United Nations TD/B/C.I/16

United Nations Conference on Trade and Development

Distr.: General
25 March 2011

Original: English

Trade and Development Board
Trade and Development Commission
Third session
Geneva, 6–10 June 2011
Item 5 of the provisional agenda

Integration of developing countries in global supply chains, including through adding value to their exports

Note by the UNCTAD secretariat

Executive summary

Over the last three decades, global supply chains (GSCs) have increasingly gained importance in linking developing countries to international markets. Initially, GSCs operated in only a few selected economic sectors, and were largely confined to developed countries. Developing countries' participation in GSCs was minor, and limited to labour-intensive processes. Since the 1990s, declines in the costs of cross-border transactions – due to trade liberalization, technological progress, and improvements in transport logistics and management, and also to increases in the industrial capacity in developing countries – have allowed GSCs to further segment, and to gradually integrate developing countries into production networks. Today, a substantial share of GSCs' production processes is taking place in developing countries. For developing countries and their enterprises, GSCs offer opportunities, as well as challenges. GSCs, while greatly facilitating access to developed countries' markets, also demand greater efficiency and competence from suppliers. For developing countries, it is therefore important to implement economic policies that, at the same time as increasing the competitiveness of their enterprises, also improve their reliability and efficiency. In the past, the competitiveness of developing countries' enterprises was mainly based on trade policies – often in the form of preferential market access. Trade policies, although still important, are not sufficient anymore. This is due not only to preference erosion and to tariff declines, but also to the GSCs' business model itself. In GSCs, competitiveness (and therefore delocalization choices, too) are determined by a wide range of factors, but especially by the quality of policies influencing the overall

business environment. These policies relate to developing transport and infrastructures, fostering competition in logistics and other trade-related services, enforcing the rule of law, improving customs procedures, providing fiscal and other incentives, and also investing in the human capital necessary to rise along the value chain. In this regard, LDCs and other low-income countries are often confronted with substantial disadvantages, as implementing these policies requires substantial resources, which are lacking. Therefore, properly directed development assistance would help. However, without a long-term national strategy aimed at improving the business environment, development assistance would not be sufficient. In the absence of business-supporting national policies, LDCs and low-income countries would continue to participate in GSCs only as providers of low value-added components, resulting in only a limited contribution to their development.

Introduction

1. The Trade and Development Board, at its fiftieth executive session,[1] decided that the Trade and Development Commission would address the topic of the integration of developing countries in global supply chains, including through adding value to their exports. The present note is prepared to facilitate the Commission's discussion under this agenda item.

I. Overview

2. Over the last three decades, the progressive liberalization of cross-border transactions, advances in production technology and information services, and improvements in transport logistics and services have provided firms with greater incentives to fragment production processes and to geographically delocalize them. Global supply or production chains, where cost-reduction strategies result in goods often being produced with intermediate inputs originating from several countries, are now common in many industries and extend over an increasing number of developing countries.

3. From an economic standpoint, the emergence of GSCs is related to the concept of comparative advantage. By relocating production processes (i.e. R&D, concept, design, manufacturing, packaging, marketing, distribution and retailing) in different countries, transnational corporations (TNCs) can take advantage of the best-available human or physical resources in different countries, with a view to maintaining their competitiveness by augmenting productivity and minimizing costs.[2]

4. For developing countries and their enterprises, the potential opportunities from joining GSCs are substantial. Indeed, integration into GSCs has become an important pillar of their policies for export-led development. GSCs enable producers within the chain to obtain modern management know-how and hands-on information on quality standards and technology, and thus to become more competitive. Such producers also quickly learn about demand patterns in high-income markets, and these markets' consumer preferences.[3] Participation in GSCs could also create economy-wide externalities for developing countries, such as employment, improvement in technology and skills, productive capacity upgrading, and export diversification into more value added. In turn, those externalities

[1] The symbol of this meeting report is TD/B/EX(50)/5.
[2] UNCTAD (2010a).
[3] Gereffi (1999); Altenburg (2000); Tewari (1998).

would increase their attractiveness to more foreign direct investment (FDI). These potential gains explain the acute interest of policymakers in many developing countries in ways of linking their private sectors to GSCs.

5. However, fundamentally, GSCs are a business strategy of TNCs, and are driven by TNCs' business interests. Low labour costs alone are not a sufficient justification for relocating a part of a TNC's production process. GSCs also rely on sophisticated and competitive networks of goods and information flow. Participating and upgrading along the chains requires not only manufacturing skills, but also a sound business environment – elements which are often lacking in developing countries.

6. GSCs have different structures, depending on three main factors: (a) the geography and nature of linkages between tasks in the chain; (b) the distribution of power among lead firms (TNCs) and other actors in the chain; and (c) the role of government institutions and policies in structuring business relationships and determining industrial location.[4]

7. The first factor, the geographical structure, is determined by the extent of the fragmentation of the production processes and by its delocalization. While the extent of fragmentation is generally specific to the sector, the choice on where to delocalize production processes depends not only on production and trade costs but also on the potential size of the domestic/regional market, as well as on proximity to high-income markets. The extent to which local markets are integrated with regional/international markets – both in regard to trade policies and infrastructure development – is important too.

8. The second factor, the distribution of power among the various firms in the GSCs, is reflected in the differing organizational structures of GSCs. Their structure can be classified in terms of the relational linkage between the buyers (lead firm) and their suppliers of manufactures (box 1). One extreme is the case of vertical integration, whereby some of the manufacturing stages are directly owned by the lead firm while certain parts and components may be bought from contract suppliers. The other extreme is the case of arm's-length contractual relationships, whereby buyers do not necessarily know and do not own their suppliers. Numerous types of different ownership structures can be found anywhere within the wide spectrum of the "buyer–supplier" relationship.

9. The third factor is related to government intervention. Governments play an important role in facilitating the integration of domestic firms in GSCs. Governments have often had recourse to trade policies to increase the competitiveness of their enterprises, especially by seeking preferential market access. Indeed, trade policies, by lowering trade costs, can help integrate domestic firms into GSCs. However, trade policies, although still important, are not sufficient anymore in the GSC business model. Removal of the behind-the-border trade-related barriers is necessary too.[5] Moreover, policies aimed at improvement of the overall business environment are essential in order to facilitate the integration of domestic firms in markets that are increasingly dominated by GSCs.

10. The first two factors are exogenous for policy implications and are largely dependent on the business model of a specific economic sector. Therefore, the special focus of this paper is to provide some insights on the third factor, so as to see how government institutions and policies – particularly trade policies – may influence the participation of developing-country enterprises in GSCs, including process and production upgrading and export value addition, with economy-wide effects.

[4] Sturgeon and Gereffi (2009).
[5] UNCTAD (2006).

Box 1. "Buyer–supplier" relational linkage of global supply chains

	(Weak) **Market-based arm's-length relationship**	**"Sticky" relationship**	(Strong) **Vertical integration**
Ownership structure	Lead firm (buyer) does not own any of the suppliers.	Lead firm (buyer) maintain some degree of relational linkage with suppliers	Lead firm (maker) directly or indirectly owns suppliers
Industry characteristics	Low level of technological requirements, labour-intensive, low design specification Economy of scale	Low level of technological requirements, labour-intensive, high design specification Economy of scope	High level of technological requirements, high design specification, labour-intensive or capital-intensive economy of scale and economy of scope
Product sectors	Consumer non-durables	Consumer non-durables	Consumer durables
Product characteristics	Standard, non-differentiated products (e.g. standard apparel, electronics, toys), long or short life cycle	Design- or process- or other requirement-specific products (e.g. designer apparel, footwear, electronics), short life cycle	Quality-sensitive (e.g. auto parts and components, assembly), long life cycle
Buyer characteristics	Mega (low-price) retailers International buyers (i.e. triangular production network)	Brand owners International buyers (i.e. triangular production network)	Makers Brand owners
Supplier location	Low-income developing countries	Low- or middle-income developing countries	Middle- or higher-income developing countries
Buyer-supplier transfer of technology	Unlikely	Likely	Necessary

Adopted from: Kaplinsky (2005) and Milberg (2004).

Note: The market-based arm's-length buyer–supplier linkage is common in the industries whose manufacturing requires low-tech, labour-intensive standard techniques and where products are standardized. As production and process requirements increase, or as final products become more differentiated, chain management needs increase as well, thus the buyer–supplier linkage tends to become stronger. In general, the trend observed is that there are more low-income countries among low-cost suppliers of non-differentiated products, and middle- to higher-income developing countries as suppliers of more differentiated products.

II. Evolution of GSCs in relation to developing countries

11. Although the use of foreign suppliers by lead firms can be traced back several decades, it was not until the late 1980s that the outsourcing of production processes started to characterize business models. Initially limited to only a few sectors such as textiles, clothing and electronics, by the early 1990s the process of globalization (where firms were increasing their competitive advantage through global sourcing) was rapidly expanding to various industries and engaging firms in a number of developing countries. In one of the first comprehensive studies of new scenarios in global production, Gereffi and Korzeniewicz (1994) stated that: "In today's global factory, the production of a single commodity often spans many countries, with each nation performing tasks in which it has a cost advantage."

12. During most of the 1990s, delocalization and fragmentation were still limited to less complex and more labour-intensive parts of the production process. Most of the assembly and the component production that required technical skills and know-how was still performed by the lead firms (TNCs). Since then, progress in a number of areas has contributed greatly to the establishment of GSCs. The first is the rapid advancement in production technology, enabling various industries to further slice up their production chains. The second is the substantial reduction in information costs, leading to a more cost-effective relationship between buyers and suppliers. The third is the overall decline in trade costs both in home and host countries.[6] A recent study by the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) identifies which trade facilitation measures and policies could be the most effective at reducing non-tariff policy-related trade costs. It suggests that "improving port efficiency (liner shipping connectivity) and access to information and communication technology facilities are essential to reducing trade costs."[7] Those developments have provided lead firms with great incentives to delocalize further, including even their most complex production processes. Today, a large number of goods are produced in a truly global factory – products are designed in one country and assembled in another, with parts and components originating in third countries.

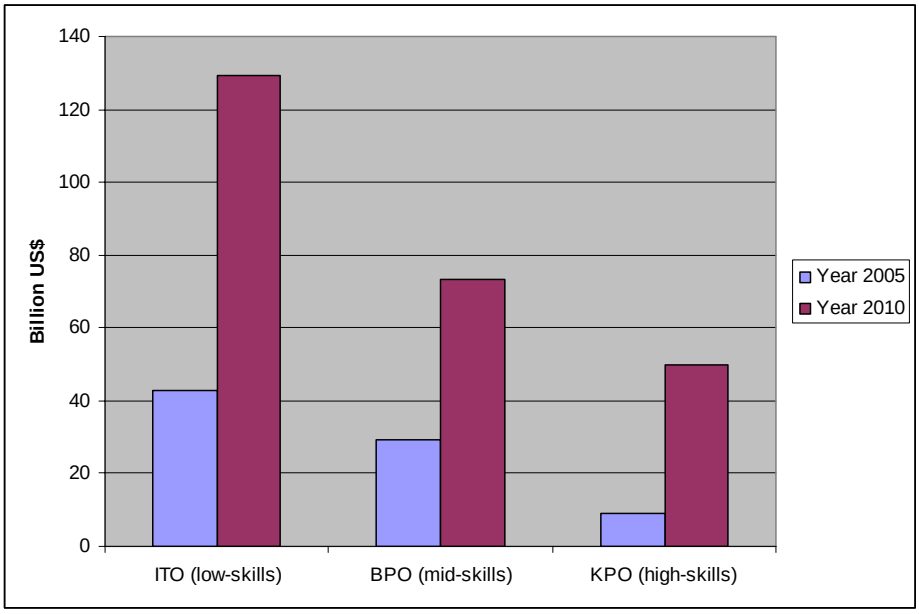
13. Delocalization of production processes encompasses not only manufacturing processes but also services. Although services offshoring is still largely related to low-skill processes, middle- and high-skill types of services are increasingly being offshored (box 2). The increasing trend to offshore these types of services may create great opportunities for developing countries able to meet this demand in terms of human capital.

[6] Jones, Comfort and Eastwood (2005).
[7] UNESCAP (2011).

Box 2. Services offshoring

Starting from a virtually zero base, the offshoring of services has been growing rapidly since the turn of the century. Precise data on the value of offshore services are lacking, however estimates for 2010 show their overall magnitude to be in the range of $250–300 billion (Gereffi and Fernandez-Stark, 2010). Besides the conventional services sectors, services that were traditionally embodied in the industrial manufacturing process are increasingly being offshored too. Thanks to technological progress, services such as research and development (R&D), design, elaboration, engineering, and other information-intensive activities can now be efficiently de-integrated and delocalized from the manufacturing process. Although the offshoring of services is still largely related to the low-skill segment, middle- and high-skill types of services are increasingly being offshored.

Offshored services by segments (2005 and 2010)



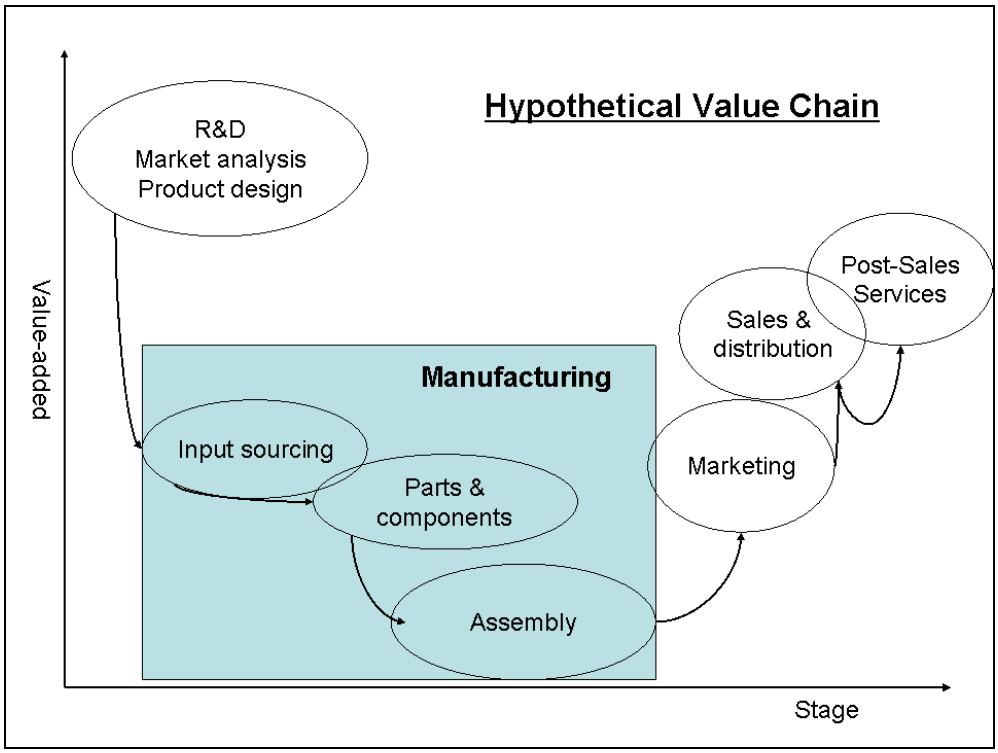
Source: Gereffi and Fernandez-Stark (2010), based on OECD data.

Note: Information Technology Outsourcing (ITO) covers the lower-skill segment (software development, applications and infrastructure management, IT consulting etc). Business Process Outsourcing (BPO) covers the middle-skill segment (management of the enterprise and of human and customer resources). Knowledge Process Outsourcing (KPO) covers the high-skill segment (business consulting, market intelligence and legal services).

14. As will be discussed later, a growing number of developing countries, particularly in East and South-East Asia, have been increasing their participation in GSCs as part of their export-led growth strategies, which embrace interrelated industrial, trade and investment policies. The key objectives are to (a) increase their integration in the world economy; (b) diversify their exports from commodities to more value-added manufactures and services; and (c) most importantly, provide economy-wide development benefits in terms of better employment and progressively higher living standards. A substantial number of developing-country enterprises have managed to enter into labour-intensive manufacturing segments of GSCs. Most of those enterprises are from middle-income developing countries.

15. The long-term development implications of participating in a GSC, however, remain ambiguous. After two decades of intensive GSC-building, developing-country experiences of participating in GSCs are rather mixed. Fundamentally, a GSC is a business strategy of a TNC, and it is never straightforward to merge the business interests of a global firm with strategies for the long-term socio-economic progress of developing countries participating in GSCs. Perhaps the biggest challenges for developing countries (especially those that are smaller and less developed) and their enterprises are: (a) to ensure their progressive movement upwards in terms of value addition in a GSC (as illustrated in fig. 1); (b) to enable local enterprises within GSCs to move up the technological ladder; and (c) to achieve economy-wide developmental impacts from integrating into GSCs.

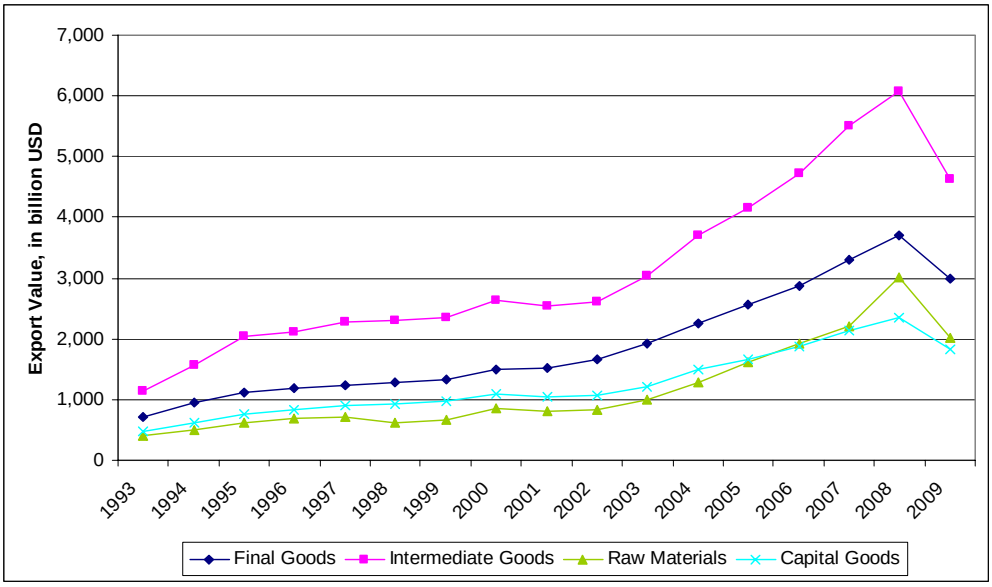
Figure 1. Value addition in GSCs



III. GSCs: trends in international trade

16. Some insights into the evolution of GSCs can be inferred from analysis of trade data. Since GSCs are characterized by fragmentation, the aggregated value in trade of intermediate products is highly correlated to their expansion. Figure 2 shows the value of international trade in intermediates vis-à-vis that of other products.

Figure 2. Trends in international trade



Source: UNCTAD secretariat calculation based on WITS-TRAINS databases.

17. Trade in intermediate products represents about 40 per cent of world merchandize trade. International trade in intermediate goods grew from about $1 trillion in 1993 to roughly $6 trillion in 2008, before falling during the crisis of 2009. In this context, GSCs are increasingly fragmented across a larger number of countries, each involved in the assembly process at a different stage. This results in parts and components crossing multiple borders before being incorporated into the final product.

18. GSCs have evolved from being mostly confined within developed countries to being increasingly present in developing countries. In the early 1990s, more than half of the world's trade in intermediates was between high-income countries, and only up to 10 per cent was between developing countries. In 2008, North–South and South–North trade in intermediates accounted for about 40 per cent of trade in intermediates, with another 20 per cent occurring between developing countries themselves (table 1). Although the economic crisis of 2009 has sharply reduced the trade in intermediates, the trend towards an increasing presence by developing countries in global manufacturing and in the trade in intermediate products has continued.

Table 1. World trade in intermediates

	Values (in billions of dollars)			*Percentages*		
	Average 1993/94	Average 2007/08	2009	Average 1993/94	Average 2007/08	2009
North–North	*780.7*	*2,387.2*	*1,704.2*	*58*	*41*	*40*
North–South	*254.5*	*1,222.3*	*922.4*	*19*	*21*	*22*
South–North	*191.3*	*1,074.3*	*758.5*	*14*	*19*	*18*
South–South	*125.8*	*1,098.6*	*887.5*	*9*	*19*	*21*

Source: UNCTAD secretariat calculation based on WITS-TRAINS databases.

19. The integration of developing countries in GSCs is not uniform, and largely depends on their income level (table 2). Upper-middle-income countries' exports of intermediates

account for more than half of the total exports of intermediates from developing countries. At the regional level, the East and South-East Asian region accounts for almost two thirds of developing countries' exports of intermediates. Latin America and Eastern Europe (including countries with economies in transition) represent another 30 per cent. The remainder is shared between South Asia, West Asia, North Africa and Sub-Saharan Africa, whose participation in GSCs, although increasing, is still rather limited.

Table 2. Exports of intermediate products for developing and transition country income groups and regions

Income group/region	**Value in billions of dollars** Average of 1993 &1994	Average of 2008 & 2009	2009	Annual growth rate (1993–2008)
High-income countries	*1,035.2*	*3,609.5*	*2,626.5*	*8.7%*
Middle-upper income countries	*223.9*	*1,173.8*	*886.2*	*11.7%*
Middle-lower income countries	*65.2*	*798.2*	*622.3*	*18.2%*
Low-income countries	*28.1*	*200.7*	*137.5*	*14.0%*
Total	***1,352.3***	***5,782.2***	***4,272.5***	***10.2%***
Developing-country regions				
East and South-East Asia	*192.0*	*1,343.1*	*1,075.2*	*13.8%*
Eastern Europe	*40.8*	*372.3*	*231.1*	*15.9%*
Latin America	*58.3*	*279.0*	*220.5*	*11.0%*
Middle East/North Africa	*4.1*	*37.2*	*24.9*	*15.8%*
South Asia	*9.7*	*74.2*	*49.3*	*14.5%*
Sub-Saharan Africa	*12.2*	*67.0*	*45.0*	*12.0%*

Source: UNCTAD secretariat calculation based on WITS-TRAINS databases.

20. Developing country participation in GSCs is still mostly related to supplying developed countries' markets. Although on the rise, South–South production networks are relatively less developed and are mainly limited to East and South-East Asia. Trade in intermediate products within the East and South-East Asian region now accounts for about 9.6 per cent of world trade in intermediates (up from about 6.1 per cent in 1993). The figures for the Eastern European and Latin American regions are much lower (about 1.9 and 1.1 per cent respectively). Other regions are lagging behind, with their regional trade accounting for less than 0.2 per cent of world trade in intermediates. South–South chains that span across regions appear to be still quite underdeveloped, even those based in the East and South-East Asian region (table 3).

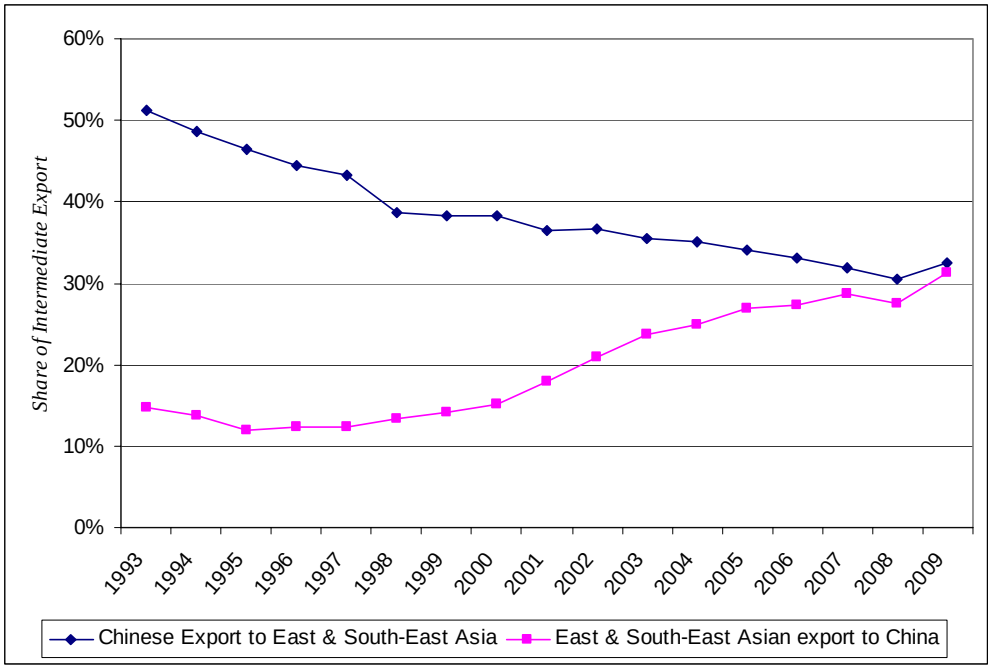
Table 3. Distribution of world trade in intermediate products across regions (2008)

Region	High Income Countries	East and South-East Asia	East Europe and CIS	Latin America	West Asia and North Africa	South Asia	Sub-Saharan Africa	***All Importers***
High Income Countries	*40.3%*	*10.4%*	*4.0%*	*3.7%*	*1.8%*	*1.1%*	*0.6%*	***62%***
East and South-East Asia	*10.1%*	*9.6%*	*0.9%*	*1.2%*	*0.5%*	*0.6%*	*0.3%*	***23%***
East Europe and CIS	*3.2%*	*0.4%*	*1.5%*	*0.2%*	*0.5%*	*0.1%*	*0.0%*	***6%***
Latin America	*2.9%*	*0.6%*	*0.1%*	*1.1%*	*0.1%*	*0.0%*	*0.1%*	***5%***
West Asia and North Africa	*0.9%*	*0.1%*	*0.2%*	*0.0%*	*0.2%*	*0.1%*	*0.0%*	***2%***
South Asia	*0.8%*	*0.3%*	*0.0%*	*0.1%*	*0.1%*	*0.1%*	*0.1%*	***1%***
Sub-Saharan Africa	*0.7%*	*0.2%*	*0.0%*	*0.0%*	*0.0%*	*0.1%*	*0.2%*	***1%***
All exporters	***59%***	***22%***	***7%***	***6%***	***3%***	***2%***	***1%***	***100%***

Source: UNCTAD secretariat calculation based on WITS-TRAINS databases.

21. The structure of GSCs is not static, but develops over time to take advantage of changes in relative costs and in economic and policy environments. In the case of the East and South-East Asian region, the data illustrate the rising importance of China as an assembly powerhouse (fig. 3). In relative terms, China's exports of intermediates to the region have been declining constantly since the early 1990s. Instead, China has become increasingly important to regional suppliers of intermediates. This may suggest that GSCs are increasingly fragmenting the production processes, localizing their assembly operations to China while delocalizing the supply of parts and components to other countries in the region.

Figure 3. China's trade in intermediates within the East and South-East Asian region



Source: UNCTAD secretariat calculation based on WITS-TRAINS databases.

22. The delocalization of production processes across industries has often been shaped to take advantage of a country's comparative advantages (both in endowments and policy-driven dynamics) in specific sectors, with the creation of regional specializations (table 4). For example, a relatively higher efficiency and abundant skilled labour force is one of the forces behind the emergence of East and South-East Asia as a supplier of ITC products (about half of the exports of intermediates in this region are in ITC products). Similarly, geographic proximity and largely duty-free access to consumer markets have been among the determinants for delocalizing the automotive industry to Latin America or Eastern Europe. Finally, lower labour costs are one of the factors behind the localization of global production chains in textiles and apparel in South Asia, West Asia and North Africa (about 60 per cent of all intermediate exports from those regions are in the textile and apparel sector).

Table 4. Composition of exports of intermediates across industries and regions (2008)

Industry	High Income Countries	East and South-East Asia	East Europe and CIS	Latin America	West Asia and North Africa	South Asia	Sub-Saharan Africa
Textile and apparel	5%	14%	9%	9%	43%	65%	17%
Power generating machines	7%	2%	8%	6%	4%	4%	5%
Metal working machines	2%	1%	1%	0%	1%	1%	1%
General industry machinery	12%	5%	8%	7%	4%	6%	18%
Information Technology and Communications	18%	49%	22%	28%	7%	7%	6%
Electrical machinery	7%	9%	11%	10%	11%	4%	4%
Road vehicles	24%	5%	21%	25%	21%	6%	31%
Furniture and parts thereof	2%	3%	6%	3%	2%	1%	3%
Others	24%	12%	13%	13%	7%	6%	16%
Value of Intermediates Exports, in billion USD	***3'739.1***	***1'931.5***	***246.6***	***262.9***	***89.9***	***82.0***	***24.5***

Source: UNCTAD secretariat calculation based on WITS-TRAINS databases.

23. These trends in trade flows imply that delocalization of production processes in GSCs depend not only on endowments, labour costs and productivity, but also on trade and other economic policies.

IV. GSCs: trade and economic policies

24. Trade policies directly affect the integration of domestic firms into GSCs in two major ways. Firstly, trade policies can add to the cost of inputs. Excessive tariffs on intermediate products make countries less attractive to global investment and are detrimental to the localization of production processes. Secondly, unfavourable market access conditions would put assemblers in a relatively disadvantaged position in distributing final products to consumers. To minimize this cost, lead companies generally prefer delocalizing the last blocks of GSCs in countries with duty-free or preferential access to final markets. This is one of the reasons why preferential trade agreements improving access to developed-country markets are important determinants in the localization of production processes. Another policy response is illustrated by WTO's Information Technology Agreement (ITA), which eliminated most-favoured-nation tariffs on a wide range of computer-related equipment (including semiconductors and software), as well as telecommunications equipment and some office equipment. These goods represent a crucial flow of international trade, amounting to about $4 trillion in 2008. Today, the ITA has 73 WTO member States, from both developed and developing countries, and covers about 97 per cent of world trade in information technology products.

25. Trade policy is often directed at protecting final products rather than intermediates. This gives an advantage to localizing the last blocks of production processes in consumers' markets. The relatively lower tariff on intermediates provides a greater incentive to import them (and thus for them to be produced in developing countries). On the other hand, the higher tariff on final products provides an incentive to localize assembly in large (or potentially large) consumer markets, or in countries enjoying free access to consumer markets. This trend, where tariffs increase along the production chain, is generally referred to as tariff escalation. Tariff escalation is often used to provide an advantage to domestic firms engaged in the assembly of the higher-value-added final products rather than in the provision of low-value-added intermediates.

Table 5. Average effectively applied tariffs on selected industries (final and intermediate products)

Industry	Average tariff on:	
	Final goods	Intermediates
Textiles and apparel	*7.1*	*3.1*
Power-generating machines	*3.6*	*1.9*
Metalworking machines	*4.3*	*2.4*
General industry machinery	*2.9*	*3.2*
Information technology and communications	*2.6*	*1.4*
Electrical machinery	*2.8*	*3.1*
Road vehicles	*5.6*	*3.3*
Furniture and parts thereof	*2.1*	*1.5*
Others	*2.7*	*1.9*
Total	***4.3***	***2.2***

Source: UNCTAD secretariat calculation based on WITS-TRAINS databases.

26. In general, the tariffs applied on final goods are higher than those on intermediates (table 5). With the exception of two sectors (general industry and electrical machinery), applied tariffs on final products are relatively higher, in all other industries. Low tariffs contribute to the delocalization of production processes in industries such as ITC, while higher tariffs on road vehicles play a role in retaining the assembly of these products in developed countries. Still, for some economic sectors, there is no direct evidence that tariffs affect the delocalization of production process. This suggests that other factors (besides trade policies) may be of greater importance.

27. To illustrate the relative importance of trade policy versus other determinants of participation in GSCs, table 6 gives some indicators of trade policy versus other economic policies (combined in an indicator of business environment), by income country-groups.

Table 6. Trade policy and business environment, by income country-groups

Country-group	Tariff faced by processed and final goods (percentage)	Tariff imposed on intermediate products (percentage)	Business Environment Index (lower is better)
High-income	*0.95*	*0.25*	*24.23*
Middle-income	*1.50*	*1.37*	*83.47*
Low-income	*3.19*	*3.22*	*123.58*
Least developed countries	*2.59*	*4.17*	*138.39*

Source: UNCTAD secretariat calculations based on WITS-TRAINS and World Bank databases.

28. Overall trade policy is captured by two indicators: effectively applied tariffs imposed on intermediate products, and those faced by final products. The overall business environment is measured by the World Bank's Doing Business index. This index provides a

measure of various aspects affecting business environment, including government regulations such as on starting a business, dealing with construction permits, registering property, getting credit, protecting investors, paying taxes, enforcing contracts and closing a business. Although all these indicators normally ameliorate with the growth of gross domestic product per capita, they are also positively correlated with participation in GSCs. Countries with economies that are more integrated in GSCs tend to have more open trade policies, face lower market-access restrictions in high-income markets (which are the main locations of lead firms), and have a more conducive business environment. The reason for this correlation is that the effectiveness of the business models behind GSCs is highly dependent on the above variables.

29. Although appropriate trade policies and a favourable business environment are both important in putting into place the conditions for countries to integrate into GSCs, their relative importance differs. Table 7 provides an indication of the role played by traditional trade policies in relation to that of the business environment.[8] This table shows the increase in participation in global production chains (measured by the increase in trade in intermediate products) that a given country group could obtain by aligning its policy to the level of another country-group.

Table 7. Importance of traditional trade policy versus overall business environment

	Increase in trade (as a percentage) due to:		
Policy change	Change in applied tariffs on processed and final goods	Change in applied tariffs on intermediates products	Change in Business Environment Index
Middle income to high income	*2.6*	*4.8*	*40.7*
Low income to middle income	*7.9*	*7.9*	*27.6*
LDC to middle income	*5.1*	*13.1*	*37.7*

Source: UNCTAD secretariat calculation.

30. By abating trade costs, more open market access conditions do contribute to the integration of countries into GSCs. However, given the already low level of effectively applied tariffs, the additional advantage provided by further trade liberalization through unilateral measures or market-access negotiations is generally not large. For example, for low-income countries, a reduction in the applied tariff on intermediates products from the existing average of 3.22 per cent to 1.37 per cent (a level similar to that of middle-income countries) would increase their trade in intermediates by about 8 per cent. A similar effect would result from an improvement in market access (a reduction in the tariff faced by their final and processed products from 3.19 per cent to 1.5 per cent). It also appears that middle- and low-income countries could achieve similar trade effects through a better functioning of existing export processing zones and a more efficient management of formally applied duty drawback systems so as to implicitly eliminate or reduce tariffs on imported inputs for export-oriented enterprises.

[8] Participation in global production chains is estimated econometrically with a panel gravity equation. Table 7 illustrates the effect on participation in GSCs (measured as trade of intermediate products) of a change in trade policy and improvement in the business environment.

31. On the other hand, a substantial improvement in the business environment would result in far more positive effects on growth of trade in intermediate products, particularly for middle- and low-income countries (both for developing countries and for countries with economies in transition).

32. Tariffs are traditional price-based trade policy instruments, while non-tariff measures can also add to the cost of trading and thus have an impact on the extent to which firms and countries integrate into GSCs. Although information costs of non-traditional trade barriers are often internalized by the lead firms, some of these barriers still add to the overall costs of moving the goods along the chain.

33. In particular, non-tariff measures such as standards, technical regulations, conformity assessment systems, complex rules of origin, subsidies, and restrictive trade-related financial and investment regulations that protect domestic industries from foreign competition have, today, a relatively greater and growing importance in shaping participation in GSCs. Removal of such barriers, for example through deeper integration via regional preferential trade agreements (RTAs),[9] is found to double trade in intermediate products among their members.[10] Today, almost all RTAs include trade facilitation and technical assistance measures. These agreements facilitate the delocalization of production processes by removing behind-the-border obstacles to trade.[11]

34. However, as an increasing number of countries – both developing and developed – move towards freer trade via RTAs, the relative advantage provided by open trade policies is not sufficient to make a country attractive for the localization of global production processes.[12] Economic policies that reduce overall business costs or minimize the risks from international business relationships may be of greater value for facilitating integration in GSCs. Therefore, policies that improve trade-related infrastructures, increase competition in trade-related services, facilitate business start-ups, guarantee the rule of law and contract enforcement, and provide fiscal and other incentives to foreign firms, are essential.

35. In addition, the effectiveness of government institutions, and their capacity to implement policies, are critical. GSCs also often involve long-term investments that require equally long-term government commitments with regard to stable and predictable policies. For example, political instability and the resulting government policy instability is detrimental for turning domestic firms into reliable suppliers of GSCs. Econometric estimation suggests that an improvement in government effectiveness in low-income countries to match that of middle-income countries would increase the former's exports of intermediates by almost 50 per cent.

36. The greater importance to GSCs of the business environment and of government effectiveness is directly related to GSCs' increasing sophistication and drive for efficiency. GSCs are extremely competitive partly because they take advantage of localization due to lower labour costs, but more so because such competitiveness comes from a sophisticated management of the chain. The majority of modern GSCs appear to rely more on the ability to move goods continuously, safely and economically, rather than on lower labour costs.

[9] In this paper, the term "RTA" refers to all types of preferential trade agreements, including bilateral free trade agreements (FTAs).

[10] These results are based on an econometric estimation where the effects of FTAs are captured by a dummy variable.

[11] Still, from an economic perspective, preferential trade agreements should be considered as sub-optimal instruments, given that maintaining barriers against non-members (while allowing free trade among members) could hinder the "natural" expansion of fragmentation-based specialization across countries.

[12] Fugazza and Nicita (2011).

37. In this regard, one of the key aspects of GSCs is synchronization – goods flow in and out of chains in a just-in-time process, so as to keep costly inventories to a minimum.[13] However, when inventories are low and a problem occurs in any of the production blocks, it quickly spreads along the entire chain, with snowballing costs. GSCs are often as fragile and prone to failure as their weakest supplier. Therefore, it is crucial that all players in a chain be fully reliable. In practice, there is a trade-off between reliability of suppliers and production costs.

38. In general, the more knowledge-intensive a product is, the more GSCs are dependent on specialized and reliable suppliers. This is one of the reasons why most enterprises in the least developed countries (LDCs) are stuck in low-value-added segments of chains, and are operating in sectors where chains are shorter and less technologically intensive (i.e. the apparel and agro-food sectors).

39. Another issue that hinders the participation of developing countries in GSCs is the relative lack of medium-sized and large enterprises. Small-scale enterprises often face additional obstacles that make it difficult for them to enter GSCs. For example, GSCs require investments to guarantee timely shipments and high-quality parts and components. Difficulty in investing in productive and trading capacity is one of the reasons why small-scale enterprises are often locked into low-value-added production process with little opportunity to upgrade along the value chain.[14] Most importantly, small-scale enterprises are also disadvantaged because they rarely have management expertise that is able to meet the complex problems that GSC management involves. Moreover, small-scale enterprises often supply a single lead firm, thus making the entrepreneurship less dynamic and more vulnerable to shocks.

40. An essential element in GSC integration is the availability of skilled labour. The production of goods for international markets – particularly by supplying a GSC – requires a skilled labour force that has technical, managerial and entrepreneurial expertise. Therefore, from a policy perspective, there is a need to invest in the development of human skills and capabilities, and in knowledge-based services. It is also important to allow for qualified foreign labour permits, so that missing critical skills can be imported.

41. Finally, in cases where the lead firm owns part of the GSC, tax policy is an important determinant for localization of production. By looking at differences in taxation across countries, lead firms contribute to the optimization of supply chains also on the basis of tax efficiency.

V. Rising along the value chain

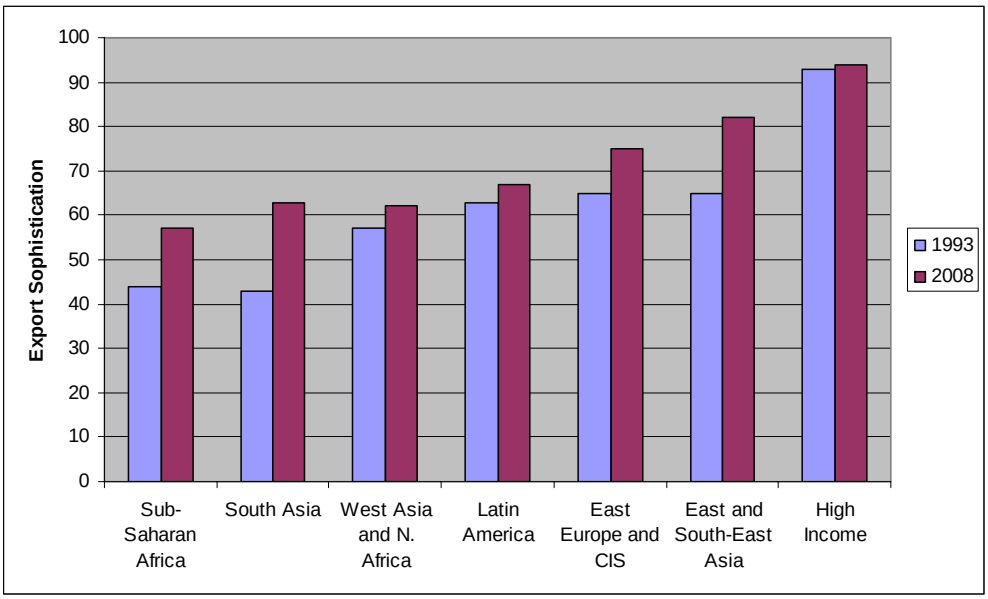
42. Although participation in GSCs has helped a number of developing countries to expand export-oriented industries, in many cases the value added from such activities has not increased markedly over previous commodity-based exports. To rise along the value chain, an industrial or process upgrading is required. Gereffi, Humphrey and Sturgeon (2005) define industrial upgrading as “the process by which economic actors – nations, firms and workers – move from low-value to relatively high-value activities in global production networks”.

[13] Inventories are rarely optimal and often costly. This implies that lead companies in GSCs would rather employ reliable and proven suppliers than rely on low-cost but unreliable ones.

[14] Lim and Kimura (2010).

43. Figure 4 shows the evolution of export sophistication originating from high-income countries and from six developing regions, between 1993 and 2008.[15] An increase in the level of export sophistication suggests that a learning and industrial upgrading is taking place in the exporting region.

Figure 4. Export sophistication



Source: UNCTAD secretariat calculation.

44. Process upgrading occurred in most regions, although to a different extent. In 1993, Latin America, Eastern Europe and East and South-East Asia had generally similar levels of export sophistication. By 2008, export sophistication had increased in all of those regions, however the largest increment was observed for East and South-East Asia. Similarly, in 1993 the average levels of export sophistication for South Asian countries and for sub-Saharan African countries were similar, however, by 2008, South Asian export sophistication was much higher. Furthermore, some of these countries were able to increase their export sophistication by transforming export-oriented industries (as parts of GSCs) from those based on raw materials and low-technology manufacturing (agro-food, apparel, footwear etc.) to one dominated by medium-technology exports.

45. An important policy question is why some developing countries were able to surge ahead in diversifying into more value addition within GSCs, while others did not succeed in doing this. Many of the factors mentioned above are quite relevant in this regard. Indeed, sound macroeconomic policies, a favourable business environment, the development of human capital, economic links to high-income markets, sector-specific industrial development policies, and natural resource endowments all determine the success or failure of the export diversification of countries. Still, many questions remain open.[16] To properly

[15] A country's overall export sophistication is measured by the Revealed Factor Intensity Index, an index developed by Cadot, Shirotori and Tumurchudur (2010) which links product sophistication levels to the endowment abundances of exporting countries.

[16] For example, whether a concentrated industrial structure (higher R&D) is better than a flexible network of small and medium-sized firms (more dynamic business model) (Wade, 1990). Another

address those questions, there is a need for more research and better data, including on TNCs as lead firms.

46. Knowledge of production processes is one of the keys to industrial upgrading and export diversification.[17] For countries that are lagging behind, knowledge must come from absorbing it from elsewhere. GSCs can be a powerful force in enabling technology transfers and industrial process upgrading. In this regard, many mechanisms have been examined, from arm's-length technological "borrowing", to a range of practices that encompass technology licensing, reverse engineering, the injection of equipment and know-how through FDI, and firm-level adaptation to demands made by both foreign affiliates and overseas buyers.[18] One important question that needs to be studied in more depth is what makes lead firms in GSCs transfer higher-value-added processes to developing countries. So far, the evidence suggests that lead firms tend to outsource lower-value-added activities (including final assembly) while retaining control over the higher-value-added areas of their core competency, such as like R&D, intellectual property, design and distribution.

VI. Policy issues

47. Being able to participate in a GSC may be a sign of a country's growing productive capacity. Moreover, having a strong relational linkage with the lead firm in a supply chain could enhance the transfer of knowledge, technology and even financial capital into the supplier's country. In this way, participating in a GSC can play a catalytic role in a developing country's economic growth, through productive-capacity upgrading. However, such a level of GSC participation appears to be possible only for countries that already have some prerequisite productive capacity; these are mainly middle-income to higher-middle-income countries.

48. Technology transfer within a GSC is not automatic. Lead firms – especially those dealing with products or production techniques or processes with a high intellectual property content – may restrictively control technical and technological spillover to subcontractor suppliers. In addition, the investment strategies of TNCs should be borne in mind. For example, there is evidence to suggest that much of United States lead firms' profits during 1996–2006 was financialized (through share buyback or dividend increase) "… to raise shareholder value, rather than investing in productive assets that raise productivity, growth, employment and income."[19] Would a new model of social business-linked FDI, such as that of Grameen Danone Foods Ltd., provide a useful insight into a new architecture for global/regional supply chains?[20]

issue is the role played by export processing zones (or special economic zones) and other "concessional" policy instruments.

[17] Kimura (2007).

[18] Gereffi and Korzeniewicz (1994); Feenstra and Hamilton (2006).

[19] Milberg and Winkler (2009).

[20] In a "social business" model, there are neither losses nor dividends. All profits that accrue from the business activities are reinvested, in order to increase productive and supply capacity.

Box 3. Bangladesh and Cambodia in global supply chains in the garment sector

LDCs are not significant players in GSCs, except in the garment sector. Over the past decade, a large number of global garment buyers – many of which serve brand owners – have set up ready-made garment factories in several LDCs such as Bangladesh and Cambodia. In the ten-year period between 1997 and 2007, exports of garments (classified as Harmonized System chapters 61 and 62) increased their share in total exports from 67 per cent to 71 per cent in Bangladesh, and from 51 per cent to 86 per cent in Cambodia. The share for 2008/09 is estimated to have increased for both countries. Garment exports from African LDCs also exhibited a strong growth over the past decade, largely thanks to the preferential access to the United States market granted under the African Growth and Opportunity Act (AGOA).

The economies of Bangladesh and Cambodia have become highly dependent on employment in the garment industry. In Bangladesh, the garment industry absorbs about three million workers. In Cambodia, some 280,000 workers were employed in the garment industry in 2008, and up to 1.6 million people's living is believed to depend on this sector. But dependence on the garment industry also presents a dilemma for governments whose long-term goal is to achieve stable socio-economic progress, as the competitiveness of these countries arises solely from the competitive wages. Bangladesh has the lowest labour cost in the world, at 22 cents per hour; in Cambodia it is 33 cents per hour. On the one hand, maintaining wage competitiveness would exacerbate the garment-factory labour unrest that has been reported in the past year in both Bangladesh and Cambodia; whereas allowing wage rises in line with rises in consumer prices – particularly food prices – would risk an exodus of generally footloose GSC buyers to other supplier countries. Moreover, the recent global economic downturn highlighted a vulnerability of LDCs that have a high level of dependence on garment exports. Within a year from October 2008, the number of factories operating in Cambodia fell from a peak of 313 down to 241, with most of the remaining factories running at only 60–70 per cent of their capacity. Almost 21 per cent of the total workforce had been laid off, at times without receiving any compensatory pay.

A major challenge to these LDCs is to increase overall competitiveness in the garment industry, i.e. in the areas of productivity, product quality, and reliability in terms of supply lead-time. As regards productivity and product quality, building the managerial capacity of locals and eventually replacing foreign factory managers with locals can improve communication at the workplace, and at the same time increase workers' motivation with better prospects for advancement. The physical connectivity to the world market also needs to be improved. UNCTAD's Liner Shipping Connectivity Index revealed that LDCs' average ranking on this scale in 2010 was 111, compared to 78 for other developing countries. Container shipping companies are less likely to provide services to and from the seaports of LDCs, because national trade volumes tend to be lower and the quality of ports is such than they are less attractive for transshipment and transit cargo.

49. As regards low-income countries, being a part of a GSC could be seen as probably a more rapid way of becoming integrated into the global trade in manufactures and services. However, the segments within a GSC in which low-income countries mostly participate are limited to the bottom of the value-added ladder with a low barrier to entry; these are labour-intensive products with low-tech requirements and low set-up cost, such as assembly in the apparel and light manufacturing industries (box 3). Low barriers to entry often create price-

cutting competition among supplier countries. As a result, declining barter terms of trade of such low-income countries have been observed over the past decade.[21] Also problematic is the fact that the relational linkages between lead firms and suppliers in these industries are often very loose and unstable. The lead firms benefit from the severe competition among numerous and almost identical suppliers, and select the ones that meet their short-term requirements. The potential negative effects of such unstable contracts, particularly to the local labour market, have been noted by many researchers.[22]

50. The challenge to suppliers and governments in low-income countries is to transform the declining net barter terms of trade into an increase in "income" terms of trade, through larger export volumes (i.e. increasing market share over competitors) or by achieving growth in factoral terms of trade – i.e. an increase in productivity.

51. For a local supplier to win a more durable relationship with the lead firm, it needs to become cheaper, better in quality, quicker in delivery, and more reliable than its competitors within an industry. Such "process upgrading" could lead suppliers to move upwards to a higher-value-added segment in a GSC, e.g. a move from standard mass production into more design-specific and other-requirement-specific production.

52. Firms in low-income countries often face greater obstacles in achieving both process and product upgrading. Government support can play a role, especially in regard to (a) investment promotion policies to attract more buyers (lead firms); (b) reducing tariff and non-tariff barriers for imported production inputs; and (c) bottoming up the supply efficiency, by improving the business environment, transport, logistics, education and training; and (d) guaranteeing long-term commitments in policies (especially in trade and fiscal policies) so as to minimize the risk for foreign enterprises and business relationships.

53. Non-policy factors also figure among the determinants of a successful process and product upgrading. These include (a) length of value chain to the final product (or depth in the manufacturing segment), i.e. how many parts and components to move into; (b) product characteristics (standard or differentiated); (c) the structure of a GSC (market-based or sticky – see box 1); (d) interest of a leading firm in assisting the product upgrading (through technology/financial injection); (e) market situation (competitors, stepladders vacated or not, etc.); and (f) comparative advantage, including geographical and/or population consumption assets (e.g. close to a big market, own large domestic market). As Mr. Rob Davies, Minister of Trade and Industry of the Republic of South Africa put it: "Identification and choice of sectoral interventions is based on identification of first-order constraints that cut across most of these sectors and sectoral "self-discovery" processes. The latter involve a combination of research into international and domestic trends, consultation with key stakeholders (particularly business and labour), policy and instrument design attached to appropriate conditionality, and periodic review and adaptation".[23]

54. The size of a country matters in a GSC. A large domestic market by itself attracts foreign firms to set up a basis and thereafter localize some segments or the main segments of their GSCs targeting both exports and domestic consumption. Smaller developing countries have less leverage in creating a strong relational linkage with lead firms. A solution for such countries is also to diversify into new markets – in particular, regional (neighboring) markets – in addition to their efforts to integrate into GSCs.

[21] Kaplinsky (2005).

[22] Bergin, Feenstra and Hanson (2008), for instance, find that maquiladora industries in Mexico are associated with volatility in United States offshoring, and with fluctuations in employment.

[23] Available at http://www.miem.gub.uy/portal/agxppdwn?5,10,431,O,S,0,6379%3BS%3B1%3B263,

55. A recent study by UNCTAD suggests that exports from Asian LDCs to other developing countries – which are mostly their neighboring countries – are higher in factor intensity.[24] That is to say that South–South trade, especially within a region, may offer some alternative upgrading opportunities to low-income countries. Governments within a region can also collaborate with each other in improving the market information flows of a given industry/sector (e.g. agro-processing), or in establishing a regional laboratory for product quality assessment. Regional collaboration could be equally useful for R&D for products and services that are most suited to the demand of regional consumers (with much less disposable income than consumers in OECD countries), with an added new technological element.

56. Distance is often assumed to be among the main determinants of trade costs and thus also of countries' participation in GSCs. However, it is not distance itself that is a direct hindrance to trade, but rather transport costs and transport connectivity, which in turn are related to the facility with which merchandise trade can be carried out. An UNCTAD study on the Caribbean region found that distance explained around 20 per cent of the variance in maritime freight rates, while competition among liner shipping companies and economies of scales each had a far stronger impact on the freight rate. When there were five or more competing carriers providing direct services, the freight rate was one third lower than when there were four providers or less. This example suggests that strategic liberalization of transport services, through its impact on competition and economies of scale, can have an important and in some cases perhaps decisive impact on the establishment of regional trade connections and on participation in GSCs.[25]

57. Transport infrastructure and services together with trade facilitation and modern customs procedures are a sine qua non both for export competitiveness and for a country's participation in GSCs. As global transport networks expand, ships get larger and port traffic grows, many LDCs are lagging behind and are not catching up as regards their access to shipping services. While globally the international liner shipping network is expanding, for many LDCs the number of shipping companies providing services from and to their ports is stagnant or even decreasing. Without effective international transport connections, trade cannot grow.

58. While trade and transport facilitation is usually a good long-term investment, it still requires financial resources. Globally, during recent years, technical and financial assistance to support trade and transport facilitation has increased significantly. However, most of this additional assistance has gone to middle-income developing countries, and not so much to LDCs. In LDCs, it appears that the resources of donors may be competing with other priorities such as health or education. Many practical solutions to trade and transport facilitation reforms require regional or bilateral cooperation, with regard – inter alia – to transit, the harmonization of documents, the recognition of certificates, transport infrastructure, and coordination at border crossings.

[24] UNCTAD (2010c).
[25] UNCTAD (2007).

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