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REGIONAL VALUE CHAINS

BACKGROUND PAPER

PRODUCTIVE INTEGRATION OF LDCS INTO REGIONAL SUPPLY CHAINS: THE CASE OF SOUTH ASIA

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Introduction

In both theory and practice, supply-chain production amounts to an amplification of the level of specialization in production by means of spatial fragmentation of the production process. By separating production into tasks that differ in the nature of input combinations required (i.e. differing proportions of labour, capital, skill and knowledge) and these tasks housed within spatially separated (but linked) production blocks, a firm (or group of firms) may be able to reduce costs by matching tasks with location-specific advantages. Thus, at a regional or global level, a web of firms engaged in supply-chain production can take advantage of variations in comparative advantage across countries and other country-specific trade advantages (or sidestep trade or regulatory restrictions) to lower production costs and increase market access. In addition, by enforcing stiff competition between firms at certain stages along the production chain, this form of production can serve to maintain strong downward pressure on costs. Nevertheless, supply chain production is economically viable only when the costs of dispersion do not exceed the advantages of fragmentation. Put differently, the cost of transferring goods between production locations must not exceed the savings achieved from task differentiation. This form of production is therefore highly dependent on cheap and effective transport, logistics and communication links. It is this aspect of supply-chain production that poses the greatest challenge for Least Developed Countries (LDCs).

Supply chain production has reached its greatest level of sophistication in East Asia. A single product assembled and exported from China is likely to embody knowledge-intensive designs originating from Japan, inputs produced from capital or skill intensive production processes in South Korea, Taiwan, Hong-Kong or Singapore (the Asian NICs), and inputs produced from more labour-intensive methods in one or more of the ASEAN 4 countries (Indonesia, Malaysia, Philippines and Thailand). This approach to production has often been associated with the

"flying geese" model of industrialization. Though that analogy was originally intended to describe country-level specialization at the *industry* level it is appropriate because it reflects a similar hierarchal division of labour across groups of countries, but that division is at the level of *tasks*. Asia's success in regional supply chain production has been the outcome of high and increasing levels of *de facto* economic integration marked by high and increasing levels of intra-regional trade, generally, and trade in intermediate goods, in particular. It is noteworthy, however, that compared to other regions, such as Latin America and Sub-Saharan Africa, East Asia has been slow to develop formal institutions for trade and economic integration. For example, the ASEAN Free Trade Area (AFTA) did not come into being until 1992 (well after many of the initiatives that would lead to the development of supply-chain production were already well advanced) and it did not include China, Japan, South Korea or Taiwan – critical players in that development of the regional production network. This suggests that the development of the "right" conditions for supply-chain based production does not need to await formal bilateral, regional or multilateral trade or economic integration agreements. Unilateral and semi-formal bilateral arrangements can create operational conditions well ahead of the development of formal institutions for regional economic cooperation. However, even East Asia has struggled to integrate its LDCs (Cambodia, Lao PDR and Myanmar) into its regional supply chains because, though they offer cheaper labour than the ASEAN 4 (Indonesia, Malaysia, Philippines and Thailand), they struggle to provide key aspects of the environment necessary for the profitable operation of firms within a supply chain.

The Challenge for LDCs:

The challenges faced by LDCs lie, not so much in their ability to host productive enterprises or to ensure low-cost production, but in their ability to provide the right environment for the quick, reliable and low-cost transfer of goods between production nodes and *assure* production at high standards. This comes from certain attributes typical of the LDC environment. Most notable of these attributes are:

- **High transport and Logistics costs** – This includes not only the high cost of moving goods across space (by road, train or otherwise) but also the extended transit times, which

comprises not only the time used up during actual physical haulage but also the time spent at transfer points, such as ports, and in fulfilling administrative protocols (such as customs clearance procedures).

- **Limited telecommunications infrastructure** – The ability of firms to use cost effective strategies, such as just-in-time delivery, as well as their ability to source the most cost-effective inputs and most lucrative markets, depends critically on access to cheap and reliable means of communication. Unfortunately, most LDCs are poorly endowed with telecommunication infrastructure – particularly internet communication. What exists, besides being limited, is typically both expensive and unreliable as well.
- **Expensive and unreliable utility provision -** The viability of a supply chain is also dependent on cheap and reliable access to basic utilities. Electricity provision is particularly important because its reliability is critical for both the production process and the fidelity of transportation links. Unfortunately, a cheap and reliable supply of electricity is not typical of the LDC environment and both the reliability of production and transit times are negatively impacted as a result.
- **High transaction costs of doing business –** Both the development and continued operation of supply chains require relative ease in the establishment of new firms and an environment that supports the speedy execution of business activity. However, because of the presence of excessive or misdirected regulation, poor administrative procedures, and weak legal systems, LDCs typically are among the lowest ranked countries in terms of "ease of doing business indicators."
- **Shallow and inefficient finance** –Shallow and inefficient finance is more typical of LDCs than any other group of economies. Shallow finance is marked by the small size of the financial sector relative to the rest of the economy. Inefficiency is marked by the high cost of intermediation – which leads, ultimately, to high borrowing costs but low reward for saving. The cost of shallow and expensive finance is felt most keenly by small and medium sized enterprises. When these firm have difficulty accessing finance (either for investment or working capital) the potential for multi-firm linkages at the local level (beyond multinational

enterprises), which is an important aspect of supply chain development, is seriously compromised.

- **Weak human resources** – While the comparative advantage of LDCs is likely to lie in cheap labour there is still likely to be a need for a critical mass of technical and skilled workers in order that multinational enterprises can be persuaded to locate productive activity within a country. Unfortunately, given that a weak human resource base is a typical attribute of LDCs, their ability to offer critical mass is not a certainty.
- **Limited Capacity to Produce Public Goods –** Particularly because of their transnational nature, regional (and global) supply chains make exacting demands in terms of the assurance of quality and other standards across jurisdictions. Governments play a critical role in providing these assurances through the provision of public and semi-public goods in the form of relevant and effective regulations, quality control, legal provisions for contract enforcement, and the dissemination of information. However, the technical and administrative demands that these requirements place on governments may prove well beyond the capacity of many LDCs.
- **Residual and Implicit Barriers to Trade –** The potential trade-enhancing effect of the many multilateral provisions for the easy access of LDC exports into developed country markets is seriously undermined by: the remaining exceptions; stringent rules-of-origin requirements; sanitary and phytosanitary requirements; and environmental requirements. These remaining implicit barriers may well serve as a disincentive for firms wishing to include these countries in regional production networks.

The Particular Situation of South Asian LDCs

In the areas of transportation and logistics, the ease of doing business, financial depth, and the literacy of the work force, South Asian LDCs are better situated than most LDCs. They generally perform above the LDC average in those areas. However, in terms of the reliable provision of electricity they perform below the LDC average – suffering, on average, a greater loss of potential output due to electrical outages. With respect to the cost and availability of communicating and governance quality and capacity, this group of LDCs presents a mixed bag.

They have low connection density and higher communication costs than the LDC average, but their costs are generally falling more rapidly than elsewhere. Afghanistan, not unexpectedly, is well below the LDC average in all governance scores but none of the other regional LDCs scored consistently above the LDC average (with respect to measures of the quality of governance). It can, therefore, be said that, as a group, South Asian LDCs, though they do face significant weaknesses, are better situated than most LDCs with respect to the potential for integration into supply-chain production. However, it should be noted that these countries are not homogenous. Afghanistan is particularly poorly placed – performing below the LDC average on every measure except the ease of doing business. However, given the past and ongoing conflict situation in the country this is not surprising.

Measures to Improve or Complement Location Advantages

In each of the areas enumerated, whether LDCs find their particular situation to be above or below the LDC average, there is still a great deal that these countries can do to improve their profile. However, it should be noted that, as LDCs, they face limitations in both government capacity and domestic resource availability. It is, therefore, important that these countries design programs and other interventions that are cognizant of these constraints. Necessary interventions can be defined within three main areas:

Transport and Trade Facilitation – Given the importance of cheap and reliable transportation and logistics links in determining the viability of fragmented (supply chain) production, projects and programs to improve the physical (transportation) infrastructure and procedures related to movement of goods (soft infrastructure) are a necessary part of making these countries attractive potential locations for supply chain-related production. As the Greater Mekong Subregion successes demonstrate, regional-level projects may be particularly effective.

Resource Mobilization – Multinational corporations are typical central players in the operation of supply chains. Thus, integration of LDCs into supply chains is predicated on their ability to attract foreign direct investment, whether at the regional or global level. That requires

making these countries hospitable to those these firms. In that regard, the assurance of a rules-based environment is a more effective lure than tax holidays and other pecuniary measures.

While multinational corporations may be central players, a large part of the employment and other dynamic economies of scale (learning by doing) from supply chain production comes from the participation of local small and medium sized enterprises (SMEs). Financing of these enterprises is notoriously constrained in developing countries and particularly so in LDCs. The development of innovative programs, such as Bangladesh's SME credit scheme, must be a necessary part of ensuring that potential static and dynamic benefits of integration into supply chains are maximized.

The large physical infrastructure projects, as well as the institution building and networking, necessary for improving countries' ability to integrate into supply chains will be well beyond the resource capacity of most LDCs. However, the trade-dependent nature of supply chain production means that most of these projects and programs fall easily under the aid-for-trade rubric. As the experiences of Cambodia and the Greater Mekong Subregion demonstrate, aid-for-trade can be an effective vehicle for overcoming immediate resource or technical constraints in trying to improve the conditions for supply chain-related production.

Directed Industrial Policy – Though industrial policy might seem an attractive means of directing economic activity in ways that enhance the possibility of integration into supply chains, broad based industrial policy places a high technical and administrative burden on governments and is thus likely to prove beyond the capacity of most LDC governments. However, interventions that are specifically directed at limiting the administrative burden while improving the climate for supply chain-related activity may be well within the reach of most LDCs. Such interventions include the development of export processing zones (which allow governments to create near ideal conditions for business activity within a limited geographic zone, long before they have the capacity to do so across the wider economy). Another potential intervention is targeted improvements in the business climate, such as removal of unnecessary legal and administrative restrictions. This can have the dual effect of reducing the

administrative burden while improving the potential for supply chain-related activity. The phenomenal success of Rwanda in improving the conditions for business activity is instructive in that regard.

The Potential for Supply Chains in South Asia

South Asia is unique in many respects. The region is dominated by India (whose population is more than three times that of all the other countries combined), and this has no doubt had some influence on the politics of the regions. The gap between countries, in terms of the income and other indicators or economic structure, is also quite narrow when compared to other regions. One of the signs of that relative parity is the fact that all the LDCs of the region (excepting Afghanistan and Bhutan) are engaged in significant levels of manufacturing for export. Those attributes would seem to suggest that, though there is potential for supply chain development in the region, its development and structure is likely to be region-specific.

South Asia has been slow to develop formal regional institutions for enhancing trade and other types of economic integration. However, the experience of East Asia suggests that this may not be as big a deterrent as it may at first seem. Much of the de facto economic integration that occurred in East Asia was outside formal regional (institutional) arrangements. However, the limited degree of structural differentiation between countries of the region means that the "flying geese" model of East Asia may not be viable for that region (on its own). But the fact that most countries of the region do have some degree of manufacturing capacity, and are already engaged in the production of related goods (such as textiles and garments), means that there is an immediate potential for developing regional supply chains from the development of forward and backward linkages within and across existing industries. Additionally, South Asia may be able to take advantage of its proximity to East Asia to develop regional arms of wider Asia-wide supply chains. The LDCs of that region may be able to offer conditions that are comparable with those of South East Asian LDCs and the middle income countries of the region (especially India and Sri Lanka) can certainly perform intermediary roles within supply chains (performing more skill-based tasks) akin to the tasks performed by the ASEAN 4.

Conclusion

While there is no doubt that LDCs face significant challenges in attempting to integrate into supply chains, it is clear that directed actions that address the areas of weakness – particularly relating to transport and logistics costs – can go a long way toward improving their chances for successful integration into supply chains. In the particular context of South Asia, the LDCs of that region are better placed than most LDCs in terms of the environments they can offer for the successful operation of supply chains. The South Asian region, on its own, does not appear to have potential for the highly differentiated supply chains that are a signature of the East Asian experience (at least not wholly within the South Asian region). However there is potential to develop supply chains that take advantage of the region's current advantages - such as the region-wide experience with manufacturing for export, the presence of similar or related industries across the region, and the region's proximity to the more advanced economies of East Asia.

I. Introduction

The use of regional supply chains in production implies the geographic dispersion of the stages of production (of goods and services) across national borders within a given region.[1] As such, these supply chains often involve a complex web of inter- and intra-firm transactions across and within national boundaries engaged in various aspects of production and marketing of a single or related range of products. (Some investigators have, perhaps more correctly, referred to them as supply networks). This web of firms is able to take advantage of variations in comparative advantage across countries and country- or region-specific trade advantages (or sidestep trade or regulatory restrictions) to lower production costs and increase market access (Kimura & Obashi, 2011). In addition, stiff competition between firms at certain stages along the production chain can serve to maintain strong downward pressure on costs (Hale and Wills, 2005). However, the geographic dispersion of the production process also means that the viability of regional supply chains is predicated on the ability to transfer goods across space and national borders both quickly and inexpensively. Those requirements pose a substantial challenge to the introduction and expansion of regional supply chains in developing regions, in general, and the participation of Least Developed Countries (LDCs), in those chains, in particular.

The infrastructural, human capital and institutional demands of this form of production has meant that, heretofore, LDCs have not typically been major participants in these supply chains. Even in East Asia, where this structure of production is most pervasive, the LDCs of the region (Cambodia, Lao PDR and Myanmar) have been the last to be integrated into the regional supply chains and their participation, though increasing, remains constrained (ESCAP, 2007). One can reasonably conclude, from this record, that the further development of regional supply chains in South Asia, in general, and the integration of South Asian LDCs into these supply chains, in particular, would likely face significant hurdles – and that is indeed the case.

[1] Of course, such supply chains can also be (and often are) global, linking countries across several world regions.

As a region, South Asia is unique in many respects. Though its regional population is large, only eight countries make up the region and half of these are LDCs. Moreover, the level of intra-regional trade is the lowest of any of the major developing regions (Appendix, Figure A1). However, in terms of infrastructural, human capital and institutional endowments, South Asian LDCs (with the notable exception of Afghanistan) are typically better placed than most LDCs. This suggests that the prospect of integrating these economies (again, excepting Afghanistan) into regional supply chains may be a formidable but not insuperable challenge.

In this report we first (briefly) explore supply chains (production networks) as a particular approach to production in a more globalized world, and the particular experience of East Asia where this form of production has reached the greatest level of sophistication. We then examine the nature of the constraints likely to be faced by LDCs in attempting to integrate into regional supply chains. This is followed by an enumeration of some of the initiatives that LDCs can undertake to improve domestic and regional conditions for participation in regional (and global) supply chains. The penultimate section of this report looks more specifically at the situation and prospects for South Asia. The report concludes with a summary of its main findings.

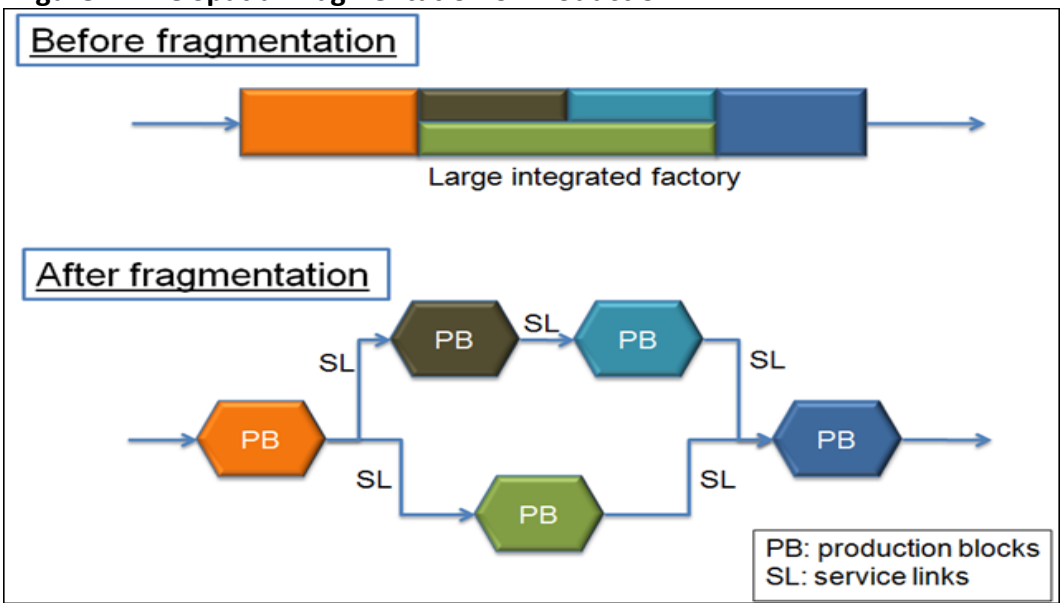
II. Supply Chains – Theory and Practice

II. a. Segmentation Theory and its Implications

In both theory and practice, supply-chain production amounts to an amplification of the level of specialization in production in a way that challenges the relevance of the single firm factory – heretofore a hallmark of capitalist production worldwide. At a theoretical level, if production processes can be separated into tasks that differ in the nature of input combinations required, and these tasks housed within spatially separated (but linked) production blocks, a firm may be able to reduce costs by matching tasks with location-specific advantages (Jones and Kierzkowski, 1990). However, fragmentation is economically advantageous only if the saving achieved by the spatial subdivision of production is large relative to the additional cost (and uncertainty) imposed by the service links needed for connecting these (spatially dispersed)

production blocks (Figure 1). It is thus not surprising that the fragmentation of production has been boosted by recent reductions in transport costs, improvements in communication technologies, and the increased adoption of institutional innovations such as "just-in-time" inventory management (Jones and Kierzkowski, 1990; Banomyong, 2010).[2]

Figure 1: The Spatial Fragmentation of Production



Source: Figure 2 of Kimura and Obashi (2011)

The degree to which production blocks are likely to be spatially separated will depend not only on their technical divisibility but also on the degree of differentiation in factor intensities between blocks, the separability of factors (such as skill and labour) and the value to weight ratio of inputs (Lall *et al*, 2004). If the rate of technical divisibility is high, factors are easily differentiable and separable, and the value to weight ratio is high, a global or regional supply chain may result.

The service links that connect production blocks in the context of fragmented production may be both inter and intra-firm, short and long-distance, and local as well as transnational. Transactions that are local are more likely to be inter-firm (arms length) and to involve small or

[2] Those factors are not unrelated since, for example, just-in-time inventory management is made much easier in the context of cheap, constant and reliable communication.

medium sized enterprises (at least on one end of the transaction) whereas long-distance and cross-national transactions are more likely to be the intra-firm activity of multinational corporations (Ando and Kimura, 2009; Machikita and Ueki, 2010). Inter-firm arrangements (for the production and/or transfer of goods) may take a variety of forms including subcontracts, spot purchases, direct auctions, and internet auctions (Kimura and Obashi, 2011).

There are, typically, large initial costs involved in the establishment of production networks. However, once fragmentation (of production) becomes established, production costs can be further reduced from the achievement of (static) economies of scale achieved in the multiple (and repeated) use of service links and dynamic economies of scale (learning by doing) from both service link activity and location advantages (Kimura and Obashi, 2011). These factors mean that a country's ability to participate in new supply chains is likely to be strongly influenced by its prior participation in such networks (path dependency). In short, with respect to regional or global supply chains, the hardest part may be getting into the club.

Given the nature of these networks, in order for firms within a country to become part of a supply chain (production network) the country must be able to offer clear location advantages. Such advantages can take the form of form of cheap (and easily trained) labour, skill abundance (or uniqueness), cheap and abundant capital, access to knowledge-intensive goods or services, or capacity to innovate. However, that location advantage (regardless of its form) must be complemented by relatively low service link costs. Though LDCs may find it easy to offer cheap labour, cheap reliable service links may prove to be a significant challenge.

II. b. Supply Chains in Practice – The East Asian Experience

Though supply chains in some form can be found in all world regions they have reached their greatest level of sophistication and density in East Asia (Kimura and Obashi, 2011). A single product assembled and exported from China may embody knowledge-intensive designs originating from Japan, inputs produced from capital or skill intensive production methods in South Korea, Taiwan, Hong-Kong or Singapore (Asian NICs), and inputs produced from more labour-intensive methods in one or more of the ASEAN 4 countries (Indonesia, Malaysia,

Philippines and Thailand). This approach to production has often been associated with the "flying geese" model of industrialization. However, it should be noted that in its original formulation (by Akamatsu (1961)[3]) the "flying geese" model referred to sequential specialization by lead and follower countries across *industries* – from simple consumer goods to sophisticated high-technology goods – whereas current (East Asian) supply networks tend to reflect sequential specialization across *tasks* in terms of capital, skill or knowledge intensity. This country-level hierarchical structure is, at least in part, a consequence of the fact that a major motivation for the development of regional supply chains in East Asia came from the desire of Japanese firms to shift labour intensive activity first to the Asian NICs and later the ASEAN 4 countries, and still later to Vietnam and China, to take advantage of lower labour cost as well as more favourable exchange rates in the aftermath of the 1985 Plaza Accord (Thorbecke, 2012).[4] The Asian NICs, in turn, have actively sought to shift labour intensive activities to other Asian countries as their comparative advantage has shifted from cheap labour to skill and capital. As labour costs and skill levels increase in the ASEAN 4, Vietnam and China, it can be expected that many of the activities currently performed by these countries will be shifted to the East Asian LDCs (Cambodia, Lao PDR and Myanmar) and possibly South Asian countries as well.

The development of supply chains in East Asia has been marked, not simply by high levels of intra-regional trade (Figure A1) but, more specifically, by high and increasing levels of trade in intermediate goods (Table 1). Parallel to this, and likely causative, has been a high level of intra-regional foreign direct investment - as multinational corporations (MNCs) expanded across the region to accommodate the desired spatial fragmentation of production (Aminian, Fung and Ng, 2009). One indication of this is the fact that Japanese foreign direct investment (FDI) has been increasingly concentrated in Asia since the signing of the Plaza Accord in 1985 (Figure 3). The *de facto* regional market integration suggested by these trade and investment flows have

[3] Though first published in English in 1961 the theory dates back to 1935 when it was first published in Japanese.

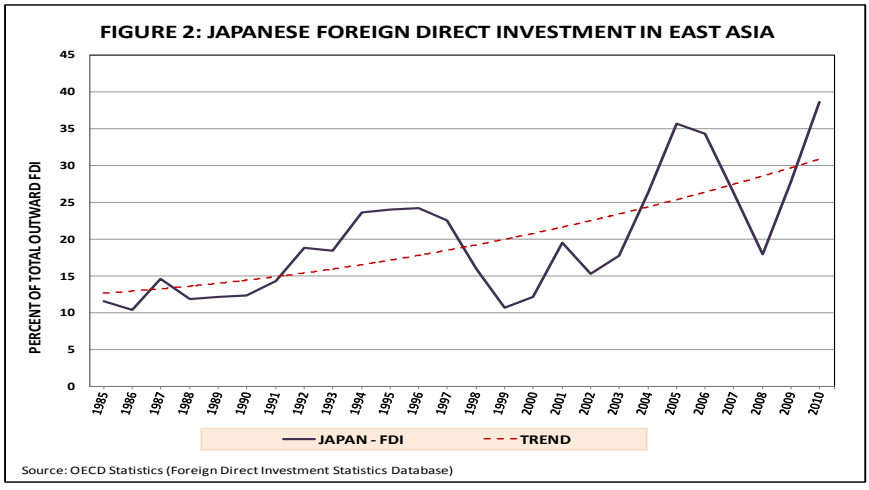
[4] The Plaza Accord was an agreement among the World's five largest economies (France, Germany, Japan, United Kingdom and United States) to intervene in the currency markets to cause the US dollar to depreciate relative to the Japanese yen and the German mark.

preceded, rather than followed, formal regional economic arrangements. Asia still does not have a formal Asia-wide trade or economic integration arrangement. The ASEAN Free Trade Area (AFTA), for example, did not come into being until 1992 (with extended periods for implementation) and formal trade agreements between ASEAN and China, Japan and South Korea are very recent (2010, 2008 and 2010 respectively). The necessary legal, institutional and policy adjustments (along with the improvements in physical infrastructure) necessary to facilitate the development and expansion of regional (and global) supply chains were largely carried out unilaterally by individual countries (Aminian, Fung and Ng, 2009).

Table 1: Intra-Regional Trade in East Asia compared to EU-15 and NAFTA

Region	Regional Trade (Exports + Imports) as % of Total Trade					
	All (Non-oil) Goods		Manufactured Goods		Parts and Components	
	1994-95	2006-07	1994-95	2006-07	1994-95	2006-07
East Asia	52.1	52.1	53.2	55.1	57.0	62.9
EU-15[5] (Western Europe)	40.8	40.0	39.9	38.4	41.4	43.3
NAFTA[6] (North America)	64.3	58.7	62.6	57.4	60.1	60.1

Source: Extracted from Tables 3 and Table 4 of Athukorala and Kohpaiboon (2009).



[5] The EU-15 countries are: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Luxembourg, Netherlands, Italy, Portugal, Spain, Sweden and United Kingdom

[6] The NAFTA countries are Canada, Mexico and the United States

III. Major Constraints to LDC Participation in Regional Supply Chains

As noted earlier, supply chains offer a competitive advantage only if the gains to be obtained from the spatial separation of production are large and are not exceeded by the many potential costs of linking production blocks. Cheap, instant, and reliable modes of communication between firms along the chain of production are critical for coordinating the production process and ensuring responsiveness to evolving conditions. Logistics services in the form of: minimal transit times, safe handling of goods, reliability, and security are critical for minimizing cost and maximizing certainty as goods move along the chain of production. To promote local firm participation in these supply chains a country must, therefore, be able to offer the requisite physical, communication and institutional infrastructure, as well as the policy conditions that can accommodate the requisite quality of communication and logistics services. Moreover, the importance of links between MNCs and local firms in these supply chains also means that countries must be able to offer an environment that is conducive to the quick and effective initiation and execution of commercial activity.

Among the definitional attributes of LDCs, only human capital deficiencies immediately suggest potential challenges with respect to the integration of LDC firms into regional supply chains. However, LDCs are more likely to demonstrate institutional and infrastructural weaknesses that can constrain these countries' ability to participate meaningfully in the trade and investment activities that are critical to the formation of regional supply chains. Further, LDCs that are also landlocked, or small islands, face additional (or more acute) constraints that (directly or indirectly) derive from these geographic attributes.

Most impediments to trade-related activities generally, and participation in regional supply chains in particular, derive from various forms of domestic supply constraints (UNCTAD, 2008). These include:

- High costs of transport and logistics;
- Limited telecommunications infrastructure;
- Expensive and unreliable utility provision;

- High transaction costs of doing business;
- Weak and shallow finance;
- Weak human resources;
- Limited capacity to produce public goods.

However, beyond these internal constraints, some aspects of the external environment, in particular, residual and implicit trade barriers, also constrain the potential participation of LDCs in regional supply chains.

High costs of transport and logistics – A competitive and efficient logistics sector (meaning cheap, rapid and reliable transport links) is an imperative of well-functioning supply chains (Hollweg & Wong, 2009).[7] Yet, most LDCs have very limited road networks and what exists is typically of low quality and limited capacity (in terms of vehicle haulage). The same typically applies to rail networks, where they exist. Port capacity is usually also limited - leading to issues of congestion which, when combined with onerous regulations, red tape and corruption, serve to lengthen transit times and reduce reliability. Extended and unreliable transit times imply poor logistics services that eventually result in increased overall production costs across the supply chain and make the operation of just-in-time-delivery-based supply chains quite impractical (Banomyong, 2010; Lyakurwa, 2007). Table 2 indicates that, in terms of the provision of transportation infrastructure and logistics services, LDCs fall well behind all other country groups except low-income countries (of which they are a majority, in any case). Thus, in order to meet the transportation and logistics demands of supply networks, most LDCs would need significant improvement in the capacity and quality of transportation networks and the quality of administration of transit links.

With respect to transportation and logistics, landlocked countries are particularly disadvantaged. Not only are transportation costs systematically higher in landlocked countries,

[7] Logistics, in this context, refers to "the part of the supply chain process that plans, implements, and controls the efficient, effective flow and storage of goods, services, and related information from the point of origin to the point of consumption, in order to meet consumers' requirements" (de Souza *et al*, 2007).

the transit fees, delays and the element of caprice introduced by their dependence on transit through neighbouring countries serve to make for extremely uncompetitive logistics.

Table 2: Two Indicators of Transport and Logistics Conditions by Country Group

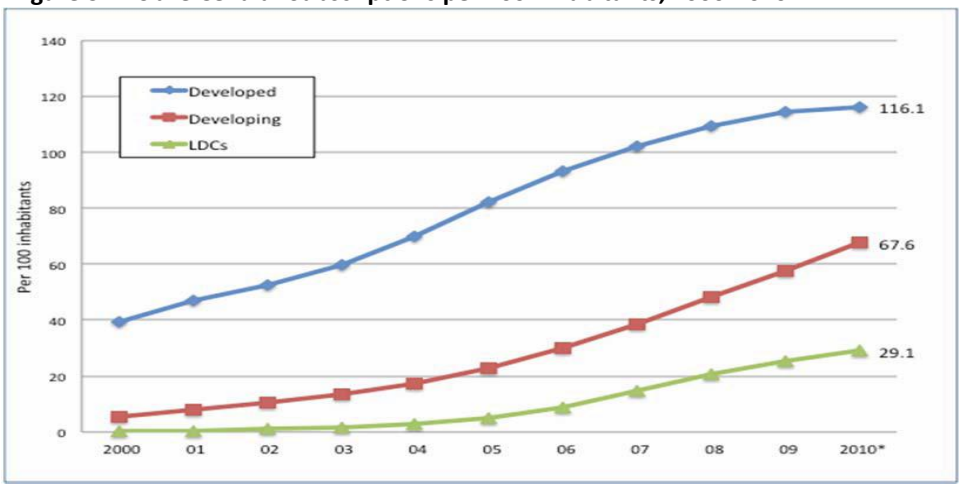
Country Group	Logistics Performance Quality Index (5=highest) 2010	Percentage of Road Network that is Paved 2009
High Income, OECD	3.7	79.7
High Income , Non-OECD	3.2	87.5
Upper Middle Income	2.5	57.6
Lower Middle Income	2.2	48.6
Low Income	2.0	20.7
Least Developed Countries	2.0	20.8

Source: World Development Indicators (World Bank)

Limited telecommunication infrastructure – As has already been mentioned, communication is critical to the functioning of a supply chain. Coordinating the movement of goods and services in ways that reduce the need for large storage capacity requires consistent communication between firms along the supply chain. Access to cheap telecommunication services would, therefore, have to be a necessary characteristic of any country hoping to be integrated into regional supply chains. The rapid rate of increase in mobile phone usage in the last decade has allowed LDCs, as a group, to surpass the Brussels Plan of Action targets for telephone line density for 2010 (ICT, 2011).[8] However, progress has been much slower with respect to access to internet services, which remains limited (in both capacity and density) and expensive in most LDCs (Figure 2). Yet, the need for constant between-nation communication, obliged by regional and global supply chains, makes internet communication much more critical (than telephone communication) for the successful integration of LDCs into those networks. (For example, an ability to participate in internet auctions would require high-quality, reliable, access to internet services.)

[8] Density is measured with respect to the combined number of mobile and land line phones. All of the increase has been with respect to the former, since the latter remained stagnant relative to 2001.

Figure 3: Mobile Cellular Subscriptions per 100 Inhabitants, 2000-2010



Source: International Telecommunications Union (2011)

Expensive and unreliable utility provision – Beyond communication and logistics, the viability of a supply chain is also dependent on the availability of a cheap and reliable source of electricity and water. High energy costs can rule out any part of the production process that is energy-intensive (Mbekeani, 2010). However, reliability may be even more critical than cost. Frequent interruptions in the provision of electricity, for instance, not only increase the direct cost of production and reduce reliability, but may also cause disruptions along the supply chain (such as transportation delays at ports and other transit stations) that compromise transportation and logistics as well (UNCTAD, 2008). As Table 3, below, shows, LDC economies are more likely to be characterized by constant electrical power interruptions with a correspondingly high loss in output value. Unreliable provision of water can have a similar effect on production costs as unreliable electricity provision (Mbekeani, 2010).

Table 3: Number and Effect of Electrical Power Outages

Country Group	Number of power outages in firms in a typical month	Value lost due to electrical outages (% of sales)
Least Developed Countries	16.1	7.6
Other Low and Lower-Middle Income Countries	7.6	5.8

Source: World Development Indicators (World Bank)

High transaction costs of doing business – Integration of LDCs into supply chains, regardless of whether it takes place through the entry of new transnational corporations, the incorporation of local firms into existing supply chains (or, more likely, some combination thereof), will require the establishment and operation of new firms that place a premium on easy and speedy commencement, execution, and termination of business activity. However, institutional weaknesses in the form of excessive or misdirected regulations, poor administrative procedures, weak legal and judicial systems and weak financial systems mean that the cost (in terms of both time and treasure) of engaging in commercial activity is typically significantly higher in LDCs than in other developing countries. As Table 4, below, shows, LDCs have a lower average rank on all "cost of doing business" indicators considered, when compared to both developed and other non-LDC developing countries. The higher cost and time involved in engaging in business activity makes these countries less attractive places for locating new business activity, in general; and significantly less attractive for integration of LDCs into supply chains, in particular, because of the inherently higher transaction intensity that this type of production structure demands.

Table 4: Country Group Performance in Terms of Doing Business Indicators

Doing Business Indicator	Average Rank by Country Group (Covering 183 Countries)		
	Developed	Developing Non-LDC	LDCs
Overall Ease of Doing Business Rank	24.1	89.2	142.5
Starting a Business	49.3	91.6	120.1
Dealing with Construction Permits	46.2	94	116.3
Getting Electricity	45.8	92.3	120.8
Registering Property	55.9	89.9	120.0
Getting Credit	37.6	78.8	126.8
Protecting Investors	61.7	80.3	117.3
Paying Taxes	52.7	96.8	105.5
Trading Across Borders	28.9	91.5	133.8
Enforcing Contracts	30.4	96.2	121.2
Resolving Insolvency	23.7	92.7	137.4

Source: International Finance Cooperation

Shallow and inefficient finance – As Table 5, below, suggests, shallow and inefficient finance is more typical of LDCs than any other group of economies. The financial sectors of most LDCs are

characterized by an oligopolistic banking system that provides predominantly short-term credit, at high interest rates, to large, established firms, but limited engagement beyond (UNCTAD, 2008). In these weak financial systems, microenterprises may be able to obtain financing from microcredit organizations or the informal financial sector, but small and medium-sized enterprises have great difficulty obtaining financing of any sort (whether for start-up or working capital). Thus, the development and/or expansion of small and medium-sized enterprises – which would likely be a critical part of integration into supply chains - may be undermined by limited finance.

Table 5: Financial Sectors Indicators

Country Group	Domestic Credit to Private Sector (% of GDP in 2010)	Interest Rate Spread (Lending rate minus deposit rate in 2008)
High income: OECD	166.5	
High income: nonOECD	92.0	
Upper middle income	83.2	5.9
Lower middle income	40.1	7.9
Low income	29.7	9.8
Least developed countries	22.9	9.8

Source: World Development Indicators (World Bank)

Weak human resources – Labour productivity is a key element of product competitiveness (UNCTAD, 2008). Therefore, access to a pool of skilled and productive labour force is a key attribute of successful export production, in general, and participation in regional and global supply chains, in particular. Moreover, firms may need the assurance of a critical mass of technical and skilled workers to be persuaded to locate productive activity in the country. Unfortunately, given that a weak human resource base is a typical attribute of LDCs, the ability of these countries to offer a workforce with the requisite skill and technical capability may be severely constrained. In that regard, small island LDCs are particularly constrained. Not only are the skill and literacy levels of their population at the lower end of the spectrum, their small populations may mean that the critical mass of workers necessary to attract new productive activity (whether skilled or unskilled) may be out of reach.

Limited Capacity to Produce Public Goods – while excessive and misguided regulation may prove a deterrent to industry, insufficient or inefficient production of public goods, in the form of necessary institutions of information, negotiation and enforcement, could be just as detrimental. Along with strict delivery schedules, supply chains also make exacting demands in terms of quality standards for goods exported. In fact, quality is an important determinant of competitive advantage (Banomyong, 2010). Governments play a critical role in terms of ensuring the correct regulatory framework, contract enforcement, quality control and information dissemination. These interventions not only reduce firm-level cost, but also provide assurance of the integrity of the production process. The larger the number of firms engaged in supply chain activity the more important it is that governments take the lead in providing these services. Yet, public goods provision is not an area of relative strength for LDCs.

Residual and Implicit Barriers to Trade – The promise of duty free and quota free (DFQF) access for LDC contained in the World Trade Organization (WTO) Hong Kong Ministerial Declaration (2005), along with additional initiatives such as the EU's Everything but Arms and the USA's Africa Growth and Opportunity Act, would seem to offer the prospect of an unrestricted trading environment for LDCs. However, the possible trade-enhancing effects of these initiatives are significantly undermined by: the remaining exceptions; stringent rules-of-origin requirements; sanitary and phytosanitary requirements; and environmental requirements. These exceptions and additional hurdles serve, effectively, as residual or implicit trade barriers. The small proportion of goods that remain excepted from the DFQF rule tend to fall disproportionately on goods that are most likely to be exported by LDC countries (Bouet *et al,* 2010). The administrative requirement and documentation cost of proving conformity with rules of origin is often sufficient to discourage utilization of preferences (ESCAP, 2007). Moreover, goods produced through regional supply chains would be very likely to fall foul of these criteria. The institutional and technical requirements for ensuring that products meet high sanitary, phytosanitary and environmental standards are simply beyond the capability of most LDCs, and thus serve to eliminate the goods they produce from potential export markets (Lyakurwa, 2007; Hinkle and Newfarmer, 2005; Matoo *et al*, 2002).

IV. Policies and Programs to Improve the Conditions for the Operation of Supply Chains

The list of potential constraints enumerated above might, at first blush, suggest that the integration of LDCs (and, more particularly, South Asian LDCs) into regional supply chains may need to await significant further development. However, experience of East Asia (briefly considered above) the ongoing (and mostly successful) integration of Cambodia, Lao PDR and Myanmar into East Asian supply chains, and the success of efforts at expanding the export manufacturing sector in Bangladesh, indicate that, by taking advantage of existing strengths, directly addressing the most binding constraints and using bridge institutions and technologies over the short and medium term, LDCs may be able to begin the process of integration into regional supply chains well before all the major constraints are ameliorated.

One of the lessons of the East Asian experience is that countries need not wait for progress on formal processes of regional trade liberalization and economic integration – most of the programs and policies that engender the development of regional (and global) supply chains are unilateral initiative taken by individual countries. However, whereas formal regional agreements may largely follow, rather than lead, progress on economic integration, region-wide attempts at improving transportation links both at the level of physical infrastructure and "soft" infrastructure (such as the simplification of cross-border) can have a large effect on transportation and logistics costs in intra-regional trade.

The initiatives that can be taken will be grouped under three headings:

a) Transport and trade facilitation;
b) Resource mobilization;
c) Industrial policy.

IV. a. Transport and Trade Facilitation

The importance of transport quality and cost in reducing the cost of linking production blocks in a supply chain are easy to recognize. However, improving the speed and cost of movement of

goods can depend just as critically on trade facilitation measures. Maur (2008: 2) refers to trade facilitation as "the sum of efforts undertaken at the national, regional and multilateral levels designed to reduce the transaction costs of trade." Thus, improvements transport infrastructure and trade facilitation measures should serve to enhance the movement of goods, services and investment within and across borders. In so doing, such programs address the biggest potential weakness of supply-chain-based production – its geographic spread and consequent dependence on the rapid and assured movement of goods and services across long distances. Such programs encompass a wider range of initiatives, only some of which will be enumerated here.

- **Improvement in physical infrastructure** – An adequate road or rail infrastructure is an imperative for reducing transit time, direct cost and maintaining quality in production. An insufficient or poor quality road or rail network means that transit times are long, delivery is unreliable and quality may be difficult to guarantee. Ports and cargo-handling facilities are also an important part of that infrastructure since poor quality or low efficiency of these facilities impose additional cost, time and uncertainty on the movement of goods (Brooks, 2008).

- **Accelerating customs and logistics procedures** – Reduced transit time leads eventually to lower production costs. Extended procedures at border crossings or transport junctures increase the amount of time it takes for goods to move between production blocks and add to the uncertainty to the timing of such movements. Supply chains that use the just-in-time approach to inventory management are particularly vulnerable to uncertainty in the movement of goods between production blocks. Accelerating customs and logistics procedures reduces the effect of spatial dispersion and opens up larger areas to participation in supply chains. Djankov *et al* (2010) found that an extra day of transit time reduced trade volumes by one percent.

- **Improved power grid infrastructure** – Though the power grid infrastructure may not be an integral part of the transportation network it is important for reducing

interruptions that increase trade, particularly at transportation nodes such as ports (ADB, 2001). The efficient operation of ports and other transportation notes is predicated on the assured provision of electricity for both the movement and storage of goods.

- **Investment in telecommunication infrastructure** – Cheap and reliable communication networks are a necessary part of ensuring that the correct goods are shipped at the correct time between production nodes in a supply chain. Therefore, reducing the transaction costs of trade also means improving the means of communication within and across national borders. This is also an area where the presence of large externalities suggests significant rewards to regional cooperation (Brooks, 2008).
- **Enhancing regional economic cooperation** – Harmonization of regulations and procedures, along with lower tariffs, are some of the outcomes of regional trading arrangements that are a critical part of reducing transit cost and time across borders (UNCTAD, 2008). Movement along this front will certainly enhance the potential for the expansion of supply chains but, as was noted earlier, progress on that front need not await formal regional institutional arrangement and can be made long before these agreements are enforced. A loose arrangement, that concentrate on the provision of regional public and quasi-public goods may offer more immediate rewards than the development of more formal institutions aimed at increased trade and regional integration. The experience of the Greater Mekong Subregion (see Box 1, below) is a clear illustration of this as well as the importance of transport and trade facilitation.

Box 1

The Greater Mekong Subregion: Intra-Regional Transportation and Trade Facilitation Initiatives

The Greater Mekong Sub-region (GMS) refers to the five countries (Cambodia, Lao PDR, Myanmar, Thailand and Vietnam) and two Chinese provinces (Yunnan and Guangxi Zhuang) that occupy the drainage basin of the Mekong River. The basin covers a land area of 795,000 square Kilometres and is home to a population of 326 million people (ADB, 2012). Four of the five core countries of the GMS are the CLMV countries (Cambodia, Lao PDR, Myanmar and Vietnam) - considered the economic laggards of the ASEAN group. In fact, three of them are LDCs. The GMS countries sought assistance from the Asian Development Bank to develop a program that enhanced the connection within that sub-region, improved competitiveness and fostered a greater sense of community. The result was the GMS Economic Program of 1992. Among the nine priority areas slated for action was improving transportation infrastructure, and enhancing transport and trade facilitation.

Notably, the GMS Program did not attempt formal *institutional integration* of the sub-region. The institutional framework that ensures program implementation is rather loose. At the policy level the program is guided by a Ministerial Conference and implementation of programs and projects are overseen by sector-specific forums or working groups (Duval, 2008). The GMS Program, instead, emphasized *market integration* - an emphasis is on the provision of public and quasi-public goods to increase "connectivity, competitiveness and a sense of community" (Menon and Melendez, 2011).

In 1995 the GMS adopted the Transportation Master Plan which identified priority transport links that could generate immediate improvements in transportation infrastructure, thereby reducing travel time and costs. These included three major road construction projects: the North-South Economic corridor (NSEC); the East-West Economic Corridor (EWEC); and the Southern Economic Corridor (SEC). An additional six corridors were added to the plan in 2007 (Stone and Strutt, 2009). To improve transportation and trade facilitation the countries entered into a Cross-Border Transportation Agreement (CBTA) in 2003 to "facilitate the cross-border movement of goods, vehicles, and people between and among [the member countries]" by reducing border crossing formalities; exchanging commercial traffic rights; establishing transit traffic regimes, and setting common standards and requirements for road vehicles and cross-border traffic (Stone & Strutt, 2009).

An examination of the impact of the NSEC found that, between 2000 and 2006, shipping cost between Bankok (Thailand) and Kunming (China) were reduced by 27 to 33% (depending on the route taken) and parallel transit times were reduced by 32 to 40% (Banomyong, 2007). The EWAC was found to have reduced travel time between Dansavahn (Lao PDR) and Kahnthabouly (in Vietnam) by 75% (from twelve to three hours) (Luanglatbandith, 2007). The SEC was similarly found to have reduced transit times and transportation cost (Phyrum, Sothy and Horn, 2007). These gains from improvements in transport infrastructure together with ongoing progress in trade facilitation measures (under the CBLT) was estimated to have generated at least 40% increase intra-regional trade by 2006 (Stone and Strutt, 2009).

IV. b. Resource Mobilization

The development and expansion of regional supply chains, like the initiation or expansion of other forms of production, requires the development and/or expansion of new firms and the capital investments that this implies. Sources of invested capital can either be internal or external. For LDCs the main source of external investment capital is FDI. Internal sources are

mainly through the banking sector (and, sometimes, the government budget). We briefly examine some of the most salient issues in both respects.

- **Foreign Direct Investment** – LDCs do not have a very good record of attracting FDI into areas other than natural resource exploitation. It is important that countries define (and emphasize) their comparative advantage and provide the necessary information to potential investors with regard to those advantages. Further, expensive incentives such as tax holidays, tax reductions and grants do not have a particularly good record of success yet come with a high relative cost to poorer countries. In fact, emphasis on lowering the transaction cost of doing business and assuring the rules of engagement may be a more effective way of attracting external investment (ESCAP, 2007).

  With respect to regional supply chains, much of the production expansion is likely to come from the expansion of firms within the region (from more advanced economies in the region to LDCs). Therefore, particular attention needs to be paid to the factors that encourage the flow of intra-regional FDI. In that regard, regional economic arrangements and other efforts at economic integration may pay particular dividends (ESCAP, 2007; Kumar, 2007). Box 2 on the experience of Vietnam speaks directly to those factors.

- **Domestic Resource Mobilization** – In the environment of shallow finance that is typical of LDCs, firm financing can be a challenge. As noted earlier, the formal financial system (largely commercial banks and near banks) is designed to serve the needs of large established firms. The informal sector and microcredit organizations typically serve the need of microenterprises. The entrepreneurial middle, consisting of small and medium sized enterprises (SMEs), are typically left unserved – starved of both long and short-term credit.

BOX 2

Attracting FDI – The Vietnam Experience (forthcoming)

Vietnam began its transition from a centrally planned economy to a market economy (the *Doi Moi* period) in 1986. This liberalization and reconstruction was implemented through a series of laws aimed at formally recognizing the right to private and foreign ownership of property as well as the right to conduct business. These included The Land Law in 1987 (with revisions in 1993 and 1999), a Bankruptcy Law (in 1993), laws that liberalized the financial sector, and a law on foreign investment (1987) (Bui, 2009). One of the responses to this new "opening up" was a spectacular increase in foreign direct investment (FDI). It rose from nearly zero in 1989 to 12% in 1994 (Figure B2-1). Investors perceived potential large and untapped markets in this country of over 66 million people and a cheap but relatively well educated labour force that could be used to produce goods for export. In addition Vietnam was the beneficiary of heightened investor interest in Asia during that period as well increasing intra-regional investment flows (Freeman, 2002). However, little of this inward flow of finance was directed at supply chain-based production. Most of this early investment took the form of joint ventures with state-owned enterprises aimed at producing goods for the local market or direct production for export (Leung, 2010).

That euphoric period came to a halt with the Asian Financial Crisis in 1997. However, that crisis may have merely accentuated a decline that was already in progress. The difficulties of business in Vietnam were becoming more apparent and there were fears that reforms were stalled (Freeman, 2002). FDI did not disappear altogether but its level (relative to GDP) had fallen to 3.4% by 2002 (from 9.6% in 1997). Thereafter, while the rest of South East Asia recovered its previous levels of FDI, Vietnam's FDI levels continued to stagnate until 2006 (Figure B2-1).

The second wave of reforms began at the turn of the century with the revision of the Law on Foreign Investment, and new Enterprise Law (2001). This was followed by a Second Enterprise Law (2005) and a Common Investment Law (2006). The purpose of these laws was to further even the playing field for the private and state sectors and local and foreign firms (Leung, 2010). Though these initiatives result in a marked increase in the rate registration of new businesses they did not have an effect on the rate of FDI flows (Figure B2-1). It was Vietnam's accession to the WTO which appeared to revive FDI flows. Membership of the WTO may have been seen as a guarantee that Vietnam would "play by the rules," thus "locking in" reforms and a promise of further market liberalization as Vietnam moved to meet WTO requirements. An increase in FDI that followed was rapid and was, by and large, maintained through the global economic crisis of 2008-2010 (Figure B2-1).

Unlike the previous wave of FDI, much of this new wave was directed at supply chain-based production. This can be seen in several attributes of the new inflows. Seventy percent of the new FDI was concentrated in industry (Bui, 2009). An increasing number of firms became involved in labour intensive manufacturing such as garments, footwear and furniture and intermediate good imports from China increased sharply (Lueng, 2010). The shift to more supply chain-based production was partly engendered by the fact that new laws allowed MNEs to acquire more than 30 percent of domestic enterprises (as opposed to the joint ventures of the previous wave) and non-

labour production and transit cost such as electricity, transportation and telephone were reduced as these sectors (formally monopolized by state-owned enterprises) were opened up to competition (Leung, 2010).

For firms engaged in production for export, the instruments most successfully employed for directing short-term credit to these firms has been various forms of trade credit. Instruments include pre-shipment guarantees, export production guarantees and post-shipment guarantees. Both public sector and external concessional resources have been used to leverage bank financing for these schemes. Yet to be tried, but potentially feasible for supply chains, is intra-firm trade credit. Larger or better financed firms may be able to provide trade credit to less financed firms within their network if given the right incentives such as tax concessions, insurance or limited guarantees.[9] This may have the added benefit of making production within supply chains more attractive to nascent firms.

Long term credit has been an even greater challenge. The use of development banks (or similar public or quasi-public agencies) has been one of the means of providing long-term credit to SMEs. However, novel approaches that seek to change the incentive structure in order to overcome the risk aversion of commercial banks have the advantage of avoiding the added administrative and organizational cost of specialized public agencies. Also, such approaches can use public sector resources to leverage domestic bank credit as well as external concessional aid. (Box 3 below describes a novel, and by and large, successful attempt to improve the financing of SMEs).

- **Aid for Trade –** the aid-for-trade rubric was developed (at the 2005 WTO ministerial meeting in Hong Kong) precisely to address developing country needs for assistance in trade-related development and adjustment challenges. More, precisely, it was meant to help developing countries expand supply side capacity and trade related infrastructure

[9] Inter firm financing through trade credit was a very important tool in the early industrialization of Japan.

to increase potential benefits from WTO agreements (WTO, 2005).[10] Among the six recommended areas of emphasis suggested by the resulting Aid for Trade Task Force, two are of particular relevance to supply chain development and maintenance. These are:

- ***Trade development*** – support for: building institutions to support business activity; public-private sector networking; development of e-commerce; and trade finance.
- ***Building trade related infrastructure*** – providing financial and technical assistance for the construction of roads, ports, rail etc. (at both the national and regional level) as well as support for programs aimed at improving trade facilitation (WTO, 2006).

BOX 3

Small and Medium Enterprise Financing in Bangladesh

Over the last few decades, both the government of Bangladesh and the central Bank, the Bangladesh Bank, have taken a number of initiatives to provide financial assistance to SMEs. These programs include setting up of a bank, namely the Bank for Small Industries and Commerce (BASIC) in 1988; requiring commercial banks to reserve 5 percent of the total loan portfolio for SME financing; and special interest and credit guarantee scheme (Jesmin, 2009). Despite all these arrangements, availability of institutional credit for the SME sector still remained grossly inadequate.

In 2004 Bangladesh Bank set up a Tk. 10.0 billion (approximately US$ 160 million) refinancing scheme for credit to SMEs. According to this program, participating institutions paid a five percent interest rate to Bangladesh Bank but were free to choose the lending rate of interest to enterprises. This removed a large part of the risk involved in such lending and allowed the lending institutions to move away from the collateral-based lending approached that had restricted the flow of credit to those enterprises. The International Development Association (IDA) added a further $10 million to the scheme and Asian Development Bank (ADB) added a further $30 million. As of 2011, 43 banks and non-bank financial institutions had used that facility to lend out approximately $278 million to over 21,000 small and medium sized enterprises (Bangladesh Bank, 2011).

Given the limited resource availability that is typical of the LDC context, the ability to access (additional) bilateral and multilateral resources specifically aimed at engendering and supporting trade can prove to be a critical element in improving countries' ability to

[10] Compensation for the loss of trade preferences and the loss of revenue from the adoption of more liberalized trade regimes were also considerations (ODI, 2009).

develop and implement programs aimed at lowering trade transaction costs in general and encouraging the development of supply-chain production in particular.

The Greater Mekong Subregion (GMS) endeavours (discussed in Box 1, above) and Cambodia's successful branding of its garment industry (discussed in Box 4, below) are both examples of successful aid-for-trade endeavours. In the case of the GMS, the participating countries have successfully directed external assistance toward the reduction in transportation and logistics costs by improving the quality of the physical infrastructure as well as the "soft infrastructure" related to trade facilitation (WTO & OECD, 2011). In the case of the Cambodia garment industry, aid was used to facilitate a public-private network that allowed the government, on the one hand, to negotiate increased access to the US market and, on the other, to successfully engage the private sector in developing and implementing a program aimed at guaranteeing adherence to international labour standards (ODI, 2005; WTO & OECD, 2011).

IV. c. Directed Industrial Policy

The limited, institutional, financial, and human resources (as well as administrative capacity) of most LDCs governments does not make broad-based industrial policy a practical option for these countries (UNCTAD, 2008). However, policies aimed at reducing or side-stepping specific constraints are well within the capability of all LDCs and are part of the efforts to improve the operational environment for supply-chain-based production. These include:

- **The use of geographically or institutionally constrained programs** – While economy-wide liberalization, and immediate improvements in physical and economic infrastructure may be infeasible for most LDCs, it may well be possible to offer these advantages within a confined geographical space. Export processing zones (EPZ) and export oriented unit (EOU) schemes, for example, allow countries to offer nearly idealized environment for production and trade (in terms of simplified rules, adequate physical infrastructure (for EPZ) and minimal taxes and tariff rates) well before the general economy has the capacity to offer a significantly improved environment for production and trade

(UNCTAD, 2008; USAID, 2005). As Box 4, below indicates, Cambodia was not only able to use its export processing zones to offer to lower transaction costs for firms well below what it could offer these advantages on an economy-wide basis. The country was also able to enhance its comparative advantage beyond cheap labour by attaching socially desirable attributes to its products.

BOX 4

Strategic Location of Special Economic Zones (SEZs) in Cambodia

Establishment: Under its Second Socio-Economic Development Plan the Government of Cambodia, with external assistance, conducted feasibility studies on the establishment of Special Economic Zones (SEZs). This led to the approval (by 2010) of 21 SEZs. Many of these are privately owned and operated (Sotharith 2011).

Objective: The spatial concentration of economic activity implied by SEZs are expected to: reduce business transaction costs by providing a range of government services (including customs clearances, business permits and labour support) on-site; reduce the cost of providing physical and administrative infrastructure to production units; provide an incubator environment for the exchange of ideas and experiences between business establishments; and allow better control of environmental externalities (Hatsukano, 2010; Ngov, 2011; Sotharith, 2011) .

Location: Of the 21 SEZs thus far established, 13 were located in border areas (five along the border with Thailand and eight along the border with Vietnam). The advantage of border locations is that firms in these SEZs can take advantage of the cheap labour and export privileges (such as preferential access to US and EU markets) afforded by location in Cambodia) but avail themselves of the cheaper energy (electricity) costs and the better transportation infrastructure of Vietnam and Thailand in order to reduce overall production, transportation and logistics costs (Hatsukano, 2010; Ngov, 2011).

Challenges: SEZs are bedeviled by excessive land speculation, insufficient investment by private owners, and limited access to financing for local enterprises. Inland SEZ continue to face high electricity and transportation costs (Sotharith, 2011).

The Garment Industry in Cambodia – the Advantage of Reputation

The development of the garment industry in the mid-1990s was initially motivated by the desire of garment manufacturers in China and other Asian countries to overcome the restrictions of the Multi Fibre Agreement (MFA). Exports from these countries was constrained by the quota restriction of the MFA and they sought further access to developed country markets by exporting garments out of countries like Cambodia for whom quota constraints were not yet binding. This advantage was further enhanced when Cambodia signed the Cambodia Bilateral Textile Agreement with the United Stated in 1999. That agreement linked quota access to the US market to garment-factory compliance with international labour standards, to be verified directly by International Labour Organization (ILO) monitoring. Within Cambodia, the government, in collaboration with the garment producers and the ILO, developed the Better Factories Program along with capacity building initiatives to monitor compliance with labour standards and assist factories in meeting and maintaining those standards (ODI, 2009). Cambodia was thus able to earn a reputation among buyers as a location of socially responsible garment production (Sotharith, 2011). In short, Cambodia guaranteed that the trademark “made in Cambodia” was equivalent to a guarantee that garments were not produced under “sweatshop” conditions. Between 1995 and 2005 the number of garment factories in Cambodia increased from 20 to 247 and employment in the industry increased from 18,700 to 283,900 (Ngov, 2011).

With the end of the MFA on January 01, 2005 it most analyses of the global garment market suggested that Cambodia, with the loss of the particular advantage offered by MFN quotas, would struggle to compete with the larger low-cost producers like China and India and likely lose market share (Nordas, 2004). However, contrary to those predictions, garment production in Cambodia continued to expand after the end of MFA quotas until the onset of the global economic crisis (in 2008). Export increased from US$ 2.2 billion in 2004 to US$2.9 billion in 2007. The number of factories increased from 247 in 2005 to 292 in 2007, and employment increased, in that same period, from 283,900 to 335,000 in the same period (Ngov, 2011). Given that Cambodia did not experience a significant decrease in cost, it is very likely that it was able to continue to expand garment production and exports because of its ability to trade on its reputation.

- **Targeted improvements in the business climate** - As the Rwandan experience (Box 5) demonstrates, an LDC can, and should attempt to, make significant improvement to the business climate by targeting specific laws and regulations and developing organizations that advance both the needs of the private sector for clarity and speed (in the determination and execution of administrative protocols) and the general society's need for a functional and coherent commercial code that protects the public trust.

BOX 5

Rwanda - Removing Impediments to Commerce

Although a densely-populated and landlocked LDC, Rwanda has become one of the easiest places in Africa, and indeed the world, in which to engage in business activity. According to the most recent Ease of Doing Business Index published by the International Finance Corporation, Rwanda placed 45th out of 183 countries and 3rd in the Sub-Saharan African region, behind Mauritius and South Africa (World Bank, 2012a). What makes Rwanda a favourable place for investors?

Following the genocide in 1994, the immediate priorities for the Rwandan government was to restore peace, resettle displaced people and promote national reconciliation. Thus, the first phase of reform from 1995 to 1997 mainly focused on reviving economic activities, restoring macroeconomic stability and budget management (Government of Rwanda, 2001). However, in the second phase of economic reform (1998-2003) Rwanda focused n the promoting private industry, along with macroeconomic reforms and trade liberalization. The measures taken included: simplifying business licensing requirements and revising the labor code to remove restrictions on the movement of labor. During the same period, government established Rwanda Investment and Exports Promotion Agency (RIEPA) to facilitate private investment and business activities. One of the most significant achievements of the government during late '90s was to implement the Investment Promotion Act in 1998, which established a one-stop centre to promote private investment, exports, and enterprise development. In April 2000, the government-run Chamber of Commerce was abolished in favour of the Rwanda Private Sector Foundation (comprising of various private sector organizations) to represent private sectors interests (Government of Rwanda, 2001).

Since 2004, Rwanda has undertaken a number of initiatives to improve its position in the Doing Business Index ranking list. In 2005, the law reform commission was established to review the existing business laws and recommend efficiency. A new company law was passed to simplify business start-up and strengthened minority shareholder protections. Additionally, two new laws were implemented to facilitate business. The first law allowed securing lending using a wider range of assets as collateral. The second law makes out-of-

court enforcement of movable collateral available to provide creditors with absolute priority bankruptcy proceeding (Business Times Magazine, 2009). In 2007, the government of Rwanda established Rwanda Commercial Registration Agency to reduce administrative hassle. During the same year, cabinet directed RIEPA to coordinate the regulatory reforms and improve Rwanda's ranking in the Doing Business Index. A new *Doing Business Unit* was also established in December 2007 to support the national steering committee on doing business. In August 2008, the Rwanda Development Board was established by bringing together all the government agencies responsible for business registration, investment promotion, environmental clearances, privatization and specialist agencies which support the priority sectors of information and communication technology (ICT) and tourism as well as small and medium enterprises (SMEs) and human capacity development in the private sector.

Rwanda jumped 10 positions in the Doing Business Index from 2008 to 2009 and the 2010 Doing Business Report recognized Rwanda as the top reforming country in the world.

V. South Asian LDCs in Context

V. a. Country Level Profiles

The constraints listed above would seem to suggest that LDCs, in general, face significant hurdles in trying to integrate into regional supply chains. However, even among LDCs, these constraints are neither universal nor immutable. Many LDCs demonstrate profiles that indicate that they have either overcome some of these constraints (quite profoundly in some cases) or were always exceptional in particular areas. In general, South Asian LDCs are advantaged relative to the LDC group. With respect to many (though not all) of these attributes, they tend to cluster near the lower end of the spectrum (in terms of the magnitude of the constraints) or have demonstrated rapid improvement in recent years. This suggests that the impediments to rapid integration of these countries into regional supply chains may be lower than it would be in other regions. However, in terms of precursors and preconditions, this region has both negatives and positives to contend with. On the negative side, its record of intra-regional trade is poor. It is structurally less differentiated than East Asia, and faces significant historic and political challenges to regional cooperation. On the positive side, all of the countries in the region, including the LDCs (with the notable exception of Afghanistan) have already developed some capacity in export manufacturing (particularly in the garment industry), the region is proximal with East Asia and, crucially, formal institutions of regional economic integration do not appear to be critical to the development of regional supply chains. Below, we discuss some of the structural attributes of the South Asian LDCs and how they compare to other LDCs.

Relative to the LDC average, South Asia does not perform particularly well in terms of transportation costs, transit speeds, and the quality of logistics services, in general. However, this is, in a large part, a reflection of the land-locked status of three of the four South Asian LDCs. Across all the criteria examined in Table 6, Bangladesh performs above the LDC average, in terms of transportation cost, and better than Senegal (which recorded the best logistics performance of all LDCs). Among the land-locked countries, Afghanistan, not unexpectedly, performs below the LDC average in all criteria examined, but Bhutan and Nepal both face cheaper transportation costs than Uganda (also landlocked but relatively high-performing), though they did not perform comparably in terms of logistics services and time to market.

Table 6: Measures of Transportation and Logistics Efficiency – South Asia and others

Country Name	Overall Logistics Performance Index: (1=low, 5=high)	Cost to export (US$ per container)	Cost to import (US$ per container)	Time to export (days)	Time to import (days)
Afghanistan	2.2	3,545	3,830	74	77
Bangladesh	2.7	965	1,370	25	31
Bhutan	2.4	2,230	2,805	38	38
India	3.1	1,095	1,070	16	20
Maldives	2.4	1,550	1,526	21	22
Nepal	2.2	1,960	2,095	41	35
Pakistan	2.5	660	705	21	18
SriLanka	2.3	715	745	21	19
Benin	2.8	1,049	1,496	30	32
Senegal	2.9	1,098	1,740	11	14
Uganda	2.8	2,880	3,015	37	34
Least Developed Countries	2.4	1,825	2,262	33	37

Source: World Development Indicators (World Bank)

In terms of the availability and cost of communication, the picture for South Asian LDCs is mixed. Only Bhutan has a better connection density than the LDC average and Bangladesh is, surprisingly, very far below the average (Table 7). However, countries in the South Asian region appear to be making significant progress in terms of reducing communication costs. As Table 8 shows, three of the top ten countries, in terms of the rate of price reduction for telecommunications services, are from South Asia and two of them (Bhutan and Bangladesh) are least developed. Therefore, though connectivity, and particularly broadband connectivity,

still remains well below the rate of other regions, such as East Asia, progress on the price front in encouraging.

Table 7 : Internet Connection - South Asia and other LDCs

Country Name	Fixed broadband subscriptions per 100 inhabitants (Latest data from 2006-2010)	Fixed Internet subscriptions per 100 inhabitants (Latest data from 2006-2010)
Afghanistan	0.0	0.0
Bangladesh	0.1	0.0
Bhutan	1.4	1.2
India	1.5	0.9
Maldives	5.3	4.8
Nepal	0.4	0.2
Pakistan	1.9	0.3
Sri Lanka	1.4	1.1
Tuvalu	8.2	3.3
Dejbouti	1.3	0.9
Yemen	2.4	0.4
Least Developed Countries	0.7	0.2

Source: ITU Database

Table 8: Decrease in ICT Price Basket (Top Ten Economies)

Country	ICT Price Basket 2010	ICT Price basket 2008	Percentage change 2008-2010	Value change 2008-2010
Azerbaijan	1.8	9.9	**81.7%**	-8.1
Bhutan	3.6	14.7	**75.4%**	-11.1
Sri Lanka	2.4	7.3	**67.4%**	-4.9
Bangladesh	12.6	36.4	**65.2%**	-23.7
Venezuela	1.6	4.3	**62.9%**	-2.7
Guyana	8.5	17.7	**51.6%**	-9.1
Uganda	30.2	61.8	**51.1%**	-31.6
Austria	0.6	1.1	**50.4%**	-0.6
Moldova	5.4	10.8	**49.8%**	-5.4
Tanzania	31.4	57.0	**44.9%**	-25.6

Source: International Telecommunication Union (ITU)

As Table 9 shows, some LDCs, in various regions, have managed to reduce the number and cost of (electrical) power outages as well as the value lost due to these outages to levels comparable with those of some industrialized developing countries. This clearly suggests that unreliable utility provision is not something the LDCs have to live with. However, only Bhutan, in South Asia, has indicators that suggest only a modest number of electrical outages (and, therefore, a modest loss of value as a result). South Asian countries (non-LDCs included) do not have a very

good record of electricity provision and the LDCs of the region (excepting Bhutan) have a particularly poor record. This is definitely an area is which rapid progress is desirable.

Table: 9 South Asia and Others – Effect of Electrical Power Outages

Country Name	Number of Power Outages in a typical month (Firm level)	Value lost due to electrical outages (% of sales)
	(Latest data for 2006-2010)	
Afghanistan	20.3	6.5
Bangladesh	101.6	10.6
Bhutan	3.1	4.3
India		6.6
Maldives		
Nepal	52.0	27.0
Pakistan	33.9	9.2
Sri Lanka		
Eretria	3.0	0.2
Vanuatu	2.3	1.2
Mozambique	3.0	2.4
Lao PDR	1.5	4.3

Source: World Development Indicators (World Bank)

In terms of the transaction costs of doing business (as summarized in the Ease of Doing Business Index), South Asian LDCs (with the exception of conflict-ridden Afghanistan) rank above the LDC average (Table 10). With respect to the specific transaction costs of: registering a business; the number of procedures involved; and the time required to complete the process, all four South Asian LDCs (including Afghanistan) perform at or above the LDC average. In fact, their registration procedures are simpler than that of both India and Sri Lanka – countries that are perceived as being significantly more economically advanced. In terms of the time required to resolve insolvency, however, only Afghanistan (among the LDCs) performs better the LDC average. In any case, there is still a great deal of room for improvement, given that Rwanda, another LDC, demonstrates the possibility of significant better performance than any South Asian LDCs has been able to achieve across all criteria (see Box 5).

With the exception of Afghanistan, South Asian LDCs appear to outperform non-LDCs in the region in terms of financial depth (at least that of the banking sector) and, though evidence is limited, the efficiency of financial intermediation (as measured by the spread between lending and deposit rates) is at least comparable to that of the non-LDCs in the region (Table 11). South

Asian LDCs also compare favourably with the better performing LDCs outside the region. The overall level of financial depth and quality of intermediation of LDCs, in general, and South Asia, in particular, would need to improve substantially to accommodate the needs of small and medium-sized businesses in the context of supply chains, but at least one LDC in the region appears to have explicitly taken up this challenge (see Box 3).

Table 10: Comparative Transaction Costs of Doing Business

Country Name	Ease of doing business index (1=most business-friendly)	Cost of business start-up procedures (% of GNI per capita)	Start-up procedures to register a business (number)	Time required to start a business (days)	Time to resolve insolvency (years)
Afghanistan	160	25.8	4	7	2
Bangladesh	122	30.6	7	19	4
Bhutan	142	7.2	8	36	..
India	132	46.8	12	29	7
Maldives	79	8.9	5	9	1.5
Nepal	107	37.4	7	29	5
Pakistan	105	11.2	10	21	2.8
Sri Lanka	89	4.7	4	35	1.7
Rwanda	45	4.7	2	3	3
Samoa	60	9.7	4	9	2.5
Least Developed Countries	143	88.9	8	36	3.7

Source: World Development Indicators (World Bank)

Table 11: Indicators of Financial Depth and Quality of Intermediation

Country Name	Broad Money (% of GDP)	Domestic Credit to Private Sector (% of GDP)	Interest rate spread (Lending minus deposit rate, %)
Afghanistan	28.6	10.5	..
Bangladesh	61.5	47.1	5.9
Bhutan	69.6	43.3	..
India	69.6	49.0	..
Maldives	60.9	64.6	6.3
Nepal	71.3	55.6	4.4
Pakistan	38.5	21.5	5.9
Sri Lanka	34.8	26.6	3.3
Mozambique	36.6	25.8	6.6
Samoa	49.9	45.0	8.0
Tonga	44.9	42.0	7.5
Vanuatu	87.4	65.8	..

Source: World Development Indicators (World Bank)

In terms of their ability to offer a literate and skilled work force, South Asian LDCs (except for Afghanistan) are well behind India, the Maldives and Sri Lanka but have better profiles than Pakistan (Table 12). The youth literacy rate and the level of enrollment at the secondary and tertiary level suggest that potential investors in these economies can have a reasonable expectation of a relatively literate population with a significant proportion with secondary education. Enrollment in tertiary education still remains low in South Asian LDCs, but the levels are still above the LDC average.

Table 12: South Asia – Some Education Indicators

Country Name	Literacy rate, youth total (15-24 yrs, %)	School enrollment, secondary (% gross)	School Enrollment, tertiary (% gross)
	(Latest year for 2006-2011)		
Afghanistan		45.5	3.3
Bangladesh	75.5	49.3	10.6
Bhutan		70.1	8.8
India	81.1	60.2	16.2
Maldives	99.3		
Nepal	82.0	43.5	
Pakistan	71.1	34.2	5.4
Sri Lanka	98.0	26.6	15.5
Least Developed Countries	73.9#	35.7	5.7

Source: World Development Indicators (World Bank)
Average across 36 countries

With respect to governance capability, South Asia presents a mixed bag relative to other LDCs when compared in terms of government effectiveness, quality of regulations and the rule of law (Table 13). Not, unexpectedly, Afghanistan performs very poorly (well below the LDC average) on all measures. In terms of government effectiveness only Bhutan performs above the LDC average. In terms of quality of regulations, Bangladesh and Nepal are above the LDC average and, in terms of evidence of the rule of law, Bangladesh and Bhutan are above the LDC average (the latter strongly so). In short, with the exception of Afghanistan, the performance of these countries is uneven across measures of governance – suggesting that (except for Afrhanistan) the regions LDCs are, more or less, typical.

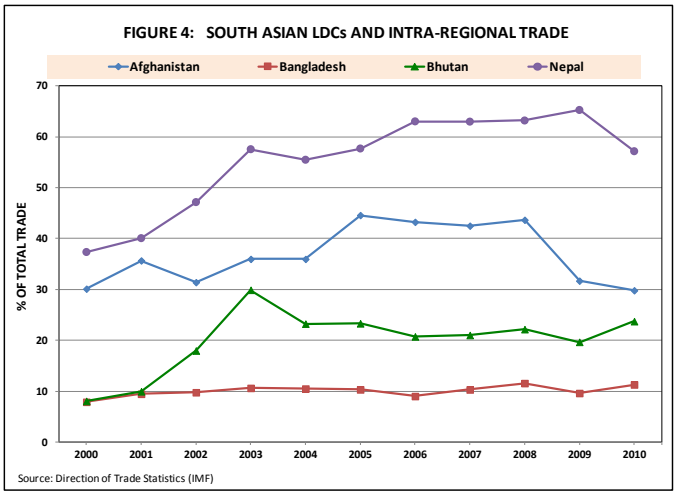
Table 13: Performance of South Asian LDCs in Terms of Government Capability

Country	Percentile Rank in terms of: Government Effectiveness	Quality of Regulations	Rule of Law
Afghanistan	3.3	2.9	0.5
Bangladesh	16.7	23.3	27.8
Bhutan	64.8	13.8	59.4
Nepal	18.1	23.8	17.9
LDC Average	21.8	22.1	25.3

Source: Worldwide Governance Indicators (World Bank)

V. b. A Regional Profile

The current trading profile and degree of structural differentiation does not necessarily make South Asia an obvious region for the operation of regional supply chains. As (Appendix) Figure A1 shows, intra-regional trade is not only very low, it is lower in South Asia than any other developing region. Moreover, intra-South Asian trade does not appear to be growing relative to regional output. Even an upward revision to accommodate the large amount of unrecorded intra-regional trade (a consequence of the persistent high tariffs and long stretches of unpatrolled borders) would not likely change that picture substantively (Srinivasan, 2002). Intra-regional trade accounts for a higher than (regional) average proportion of the total trade of land-locked Afghanistan and Nepal, but even Bhutan (which is also land-locked) has very limited trade with its regional neighbours and Bangladesh, has even less (Figure 4). The development of supply chains in the region will have to overcome the extra-regional trade biases that these figures suggest.



In terms of productive structure, South Asia shows limited structural differentiation across countries compared, for instance, to East Asia. As (Appendix) Table A1 indicates, the importance of manufacturing (in total output) and of high technology exports (as a proportion of total exports) vary much more widely across East Asian nations than across South Asian nations. In fact, even relatively industrialized India exports a lower proportion of high-technology goods than Mongolia! It is, therefore, not obvious that the chain of production that stretches from design and invention in South Korea and Japan to labour-intensive assembly in Lao PDR or Cambodia (with intermediate steps in other East Asian countries) is immediately reproducible in South Asia. However, this may be balanced by the fact that the export of manufactured goods is already dominant for all but two of the South Asian countries. Thus, while limited differentiation may mean that, in the immediate term at least, regional supply chains might need to be less differentiated than most Asian supply chains (or only part of the production chain can be located in this region), the prevalence of manufactured product in regional exports also means that some basic infrastructure for the production of manufactured goods already exists in South Asia. Countries, such as Bangladesh, Nepal, and Pakistan may be able to host, simultaneously, both labour-intensive assembly-type activities and more technically demanding intermediate activity across different supply chains, while India may be able to straddle all but the most technically demanding aspects of production process. In short, it is unlikely that South Asia will fit the "flying geese" model in the classic sense so famously attributed to East Asian industrial development.

For South Asia, there are at least two alternative (origins and) configurations for regional supply chains, and they are not mutually exclusive. One possible configuration would be South Asian integration into larger Asian supply chains. To some extent this is already happening. Japan and Asian NICs already invest in South Asian countries. South Asian LDCs may offer location advantages at least comparable to those offered by the CMLV countries while others, such as India, may have comparable location advantages to the ASEAN 4. Another configuration could be a closer regional integration in which South Asian countries try to develop forward and backward linkages across the region within (and across) existing industries. In a Study of the Textile and Clothing Sector in South Asia UN-Commonwealth Secretariat (2011) showed: (1)

that there is substantial potential for forward and backward linkages in the textile and garment industries in the region; and (2) that given the some countries appear to specialize in the production of garments (Bangladesh and Sri Lanka) while others seemed to specialize in the production of textiles (Pakistan) there was some potential for country specialization in various aspects of the production of clothing from the production of raw materials (cotton and silk) to ready-to-wear apparel. It might be noted further that establishment of regional supply chains within a well established industry may make it easier to develop additional supply chains in other industries because it would likely involve lower initial costs of establishing service links (than would be the case for new industries) while producing opportunities for static and dynamic economies of scale (in transport and logistics) for other industries (once these links are established).

Though one can identify dominant countries in all regions (either in terms of economic or population size), South Asia is unique even in that regard. The size of India, in relation to its neighbours in South Asia, is much greater than the relative size of any other country (including China) in its region (Table 14). This makes the Indian economy, its trade and investment policies, and its political stance even more critical to the economic fortunes of the region. The fact that India is the most industrialized of the South Asian countries serves only to magnify its relative economic and political influence. This actual potential regional hegemonic weight has (and is likely to continue to) complicate efforts at regional cooperation, since other countries in the region may be overly sensitive to any set of institutions or policies that are seen to add to India's already dominant position. This may be a large part of the reason South Asia has been slow in constructing formal institutions aimed at regional economic integration. The South Asian Free Trade Area agreement was not signed until 2004 and the planned achievement to a zero tariff regime for non-LDC countries was not expected to occur until 2012 (SAARC, 2004). Moreover, despite the signing of the trade agreement, actual implementation has been hostage to politics. Pakistan did not accord India with most favoured nation (MFN) status – a fundamental requirement of the trade agreement - until 2011. However, based on the East Asian experience, it would appear that formal agreements are not critical to supply chain

expansion. Therefore, much progress may be possible with unilateral and informal arrangements that aim to ease the movement of firms as well as goods and services.

Table 14: Relative Dominance of Regional Powers

Region (Largest Country)	Income (% or Regional Total)	Population (% of Regional Total)
East Asia and Pacific (China)	36.5	60.8
Eastern Europe and Central Asia (Russia)	7.4	15.9
Latin America and the Caribbean (Brazil)	40.8	33.1
Middle East and North Africa (Saudi Arabia)	17.6	
Middle East and North Africa (Egypt)		21.2
South Asia (India)	82.6	75.0

Source: World Development Indicators (World Bank).

VI. Conclusion

This report began by outlining the nature and intent of supply chains and presenting an overview of the East Asian experience in utilizing that approach to production. This was followed by an assessment of the challenges and constraints facing LDCs wishing to integrate into regional supply chains. That analysis was followed by a discussion of some of the main concerns that should inform policies and programs aimed at accelerating integration of LDCs into regional supply chains as well as the general development and expansion of supply chains. We then looked more specifically at South Asian LDCs in terms of how they compared to other LDCs, and then examined the prospect of supply chain development in the South Asian region.

In general, this report finds that the LDCs of south Asia (with the notable exception of Afghanistan) are relatively well appointed when compared to other LDCs. They are already engaged in significant levels of manufacturing for export, have reasonably well educated populations (in LDC terms), and have rapidly falling telecommunications costs. However, the transaction costs of doing business in the LDCs of that region remain high, it governance indicators are uneven, and the region is structurally quite different from East Asia – the region most noted for the development of supply chains. Also, progress on regional trade and economic integration has been slow and the potential hyper-dominance of India may make further progress less attractive than it might have been. However, the East Asian experience

suggests that most of accomplishments needed to engender the development of regional supply chains can be accomplished either as unilateral policy initiatives by individual countries or as the product of relatively informal arrangements to produce regional public and quasi-public goods. Moreover, instigating the links between spatially separate activities may be the most difficult part of supply chain development and, in that area, South Asia may have an advantage. There are already opportunities to develop forward and backward linkages within and across existing industries that are region-wide. Success will likely require complementary policies in: improving transport and logistics services across the region; attracting regional and extra-regional FDI, improving financing to allow greater participation of local small and medium sized enterprises, and improving the local transaction costs of doing business across regional LDCs in particular and the region in general. These are significant challenges that will likely require external assistance (through aid for trade and other initiatives) but the experiences of other LDC and low-income countries suggest that these are achievable objectives.

The limited differentiation of South Asia and, in particular, the absence of a developed knowledge-based economy in its midst, may mean that the top-down development of supply chain linkages that occurred East Asia is unlikely in South Asia. However, South Asia may be able to use its proximity to East Asia to develop (South Asian) regional branches of larger Asia-wide (or global) supply chains. Current foreign direct investment flows from Japan and the Asian NICs into South Asia suggest that, to some extent, this may be occurring already.

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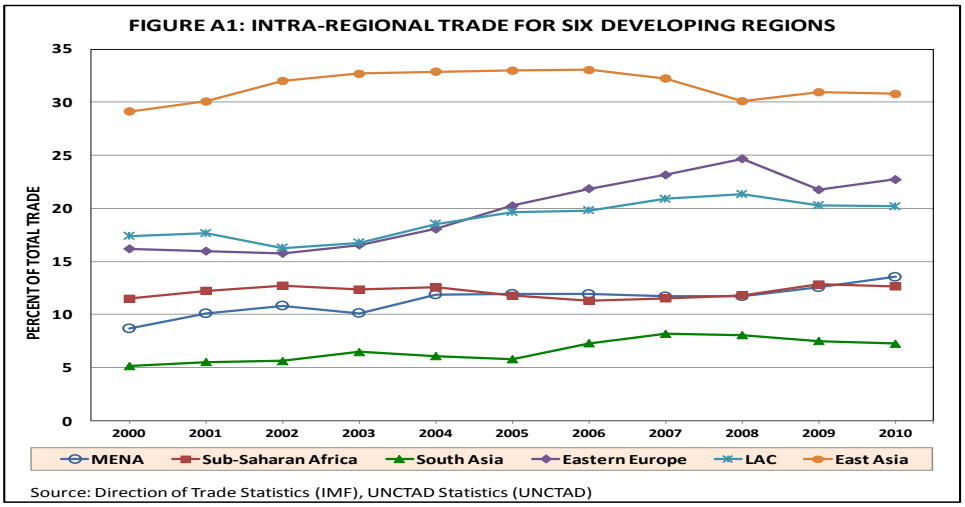

Appendix

Table A1: Profile of Manufactured Exports in South and East Asia

	Manufacturing Value Added (% of GDP)	Manufactures Exports (% of merchandise exports)	High-Technology Exports (% of manufactured exports)
South Asia			
Afghanistan	13.1	19.6	
Bangladesh	17.9	88.3	1.2
Bhutan	8.4	69.5	0.1
India	14.2	63.8	7.2
Maldives	3.8	0.1	0.0
Nepal	6.6	72.3	0.6
Pakistan	16.8	74.1	1.7
Sri Lanka	18.0	66.5	1.0
East Asia			
Cambodia	15.6	96.1	0.1
China	29.6	93.6	27.5
Indonesia	24.8	37.5	11.4
Japan	18.1	89.0	18.0
Korea, Rep.	30.6	89.0	28.7
Lao PDR	7.6		
Malaysia	26.1	67.2	44.5
Mongolia	7.3	5.6	7.4
Myanmar	19.5		
Philippines	21.4	85.8	67.8

Singapore	22.2	73.1	49.9
Thailand	35.6	75.3	24.0
Vietnam	19.7	60.1	6.2

Source: World Development Indicators (World Bank)