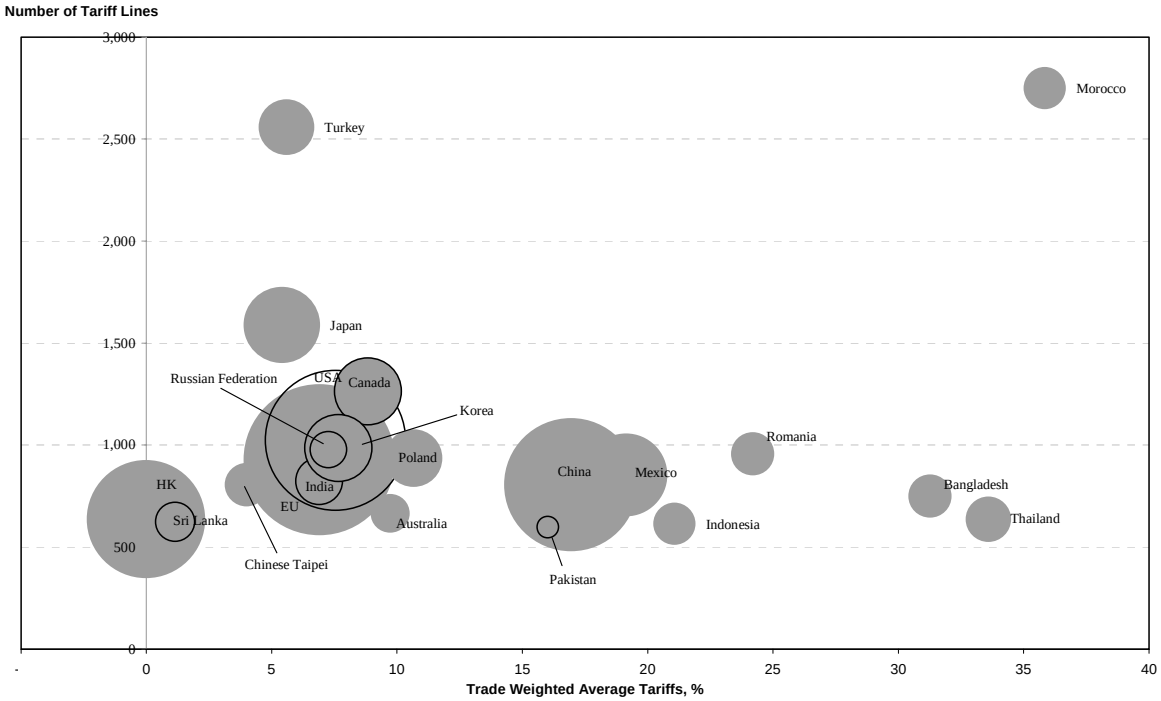
ECONOMY	CLOTHING (HS 61-62)				
	Latest year available	Average tariff	Maximum tariff	Number of tariff lines	Standard deviation
Philippines	2002	15.0	15.0	233	0.0
Singapore	2002	0.0	0.0	235	0.0
Pakistan	2002	25.0	25.0	243	0.0
Mexico	2002	35.0	35.0	353	0.0
Poland	2002	18.0	18.0	375	0.0
Romania	2001	30.0	30.0	375	0.0
Republic of Korea	2002	12.9	13.0	333	1.0
Turkey	2001	11.9	12.6	990	1.3
European Union	2002	12.0	12.4	471	1.4
Dominican Republic	2002	19.9	20.0	238	1.6
China	2001	23.5	25.0	292	1.7
Japan	2002	10.8	14.2	563	2.0
Indonesia	2002	14.3	15.0	407	2.3
Morocco	2002	49.8	50.0	561	2.4
Chinese Taipei	2002	12.6	19.0	360	2.6
Norway	2002	13.4	16.0	289	3.3
Canada	2002	18.0	20.0	272	4.6
Russian Federation	2002	7.5	20.0	392	5.6
Bangladesh	2002	36.9	37.5	260	6.4
United States	2002	12.3	32.5	568	7.9
Australia	2002	23.6	25.0	278	8.7
Thailand	2001	38.3	60.0	305	12.0
Switzerland	2002	-	-	329	-

Note: Weighted average applied tariffs for the most recent year available. Since Switzerland applies specific duties as opposed to *ad valorem* tariffs, there is no average tariffs mentioned for this country. Norway also applies a fair number of specific *ad valorem* tariffs, its average tariffs should be interpreted with caution.
Source: World Integrated Trade Solution, WITS.

58. There are no direct relationships between the number of tariff lines and the degree of protection afforded. For example, the Philippines has about the same number of tariff lines as Singapore but while the former applied an uniform 15% tariff rate on all clothing tariff lines in 2002, Singapore granted duty-free entry on all lines. Leaving aside the economic aspects of tariff rates, the tariff regime of the Philippines and Singapore are relatively easy to administer from a strict trade facilitation point of view given their flat rate structure and small number of tariff lines.

59. For several developing countries undertaking customs reforms without the financial resources to invest in paperless customs systems, simplicity in tariff definitions combined with a simplified tariff rate structure often represents a cost effective approach to protect government revenue sources and to address fraudulent and integrity concerns. In most advanced countries where IT customs services are effectively enforced, more complex tariff structure can be managed without compromising transparency and high compliance standards. Nevertheless, more complex tariff structures offer a greater possibility for deliberate or accidental tariff misclassification.

Chart 5.4 Average Applied Tariffs and Number of Tariff Lines for Textile Products



Notes: Trade weighted average tariffs for the most recent year available. Country circles are proportional to the corresponding country's share of world textile imports.
Source: World Integrated Trade Solution, WITS.

60. A large number of tariff lines grants more flexibility to calibrate the level of protection with the level of trade sensitivity of concerned products. A large number of tariff lines may also reflect a statistical objective to gather detailed trade data on imported products. For example, a given article may be specified under several tariff lines according to the fabric composition of the article, *e.g.* a given article made of cotton, rayon or polyester would be specified under three distinct tariff lines. This multiplicity of tariff lines for statistical objective is acknowledged by Japan and the United States. Reconciling customs simplification with either calibration flexibility or statistical objectives is not necessarily contradictory to the extent that the concerned countries apply high transparency and integrity standards throughout their customs procedures. In the context of the Doha Round of multilateral trade negotiations, WTO Members have an opportunity to work toward achieving greater tariff simplification and eventual reductions in tariff rates.

Table 5.6 Structure of Customs Tariffs on Textile

ECONOMY	TEXTILE (HS 50-60, 63)				
	Latest year available	Average tariff	Maximum tariff	Number of tariff lines	Standard deviation
Singapore	2002	0.0	0.0	613	0.0
Switzerland	2002	-	-	800	-
Japan	2002	5.1	15.8	1,587	2.8
European Union	2002	6.9	12.4	1,251	2.8
Turkey	2001	5.6	12.6	2,557	2.9
Indonesia	2002	6.8	15.0	822	3.9
Republic of Korea	2002	7.9	52.9	985	4.0
Philippines	2002	6.0	15.0	607	4.0
Chinese Taipei	2002	4.2	19.0	806	4.6
Russian Federation	2002	7.6	20.0	952	4.9
Poland	2002	10.6	38.0	936	5.0
United States	2002	7.6	27.2	1,026	5.2
Thailand	2001	12.4	30.0	1,496	5.9
Mexico	2002	19.9	35.0	856	6.1
Norway	2002	7.3	16.0	698	6.2
Australia	2002	9.8	25.0	687	6.4
Canada	2002	9.1	19.0	1,155	6.9
China	2001	20.1	90.0	775	7.5
Dominican Republic	2002	5.7	38.0	639	7.8
Sri Lanka	2001	1.1	25.0	624	8.0
Pakistan	2002	13.5	25.0	670	8.1
Romania	2001	22.8	76.0	917	8.3
Morocco	2002	35.9	50.0	2,834	10.2
Bangladesh	2002	28.4	37.5	680	12.8

Products

Note: Weighted average applied tariffs for the most recent year available. Since Switzerland applies specific duties as opposed to *ad valorem* tariffs, there is no average tariffs mentioned for this country. Norway also applies a fair number of specific *ad valorem* tariffs, its average tariffs should be interpreted with caution.
Source: World Integrated Trade Solution, WITS.

V. Essential Business Services

61. Among the important inputs required in the production of textile and clothing products, after raw materials and labour, are electricity, telecommunications and water services. Modern and reliable electricity services play a crucial role in the increasingly capital–intensive textile fabrication process. Specialised equipment is required for the weaving, knitting, washing, dying and finishing of textiles, and each fabrication stage relies on electricity as the main energy source. Since each process uses different energy-intensive equipment, it is difficult to quantify the share of total production costs accounted for by electricity.

62. In the same vein, modern and reliable telecommunications services play a crucial role for effectively managing internationally fragmented clothing operations on a just-in-time basis. They reduce the occurrence of errors in specifications and also facilitate business-to-business (B2B) contacts. Hence, without reliable telecommunications, the risks of production errors and delays are multiplied and hamper the process of production fragmentation on the basis of comparative advantages. Based on a business survey of major textile and clothing producers in Hong Kong (China), the quality of the telecommunications infrastructure was identified as one of the most important investment factors: more important than policies affecting trade and investment, labour costs, and education and training of workers (Spinanger, 2001). The authors Fink, Matteo and Neagu (2002) have assessed the impacts of communication costs on international trade and found that international variations in communication costs

have a significant influence on trade patterns. In particular, their work reveals that the impact of communication costs on trade in differentiated products is larger than in homogenous products, by as much as one-third. They estimated the elasticity of trade flows in clothing products with respect to bilateral calling price to be -1.112, which means that an increase of 1% in the cost of bilateral communication calls would lead to a drop in trade flows of 1.112%.[20]

63. The ITC report (2004) underscores that telecommunications infrastructure has become very important for US clothing firms and retailers in communicating with suppliers in order to reduce lead production time and to exercise effective control over all elements of the supply chain. The ITC report also stresses the importance of access to reliable sources of electricity for all the segments of the industry and reliable supplies of water. In respect of water, certain production segments of the textile supply chain, such as washing, dyeing, finishing of fabrics yarns and denim jeans require reliable supplies of clean water. Economic instruments, such as the use of water meter, the pollution pay principle, water tariffs set on a cost-recovery basis, and fines and compensation for damage to water bodies, can be useful for countries to improve the efficiency of their water management policies. For countries which are poorly endowed with domestic sources of soft water, such as small islands and hot climate countries, care should be exercised in respect of water-intensive production processes and water conservation programmes should be actively promoted.

64. High telecommunications and electricity costs due to outdated regulatory framework act as taxes on textile and clothing firms and, more importantly, undermine their capacity to focus production on the higher value-added segments of the supply chain that are critically dependent on reliable equipment to ensure quick market responses. Considerable cost overruns occur when production and shipment deliveries are delayed due to inefficiencies in information transmission systems. Moreover, Mann, Eckert and Knight (2000) argue that where production, distribution and delivery are not coordinated, the private sector loses the incentive to innovate and invest in new technology. These authors suggest that policy makers must adjust to a more networked global economy and as a result adapt national regulatory framework to rapidly changing technology to ensure that stakeholders are well positioned to reap the market opportunities offered by innovative telecommunications equipment and services.

A. Business Telephone Charges

65. There are considerable disparities in business telephone charges among OECD countries. Some of the leading textile and clothing producing OECD countries are relatively less well off than others, *e.g.* Mexico, Czech Republic, Poland, Hungary and Turkey. In 2000, these countries' average business phone charges exceeded by at least 50% the OECD average charges (Table 5.7). The regulatory framework of the telecommunications industry changed radically during the past decade in almost all OECD countries. As technological innovation made competition increasingly possible in the long-distance and international telephony markets, policy makers sought to liberalise the access of new entrants.

66. In developing countries, no reliable data are available to compare the cost advantage (disadvantage) among them and relative to OECD countries. Anecdotal information suggests that international business telephone charges and Internet services are relatively more expensive in developing countries than in developed countries, with few exceptions, *e.g.* Hong Kong (China) and Singapore, where modern infrastructure is operational.

67. Within OECD countries, new independent regulatory agencies were established with a mandate to open markets to competition, prevent incumbents from abusing their position and avoid collusion between operators. As a result, competition has intensified and consumers have benefited from greater choice, lower prices and higher quality services. However, the intensity of competition has not been the same among all telecommunications services and some countries have opened up their markets sooner than others. In the

new markets of mobile telephony and Internet dial-up access (low–speed) services, the absence of pre–established market positions has facilitated competition (OECD, 2003c).

68. In the aftermath of the telecommunications bubble, telecommunications firms have encountered severe financial difficulties and undertook restructuring programmes to cut costs and strengthen their balance sheets. In this context of consolidation and painful restructuring, governments and regulators should resist the temptation to ease competition requirements. In the post–ATC period, the international competitiveness of textile and clothing firms will be enhanced in countries that maintain a competitive environment, spurring new investment in innovative telecommunications equipment and services, and providing lower cost opportunities for consumers.

Table 5.7 Business Telephone Charges in OECD Countries

OECD	Fixed	Usage	Total	% of OECD average
	US Dollars (using PPPs)			
Australia	237.1	1192.0	1429.1	102.5%
Austria	228.7	949.5	1178.2	84.5%
Belgium	178.4	1298.3	1476.8	106.0%
Canada	415.7	329.8	745.5	53.5%
Czech Republic	179.7	2828.6	3008.3	215.9%
Denmark	139.1	565.6	704.8	50.6%
Finland	128.4	736.3	864.7	62.0%
France	184.5	891.6	1076.1	77.2%
Germany	135.7	1041.3	1177.0	84.5%
Greece	116.3	1300.5	1416.8	101.7%
Hungary	357.6	2100.1	2457.7	176.4%
Iceland	119.8	349.4	469.2	33.7%
Ireland	190.2	945.6	1135.8	81.5%
Italy	205.2	1238.3	1443.4	103.6%
Japan	399.8	1166.1	1565.9	112.4%
Korea	45.7	1473.5	1519.3	109.0%
Luxembourg	152.7	639.1	791.8	56.8%
Mexico	449.2	2728.8	3178.0	228.0%
Netherlands	172.6	679.3	851.9	61.1%
New Zealand	437.2	894.4	1331.6	95.6%
Norway	151.7	526.4	678.1	48.7%
Poland	172.0	2459.0	2630.9	188.8%
Portugal	206.7	1355.3	1562.0	112.1%
Spain	160.6	1426.9	1587.4	113.9%
Sweden	151.7	570.2	721.9	51.8%
Switzerland	166.0	835.5	1001.6	71.9%
Turkey	71.6	2057.0	2128.6	152.7%
United Kingdom	247.1	820.0	1067.1	76.6%
United States	298.8	916.1	1214.9	87.2%
OECD average	210.3	1183.3	1393.6	100.0%

Note: Annual composite charges measured in August 2000, excluding VAT.
Source: OECD and Telïgen.

B. Industrial Electricity Prices

69. There are disparities in industrial electricity prices among OECD countries (Table 5.8), as measured in US dollars (computed on purchasing power parity exchange rate basis) for kilowatt per hour

(kWh). Some of the leading textile and clothing producers have relatively high electricity costs which hamper the competitiveness of their firms. Some of the highest industrial electricity prices are found in Turkey, Slovak Republic, Hungary, Italy, Czech Republic, Portugal and Korea, where average electricity prices are at more than twice the OECD average. At the other end, the Nordic countries, Canada and the United States enjoy lower than average OECD electricity prices. Table 5.8 also shows nominal electricity prices for some non-OECD countries but they are not computed on a PPP basis, hence are not strictly comparable with quoted OECD countries' prices. Within these countries, there are also considerable disparities in industrial electricity prices. For example, Indian electricity prices exceeded by a factor of more than four prevailing prices in South Africa and a factor of two those in Indonesia. Moreover, the electricity prices mentioned for some countries are no longer relevant, particularly for China which now has recurrent power shortages and blackouts. Box 5.2 illustrates the importance of reliable electricity systems to foster the competitiveness of national textile and clothing suppliers in several developing countries.

Box 5.2 Adverse Impacts of High Electricity Costs and Unreliable Electricity Systems on Textile and Clothing Production in Several Developing Countries

Bangladesh

The limited attractiveness of Bangladesh for foreign investors is partly attributed to its underdeveloped electricity system, *e.g.* the national electrification rate of 30%, and the inadequacy of its port facilities (ITC, 2004).

China

China's stellar economic growth has outpaced the growth of electricity supply and cumulated in power shortages in 2003. Blackout measures were imposed to limit electricity consumption in many regions, especially in east and south China. The State Electricity Regulatory Commission predicts a shortfall of more than 20 million kilowatts in 2004: electricity demand rose by 15% in 2003 and is forecast to rise by 12% to 2 100 billion megawatts in 2004. China's power shortage is not expected to be fundamentally altered until 2006 as new generation capacity is installed and distribution system improved. The power shortage is further exacerbated by bottlenecks in transportation infrastructure which are delaying the distribution of imported coal and oil feeds. Power shortages are forcing plants to halve production temporarily in several regions and are pushing upward pressures on energy and transportation costs. Although it is considered too earlier to evaluate the inflation risks on the cost competitiveness of Chinese exporters, the emergence of infrastructure bottlenecks is raising questions about the reliability of Chinese suppliers in meeting tight delivery requirements in the just-in-time manufacturing sectors.

The Dominican Republic

The relative scarcity of low-cost electricity and clean water in the Dominican Republic makes this country less attractive as an investment location in the post–ATC period for energy-intensive and water-intensive production processes, such as for the spinning of yarns, and the weaving and finishing of fabrics (USAID, 2003).

India

High industrial energy prices in India due to cross-subsidisation between different Indian States and huge transmission and distribution losses are considered a major obstacle to improve the competitiveness of the Indian textile and clothing sectors (Verma, 2002).

The Philippines

Due to high electricity costs in the Philippines, energy-intensive textile production, such as woven fabrics used in the production of most shirts and blouses, is too expensive to be manufactured domestically and must be imported (ITC, 2004).

Table 5.8 Industrial Electricity Charges in OECD and Non-OECD Countries

OECD	US Dollars/kWh (using PPPs)				% of OECD average		
	1990	1995	2000	2002	1990	1995	2000
Australia	0.042	0.048	0.044	0.048	67.7%	78.7%	97.8%
Austria	0.053	0.06	0.046		85.5%	98.4%	102.2%
Belgium	0.059	0.061	0.057		95.2%	100.0%	126.7%
Canada	0.032	0.042			51.6%	66.7%	
Czech Republic	0.101	0.149	0.119	0.113	162.9%	244.3%	264.4%
Denmark	0.041	0.046	0.056	0.065	66.1%	75.4%	124.4%
Finland	0.038	0.045	0.042	0.048	61.3%	73.8%	93.3%
France	0.046	0.048	0.041	0.042	74.2%	78.7%	91.1%
Germany	0.071	0.071	0.047	0.051	114.5%	116.4%	104.4%
Greece	0.073	0.071	0.064	0.065	117.7%	116.4%	142.2%
Hungary	0.18	0.093	0.13	0.132	290.3%	152.5%	288.9%
Ireland	0.059	0.064	0.055	0.078	95.2%	104.9%	122.2%
Italy	0.082	0.097	0.12		132.3%	159.0%	266.7%
Japan	0.091	0.103	0.1		146.8%	168.9%	178.6%
Korea	0.088	0.078	0.096	0.101	141.9%	127.9%	213.3%
Mexico	0.074	0.059	0.078	0.078	119.4%	96.7%	173.3%
Netherlands	0.044	0.059	0.067	0.072	71.0%	96.7%	148.9%
New Zealand	0.036	0.04	0.046	0.049	58.1%	65.6%	102.2%
Norway	0.023			0.033	37.1%		
Poland	0.08	0.084	0.086	0.105	129.0%	137.7%	191.1%
Portugal	0.135	0.148	0.108	0.104	217.7%	242.6%	240.0%
Slovak Republic		0.122	0.131	0.138	0.0%	200.0%	291.1%
Spain	0.091	0.077	0.061	0.061	146.8%	126.2%	135.6%
Sweden	0.032	0.029			51.6%	47.5%	
Switzerland	0.056	0.074	0.061	0.059	90.3%	121.3%	135.6%
Turkey	0.144	0.156	0.168	0.215	232.3%	255.7%	373.3%
United Kingdom	0.066	0.066	0.057	0.053	106.5%	108.2%	126.7%
United States	0.048	0.047	0.04	0.049	77.4%	77.0%	88.9%
OECD Europe	0.067	0.07	0.064		108.1%	114.8%	142.2%
OECD Total	0.062	0.061	0.045		100.0%	100.0%	100.0%

Non-OECD	US Dollars/kWh (nominal)			
	1990	1995	2000	2002
Brazil	0.093	0.057		
China	0.025	0.028		
Chinese Taipei	0.077	0.076	0.061	0.053
India		0.068	0.080	
Indonesia	0.049	0.066	0.040	
Kazakhstan		0.021	0.013	0.014
Romania		0.040	0.044	0.053
Russia		0.000	0.000	0.024
South Africa	0.028	0.029	0.017	0.012
Thailand	0.061	0.066	0.057	
Venezuela	0.019	0.054	0.055	

Notes: Data in 1995 for Canada, data in 2000 for Japan and Venezuela, data in 2002 for Germany, Korea, Mexico, Netherlands, Norway, Spain and Kazakhstan refer to the previous year. Data in 1995 for Kazakhstan refer to the next year. Price for Australia and the United States excludes tax.

Source: International Energy Agency (2003), Energy Prices & Taxes, Quarterly Statistics.

70. Electricity cost is one of many factors that influence production costs and international competitiveness but its relative importance should not be underestimated for certain production segments that are more energy-intensive. In the post-ATC period, the international competitiveness of textile and clothing firms will be enhanced in countries that have reliable systems and are maintaining a competitive environment in electricity generation and distribution systems.

VI. Other Dimensions

A. Standards Heterogeneity and Labelling

71. With the advent of new fabrics and public awareness for integrating sustainable development throughout the life cycle of textile and clothing products, producers and consumers are confronted with various standards and labelling schemes. There is an increased awareness of the need to protect consumer health from potentially harmful substances in fabrics, *e.g.* allergenic, carcinogenic or poisonous, and to protect the environment from potentially harmful effects in terms of air pollution, the generation of waste and the contamination of water and soil.

72. The textile production process is fairly intensive in chemical uses and subject to various safety regulations. Starting with natural fibres, some crops, like cotton, are sprayed with different types of pesticides as they are highly pest prone. The spinning of man–made fibres requires many additives to provide the desirable fibre properties, such as fire retardant, hydrophilic or antistatic. The highest incidence of textile contamination occurs in the dying and finishing processes where traces of heavy metal are likely to be present in certain dyestuffs, as well as chlorinated products and stain removers. In the clothing assembly process, the use of stain removers containing chlorinated products and some sprayed products containing chloro–fluorocarbon and fluorides are subject to various safety regulations.

73. Compliance with different standards and regulations for like products in different countries can present firms wishing to engage in international trade with significant and sometimes prohibitive costs. For textile manufacturers, differentiated national standards may entail engineering costs and the purchase of specialised equipment or chemicals that are only required to satisfy a limited number of foreign customers. Higher manufacturing costs result from the loss of economies of scale when smaller production runs are necessary to meet different national standards. Responses to changing consumer demand can also be delayed. SMEs are usually more vulnerable than larger enterprises to regulatory heterogeneity as they are the least able to afford the investment in costly equipment and chemical treatment.

74. Extra costs incurred in complying with different regulatory regimes are ultimately born by consumers. To some extent, consumers are willing to pay for qualitative features and more environmentally-friendly products but they could save if production inefficiencies resulting from the absence of regulatory harmonisation were minimised. Consumers also need to be protected from voluntary labelling schemes that do not confer real and verifiable qualitative or ecological advantages.

75. In the post-ATC period, some countries are concerned that constraining standards-related regulations may be developed as a means to shield domestic production from foreign competition. Eco-labelling schemes and standards-related regulations may be captured by domestic vested interests, *e.g.* retailers and producers, to promote their products, thereby adding to regulatory heterogeneity and making trade more difficult. The validity of these concerns should be weighted against the multilateral and regional frameworks put in place to contribute to the avoidance of unnecessary obstacles to trade in the preparation, adoption and application of standards-related systems.

76. The process of preparation, adoption and application of standards-related systems in textiles and clothing are covered by the WTO Agreement on Technical Barriers to Trade (TBT). This Agreement

provides for the application of WTO principles, such as transparency and national treatment, and it encourages the use of internationally–recognised standards and systems. The WTO Committee on Technical Barriers to Trade is overseeing the application of the Agreement and regularly prepares a review of the operation and implementation of the Agreement. The third triennial review was recently completed in November 2003 and highlighted a number of generic trade concerns (not necessarily related to textiles and clothing) concerning the lack of transparency for certain labelling requirements involving procedural problems, *e.g.* failures to notify, short periods for comments and inadequate handling of comments (WTO, 2003).[21] With regard to the Code of Good Practice for the Preparation, Adoption and Application of Standards (the Code), the Committee also noted that in some cases, concerning voluntary labelling requirements, the related standards were developed by bodies that are not commonly considered as standardising bodies and which have not accepted the Code (WTO, 2003).[22] These comments underscore the continuing trade sensitivity among WTO Members about standards developed in respect of voluntary labelling requirements.

77. Concurrently, harmonisation and/or mutual recognition provisions are been pursued within the framework of regional groupings, such as the European Union, the North American Free Trade Agreement (NAFTA) and the Asian-Pacific Economic Cooperation (APEC), and they also contribute to the process of minimising regulatory heterogeneity and the incidence of standards-related trade conflicts within their respective region.

78. Hence, standards heterogeneity in textile and clothing products may contribute to regulatory inefficiencies and trade restrictiveness. But standards adopted in a manner consistent with international obligations may reduce such inefficiencies and restrictions. The issue for policy makers is then to promote the widest participation of stakeholders in the preparation, adoption and application of standards-related regulations, to ensure the transparency of the whole process and to promote various internationally-recognised standards and systems. In the segmented clothing markets where private labelling schemes are promoted to confer qualitative or ecological advantages, vigilance is required by policy makers to ensure that the related standards are developed in conformity with the WTO Code and that consumers are protected from unverifiable labelling claims.

79. The importance of involving the participation of developing countries in the preparation of standards was highlighted in the UNCTAD (1996) report dealing with eco–labelling requirements in textiles and clothing. With a growing world share of textile and clothing production taking place in developing countries,[23] co-operation between standards setting bodies in developed and developing countries is necessary. Technical assistance to developing countries can be helpful to improve the awareness of the WTO TBT Agreement in these countries and to build their technical capacity.

B. SME–Related Dimensions

80. In recognition of the economic role of SMEs, most governments implement a range of programmes aimed at alleviating the difficulties that SMEs experience in diverse areas, *e.g.* financing, technology and innovation, e-commerce, management and export promotion, and seek to identify and implement best practices. In SME-related policies, the OECD has a broad mandate to contribute to the implementation of the Bologna Charter on SME Policies (adopted in June 2000) by further deepening analysis of some of the main issues included in the Charter, *e.g.* globalisation, innovation, clusters and partnerships, e-business, partnerships for development, entrepreneurship, etc. In the framework of the Bologna Process, a second OECD Ministerial Conference on SMEs is scheduled in Istanbul on 4-5 June 2004 under the theme "Promoting Entrepreneurship and Innovative SMEs in a Global Economy".[24] The SME policy agenda is broad and horizontal in nature with application across sectors, including the textile and clothing sectors. This report does not intend to review all SME-related dimensions that could have a bearing on textiles and clothing.

Instead, it focuses on entrepreneurship dimensions which are relevant to the textile and clothing industries given the predominance of SMEs (Table 5.9).

81. The commercial viability (failure) of SMEs in the textile and clothing industries depends to a large extent on the entrepreneurial skills of thousands of individuals who strive daily in a highly competitive environment. Particularly within the clothing industry, competition is perhaps the closest to the perfect competition assumption of the economic theory and most firms have no or little influence on selling prices. A vibrant entrepreneurship culture supported by a dynamic entrepreneurial business environment is thus increasingly considered as a crucial factor for economic growth and international competitiveness in a global economy.

82. Relative to other industrial processes, barriers to entry (and exit) in the clothing industry are low; as a result, the industry is characterised by a large number of producers with typically a very large number of SMEs that concentrate production on just a few product categories. The industry also includes multi-division enterprises producing a wide range of products – often high-volume. Table 5.9 shows that 80% of clothing establishments in the United Stated and 95% in the European Union employ less than 49 employees. Nevertheless, the larger establishments employing more than 250 employees account for 37.5% of total clothing employment in the United States and 19.2% in the European Union. Within the textile industry, although industrial processes are more capital-intensive than in the clothing industry, the shares of establishments by employment size broadly replicate the prevailing establishment composition in the clothing industry.

Table 5.9 Establishments by Employment Size in the USA and the EU

Establishments	Textiles			Clothing		
	Number of	Share of total		Number of	Share of total	
	Establish.	Establish.	Employment	Establish.	Establish.	Employment
United States (1997)						
1-9 empl.	6,917	54.9%		7,896	46.5%	
10-49 empl.	3,235	25.7%		5,933	34.9%	
50-249 empl.	1,812	14.4%		2,618	15.4%	
250-2499 empl.	629	5.0%	49.7%	542	3.2%	36.3%
2500 or more	3	0.024%		3	0.018%	1.2%
Total	12,593		627,340	16,989		710,796
European Union (2000)						
1-9 empl.	48,262	66.5%	13.3%	84,738	78.7%	20.9%
10-49 empl.	15,079	20.8%	26.7%	18,765	17.4%	35.4%
50-249 empl.	6,103	8.4%	33.1%	2,942	2.7%	24.2%
250 or more	3,082	4.2%	26.9%	1,162	1.1%	19.2%
Total	72,575		1,044,756	107,663		1,022,304

Notes: Due to rounding, the percentages do not necessarily add up to 100%.
Source: US data: U.S. Census Bureau, 1997 Economic Census, June 2001; and EU data: EUROSTAT, EURATEX calculations.

83. While it is commonly agreed that entrepreneurship is a driving force behind SMEs, there is no universally accepted definition of entrepreneurship. It appears that entrepreneurs have some common characteristics, whether they are prompted to become entrepreneurs out of necessity (to escape a state of unemployment) or as a result of an observed opportunity. In the fashion-oriented clothing markets, multiple skills are required from entrepreneurs, combining creativity, management and commercial flair. In the growing specialised textile applications, entrepreneurs also need science-based knowledge to succeed.

84. Although it is important to nurture SME-related entrepreneurship, it must be recognised that the danger of over-shooting by granting excessive fiscal advantages and labour law exemptions which may ultimately discourage entrepreneurs from investing in optimal production scale plants and creating strong vested interests opposes reforms. In India, the textile and clothing industries are based on a system of decentralised production, referred to as "reservation of garment manufacture for small-scale industry (SSI)" that provides a series of economic advantages to small scale labour intensive firms. As a result, these domestic measures have fragmented the Indian textile and clothing industries which have neither attained optimal economies of scale, nor have they produced quality clothing products (Verma, 2002). In the same vein, Kathuria and Bhardwaj (1998) have argued that India faces formidable domestic hurdles to meet international standards and competition due to the government SSI policy and other inefficiencies in domestic infrastructure. The ITC report (2004) also argues that India's SSI policy has prevented Indian firms from achieving economies of scale and investing in new state-of-the art technology.

85. To cultivate an entrepreneurial culture and to foster entrepreneurship values and spirit with a view to building an entrepreneurial society, most governments have set up SME–related entrepreneurship agendas to facilitate the emergence of a larger pool of entrepreneurs. Education and training have been recognised in this context as the single most effective means for achieving the objective of fostering entrepreneurship in societies (OECD, 2003d). Education and training in entrepreneurship can have two types of effects. First, it can have considerable impact on the performance of entrepreneurs, especially, as it concerns helping entrepreneurs increase their firm's chances of survival, and to a lesser extent, to help make the resulting business more profitable. Second, although extremely difficult to measure, education in entrepreneurship is also supposed to have some long-term impacts on the level of entrepreneurial spirit and attitude which are fundamental for an entrepreneurial population and society.

86. The benefits of education and training in entrepreneurship are widely recognised and practically all OECD countries have launched initiatives in this respect. The OECD report (2003d) has compared various national experiences in entrepreneurial education and stressed three elements to improve the effectiveness of national programmes: (1) use hands-on teaching methods in schools to introduce children to entrepreneurship; (2) teach personal characteristics of entrepreneurs in schools; and (3) focus on integrating entrepreneurship at the university level.

VII. Concluding Remarks

87. In the post-ATC period, there will be neither quantitative restrictions nor MFA–related guaranteed market access to mask the vulnerable situation of national textile and clothing suppliers whose international competitiveness are hampered by: inefficient domestic regulatory regimes; obsolete infrastructure in essential business services; cumbersome customs procedures; and other distorted market structures. All these dimensions are influenced by the policy and regulatory framework set up by governments. From a trade policy perspective, efficiency in transportation, telecommunications and electricity infrastructure and in customs services is an important determinant of a country's ability to integrate fully in the world economy.

88. The prime responsibility for adjustment in the textile and clothing industries falls on the firms themselves which are better placed to evaluate how to organise production methods, procure high quality fabrics, invest and shift the product mix on the basis of evolving market signals. For governments, their role is one of support for the entire economy in which the domestic policy and regulatory framework supports private initiatives and does not impose unnecessary costs on them. Achieving greater policy synergies among distinct policy and regulatory areas that impact the competitive position of national firms is in essence the purpose of a business facilitation agenda.

89. Above all, the role of government relates to the pursuit of sound and dynamic macroeconomic environment that aims at sustaining non-inflationary economic growth. There is strong evidence to attest that real economic growth and, in turn, net employment creation is stimulated in a low-inflationary environment. The pursuit of sound macroeconomic policies fosters market adjustment to change in the competitive environment and facilitates the redeployment of affected resources to other productive sectors without having to revert to costly trade protection measures for taxpayers and consumers. The pursuit of a business facilitation agenda complements other government actions at the macroeconomic and microeconomic levels, *i.e.* trade, labour adjustment and innovation, and brings benefits that go well beyond the textile and clothing industries.

90. The review stresses the importance of efficient port infrastructure, reliable and competitive modes of transport and efficient customs procedures for maintaining a competitive edge in the highly competitive, time-sensitive and fashion-oriented textile and clothing markets. The reliability of transportation infrastructure and efficiency in customs procedures complements each other in minimising transit periods for shipments involved in international trade and can make geographically-remote locations more internationally competitive. The corollary being that long transit periods can essentially eliminate from international competition the offshore centres that are either geographically-remote or nearby centres with poor infrastructure. Even if long transit periods can be mitigated to some extent by preferential market access arrangements, the outward processing programmes requiring two-way shipments are found to offer no net cost advantage for geographically-remote suppliers.

91. Recognising that each country has a different geographical position relative to large consumer regions and different transportation options, countries should assess their logistical cost involved in export markets with a view to: (1) setting up an efficiency-enhancing environment in port infrastructure; (2) strengthening competition conditions in and between transportation modes; (3) setting up a competition-enhancing environment in various port services; (4) addressing the terrorist risks in transportation without losing sight of the beneficiary effects of frictionless transportation systems; and (5) better integrating the enforcement of national laws and regulations, *e.g.* customs procedures, taxation, sanitary and environment protection, with other service providers in ports.

92. Where matters concern the facilitation of international trade, textile and clothing traders are poised to benefit from streamlined border requirements with the dismantling of MFA export permits and related controls in formerly-constrained exporting and importing countries. However, the internationally fragmented supply chain remains vulnerable to cumbersome and outdated customs procedures in countries that are less advanced in the implementation of modern customs systems. The review highlights that the holding up of shipments in customs warehouses due to inefficiencies in customs procedures undermines export-led strategies especially for those countries that rely on imported inputs for a significant share of their production.

93. In the aftermath of the 11 September World Trade Centre attacks, added emphasis is placed on security and safety measures but many exporting countries are concerned about the compliance costs resulting from the enforcement of these measures. While the trade-off between security and efficiency of border crossing is unavoidable in the short term, governments should not lose sight of the beneficiary effects of smoothly functioning transportation and customs clearance systems. The cost pressures on traders can be minimised by furthering co-operative approaches between stakeholders. Ultimately, these developments have the potential to bring faster interaction between traders and customs authorities.

94. The review notes that there are considerable disparities among countries in the number of tariff lines that are defined for classifying textile and clothing products as well as considerable differences in the tariff protection afforded. The review stresses that simplicity in tariff definitions combined with a simplified tariff rate structure represents a cost-effective approach to protect government revenues and to

address fraudulent and integrity concerns. In the context of the Doha Round of multilateral trade negotiations, WTO Members have an opportunity to work toward greater tariff simplification and also to reduce tariff rates.

95. The review underscores that reliable and updated telecommunications and electricity infrastructure are important competitive determinants of textile and clothing suppliers. Trade flows in differentiated products, such as textiles and clothing, are found to be sensitive to international variations in communication costs. Moreover, the quality of telecommunications infrastructure is considered as one of the most important factors in deciding on investment projects by entrepreneurs in Hong Kong (China). Outdated regulatory framework in electricity and telecommunications services acts as a tax on textile and clothing firms and, more importantly, it undermines the capacity of national suppliers to focus production on the higher value-added segments of the supply chain that are critically dependent on reliable infrastructure to ensure quick market responses. In the post-ATC period, the international competitiveness of textile and clothing suppliers will be enhanced in countries that maintain a competitive environment, spurring investment in innovative telecommunication equipment, electricity generation and distribution systems.

96. Some countries are concerned that constraining standards-related regulations and eco-labelling schemes may be developed as a means to shield domestic production, or used by domestic vested interests to promote their products, thereby adding to regulatory heterogeneity and making trade more difficult. The review highlights that differentiated standards in textile and clothing products may contribute to regulatory inefficiencies or trade restrictiveness. Standards adopted in a manner consistent with international obligations may reduce such inefficiencies and restrictions. It suggests that policy makers could promote the widest participation of stakeholders in the preparation, adoption and application of standards-related regulations, in order to ensure the transparency of the whole process and to promote internationally-recognised standards and systems. Moreover, the review suggests that efforts could be made to further develop co-operation between standard setting bodies in developed and developing countries.

97. In recognition of the economic role of SMEs, most governments apply a range of programmes aimed at alleviating the difficulties that SMEs experience in different areas, *e.g.* financing, technology and innovation, e-commerce, management and export promotion, and seek to identify and implement best practice policies. The review recognises the importance of nurturing SME-related entrepreneurship but warns against the danger of distorting investment incentives in sub-optimal productive capacity when excessive fiscal advantages and labour law exemptions are offered to small-scale operations. Recent work by the OECD in the context of the Bologna Charter on SME Policies has found that education and training are recognised as the single most effective means for achieving the objective of fostering entrepreneurship in societies and this policy focus should be pursued

NOTES

[1] The WTO Agreement on Textiles and Clothing (ATC) superseded the Multi-Fibre Arrangement (MFA) regime of quantitative trade restrictions when it entered into force in January 1995 and provided the multilateral trade framework applicable for trade in textiles and clothing for all WTO members. The ATC provides for the elimination by 31 December 2004 of all forms of quantitative restrictions applied to trade in textile and clothing products, including those that originated from the MFA regime. The ATC phases itself out of existence at the end of 2004. For the purpose of qualifying the period when there will be no more quantitative restrictions applied to trade in textile and clothing products, the term "the post-ATC period" is used throughout this review.

[2] Trade facilitation is defined in WTO reference materials as the "simplification and harmonisation of international trade procedures, with trade procedures being the activities, practices and formalities involved in collecting, presenting, communicating and processing data required for the movement of goods in international trade".

[3] See Batra, Kaufmann and Stone (2002); OECD (2003g); SWEPRO (2002); Wilson, Mann and Otsuki (2003); Wilson, *et al.* (2002); and Woo, Wilson and the World Bank (2000).

[4] They estimated that the elasticity of trade with respect to port logistics is 5.2, implying that an increase of 1% in the average APEC indicator of port logistics would increase intra-APEC trade in manufactured goods of 5.2%. In a rather similar quantitative study for APEC trade, Wilson, Mann and Otsuki (2003) estimated that the trade benefits of specific facilitation efforts are USD 254 billion for intra-APEC trade, which would be equivalent to an increase in APEC average per capita GDP of 4.3%.

[5] The general rule-of-thumb for the total delivery costs involving seaborne movements, *e.g.* from the seller's doors to the buyer's doors, is that the maritime leg usually accounts between one third and one half of total delivery costs.

[6] UNCTAD (2002a) reports that imports from African landlocked countries suffer from high freight costs that ranged between 16.2 and 27.6% of the value of the goods imported in 2000. Moreover, it argues that the situation of landlocked African countries "reflects inefficient transport organisation and facilities; poor utilisation of assets; weak managerial, procedural, regulatory and institutional systems; apart from overall inadequate infrastructure conditions".

[7] AGOA's LDCs are temproarily entitled to use non-US fabrics and still enjoy duty-free access. But this special provision expires at the end of September 2004.

[8] While it is recognised that achieving greater competitive conditions in air shipping should remain a policy objective for trading countries, the relative importance of maritime and rail shipping modes for trade in textile and clothing products explains the focus on maritime and rail shipping conditions in the following sub-sections.

[9] For comprehensive reviews of policy reforms in seaport industry, see Trujillo and Nombela (1999); Trujillo and Estache (2001); Hoffman (1998); Juhel (1997); and UNCTAD (2002b).

[10] This is more important given the fact that over the years, port activities have become more capital-intensive, requiring significant investment to accommodate larger and more specialised ships.

[11] Generally, port authorities do not publicly release their information on ship turn-around time for fear of losing business to competitors. Another performance indicator to evaluate the efficiency of ports is the container handling charge per TEU, which typically represents between 70 and 90 % of total port charges. Under normal business circumstances, port authorities pass on to users their operating and infrastructure improvement costs and the container handling charge ultimately reflects these costs. The container handling charge per TEU is another

indicator for comparing and benchmarking ports, though it is recognised that local conditions might vary considerably.

[12] OECD (2002a), page 19.

[13] OECD (2002a), page 22.

[14] Three Directives were adopted that required their implementation by 15 March 2003. Directive 2001/12/EC requires the legal separation (not just accounting separation) between infrastructure managers and railway undertakings. Under Directive 2001/14/EC, infrastructure managers are required to provide a number of mandatory access services on a non-discriminatory basis. Finally, Directive 2001/14 provides for the creation of an organisation to co-ordinate the international allocation of capacity on different networks, in order to allow for the creation of international train paths.

[15] The eight countries reviewed are: The United States, the United Kingdom, Argentina, Sweden, Brazil, Chile, New Zealand and Japan.

[16] For example, the United States and Canada signed the "Smart Border" initiative to facilitate trade through improved co-ordination and information sharing in December 2001 and a similar initiative was unveiled between the United States and Mexico in March 2002. More recently, the Customs-Trade Partnership against Terrorism (C-TPAT) was launched in the United States which aims at increasing the integrity and security of the supply chain by offering expedited clearance to carriers and importers enrolled in this programme. In Canada, the programme "Partners in Protection" has similar objectives as the C-TPAT programme. In the European Union, the Commission has recently proposed a series of measures to address security issues, including amendments to the "Community Customs Code" to harmonise risk assessment systems and to launch a "Container Security Initiative" that provides for enhanced cooperation in transport security.

[17] With an estimated elasticity of trade flows with respect to transaction costs at about -2 (Limão and Venables, 2001), it means that an increase of 1% in the cost of trading internationally would lead to a drop in trade flows of 2%.

[18] OECD (2003a), page 56.

[19] OECD (2003a), page 57.

[20] Their estimated elasticity of trade flows to bilateral calling price is: -0.764 for textile fibres (SITC2 code 26); -1.112 for clothing (SITC2 code 84) ; and -1.15 for textile yarns, fabrics and made-up articles.

[21] WTO (2003), paragraph 19.

[22] WTO (2003), paragraph 25.

[23] Between 1985 and 2001, the developing countries' share of world textile production increased from 23 to 33 %. During the same, the developing countries' share of world clothing, leather and footwear increased from 22.7 to 27.8 % (Part II).

[24] The following SME dimensions are proposed for discussion during this Second SME Conference (see DSTI/IND/PME(2003)3): (1) fostering entrepreneurship, including women's entrepreneurship; (2) fostering SMEs' access to innovation and technology through access to financing and through clusters, networks and partnerships; (3) financing innovation SMEs in a global economy; (4) clusters, networks and partnerships: opportunities and challenges for innovative SMEs in a Global economy; (5) promoting ICT use and e-business adoption by SMEs; (6) alternative dispute resolution mechanisms online for SMEs; (7) promoting SMEs for development; (8) cross-cutting themes; (9) SME statistics; and (10) evaluation of SME policies and programmes.

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ANNEX A: TABLE

Annex Table 5A.1 Freight Costs by Mode of Transport for Textile and Clothing Imports in the USA, 2003

Mode of transport	Air	Rail	Seaborne	Truck	Total
North and Central Americas (NCAs)					
Mexico	7.0%	0.6%	2.0%	2.8%	0.9%
Canada	5.5%	0.9%	3.3%	6.0%	1.1%
Honduras	13.8%	1.1%	1.9%	7.8%	2.1%
Costa Rica	-	0.2%	2.0%	5.3%	2.2%
El Salvador	4.3%	1.9%	2.0%	6.4%	2.3%
Guatemala	7.0%	11.8%	2.4%	8.8%	3.0%
Nicaragua	10.4%	3.0%	2.7%	5.9%	3.0%
Total for NCAs	**6.9%**	**0.7%**	**2.1%**	**4.7%**	**1.5%**
Other Countries					
Dominican Republic	3.7%		1.7%		1.9%
Colombia	5.6%		1.7%		3.2%
Peru	5.5%		2.4%		3.8%
Italy	4.5%		3.1%		4.1%
Israel	7.8%		3.5%		4.1%
Japan	16.9%		3.0%		4.2%
United Kingdom	5.9%		3.3%		4.6%
Hong Kong, China	8.7%		3.1%		4.8%
France	5.9%		3.4%		4.9%
Jordan	9.3%		3.8%		5.1%
Macau	11.6%		3.5%		5.3%
Malaysia	21.2%		4.0%		5.6%
Philippines	9.7%		4.2%		5.6%
Cambodia	41.0%		4.3%		5.8%
Turkey	14.1%		4.4%		5.8%
Egypt	16.6%		4.3%		5.8%
Thailand	9.8%		4.7%		6.1%
Chinese Taipei	12.8%		4.6%		6.2%
Indonesia	16.3%		4.5%		6.2%
Sri Lanka (Ceylon)	13.4%		4.4%		6.3%
Russia	9.0%		5.7%		6.6%
Korea, South	11.0%		4.8%		6.7%
Bangladesh	14.1%		5.6%		6.8%
China	14.5%		5.8%		6.9%
Brazil	13.9%		5.1%		7.1%
South Africa	13.9%		5.0%		7.2%
Vietnam	10.6%		5.0%		7.3%
India	14.4%		5.0%		7.3%
Pakistan	24.8%		6.4%		8.0%
Rest of the world	9.3%		4.3%		5.7%
Total Non–NCAs	**11.1%**		**4.5%**		**5.9%**

Note 1: The mode of transportation is one by which the imported merchandise entered the US port of arrival from the last foreign country.

Source: Secretariat calculation based on data from the U.S. Department of Commerce, Bureau of the Census.

PART VI. LITERATURE REVIEW OF QUANTITATIVE STUDIES

I. Introduction

1. There is a considerable body of analysis available that aims to quantify the economic and trade effects of textile and clothing market liberalisation. A number of analysts at national and international institutions have provided their assessments. Different tools and approaches have thereby been used to evaluate the impacts of textile trade reforms at the regional or global level. Given the economic importance of the textile and clothing sectors in some developed and developing countries and the resulting economy–wide repercussions that changes in the scale and pattern of textile production will tend to trigger, analysis using general equilibrium models has been dominant, even though in some cases partial equilibrium approaches have been pursued. Most of this research has been published during the 1990s, and the following review summarises and compares the findings of pertinent quantitative studies. References to earlier analysis that has aimed to assess the effects of liberalising textile and clothing trade can be found, for example, in Pelzman (1983), Goto (1989) and Spinanger (1991).

2. The remainder of the literature review is organised in four parts. Section II provides background information for the subsequent literature review by discussing some of the major economic effects that would be expected from the WTO Agreement on Textiles and Clothing (ATC) reforms, as well as the implications of different modelling approaches and assumptions. This overview aims to help the reader understand the factors that are driving the modelling results. Section III reviews quantitative studies of ATC reforms at the global level, while section IV complements the survey by discussing relevant studies that have a country or regional focus. Finally, section V briefly summaries the main findings.

II. Quantitative Aspects of Trade Liberalisation in the Textile and Clothing Sectors

3. Under the Multi-Fibre Arrangement (MFA), developed and developing countries negotiated bilateral quotas regulating trade in textiles and clothing.[1] In order to implement these quantitative restrictions, it was agreed that exporting developing countries would voluntarily restrain their supplies. Export rights became scarce and turned into valuable assets, generating rents for internationally competitive suppliers. Governments generally distributed the quotas free of charge to domestic firms based on criteria, such as past export performance (Hamilton, 1990). In most countries, quotas were not tradable. Such allocation schemes favouring *status–quo* exporters, as well as requirements that, for example, related annual quota renewal to export performance in unrestricted markets, generated substantial efficiency losses in developing countries over time (Trela and Whalley, 1995). In some cases, developing country exporters had to share parts of their quota rents with importing firms that were able to exercise market power at the individual product level (Krishna, Erzan and Tan, 1994). Yet, most of the rents generated under the MFA accrued to developing country exporters. Table 6.1 shows estimates of quota rents for a number of countries, as reported by Harrison, Rutherford, and Tarr (1997).

Table 6.1 Estimates of MFA Quota Rents and Price Premia for Textiles and Clothing, 1994

	Textiles				Clothing			
	Value of quota rents (USD mn)	Share of exports constrained (%)	Quota premium (%)		Value of quota rents (USD mn)	Share of exports constrained (%)	Quota premium (%)	
			EU	USA			EU	USA
Korea	119	16	10	10	555	55	19	23
Indonesia	97	24	17	12	512	52	48	47
Malaysia	65	100	12	10	330	100	32	37
Philippines	7	50	10	9	363	81	28	34
Singapore	7	11	10	8	365	100	28	31
Thailand	53	40	13	9	396	42	36	35
China	378	19	27	18	2 223	31	36	40
Hong Kong, China	48	13	8	8	1 249	100	16	18
Chinese Taipei	95	13	12	8	515	81	22	19
Brazil	65	100	14	9	43	77	18	20
Mexico	41	60	14	9	181	99	18	20
Latin America	46	45	14	9	619	86	18	20
Middle East & North Africa	84	78	7	5	390	97	9	10
Eastern Europe & FSU	87	78	9	6	430	97	12	13
South Asia	566	46	27	18	1 375	85	36	40

Source: Harrison, Rutherford and Tarr (1997)

4. The system of bilateral quotas has frequently been accompanied by high tariffs applied on imports of textiles and clothing. Countries engaged in tariff reduction commitments during the Uruguay Round, but tariffs on textiles and clothing frequently remain significant even after the cuts, and as illustrated in Table 6.2 for the case of the European Union, are on average considerably higher than in the manufacturing sector overall. Also, textiles and clothing tariffs appear to be consistently high across a large number of products and show lower than average variation. Moreover, high tariffs on textiles and clothing exports are not confined to OECD countries. Large developing country exporters, in the Association of South East Asian Nations (ASEAN), and South Asia have tariffs ranging from 20 to 33% on textiles and 30 to 35% on clothing, impeding the increasingly important trade among developing countries (Lankes, 2002).

Table 6.2 Structure of EU Pre- and Post-Uruguay Round Tariffs in the Textile and Clothing Sectors

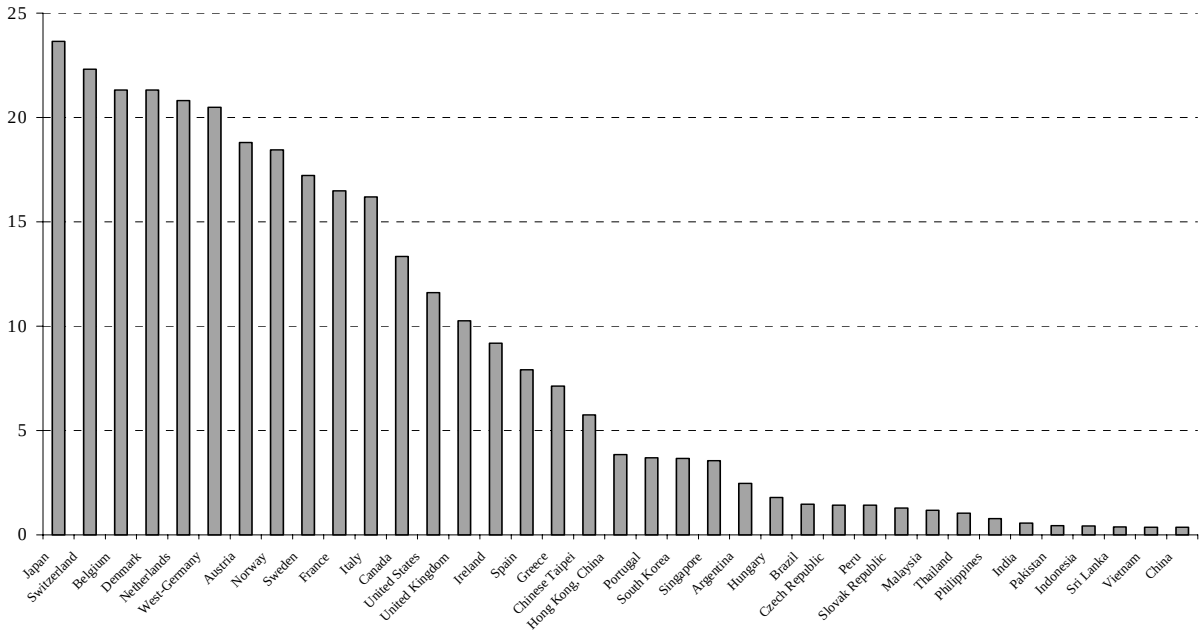
Pre-Uruguay Round (1994)				**Tariff Rate Distribution (in %)**										
	HS lines	Mean	CoV[1]	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22
Textiles	3943	10.1	0.26	0.8	0.3	2.7	11.2	6.6	64.9	6.1	4.6	2.8	0.0	0.0
Clothing	447	12.3	0.26	0.4	1.1	5.6	4.7	5.4	2.7	13.6	66.4	0.0	0.0	0.0
All manuf.	17760	6.5	0.53	6.8	5.2	29.7	22.3	11.3	17.0	3.6	3.2	0.7	0.0	0.2
Post-Uruguay Round (2004)				**Tariff Rate Distribution (in %)**										
	HS lines	Mean	CoV*	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22
Textiles	3941	7.3	0.25	0.9	0.4	16.2	2.5	68.0	8.1	2.7	0.5	0.8	0.0	0.0
Clothing	447	10.6	0.29	2.0	6.3	1.1	3.1	5.6	1.8	72.7	7.4	0.0	0.0	0.0
All manuf.	17324	4.0	0.96	14.6	27.4	24.6	11.4	17.7	2.8	3.1	0.6	0.4	0.0	0.0

Note 1: CoV means Coefficient of variation.
Source: Spinanger (1999b).

5. The complexity of the quota system, the interaction between quotas and tariffs, and the simultaneous Uruguay Round changes in other sectors of the economy make the evaluation of ATC reforms difficult. Empirical analysis to quantify the relative magnitude of different impacts becomes necessary. Some of the welfare effects from tariff reduction and quota phase-out that need to be considered are outlined in the following:

- The removal of quantitative restrictions eliminates the basis for quota rents. The latter are passed from exporters to consumers in previously import constrained markets in the form of lower prices. There are also efficiency gains from specialisation according to comparative advantage, which in the case of the United States, the European Union and other quota-constrained countries is likely to imply increasing domestic consumption and reducing production. As the MFA arrangements were motivated by potential adjustment problems within developed importing countries caused by surges of lower cost imports, the shift of labour and capital resources out of the textile and clothing sectors is likely to entail sizeable adjustment costs. Hence, there are advantages and disadvantages to developed importing countries from ATC reforms.
- Importers of textiles and clothing that were previously unconstrained, such as Japan, could well experience reductions in welfare from the removal of textile quotas. Exporters will tend to divert sales to previously constrained markets, possibly resulting in import price increases and a terms-of-trade deterioration in previously unconstrained importing countries.
- The lowering of tariffs applied to textile and clothing imports will affect the amount of tariff revenues collected by governments. If the demand for imports is very price elastic, such that a reduction in tariffs (to non-zero levels) triggers a large increase in imports, tariff revenue might increase. Otherwise it will decrease.
- For quota-constrained exporting countries, the welfare effects are mixed (Yang, Martin and Yanagishima, 1997). On the one hand, there is the loss of quota rent in export markets that were previously constrained. On the other hand, exporters could potentially gain in efficiency to the extent that they shift resources into textiles and clothing, assuming they have an *ex post* comparative advantage in these industries, which in many cases will be based on their low labour costs (Figure 6.1). In addition, there is the potential improvement in terms-of-trade on sales of textile and clothing products to previously unconstrained markets, such as Japan. The size of the terms-of-trade effects will depend largely on the share of sales to previously constrained *versus* unconstrained markets.
- ATC reforms will also influence the country composition of exports, most likely in the direction of a concentration of suppliers. Whenever textile and clothing quotas became binding in one country under the MFA, investment was directed to initially unconstrained exporting countries, who then later became constrained also, with investment flowing yet elsewhere. Removing the discriminatory restraints will tend to lead to a reversion to more country concentrated patterns of exports, with many higher cost developing countries, for which the production of textiles and clothing might have been the first stage of the industrialisation process, possibly losing out (Whalley, 1999).

Figure 6.1 Hourly Labour Costs in the Primary Textile Industry, 1993 (in USD)



Source: Werner International, reproduced from Brugnoli and Resmini (1996).

6. One major challenge for applied economic modelling of textile and clothing liberalisation is to represent existing quantitative restrictions appropriately. The restrictiveness of the applied MFA quotas varies from product to product, and from supplier to supplier, and aggregate measures have to be interpreted with care. Some researchers have modelled the phase-out of quotas as an increase in exporting efficiency in order to capture the effect of removing the constraint to exports (Diao and Somwaru, 2001), while most analysts liken the effects of the MFA quotas to price wedges and use estimates of export tax equivalents, such as those derived by Francois and Spinanger (2000) and generalised in the GTAP database, in their simulations.

7. There are a number of other differences between the available empirical studies. Analysts emphasise different economic relationships in the textile and clothing sectors and choose their methods and simplifying assumptions accordingly. It is then not surprising that different modelling approaches and sets of behavioural and structural hypotheses generate differing results. The following listing describes some major aspects of frequently encountered analytical approaches, as applied to ATC reforms. Reviewing these aspects will provide the background for the subsequent discussion of individual studies.

- General equilibrium versus partial equilibrium analysis: Computable general equilibrium (CGE) models make it possible to consider changes simultaneously in different parts of the economy, linkages between sectors, and economy-wide resource constraints at the national and international level (Francois and Reinert, 1998). However, these tools rely on a number of simplifying assumptions, such as full employment of resources, and depend on a large amount of empirical information. If the sector to be analysed is small and not tightly linked to other parts of the economy, partial equilibrium analysis that focuses on the sector under consideration will tend to yield similar results, while being less data-intensive. Most ATC reform studies employ CGE models, though.

- Base year: The base year influences the modelling results in several ways. Prices and quantities change over time, so that models that are calibrated on data for different time periods are not fully comparable. Also, knowledge about policy parameters evolves. For example, available estimates of the export tax equivalents of MFA quota restrictions have undergone major revisions during the 1990s. Moreover, when comparing absolute welfare effects across studies that use different base periods, the effects of inflation should be taken into account.

- Level of aggregation: The sectoral and regional aggregation of a model varies with the objective of a study and data availability. Some aggregation seems inevitable, because it is virtually impossible to model the hundreds of product-lines that are involved in product-specific MFA quotas. A relatively high level of aggregation has the advantage of reducing computational complexity and the need to estimate unknown model parameters. However, aggregation reduces the dispersion of distortions in the economy, so that welfare estimates of the removal of these distortions will be biased downwards. For example, when using a 12 region model, Harrison, Rutherford and Tarr (1997) find global welfare gains from the Uruguay Round that are 5-10% lower than those obtained from an otherwise identical model that differentiates between 24 regions.

- Homogenous versus heterogeneous imports: One important modelling issue concerns the degree to which domestically produced goods and imports from different countries are substitutes for each other. If imports from different countries are taken to be imperfect substitutes (the so-called Armington assumption), intra-industry trade can be represented. Most studies of ATC reforms differentiate textile and clothing products by place of origin and, hence, allow for intra-industry trade. This heterogeneity assumption tends to lead to smaller quantity changes in simulations than would be the case for homogenous products, as consumers are taken to express a preference for domestically produced goods over foreign goods.

- Constant versus increasing returns to scale: Several ATC studies depart from the standard framework of perfect competition and constant returns to scale by assuming that manufacturing, including textile and clothing production, is characterised by increasing returns to scale. This assumption implies some degree of market power and the representation of firms' behaviour as monopolistic competition. Both domestic and imported products are heterogeneous, so that there is no "home bias" and import price changes are transmitted symmetrically to the domestic market. As a result, simulations of ATC reforms generally show stronger impacts than under constant returns to scale and "Armington preferences".

- Static versus dynamic analysis: Analysis using comparative static models is generally based on a medium-term time horizon that allows for some adjustments, like employment shifts, to take place, while assuming a fixed stock of capital. Longer-run dynamic models incorporate additional linkages over time, such as those between policy reform, savings and investment. Changes in investment, in turn, trigger further changes in production and income. Hence, dynamic models tend to predict more pronounced economic effects from policy reform than static ones.

8. A number of analysts have aimed to quantify the impacts of the complex set of trade policy changes contained in the Uruguay Round Agreement. The information requirements for such an undertaking are considerable and analysts have had to compromise between the comprehensiveness of sector and country coverage and the detail of structural and trade policy representation. For example, Haaland and Tollefsen (1994) and Brown *et al.* (1997) place the emphasis of their CGE analysis on tariff and services trade liberalisation and do not model the phasing-out of MFA quotas. Their sectoral results contain estimates of the impact of the Uruguay Round on textiles and clothing, but as the central liberalisation feature in this sector was not represented, the findings should be interpreted with care. The following discussion

concentrates on quantitative analysis that explicitly deals with MFA quota elimination. Some structural features and the central results of some of the main studies are summarised in Annex Tables 6.1 and 6.2.

III. Studies at the Global Level

9. The global effects of trade liberalisation in textile and clothing have been considered and quantified before the ATC was conceived. For example, Trela and Whalley (1990) analyse the removal of quotas and tariffs between Canada, the European Union, the United States and 34 supplying developing countries using a static CGE model under assumptions of perfect competition and constant returns to scale.[2] Traded products are assumed to be homogenous. Their analysis is explicitly geared towards the textile sector by specifying fourteen textile and clothing categories and one composite other sector in their model. The researchers expect global welfare gains from quota and tariff elimination to total USD 23 billion per year, with the three developed country importers together accounting for about two-thirds of the gains and developing countries for one third. A number of developing countries are expected to be able to increase their exports by several hundred per cent at the expense of production in developed countries. Nevertheless, a few developing countries are expected to face welfare losses from textile trade liberalisation, as the improved access to developed countries markets would in their cases not compensate for the loss in quota rents. These losses would be more widespread and pronounced, if the textile market liberalisation would consist of eliminating quotas, but leaving tariffs unchanged, as assumed by the analysts in a second policy scenario.

10. In a follow-up study (Trela and Whalley, 1995), the authors expand their CGE model to capture effects related to internal quota-allocation schemes in exporting countries.[3] This is done by distinguishing two types of producers in exporting developing countries: established high-cost producers that supply restricted export markets, and new and more efficient producers that are confined to supply the domestic market. Removal of MFA restrictions and quota-allocation procedures would allow textile and clothing production to shift to the most efficient producer, both internationally and domestically. Trela and Whalley estimate that the welfare losses from inefficient quota-allocation schemes exceed those from the country quotas, so that the global benefits of quota and tariff elimination would amount to USD 49.7 billion annually. The benefits of removing the inefficient quota-allocation scheme would mainly accrue to developing country exporters, even though some of the efficiency improvements would be passed on to developed country importers in the form of lower prices.

11. Similar to Trela and Whalley, Yang (1994) concludes that the abolition of the MFA would benefit most countries and result in a substantial global welfare gain.[4] However, his study based on a partial equilibrium model of two sectors (textiles & clothing) across eight country groups finds aggregate welfare improvements that are substantially lower than those expected by Trela and Whalley. Moreover, the gains are not falling mainly on developed countries, but are about equally divided between developed and developing countries, even though internal inefficiencies from quota-allocation schemes in developing country exporters are not explicitly considered. The differences in findings seem to be mainly due to lower tariff equivalents used to represent the quota protection of developed country markets and to the differentiation between restricted and unrestricted products in the United States, European Union and other restricted markets in Yang's study.

12. The first quantitative assessments of the Uruguay Round Agreement have predicted very substantial impacts from the opening of textile and clothing markets. Nguyen, Perroni and Wigle (1993) evaluate the implications of the Draft Final Act of the Uruguay Round for nine sectors and ten country groups using a static CGE model. They find that the aggregate welfare gains from textile quota expansion would exceed those of the scheduled agriculture and service market liberalisation and account for USD 84.5 billion per year, or almost 40% of the total Uruguay Round gains.[5] The welfare gains would fall roughly equally on developed and developing countries and world trade in textiles would increase by an

estimated 6%. Large-scale labour market adjustments are predicted, with the country group comprising South Korea, Chinese Taipei, Hong Kong (China), and Singapore expected to see employment in textile and clothing production increase by more than 80%, while the textile labour force in Australia and New Zealand, Canada, the United States, and Western Europe is foreseen to contract by 22 to 36%.[6]

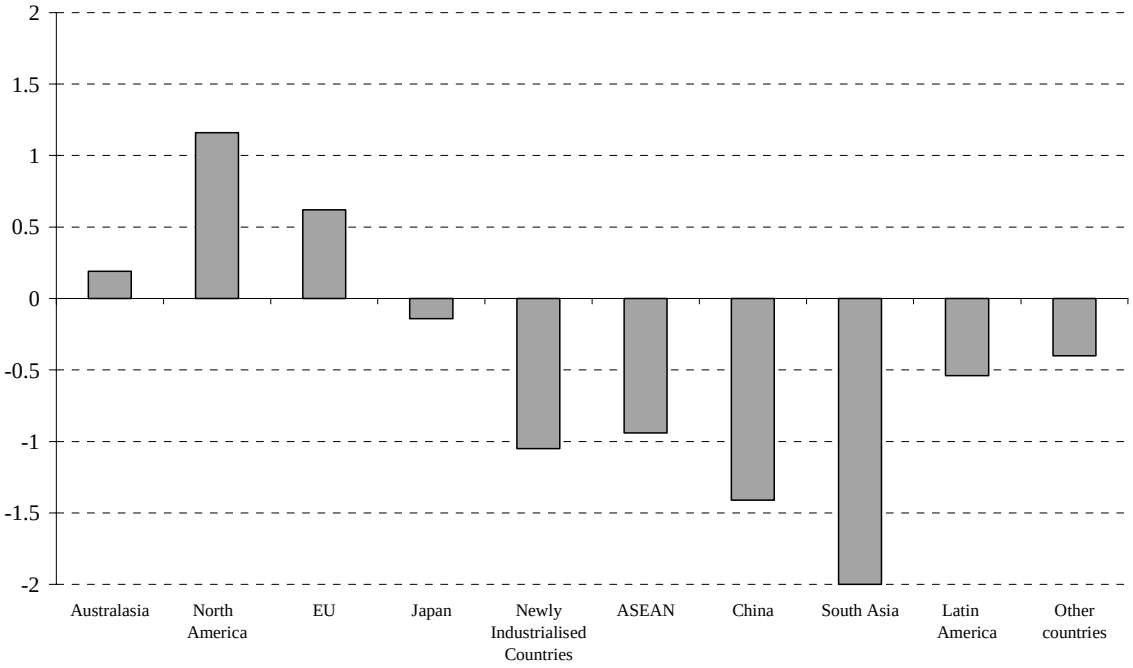
13. Large shares in overall Uruguay Round welfare gains from textile trade liberalisation are also found by other analysts. Using a dynamic CGE model under assumptions of perfect competition and constant returns to scale, Francois, McDonald and Nordström (1994) estimate the global gains from textile and clothing quota removal to amount to USD 47 billion annually, which corresponds to 42% of their estimate of total Uruguay Round welfare increases[7]. In a second scenario, in which the authors assume monopolistic competition and increasing returns to scale, the predicted welfare gains from textiles market liberalisation are at USD189 billion more than four times higher than in their first scenario and account for no less than two-thirds of all Uruguay Round gains. Moreover, in the second scenario all countries, including developing countries, see welfare improvements from textile quota elimination, while developing countries lose in the case of perfect competition and constant returns to scale. This result is due to the greater price elasticity of import demand under monopolistic competition and increasing returns to scale, so that the benefits from improved access of developing countries to developed country markets more easily compensate for the loss of quota rents[8].

14. In a subsequent study (Francois, McDonald and Nordström, 1996), the authors use a similar modelling set-up for a different baseline period and a more detailed sectoral and regional breakdown. In addition, they explore alternative linkages between trade, income and capital accumulation. In particular, different assumptions concerning the capital stock (fixed or endogenous) and the savings rate (fixed or endogenous) are considered in order to study longer-term capital accumulation effects that can magnify income gains or losses. The results indicated that incorporation of “full dynamics” (both capital stock and savings rate endogenous) leads to estimates of global welfare gains from textile and clothing market liberalisation that are almost twice as high as those under the assumption of a fixed capital stock and a fixed savings rate.

15. Yang, Martin and Yanagishima (1997) analyse textile and clothing market liberalisation using the Global Trade Analysis Project (GTAP) a CGE model calibrated on data for the year 1992. They distinguish 10 sectors, including two for textiles and clothing, and ten regions. Their results suggest that the ATC would account for aggregate annual benefits of USD 28.6 billion, or 38% of all global welfare gains from the Uruguay Round. The authors also report expected terms-of-trade changes due to the phase-out of MFA quotas, which show improvements in export to import price ratios for Australasia, North America and the European Union, while Japan and developing countries are expected to see a worsening in their terms–of–trade (Figure 6.2).

Figure 6.2 Expected Changes in Terms-of-Trade After MFA Quota Removal

(in %)



Note: No change in pre-Uruguay Round tariffs are assumed.
Source: Yang, Martin and Yanagishima (1997).

16. A version of the GTAP model is also used by Hertel *et al.* (1996) when analysing the liberalisation of manufacturing trade. But their estimates are based on ATC reforms in a projected economy of the year 2005. They find that MFA quotas would become more binding over time for virtually all exporters, taking into account projected economic growth, structural changes, and ATC quota growth. The increases in restrictiveness are particularly pronounced for exports of clothing from China, Indonesia, Malaysia and the Philippines. Removing textile and clothing quotas under these circumstances would lead to global welfare gains of USD 37.3 billion per year.

17. Bach *et al.* (2000) explicitly compare liberalisation scenarios with and without considering projected changes in the economy during the Uruguay Round implementation period. Simulations of MFA removal using the high export tax equivalents for 2005 yield estimates of global welfare gains that are more than 140% higher (in 1992–USD) than those obtained using export taxes for the year 1992. The differences between simulation results for other parts of the Uruguay Round package, such as tariff reform, are much less pronounced, suggesting that economic growth and structural changes in the textile and clothing sector warrant particular attention by analysts.

18. Yang (1996) also analyses MFA reforms for an economy projected to the year 2005. He first evaluates the impacts of quota acceleration during the ATC transition period, before proceeding to an assessment of MFA quota elimination. He finds that the production and welfare impacts during the three phases of ATC transition are limited. One reason for the small effects might be that the integration requirements are defined in volume terms so that importing countries can minimise their adjustment needs by first integrating product items that are high in volume but low in value (Bagchi, 1994). The global welfare improvement from full elimination of MFA quotas is projected to amount to USD 52.9 billion annually. In a further scenario, the author evaluates the implications of induced technological change on

the liberalisation outcome and estimates that the benefits of reform would be magnified substantially and would, under his assumptions, lead to welfare gains for all country groups concerned.

19. The substantial size of the expected welfare gains in some of the early studies of ATC reforms may be partly due to an overestimation of the tariff equivalents of textile and clothing quotas and, hence, the benefits of removing existing protection. Using updated figures for tariff equivalents and a static CGE model under constant returns to scale, Harrison, Rutherford and Tarr (1997) estimated the annual benefits of ATC reforms to amount to USD 16 billion, or 27% of total Uruguay Round gains.[9] An increasing returns to scale version of their model predicted slightly higher global welfare gains from textile and clothing liberalisation of USD 16.4 billion, and the simultaneous consideration of dynamic capital accumulation effects resulted in a benefit estimate of USD 20.3 billion. Similar to the analysis by Francois *et al.* (1996), the incorporation of dynamic linkages in the model led to more optimistic estimates concerning the impact of ATC reforms on developing countries. Harrison *et al.* (1997) also conducted sensitivity analysis with respect to the elasticities of demand, and found that developing countries would experience higher and more widely spread welfare increases if demand was assumed to be relatively more inelastic, as reductions in import prices would trigger larger demand increases in developed importing countries and higher terms-of-trade gains in unconstrained markets. Moreover, larger elasticities of substitution between different export markets would benefit developing countries in the aggregate, but efficient producers, such as China, South Asia, Indonesia, Thailand, and Malaysia would gain from the possibility of breaking more easily into previously constrained markets at the expense of high-cost producers in Latin America, the Middle East, North Africa, Eastern Europe and the former Soviet Union.

20. Diao and Somwaru (2001) stress the impacts of liberalisation over time in their analysis. They model ATC reforms as a reduction in tariffs by 30 – 40% and an annual increase in export efficiency by 0.5% over 20 years. They predict that textile and clothing trade levels after trade policy reform would be 5 to 16% higher than they would have been without trade liberalisation, with trade in clothing products increasing twice as fast as textile trade. Clothing and textile exports from developing countries would increase, but so would to some extent textile exports from industrialised countries. This finding hints at the international interrelationships in production patterns with lower prices for clothing stimulating demand in developed countries and exports from developing countries, which in turn increase their imports of capitalintensive textile products used as inputs for the production of labour-intensive clothing. Asian and Middle Eastern exporters are expected to gain world market share, at the expense of producers in Eastern Europe, Latin America, and industrialised countries. As the authors assume that no MFA quota rents exist, the improved resource allocation after trade liberalisation leads to welfare gains in all countries. Global benefits are expected to amount to USD 88 billion annually in the short run (Year 5) and USD 203 billion in the long run (Year 20). More than two-thirds of all welfare gains accrue to developing countries.

21. Recent IMF analysis using the GTAP model covers impacts on labour market and upstream sectors (Lankes 2002). It is estimated that each job saved in a developed country by tariffs and quotas costs about 35 jobs in developing countries. Eliminating MFA quotas and tariffs on textiles and clothing in developed countries would generate employment for as many as 27 million workers in developing countries. Global welfare gains are estimated to amount to USD 34.7 billion per year, with more than two-thirds of the total accruing to developing countries. Some of these gains would be captured by fibre crop producers. For example, cotton exports from sub–Saharan Africa are expected to increase by 9%, or USD 132 million, as a result of textile and clothing liberalisation. The study also evaluates the impact of further liberalisation of textile and clothing trade, including tariff reductions in developing countries, and finds that developing countries would be able to capture almost all the welfare gains from such liberalisation efforts.

22. A major impact on textile and clothing trade flows during the 1990s has ensued from regional trade agreements, like the Europe Agreements and NAFTA, as well as from the establishment of offshore processing legislation, which enabled firms to circumvent MFA quotas (Brugnoli and Resmini, 1996;

Spinanger, 1999a). Fouquin *et al.* (2002) quantify the impacts of further regional integration, in addition to analysis of MFA quota elimination. In particular, they simulate the impact of hypothetical free trade areas between the European Union and Mediterranean countries, and between North and Latin American countries. They find that removing the remaining European Union tariffs on textile and clothing imports from Mediterranean countries would boost production of textiles and clothing by 20% and more than 50%, respectively. Clothing exports to the European Union would more than double. In terms of welfare effects, the Mediterranean countries would gain USD 3 billion per year compared to a welfare loss under a scenario of MFA quota elimination without regional preferences. Due to trade diversion, Asian exporters, notably China, would lose in exports and economic welfare. Qualitatively similar effects are predicted from the creation of a free trade area of the Americas, even though the quantitative impacts are expected to be less pronounced.

IV. Studies with a Regional Focus

23. In addition to analysis that evaluates the global impacts of ATC reforms, there are a number of studies that focus on the effects of liberalising textile and clothing trade for particular regions. Francois, Glismann and Spinanger (2000) analyse the impacts of ATC reforms for the European Union using a CGE model. In particular, they evaluate the relative effects of MFA quota phase-out and Uruguay Round tariff reductions. They find that the European Union would reap total welfare gains of EUR 25.3 billion per year, of which 97% would derive from MFA elimination and 3% from tariff reform. Moreover, they estimate the distribution of reform benefits across member countries (Table 6.3). Germany, France, and the United Kingdom are the main beneficiaries of ATC reforms in absolute terms, while Denmark, Germany, and Austria gain most if the welfare increases are related to population size. Southern European countries would carry relatively large shares of negative sectoral impacts, but these would be more than compensated through estimated consumer gains. Nevertheless, Greek families would on average gain only about a fifth as much from ATC reforms as Danish ones. The authors also assess the annual costs of protection per job saved. For textiles, the latter amount to about EUR 28 500 per worker, and for clothing to about EUR 41 100.

Table 6.3 Annual Welfare Gains from ATC Reforms in the European Union, 1997

	MFA Elimination	UR Tariff Cuts	Total ATC Reforms	
	Million EUR	Million EUR	Million EUR	EUR per family of four
Austria	639	18	661	327
Belgium/Lux.	789	22	815	307
Denmark	494	14	511	386
Finland	350	10	362	281
France	4 428	124	4 581	312
Germany	6 752	196	6 999	341
Greece	211	5	217	83
Ireland	175	5	181	196
Italy	3 356	83	3 453	240
Netherlands	1 101	32	1 140	291
Portugal	230	5	235	94
Spain	1 580	43	1 633	166
Sweden	517	15	536	242
United Kingdom	3 824	106	3 956	268
Total EU	24 446	677	25 282	270

Source: Francois, Glismann and Spinanger (2000).

24. The production and labour market effects of ATC reforms on the German textile and clothing sectors have been investigated and quantified by Schöppenau *et al.* (2002). They first simulate the impact of the European Union's eastward enlargement on textile and clothing markets, as the final stage of ATC reforms is scheduled to take place after 10 new members have joined the European Union. Enlargement is

expected to have a moderately positive effect on textile production (plus 2.9%) and a moderately negative impact on clothing output (minus 1.5%) in Germany. The removal of MFA quotas will have more pronounced though still limited effects, with expected reductions of textile output and employment of about 4.4% and a contraction of clothing production and employment by about 6.4%. In a further simulation, the authors assess the impact of a worldwide cut in textile and clothing tariffs by 20% and find that such an additional liberalisation step would only have minimal effects in Germany and the European Union. The general equilibrium analysis is complemented by partial equilibrium assessments of the effects on textiles and clothing related industries, such as spinning, weaving, and machinery. The expected impacts vary across these industries, as the latter are affected to a differing extent by the removal of MFA quotas and the subsequent adjustments in the textile and clothing sectors. The output of the spinning sector in Germany is expected to contract by 3.4%, while production in the weaving and machinery industry is foreseen to fall more than proportionally (10.4 and 9.2% respectively). The study did not report any estimates of welfare impacts, but, as indicated by Francois, Glismann and Spinanger (2000), Germany can be expected to be among the main beneficiaries of ATC reforms in the European Union, due to lower consumer prices and more efficient resource use.

25. The United States is also expected to gain considerably from liberalisation of textile and clothing trade. Using a partial equilibrium approach, Cline (1987) estimates the net welfare gains from complete liberalisation to amount to USD 7.3 billion annually for clothing and USD 0.8 billion for textiles.[10] He also investigates the income distribution effects of textile and clothing protection. When taking employment effects, consumption patterns and enterprise profits into account, he finds that protection tends to benefit primarily the higher income groups that obtain most of the protection-inflated industry profits.

26. De Melo and Tarr (1990) use a CGE model of the US economy to examine the effects of quota removal. They estimate that improvements in efficiency would generate annual benefits of USD 5.9 billion and capturing rents from foreigners would result in additional gains of USD 6 billion, resulting in an overall annual welfare improvement of USD 11.9 billion. The authors also assess concerns regarding adjustment costs in the domestic quota-protected industries. When measuring social hardship as the earnings losses of displaced workers over six years, they estimate that the benefits of quota elimination would largely outweigh the adjustment costs, to the extent that for every dollar of worker income saved, the economy would lose USD 65.[11]

27. Reinert (1993) uses a similar approach as the one employed by De Melo and Tarr, while differentiating between the textile and clothing sectors and explicitly considering five upstream supplier sectors: cotton, cellulosic man-made fibres, non-cellulosic organic fibres, textile machinery, and needles, pins and fasteners. He estimates US welfare gains from MFA quota elimination to amount to USD 7.3 billion. About 90% of these gains are due to the removal of clothing quotas and 10% to the liberalisation of textile trade. Employment in the textile and clothing sectors is expected to contract by 16 100 and 21 300 full-time equivalent employees, respectively, and by an aggregate 2 560 workers in the five upstream sectors.[12]

28. In a related study, Hanson and Reinert (1997) investigate the distributional effects of textile and clothing protection in the United States. Using the CGE model of Reinert (1993), they disaggregate households into eleven income groups and assess the effects of MFA quota removal on the different groups. Contrary to Cline (1987), they find that textile and clothing protection is slightly progressive. In particular, the losses in employment opportunities for low–wage workers in textile and clothing production after MFA elimination are not entirely offset through lower consumer prices. Hence, removing quota–protection is predicted to affect the US income distribution slightly in the direction of greater inequality.

29. The impact of ATC reforms on some major developing country exporters, notably Asian countries, have also been subject to quantitative investigations. For example, Yang and Zhong (1998) use the GTAP–CGE model to compare projected annual changes in output and trade for some major textile and clothing exporters with and without trade liberalisation. One of their findings is that while trade liberalisation would accelerate output growth in China, textile output would continue to grow much less rapidly than GDP. In contrast, growth in clothing production exceeds overall economic growth. The group of newly industrialised economies (NIEs) shows an opposite growth pattern, pointing to fiercer competition from China in clothing production after trade liberalisation, while increased textile demand in China and other efficient clothing producers helps boost textile production in the NIEs. In a related study (Zhong and Yang, 2000), the authors estimate that China would realise welfare gains of as much as USD 8.6 billion per year from the phasing out of the MFA. This would correspond to almost two–thirds of the country's total gains from liberalising according to Uruguay Round patterns.

30. Ianchovichina, Martin and Fukase (2000) evaluate the impacts of China's accession to the WTO, based on the "accession offer" of November 1999. Their GTAP-analysis uses economic projections for the period 1995-2005. They find that the most important sectoral impacts of China's accession to the WTO would concern the clothing industry. Production of clothing is expected to rise by 249% over the ten year period following accession, compared to 54% in a counterfactual scenario of no accession. Exports would increase by 330%, compared to 43% without accession. The expansion of clothing production is predicted to stimulate input demand for imported textiles, to the extend that the latter would increase by 163%.

31. Walmsley and Hertel (2000) use a dynamic version of the GTAP model to analyse the effects of alternative target dates for the elimination of China's MFA quotas following WTO accession. In particular, they compare a scenario in which quotas levied by North American and European countries are assumed to be eliminated at the beginning of 2005 with one in which safeguards are invoked to delay the removal of quotas on Chinese textiles and clothing until 2010. The results indicate that China, North America and Europe would all experience lower welfare gains from deferred liberalisation. Moreover, the authors find that job losses in the textile and clothing industries of industrialised countries are delayed, but not avoided, when quotas are phased out more gradually.

32. China's and Chinese Taipei's accession to the WTO is also the subject of analysis by Francois and Spinanger (2002). Similar to other analysts, they see textiles and clothing as sectors with very strong production and export potential in Greater China, particularly the People's Republic. ATC reforms alone are expected to increase China's GDP by 1.1%, which corresponds to about a fifth of the economy-wide growth impact of WTO accession. According to the authors' GTAP results, WTO accession and ATC reforms will increase textile exports significantly both in China (+39%) and Chinese Taipei (+14%). For clothing, exports from China are expected to explode (+168%), while those from Chinese Taipei (-53%) will likely contract. More generally, countries that have profited from preferential market access to industrial countries through the MFA are expected to suffer substantial losses in international market share. The authors also evaluate the prospective impact of China's WTO accession and ATC reforms on Hong Kong (China) and conclude that Hong Kong (China) will remain a major sourcing hub for textile and clothing production, but will face fiercer competition in world markets.

33. Another developing country beside China that is expected to experience significant production, export, and welfare increases from ATC reforms is India. In their study of the impact of global trade policy, Chadha *et al.* (2000) expect India to experience welfare improvements of USD 1.9 billion (in 1995–USD) from the phase-out of MFA quotas, which corresponds to more than half of the country's total Uruguay Round gain.[13] These gains are likely to have further increased in recent years, as export tax equivalents of Indian MFA quotas for textiles and clothing have risen over time (Kathuria and Bhardwaj, 1998; Kathuria, Martin and Bhardwaj, 2001). Moreover, when studying the implications of domestic policy reforms in India in the context of trade liberalisation, Elbehri, Hertel and Martin (2003) find that if

labour productivity in Indian textile and clothing industries would increase by 67% to reach the level enjoyed by China, the benefits from ATC reforms for the country would more than double.

V. Summary

34. The preceding sections surveyed a considerable number of quantitative analyses of ATC reforms. The key characteristics and main results of 29 assessments, drawn from 16 different studies, are summarised in Annex Tables 6A.1 and 6A.2. The ATC reform simulations rely on differing modelling approaches, base data, and structural assumptions, which, as discussed in section II, drive the results. It seems *a priori* impossible to judge which analyst is right or wrong in his or her assessment. In any case, having several estimates derived under different circumstances can make it possible to increase one's confidence about some consistently obtained simulation outcomes, while at the same time help to identify issues that might warrant further analysis.

35. For example, the modelling results consistently indicate considerable shifts in textile and clothing production and trade as the ATC is implemented. There is pressure for a large-scale reallocation of resources, with production of textiles and clothing expanding in Asian and other developing countries. In parallel, textile and clothing production in industrialised countries is expected to contract significantly, while imports of textiles and clothing from developing countries increase.

36. All the reviewed studies foresee increases in global welfare as a result of a liberalisation of trade in textiles and clothing. But the estimates of welfare gains show considerable variation, with expected annual global benefits ranging from USD 6.5 billion to USD 324 billion. Some studies predict ATC reforms to account for up to two-thirds of all gains from the Uruguay Round, while others put the contribution of textile and clothing liberalisation at merely 5%. There is similar discrepancy with respect to the distribution of welfare gains. A number of analysts see developing countries as the main beneficiaries of ATC reforms, while others expect them in the aggregate to lose from the policy changes. There is also variation in the direction and magnitude of expected welfare impacts at the level of many individual developing countries.

37. In this context of uncertainty regarding the reform outcome, it is striking that developing countries have consistently been supporting the removal of the MFA. But, as some of the quantitative studies show, this stance is understandable in a dynamic world where capital accumulation effects are taken into account and the fact that inefficient quota-allocation schemes can lead to a dissipation of quota rents over time. Under these circumstances, elimination of the MFA might make it possible for developing countries to seize upon their comparative advantage in textiles and clothing and increase their export revenues and incomes.

38. Another significant result from the empirical studies is that Canada, the European Union and the United States are expected to experience substantial increases in welfare from ATC reforms, while these countries had been among the initiators of the MFA in the first place. The optimistic modelling results seem partly due to the implicit assumption that resources that are released from some activity can switch to another one without major disruption. In other words, any potential short– or medium–term adjustment problem is assumed away. This assumption makes it difficult to properly understand the purpose of quotas. Of the reviewed studies, only De Melo and Tarr (1990) try to incorporate adjustment costs into their assessment, and this in a rather *ad hoc* way. While substantial welfare gains for most OECD countries from lower consumer prices and more efficient resource allocation seem likely in the longer run, potential adjustment problems following MFA phase-out are an important policy consideration.

NOTES

[1] The quotas on exports from developing countries were to grow by 6% annually, although the growth rate of bilateral quotas often fell short of this target. The MFA also foresaw some limited flexibility that allowed countries to transfer a portion of an unfilled quota from one category to another ("swing"), to use the unfilled quota from the previous year ("carry-over"), or to borrow quota from the next year ("carry-forward").

[2] An earlier version of the analysis was published as a working paper (Trela and Whalley, 1988).

[3] This study was completed before the ATC came into effect, so that it does not assess the ATC as such.

[4] The analysis draws on a doctoral dissertation (Yang, 1992a) and a working paper (Yang, 1992b).

[5] In the Nguyen *et al*. analysis, textiles and clothing are grouped together with furniture into a 'light industries' sector, so that a part of the reported welfare gains from trade liberalisation will be due to improved furniture market access.

[6] Yet, employment losses have to be seen in the context of ongoing restructuring in the textile and clothing sectors, which in the United States, for example, has resulted in the contraction of employment by 725 000 jobs between 1994 and 2002.

[7] The estimates apply to the removal of industrial quotas, which in the authors' analysis comprise quotas on Japanese car exports alongside textile and clothing quotas.

[8] In the case of increasing returns to scale and imperfect competition, there is no dichotomy between homogenous domestic products and heterogeneous imported products. Both domestic and imported products are heterogeneous, while with perfect competition and constant returns to scale the use of the so called "Armington assumption", which implies that imports from different regions are imperfect substitutes, leads to an inherent home bias with a relatively low transmission of import price changes to the domestic market.

[9] The study was also published as a book chapter (Harrison, Rutherford and Tarr, 1996).

[10] This study was completed before the ATC came into effect and therefore does not directly assess the ATC.

[11] Concerning adjustment impacts on capital owners in the textiles industry, the losses can be expected to be relatively modest, as the US textile industry has consistently lagged the sector-average in terms of profitability. This study was also completed before the ATC came into effect and therefore does not directly assess the ATC.

[12] This study was completed before the ATC came into effect and therefore does not directly assess the ATC. It should also be noted, however, in retrospective, these estimates of employment effects far understate the employment loses that was experienced by the US textile and clothing industries which have exceeded 800,000 between 1994 and 2002.

[13.] This study is related to the earlier conference paper by Chadha, Pohit, Stern and Deardorff (1999).

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ANNEX TABLES

Annex Table 6A.1 Structural Characteristics of ATC Reform Studies

Study		Author affiliation	Approach	Base year	Dynamics	Competition	Imports	Sectors (T & C)	Regions	Policy reform
Trela & Whalley (1990)	a	Univ.-CAN	CGE	1986	Static	Perfect	Homogeneous	15 (14)	37	Quota & tariff elimination
	b		CGE	1986	Static	Perfect	Homogeneous	15 (14)	37	Quota elimination
Trela & Whalley (1995)	a	Univ.-CAN	CGE	1986	Static	Perfect	Homogeneous	15 (14)	37	Quota & tariff elimination
	b		CGE	1986	Static	Perfect	Homogeneous	15 (14)	37	Quota elimination
Nguyen *et al.* (1993).		Univ.-CAN	CGE	1986	Static	Perfect	Heterogeneous	9 (1)	10	Exp. of quotas by a factor of 4
Yang (1994)		Univ.-AUS	PE	1986	Static	Perfect	Heterogeneous	2 (2)	8	Quota elimination
Francois *et al.* (1994)	a	GATT	CGE	1990	Dynamic	Perfect	Heterogeneous	15 (2)	9	Quota elimination & tariff red.
	b		CGE	1990	Dynamic	Monop.	Heterogeneous	15 (2)	9	Quota elimination & tariff red.
	c		CGE	1990 & 2005	Dynamic	Perfect	Heterogeneous	15 (2)	9	Quota elimination & tariff red.
	d		CGE	1990 & 2005	Dynamic	Monop.	Heterogeneous	15 (2)	9	Quota elimination & tariff red.
Francois *et al.* (1996)	a	GATT	CGE	1992	Static	Perfect	Heterogeneous	19 (2)	13	Quota elimination & tariff red.
	b		CGE	1992	Semi-dyn.	Perfect	Heterogeneous	19 (2)	13	Quota elimination & tariff red.
	c		CGE	1992	Dynamic	Perfect	Heterogeneous	19 (2)	13	Quota elimination & tariff red.
	d		CGE	1992	Static	Monop.	Heterogeneous	19 (2)	13	Quota elimination & tariff red.
	e		CGE	1992	Semi-dyn.	Monop.	Heterogeneous	19 (2)	13	Quota elimination & tariff red.
	f		CGE	1992	Dynamic	Monop.	Heterogeneous	19 (2)	13	Quota elimination & tariff red.
Yang *et al.* (1997)		Univ.-AUS & WB	CGE	1992	Static	Perfect	Heterogeneous	10 (2)	10	Quota elimination & tariff red.
Hertel *et al.* (1996)		Univ.-USA & WB	CGE	1992	Static	Perfect	Heterogeneous	10 (2)	15	Quota elimination
Bach *et al.* (2000)	a	Univ.-DNK/USA & WB	CGE	1992	Static	Perfect	Heterogeneous	8 (2)	13	Quota elimination
	b		CGE	1992 & 2005	Static	Perfect	Heterogeneous	8 (2)	13	Quota elimination
Harrison *et al.* (1997)	a	Univ.-USA & WB	CGE	1992 & 94	Static	Perfect	Heterogeneous	22 (2)	24	Quota elimination & tariff red.
	b		CGE	1992 & 94	Static	Monop.	Heterogeneous	22 (2)	24	Quota elimination & tariff red.
	c		CGE	1992 & 94	Dynamic	Monop.	Heterogeneous	22 (2)	24	Quota elimination & tariff red.
Yang (1996)		UN	CGE	1992 & 2005	Static	Perfect	Heterogeneous	6 (2)	15	Quota elimination
Chadha *et al.* (2000)		R-Inst.-IND	CGE	1995	Static	Monop.	Heterogeneous	23 (2)	7	Quota elimination
Diao & Somwaru (2001)		IFPRI & Gov.-USA	CGE	1997	Dynamic	Perfect	Heterogeneous	7 (2)	13	Exp. efficiency incr. & tariff red.
Fouquin *et al.* (2002)		R-Inst.-FRA	CGE	1997	Static	Perfect	Heterogeneous	7 (2)	13	Quota elimination
Lankes (2002)		IMF	CGE	1997	Static	Perfect	Heterogeneous	7 (3)	17	Quota & tariff elimin. in ind. c.

Annex Table 6A. 2 Estimates of Annual Welfare Gains from ATC Reforms (Base Year Billion USD)

Study		Global	CAN	EU	JPN	USA	CHN	IND	All dev. c'tries (% of tot gains)	Share of UR (% of tot gains)	Comment
Trela & Whalley (1990)	a	23.4	0.8	2.2		12.3	1.8	0.1	35%		
	b	21.9	0.9	3.0		15.0	0.9	-0.1	13%		
Trela & Whalley (1995)	a	49.7	1.1	3.7		16.4	1.9	0.5	57%		Capturing effects of inefficient quota-allocation.
	b	48.3	1.2	4.7		19.2	1.2	0.3	48%		Capturing effects of inefficient quota-allocation.
Nguyen *et al.* (1993).		84.5	1.6	17.2	-0.5	21.6			49%	40%	
Yang (1994)		7.3		1.0	-0.1	2.2	0.4		52%		
Francois *et al.* (1994)	a	47.0	1.7	26.4	-0.3	23.6	-1.0		-16%	42%	Dynamics through endogenous capital stock
	b	189.0	6.3	70.7	1.3	62.9	1.6		19%	65%	Dynamics through endogenous capital stock
	c	71.0	2.7	42.9	-0.4	38.4	-3.5		-24%	39%	Dynamics & 2005 projected economy
	d	324.0	10.2	115.1	2.1	102.3	5.4		23%	64%	Dynamics & 2005 projected economy
Francois *et al.* (1996)	a	18.4	0.3	5.9	-0.6	7.1	3.3		27%	46%	
	b	28.4	0.7	8.6	-0.8	10.8	5.4		28%	44%	Endogenous capital stock & fixed savings rate
	c	35.7	1.0	9.4	-0.6	11.9	5.9		36%	35%	Endogenous savings rate & end. capital stock.
	d	58.7	-0.2	10.3	2.0	11.7	9.4		61%	59%	
	e	118.1	-0.1	17.3	3.3	19.2	19.0		68%	61%	Endogenous capital stock & fixed savings rate
	f	107.7	0.4	18.5	4.2	22.6	11.2		59%	50%	Endogenous savings rate & end. capital stock.
Yang *et al.* (1997)		28.6		13.5	-1.7		5.6		-4%	38%	
Hertel *et al.* (1996)		37.3		24.9	0.8		5.9		-32%	14%	Based on 2005 projected economy
Bach *et al.* (2000)	a	16.2		8.1	0.2		1.9	1.4	-11%	30%	
	b	38.9		23.3	0.7		7.2	1.9	-20%	38%	Based on 2005 projected economy
Harrison *et al.* (1997)	a	16.0	0.9	7.6	-0.5	10.1	0.9		-14%	27%	
	b	16.4	0.9	7.6	-0.6	10.0	1.0		-9%	17%	
	c	20.3	1.0	7.8	-0.5	9.2	1.7		17%	12%	Dynamics through endogenous capital stock
Yang (1996)		52.9		30.7	3.7		5.1		-31%	49%	
Chadha *et al.* (2000)		6.5	0.8		-1.7	4.4	0.6	1.9	37%	5%	
Diao & Somwaru (2001)		203.0		19.4			23.7	10.8	72%		Welfare effects after year 20
Fouquin *et al.* (2002)		9.8		1.5	-0.8		6.0	4.1			
Lankes (2002)		34.7							69%		

Source: OECD Secretariat.