



**GLOBAL SUPPLY CHAINS:
TRADE AND ECONOMIC POLICIES
FOR DEVELOPING COUNTRIES**

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FOR DEVELOPING COUNTRIES**

by

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Abstract

Over the last three decades, global supply chains (GSCs) have increasingly gained importance in linking developing countries to international markets. Today a substantial share of the production processes of GSCs is taking place in developing countries. For developing countries and their enterprises, GSCs offer opportunities as well as challenges. While greatly facilitating access to developed countries' markets, GSCs also demand greater efficiency and competence from suppliers. For developing countries, it is thus important to implement economic policies that while 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 no longer sufficient. The reason is not only because of the preference erosion and decline of tariffs, but also because of the GSCs business model itself. In GSCs, competitiveness (and thus delocalization choices) is determined by a wide range of factors, especially by the quality of policies influencing the overall business environment. In this regard, LDCs and other low-income countries are often confronted with substantial disadvantages as implementing these policies require substantial resources that are lacking. 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 that have only a limited contribution to their development.

Keywords: Global supply chains, trade policy, international trade, LDCs.

JEL Classification: F1

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I. Introduction

Over the last three decades, the progressive liberalization of cross-border transactions, advances in production technology and information services, and improvement 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 (GSCs), 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 to an increasing number of developing countries.

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.¹

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 consumer preferences in such markets.² 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 would increase their attractiveness for more foreign direct investment. These potential gains explain the acute interest of policymakers in many developing countries over ways to link their private sectors to GSCs.

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

GSCs have different structures depending on three main factors: (1) the geography and nature of linkages between tasks in the chain; (2) the distribution of power among lead firms (TNCs) and other actors in the chain; and (3) the role of government institutions and policies in structuring business relationships and industrial location.³

The first factor, the geographical structure, is determined by the extent of fragmentation of production processes and by their delocalization. While the extent of fragmentation is generally specific to the sector, the choice of 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 the 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 also important.

¹ UNCTAD (2010a).

² Gereffi (1999); Altenburg (2000); Tewari (1998).

³ Sturgeon and Gereffi (2009).

The second factor, the distribution of power among the various firms of GSCs, is reflected in the different organizational structures of GSCs. Their structures 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 where 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 a contractual relationship at arm's length, where buyers do not necessarily know and do not own their suppliers. Numerous types of ownership structures can be found anywhere within the wide spectrum of the buyer-supplier relationship.

The third factor is related to government intervention. Governments play an important role in facilitating the integration of domestic firms into GSCs. Governments have often resorted to trade policies to increase the competitiveness of their enterprises, especially by seeking preferential market access. Indeed, by lowering trade costs trade policies can help to integrate domestic firms into GSCs. However, trade policies although still important are not sufficient in the GSCs business model. The removal of behind-the-border trade-related barriers is also necessary.⁴ Moreover, policies aimed at improving the overall business environment are essential to facilitating the integration of domestic firms into markets that are increasingly dominated by GSCs.

The first two factors do not pose 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 progressive process and production upgrading and export value addition with economy-wide effects.

⁴ UNCTAD (2006).

Box 1. Buyer-supplier relational linkage strength of global supply chains			
	← (Weak)		(Strong) →
	<u>Market-based arm's length relationship</u>	<u>"Sticky" relationship</u>	<u>Vertical integration</u>
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-tech requirement, labour-intensive, low design specification economy of scale	Low-tech requirement, labour-intensive, high design specification economy of scope	High-tech requirement and design specification, labour intensive or capital-intensive economy of scale and 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-, 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).			
<p>The market-based arm's length buyer-supplier linkage is common in industries whose manufacturing requires low-tech, labour-intensive standard technique and where products are standardized. As production and process requirements increase, or as final products become more differentiated, buyers' or the lead firms' 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 higher- to middle-income developing countries among suppliers of more differentiated products.</p>			

II. Evolution of GSCs and developing countries

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 only to some sectors like textiles, clothing and electronics, by early the 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 “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.”

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 component production technical skills required and the know-how were still held by lead firms (TNCs). Since then, progress in a number of areas has greatly contributed to the establishment of GSCs. First, the rapid advancement in production technology enabled various industries to further slice up their production chains. Second, the substantial reduction in information costs led to a more cost effective relationship between buyers and suppliers. Third, there was an overall decline in trade costs both in home and host countries.⁵ A recent study by the United Nations ESCAP identifies which trade facilitation measures and policies could be 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.”⁶ Those developments have provided great incentives to lead firms for delocalizing further, including even the 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.

The 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-skilled type of services are increasingly being offshored (box 2). The increasing trend in the offshoring of these types of services may create great opportunities for developing countries able to meet this demand in terms of human capital.

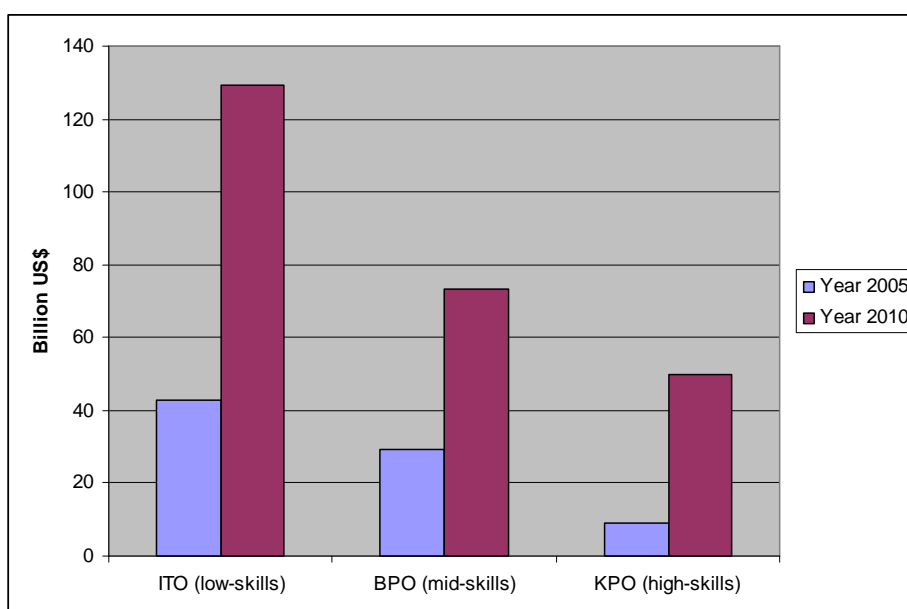
⁵ Jones Comfort and Eastwood (2005).

⁶ United Nations ESCAP (2011).

Box 2. Services offshoring

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

Offshored services by segments (2005 and 2010)



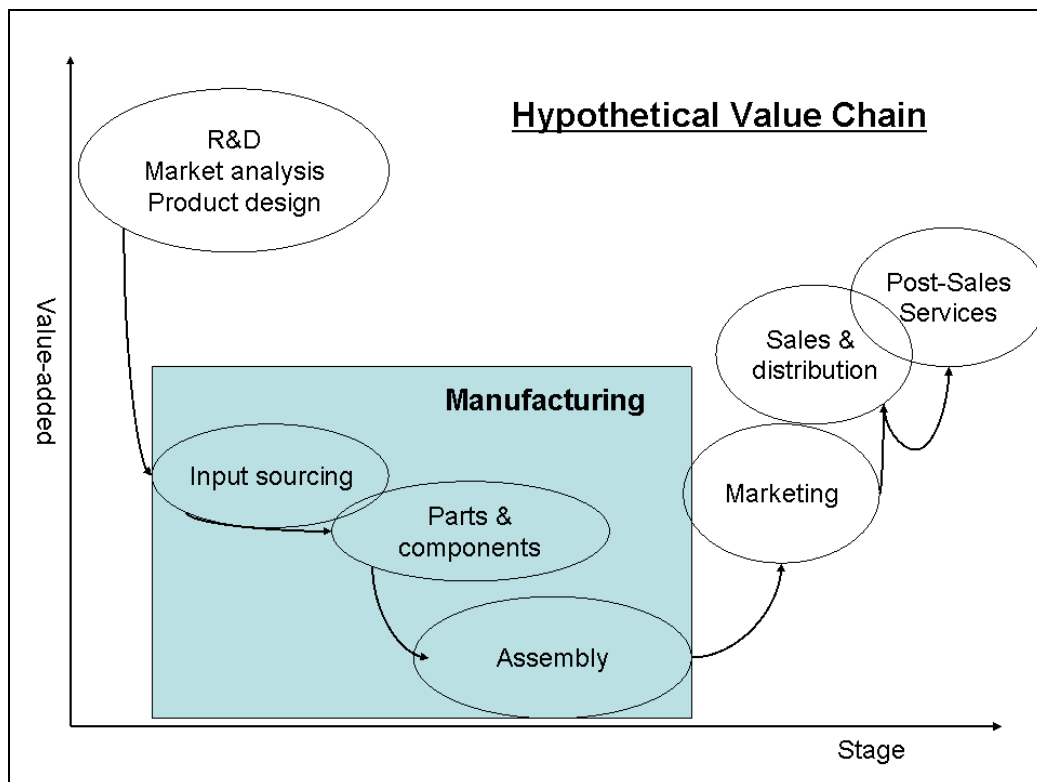
Source: Gereffi and Fernandez-Stark (2010), based on OECD data.

Note: Information technology outsourcing (ITO) covering lower-skill segment (software development, applications and infrastructure management, IT consulting, etc.). Business process outsourcing (BPO) covering the middle-skill segment (enterprise, human and customer resource management). Knowledge process outsourcing (KPO) which includes highly-skilled components (business consulting, market intelligence and legal services).

As 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 embraced interrelated industrial, trade and investment policies. The key objectives were to increase their integration in the world economy, diversify their exports from commodities to more value added manufactures and services and, most importantly, provide economy-wide development benefits in terms of better employment and progressively higher living standards. A substantial number of developing country enterprises managed to enter into labour-intensive manufacturing segments of GSCs. Most of those enterprises are from middle-income developing countries.

The long-term development implications of participating in a GSC, however, remain ambiguous. After two decades of intensive GSCs-building, developing countries' experiences of participating in GSCs are rather mixed. A GSC fundamentally 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 socioeconomic progress of developing countries participating in a GSC. Perhaps the biggest challenges for developing countries, especially for the smaller and less developed ones among them, and their enterprises are to (1) ensure their progressive movement upwards in terms of value addition in a GSC (as illustrated in figure 1); (2) enable local enterprises within GSCs to move up the technological ladder; and (3) achieve economy-wide development impacts from integrating into GSCs.

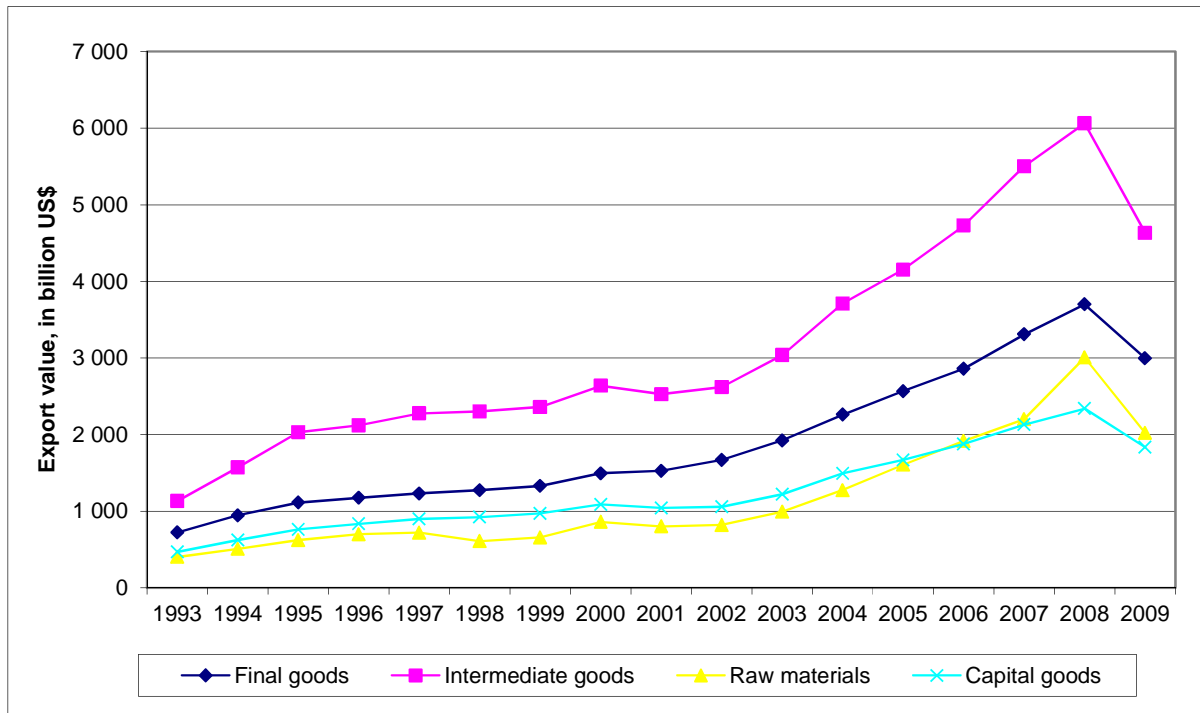
Figure 1. Value addition in a GSC



III. GSCs: trends in international trade

Some insights on the evolution of GSCs can be inferred from the 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 reports the value of international trade in intermediates vis-à-vis that of other products.

Figure 2. Trends in international trade



Trade in intermediate products represents about 40 per cent of world merchandise trade. International trade in intermediate goods grew from about US\$1 trillion in 1993 to roughly US\$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, thus resulting in parts and components crossing multiple borders before being incorporated into the final product.

GSCs evolved from being mostly confined within developed countries to increasingly the integration of developing countries. In the early 1990s more than half of the world trade in intermediate products 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 intermediate products, the trend towards an increasing presence of developing countries in global manufacturing and trade in intermediate products has continued.

Table 1. World trade in intermediates

	<i>Values (billion US\$)</i>			<i>Percentages</i>		
	<i>Avg. 1993/94</i>	<i>Avg. 2007/08</i>	<i>2009</i>	<i>Avg. 1993/94</i>	<i>Avg. 2007/08</i>	<i>2009</i>
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

The integration of developing countries into GSCs is not uniform and largely depends on their income level (table 2). Upper middle-income countries' exports of intermediate products take more than half of total exports of intermediate products from developing countries. At the regional level, the East and South-East Asian region accounts for almost two-thirds of developing countries' exports of intermediate products. Latin America and East Europe (including economies in transition) represent another 30 per cent. The remainder is shared among South Asia, West Asia and North Africa, and sub-Saharan Africa. For countries in these regions, participation in GSCs although increasing is still rather limited.

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

<i>Income group / Region</i>	<i>Value of intermediate export, in billion US\$</i>			<i>Annual growth rate, 1993-2008 (per cent)</i>
	<i>Average of 1993 & 1994</i>	<i>Average of 2008 & 2009</i>	<i>2009</i>	
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	1 352.4	5 782.2	4 272.5	10.2
<i>Developing countries region</i>				
East and South-East Asia	192.0	1 343.1	1 075.2	13.8
East Europe	40.8	372.3	231.1	15.9
Latin America	58.3	279.0	220.5	11.0
Middle East and 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

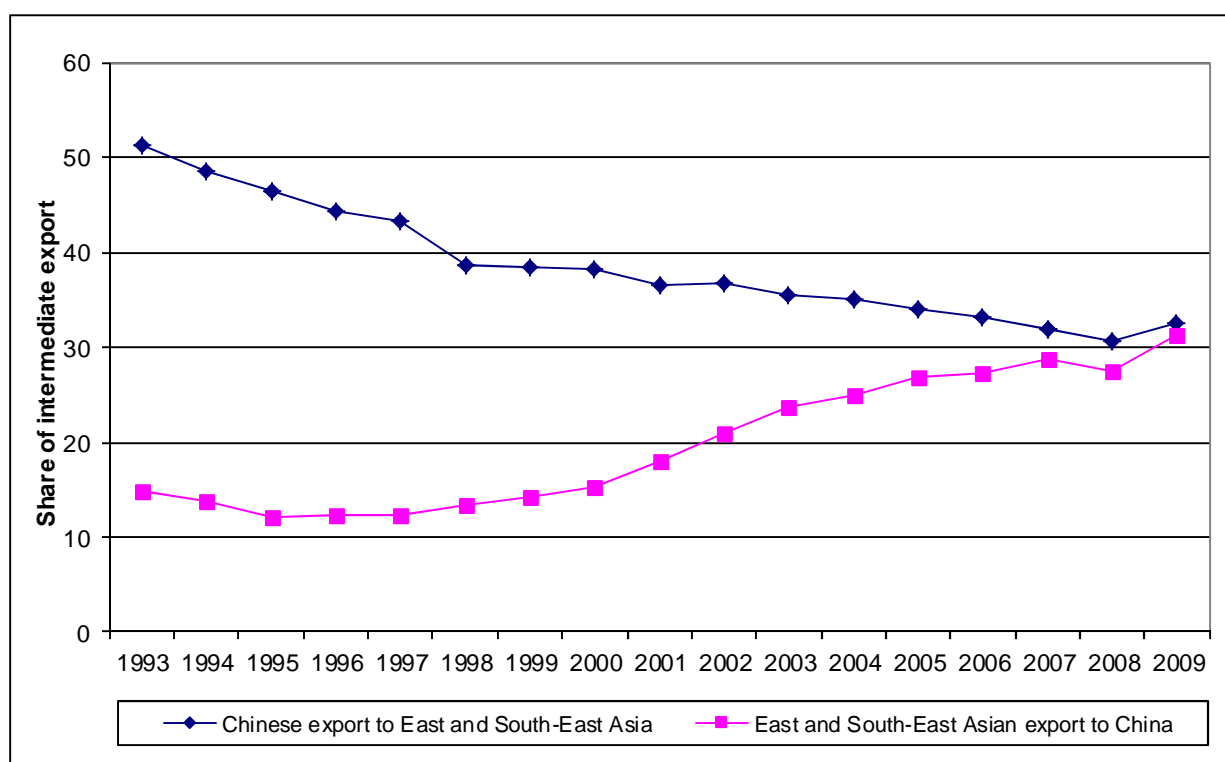
Developing country participation in GSCs is still mostly related to supplying developed countries' markets. Although on the rise, South-South production networks are relatively less developed and mainly limited to East and South-East Asia. Trade in intermediate products within the East and South-East Asia region in 2009 accounted for about 9.6 per cent of world trade in intermediate products (up from about 6.1 per cent in 1993). Similar figures for the East European and Latin American regions are much lower (about 1.9 per cent and 1.1 per cent respectively). Other regions are lagging behind as their regional trade accounts for less than 0.2 per cent of world trade in intermediate products. South-South chains that span across regions appear to be still quite underdeveloped, even those based in the East and South-East Asia region (table 3).

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

<i>Region</i>	<i>High income countries</i>	<i>East and South-East Asia</i>	<i>East Europe and CIS</i>	<i>Latin America</i>	<i>West Asia and North Africa</i>	<i>South Asia</i>	<i>Sub-Saharan Africa</i>	<i>All importers</i>
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

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

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



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 a relevant regional specialization (table 4). For example, a relatively higher efficiency and abundant skilled labour force is one of the forces behind the connotation of East and South-East Asia as a supplier of ITC products (about half of intermediate products' exports in this region is in ITC products). Similarly, geographic proximity and largely duty free access to consumer markets are among the determinants of delocalizing the automotive industry in Latin America or East Europe (about one quarter of their exports of intermediate products respectively). 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 intermediate exports across industries and regions (2008)
(percentage)

<i>Industry</i>	<i>High income countries</i>	<i>East and South-East Asia</i>	<i>East Europe and CIS</i>	<i>Latin America</i>	<i>West Asia and North Africa</i>	<i>South Asia</i>	<i>Sub-Saharan Africa</i>
Textiles 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 intermediate exports, in billion US\$	3 739.1	1 931.5	246.6	262.9	89.9	82.0	24.5

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

IV. GSCs: trade and economic policies

Trade policies directly affect the integration of domestic firms into GSCs in two major ways. First, 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. Second, unfavourable market access conditions would put assemblers in a position of relative disadvantage when 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 the WTO multilateral Information Technology Agreement (ITA), which eliminated MFN tariffs on a wide range of computer-related equipment (including semiconductors and software), as well as telecommunication and certain office equipment. These goods represent a crucial flow of international trade amounting to about US\$4 trillion in 2008. Today ITA has 73 WTO members States, including both developed and developing countries, and covers about 97 per cent of world trade in information technology products.

Trade policy is often directed to protect final products rather than intermediate products. This provides an advantage to the localization of the last blocks of production processes in consumers' markets. The relatively lower tariff on intermediate products provides a greater incentive to import them (and thus 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 product rather than in the provision of low value added intermediate products.

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

<i>Industry</i>	<i>Average tariff on:</i>	
	<i>Final goods</i>	<i>Intermediate products</i>
Textile 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

In general, tariffs applied on final goods are higher than those on intermediate products (table 5). With the exception of two sectors (general industry and electrical machinery), in all other industries, applied tariffs on final products are relatively higher. Low tariffs contribute to the

delocalization of production processes in industries such as ITC, while higher tariffs on road vehicles play a role in keeping 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 higher importance.

To illustrate the relative importance of trade policy versus other determinants of participation in GSCs, table 6 reports 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

<i>Country group</i>	<i>Tariff faced by processed and final goods (per cent)</i>	<i>Tariff imposed on intermediate products (per cent)</i>	<i>Business Environment Index (lower better)</i>
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	2.59	4.17	138.39

Overall trade policy is captured by two indicators: effectively applied tariffs imposed on intermediate products, and those tariffs 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 the business environment, including government regulations such as for starting a business, dealing with construction permits, registering property, getting credit, protecting investors, paying taxes, enforcing contracts and closing a business. Although all of these indicators normally ameliorate with the growth of GDP per capita, they are also positively correlated with participation in GSCs. Countries with economies more integrated into GSCs tend to have more open trade policies, face lower market access restrictions in high-income markets (the main location of lead firms), and have a more conducive business environment. The reason for the correlation is that the effectiveness of business models behind GSCs is highly dependent on the above variables.

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.⁷ This table reports the increase of participation in global production chains (measured by the increase in the trade in intermediate products) that a given country group could obtain by aligning its policy to the level of another country group.

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

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

<i>Policy change</i>	<i>Increase in trade (per cent) due to:</i>		
	<i>Change in applied tariffs on processed and final goods</i>	<i>Change in applied tariffs on intermediate products</i>	<i>Change in Business Environment Index</i>
Middle-income to high-income	2.6	4.8	40.7
Low-income to middle-income	7.9	7.9	27.6
LDCs to middle-income	5.1	13.1	37.7

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 intermediate 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 intermediate products 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 the better functioning of existing export processing zones (EPZs) and more efficient management of formally applied duty drawback systems so as to implicitly eliminate or reduce tariffs on imported inputs for export-oriented enterprises.

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

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 the information costs of non-traditional trade barriers are often internalized by lead firms, some of these barriers still add to the overall costs of moving goods along the chain.

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 the participation in GSCs. Removal of such barriers through, e.g. a deeper integration through regional preferential trade agreements (RTAs),⁸ is found to double trade in intermediate products among their members.⁹ Today almost all RTAs include trade facilitation and technical assistance measures. These agreements do facilitate the delocalization of production processes by removing behind-the-border obstacles to trade.¹⁰

However, as an increasing number of developing and developed countries 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.¹¹ Economic policies

⁸ In this paper, the term RTA refers to all types of preferential trade agreements, including bilateral free trade agreements (FTAs).

⁹ These results are based on econometric estimation where the effects of FTAs are captured by a dummy variable.

¹⁰ Still, from an economic perspective, preferential trade agreements should be considered suboptimal instruments as maintaining barriers against non-members (while allowing free trade among members) could hinder the natural expansion of fragmentation-based specialization across countries.

¹¹ Fugazza and Nicita (2011).

that reduce overall business costs or minimize the risks from international business relationships may be of greater value for facilitating integration into GSCs. Thus, 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.

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 intermediate products by almost 50 per cent.

The larger importance of business environment and government effectiveness for GSCs is directly related to their increasing sophistication and drive for efficiency. GSCs are extremely competitive not only 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 than on lower labour costs.

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 at a minimum.¹² 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 is their weakest supplier. Thus, it is crucial that all players in a chain are fully reliable. In practice, there is a trade-off between the reliability of suppliers and production costs.

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 of LDCs' enterprises are stuck in a low value added segment of chains, and are operating in sectors where chains are shorter and less technologically intensive (i.e. the apparel and agro-food sectors).

Another issue that hinders the participation of developing countries in GSCs is the relative lack of medium- sized and large enterprises. Small enterprises often face additional obstacles that make it difficult 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 that small enterprises are often locked into low value added production processes with little opportunity to upgrade along the value chain.¹³ Most importantly, small enterprises are also disadvantaged as they rarely have management expertise able to meet the complex problems that GSC management involves. Moreover, small enterprises often supply a single lead firm, thus making the entrepreneurship less dynamic and more vulnerable to shocks.

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

¹² Inventories are rarely optimal and are often costly. This implies that lead companies in GSCs would rather employ reliable and proven suppliers than rely on low-cost but unreliable ones.

¹³ Lim and Kimura, 2010.

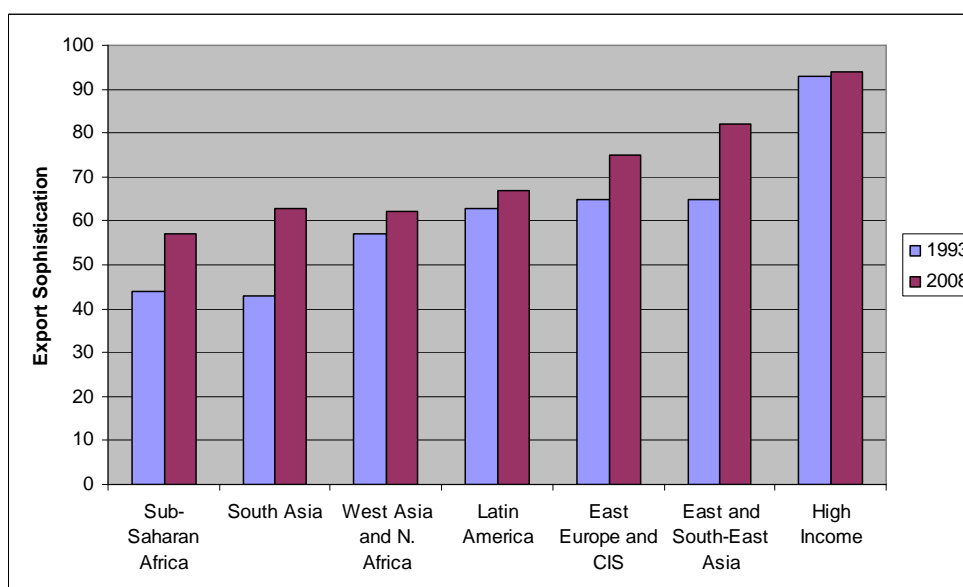
Finally, in cases where the lead firm owns part of the GSC, tax policy is an important determinant for the localization of production. By looking at the differences in taxation across countries, lead firms tend to optimize supply chains also based on tax efficiency.

V. Rising along the value chain

Although participation in GSCs helped a number of developing countries to expand export-oriented industries, in many cases, the value added from such activities did not increase 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”.

Figure 4 reports the evolution of export sophistication originating from high-income countries and six developing regions between 1993 and 2008.¹⁴ Increase in the level of export sophistication suggests that learning and industrial upgrading is taking place in the exporting region.

Figure 4. Export sophistication



Process upgrading occurred in most regions, although to a different extent. In 1993, Latin America, East Europe and East and South-East Asia had largely a similar level of export sophistication. By 2008, export sophistication increased in all of those regions, though the largest increment was observed for East and South-East Asia. Similarly, in 1993 the average level of export sophistication of South Asian and sub-Saharan African countries were similar, but 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

¹⁴ 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 the product sophistication level to the abundance of endowments of exporting countries.

GSCs) from those based on raw materials and low-technology manufacturing (agro-food, apparel, footwear, etc.) to ones dominated by medium-technology exports.

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. 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, natural resources endowments all determine the success or failure of the export diversification of countries. Still many questions remain open.¹⁵ To properly address those questions, there is a need for more research and better data, including those on TNCs as lead firms.

Knowledge of production processes is one of the keys to industrial upgrading and export diversification.¹⁶ 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 were 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 foreign direct investment and firm-level adaptation, to demands made by both foreign affiliates and overseas buyers.¹⁷ One important question that needs to be studied more deeply 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 R&D, intellectual property, design and distribution.

VI. Policy issues

Being able to participate in GSCs 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 a transfer of knowledge, technology and even financial capital into the suppliers' 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 which already have some prerequisite productive capacity, which are mainly middle- to higher-middle income countries.

Technology transfer within a GSC is not automatic. Lead firms, especially those of products or production technique/processes with high intellectual property content, may restrictively control technical and technological spillover to subcontracted suppliers. In addition, the investment strategies of TNCs should be borne in mind. For example, there is evidence to suggest that much of the profits of the United States of America's lead firms' during 1996–2006 was financialized (through share buyback or a dividend increase) "... to raise shareholder value, rather than investing in productive assets that raise productivity, growth, employment and income."¹⁸ Would a new

¹⁵ For example, whether a concentrated industrial structure (higher R&D) is better than a flexible network of small and medium firms (more dynamic business model), Wade (1990). Another issue refers to the role played by export processing zones (or special economic zones) and other "concessional" policy instruments.

¹⁶ Kimura (2007).

¹⁷ Gereffi (1994); Feenstra and Hamilton (2006).

¹⁸ Milberg and Winkler (2009).

model of social business-linked FDI, such as the Grameen Danone Foods Ltd, provide a useful insight into a new architecture of a global/regional supply chain?¹⁹

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

Least developed countries (LDCs) are not significant players in GSCs, except in the garment sector. In the past decade, a large number of global garment buyers, many of which serve brand owners, set up ready-made garment factories in several LDCs such as Bangladesh and Cambodia. In the decade between 1997 and 2007, exports of garments (classified as HS chapters 61 and 62) increased the share in their 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 2008/2009 is estimated to have increased for both countries. Garment exports from African LDCs also exhibited strong growth in 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 remittances generated by garment factory workers. But dependence on the garment industry also presents a dilemma for governments whose long-term goal is to achieve stable socioeconomic progress, as the competitiveness of these countries arises solely from competitive wages. Bangladesh has the lowest labour costs in the world at 22 cents per hour, with Cambodia at 33 cents per hour. On the one hand, maintaining wage competitiveness would exacerbate garment-factory labour unrest that has been reported in the past year both in Bangladesh and Cambodia, while allowing wage rise in line with the rise in consumer prices, particularly food prices, would risk an exodus of generally free-to-move GSC buyers to other supplier countries. Moreover, the recent global economic downturn highlighted a vulnerability of LDCs with a high dependence on garment exports. Within a year from October 2008, the number of operating factories in Cambodia dropped from a peak of 313 to 241, with most of the remaining factories running at only 60-70 per cent of their capacity. Almost 21 per cent of total the workforce was 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 the replacement of foreign factory managers by locals can improve communication at the workplace, as well as increase workers' motivation with better prospects for advancement. Physical connectivity to the world market also needs to be improved. UNCTAD's Liner Shipping Connectivity Index revealed that the LDCs' average ranking 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 that they are less attractive for trans-shipment and transit cargo.

¹⁹ In a social business model, there are neither losses nor dividends. All profits accrued from business activities are reinvested to increase productive and supply capacity.

As regards low-income countries, being a part of a GSC could be seen as probably the more rapid way to become 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 costs, such as assembly in apparel and light manufacturing industries (box 3). Low barriers to entry often create price-cutting competition among supplier countries. As a result, declining net barter terms of manufacture trade in such low-income countries was observed over the past decade.²⁰ Also problematic is that the relational linkages between the lead firm and the supplier in these industries are often very loose and unstable. 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, were noted by many researchers.²¹

The challenge to suppliers and governments of 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. winning over the competitors) or through concurrently achieving a growth in factoral terms of trade, i.e. a productivity increase.

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 a standard mass production into more design-specific and other requirement-specific production.

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

Non-policy factors are also among the determinants of a successful process and product upgrading. Those include (a) the length of the 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 a sticky one, see box 1 above); (d) the interest of a leading firm in assisting with the product upgrading (though technology/financial injection); (e) the market situation (competitors, stepladders vacated or not, etc.); and (f) the comparative advantage, including geographical and/or population consumption assets (e.g. being close to a big market, having a large domestic market). As Rob Davies, Minister of Trade and Industry, 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 of 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.”²²

²⁰ Kaplinsky (2005).

²¹ Bergin, Feenstra and Hanson (2008), for instance, find that maquiladora industries in Mexico are associated with the United States’ offshoring volatility and fluctuations in employment.

²² See <http://www.unctad.org/Templates/Page.asp?intItemID=5717&lang=1> ().

The size of a country matters in a GSC. A large domestic market by itself attracts foreign firms to set up a basis and localize thereafter some or 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 (neighbouring) markets, in addition to their efforts to integrate into GSCs.

A recent study by UNCTAD suggests that Asian LDCs' exports to other developing countries, which are mostly their neighbouring countries, are higher in factor intensity.²³ 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 the areas of improving the market information flows of a given industry/sector (e.g. agro-processing) or establishing a regional laboratory for product quality assessment. Regional collaboration could be equally useful for R&D for products/services that are best suited to the demands of regional consumers (with much less disposable income compared to OECD consumers), with an added new technological element.

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 explains around 20 per cent of the variance of maritime freight rates, while competition among liner shipping companies and economies of scales each have a far stronger impact on the freight rate. When there are 5 or more competing carriers providing direct services, the freight rate is one third lower than when there are four or fewer providers. This example suggests that the 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 participation in GSCs.²⁴

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 and 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.

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 as much to LDCs. In LDCs, it appears that the resources of donors may compete with other priorities, such as health or education. Many practical solutions to trade and transport facilitation reforms require regional or bilateral cooperation, for example as regards transit, the harmonization of documents, the recognition of certificates, transport infrastructure, coordination at border crossings and so on.

²³ UNCTAD (2010c).

²⁴ UNCTAD (2007).

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