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## Editorial

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## 1 Introduction

This special issue aims to contribute to our understanding of developing countries' prospects for upgrading in global value chains (GVCs) in the context of recent shifts in global demand and production. Trade integration and economic growth in many developing countries has been fuelled by the insertion of local producers in GVCs feeding into high-income markets, in particular North America, Europe and Japan. However, since the mid-1980s – a trend that has been accelerated by the 2008/2009 global economic crisis – demand has stagnated in the historically dominant Northern countries and shifted to Southern countries, in particular to large emerging countries such as China, India, Brazil, South Africa, Russia and to the Middle East. Increasingly, the largest markets are in developing countries. At the same time, on the production side there has been a trend towards consolidation. While in the 1980s and 1990s an increasing number of developing country suppliers participated in GVCs geared towards Northern markets, typically by producing intermediate inputs or performing final assembly, in the last decade, a process of consolidation has been underway across a large spectrum of sectors with fewer firms and countries performing a wider range of tasks in GVCs.

Since the 2008/2009 trade collapse, developing countries have been the main engine of the world economic recovery. Traditional Northern end markets continue to absorb most of the developing countries' exports, but the prospects for South-South trade are brighter. Given the high level of deficits and debt, it is expected that demand will continue to stagnate in high-income countries. The consolidation process has also made it more difficult for developing country suppliers to enter and upgrade within GVCs oriented to high-income markets. In this context, developing country markets have received increasing attention. In the case of large emerging economies, including China, India and Brazil, this has translated into a greater focus on domestic markets. For smaller economies, it has meant a focus on exporting to regional or large emerging markets in the South. Hence, the shift in the geography of global production that started in the 1970s is now followed by a shift in the geography of global demand and consumption.

The main focus of this special issue is to assess the implications of these changes affecting global demand and production for GVCs and upgrading prospects for developing countries. In particular, it attempts to address the following questions:

- To what extent are the shifts in demand/end markets from the North to the South and the consolidation of global production observable in different commodity, manufacturing and service GVCs?
- What are the implications of these changes affecting global demand and production for upgrading or downgrading prospects in GVCs and for meeting development goals in low-income countries?
- Which policies are required to increase economic and social gains of participation in these GVCs?

The nine papers of this special issue present emerging evidence from different sectors and countries/regions on these questions. The first two papers assess the shifting end market trend where it has been most obvious: primary commodity value chains. The following papers focus on other sectors where demand has also shifted with crucial

implications for GVCs and upgrading processes. Two papers with different regional foci cover the apparel sector; two papers focus on different market segments of the electronics sector; one paper assesses the automotive sector; and one deals with offshore services. The last paper assesses the global football industry and interactions between upgrading and social compliance. This kind of cross-industry perspective is crucial to understand industry specificities and differences in upgrading or downgrading patterns across industries.

Despite important sector and country differences that are discussed in the papers, this Introduction attempts to identify some general trends. It first provides a short overview of the debate on upgrading in GVCs, then turns to the emerging issue of shifting end markets and explores how it fits with the upgrading debate. It ends with an overview of the papers included in the special issue.

## 2 Upgrading in GVCs

The global economy has been characterised by a rapid expansion of offshore production since at least the 1970s. Initially, offshore production was carried out by subsidiaries of multinational corporations, but soon local suppliers in a wide range of developing economies began to take over more of the responsibilities associated with export production, following the specifications laid out by global manufacturers, retailers, and brand marketers based in developed countries. The process by which developing countries' suppliers have moved up the value chain from merely assembling export items using imported inputs, to purchasing or producing all the required inputs and providing all production services, finishing, and packaging for delivery to retail outlets in end markets is broadly referred to as GVC upgrading [see Gereffi (1999) and Humphrey and Schmitz (2002) among others, for more detailed definitions].

Until the 1990s, upgrading had been discussed in the context of industrial development strategies based on import substitution or export orientation (Fold and Larsen, 2008). With the emergence of global production in many sectors and the increasing dominance of export-oriented development strategies, upgrading has been increasingly linked to GVCs (Kaplinsky and Morris, 2001). In its initial formulation, upgrading described development trajectories of export-oriented countries and regions and was linked to the participation in producer-driven or buyer-driven commodity chains, such as automobiles or apparel, respectively. Upgrading possibilities were different in each type of chain because the core competencies of the lead firms varied (Gereffi, 1994, 1999; Bair and Gereffi, 2001). A more differentiated typology of GVC governance structures argued that developing country suppliers actually participate in a broader range of industrial settings, including the extremes of competitive markets and vertically integrated 'hierarchies', and several types of network structures: captive, relational and modular (Gereffi et al., 2005).

With this new governance typology, the focus shifted from the country or region towards the firm level. Humphrey and Schmitz (2002) proposed an influential fourfold upgrading classification:

- 1 functional upgrading whereby an improvement in the position of firms would result from increasing the range of functions performed and moving from lower-value

- activities with high competition (e.g., manufacturing) into higher-rent activities (e.g., design, branding, marketing, and logistics)
- 2 process upgrading which yields efficiency gains by re-organising the production system or introducing new technologies
  - 3 product upgrading with higher unit value prices as products become more sophisticated
  - 4 inter-chain upgrading with capabilities that were acquired in one chain leading to competitive benefits in another.

Upgrading opportunities are shaped by the type of value chain in which developing country suppliers are inserted, and in particular by the governance structure of chains. Governance structures determine the power relationships among the different actors involved in the chain and the flows and allocation of resources within chains. These structures are crucially influenced by lead firms – i.e., the firms that coordinate and govern GVCs. Lead firm governance strategies can both enable and constrain upgrading prospects of suppliers. Despite important sector, country and firm differences, lead firms are generally more supportive in process and product upgrading that leads to more efficient and higher quality production in their value chains. Functional upgrading is, however, only supported as long as it does not encroach on the core competencies of lead firms, which are activities with high returns and entry barriers such as design, branding and marketing. In particular, buyer-driven value chains have been widely seen to involve forms of governance that keep developing country suppliers out of these high-return activities (Kaplinsky, 2005). Low entry barriers and high competition in widely dispersed low value activities such as manufacturing have forced world market prices down and resulted in declining rewards even as exports as well as capabilities of suppliers have risen, leading to what has been called ‘immiserising growth’ (Kaplinsky, 2005).

However, upgrading patterns have become more complex in recent years, as illustrated by the diffusion of knowledge-intensive activities, including research and development (R&D) and innovation, particularly in Asia. In several sectors, such as automotive, electronics, and apparel, large first-tier suppliers have emerged that bundle diverse activities in GVCs, manage complex global production and sourcing networks, and play influential roles in logistics, financing, design and product development. Lead firms have also emerged in some developing countries that not only sell their products/services domestically, but increasingly on regional and global markets. The growing importance of developing country markets, including domestic, regional and large emerging markets, has supported this trend. However, there are important asymmetries between and within developing countries in firm and state capacity to capture these upgrading possibilities.

Upgrading efforts have also become more complex by taking into account the social dimensions of upgrading. The upgrading debate has largely focused on economic upgrading and has not specifically taken into account social upgrading understood as improved working conditions, higher-skilled and better paid jobs. Economic and social dimensions of upgrading are often intertwined, but one does not necessarily lead to the other. In fact, we understand relatively little about the conditions under which they occur together.

### 3 End markets and upgrading

While governance structures and the role of lead firms have received most attention in the upgrading debate, the role of (different) end markets is generally not explicitly discussed. Usually, the common assumption is that high-income countries are the target markets which becomes increasingly problematic in the context of shifting end markets to lower-income countries. End markets have important implications for the dynamics of GVCs and the upgrading prospects of firms and economies. Demand factors decisively shape upgrading possibilities not only by determining the size and the growth of markets, but also by the nature of demand that is distinct in lower-income countries compared to traditional (high-income countries) end markets. Demand in high-income countries has become increasingly sophisticated, including high expectations with regard to quality levels, product differentiation, rate of innovation, and high standards with regard to products and processes (Kaplinsky, 2010). In contrast, demand in lower-income countries is generally for less sophisticated products with regard to quality, variety, fashion/innovation content and frequency of deliveries, and process and product standards tend to receive less attention. However, price competition tends to be fiercer. Further, commodities (agricultural products for food and minerals, metals and energy to build up infrastructure) and basic manufactures such as apparel, low tech electronics and simple automotive models account for a higher share in the demand profile of lower-income countries as compared to high-income countries.

These different characteristics of demand have implications for entry and upgrading prospects in GVCs. With regard to entry, the development outcome might be positive. The sophisticated demand requirements in high-income countries have increased entry barriers, furthering consolidation in GVCs and the emergence of large global first-tier suppliers that can fulfil these requirements. Despite the efforts of development practitioners to build capacities, a number of less developed countries and smaller firms have been unable to meet the strict requirements of high-income markets and have been progressively excluded from GVCs. Entry barriers in GVCs feeding into lower-income countries tend to be lower and the shift in demand to the South has resulted in new opportunities for exports of cheaper, less sophisticated and lower quality products.

With regard to upgrading, evidence is mixed. On the one hand, upgrading prospects might be negatively affected by the lesser importance attributed to process and product standards in developing country end markets. With respect to functional upgrading, there may be constraints in particular for moving to processing activities in commodity GVCs. Low-income end markets with an economic structure comparable to that of their suppliers will primarily purchase unprocessed commodities, limiting opportunities for the supplier to develop processing activities and increase its value added. On the other hand, the less sophisticated nature of demand could help suppliers develop higher-return activities such as product development and design, branding and marketing that are tailored to their new customers' needs. Developing country firms may have an advantage in designing and making products for lower-income markets as they have a better understanding of these markets and as consumers tend to prefer 'good enough' quality at a reasonable price rather than cutting-edge technology for a premium. What used to be 'not enough' for high-income country lead firms could be 'just enough' for developing country markets. However, first evidence suggests that such functional upgrading seems to be more relevant in domestic or regional markets where suppliers have knowledge of the market and can adapt to its specificities.

Developed country firms have also changed their approach towards serving developing country markets. Instead of modifying and selling at lower prices to developing countries products that had been developed for consumers in the North, multinational companies have started to transfer innovation centres to large emerging countries and develop products tailored to local demand. This process of 'reverse innovation' has become the core business strategy of multinational companies like General Electric, and a major driver of South-South trade (Immelt et al., 2009). It also offers perspectives for increased exports to the North since the demand for 'good enough' products grew in rich countries in the context of the global economic crisis. For example, the Renault Logan, initially developed for emerging economies only, has been introduced on the French market in response to a pressing demand for simple, practical and cheap cars. This shift in multinational companies' business innovation strategy has major implications for upgrading in developing countries as these investments are often accompanied by substantial transfers of knowledge, but they also challenge the competitive advantage of developing country firms in supplying local and regional markets. First evidence suggests that only a few countries with sufficiently large domestic markets, such as China, India and Brazil, have benefited so far from this delocalisation of innovation and other high value-added activities.

Hence, shifting end markets offer opportunities and challenges for developing country suppliers. It will be important to understand these new end market dynamics, respond to them and build up capabilities necessary to enter and upgrade in GVCs oriented to these new markets. Up to now, however, policies of governments, donors, and multilateral organisations, as well as firms, have largely focused on export orientation towards traditional high income markets. These policies will need to be broadened to take into account the specific opportunities and challenges in lower-income export markets, regional markets, and domestic markets. This could prove difficult: For example, a large share of the trade technical assistance and capacity building efforts have been aimed at adapting and raising the standards of production in developing countries with a view to meet the standards imposed in high-income markets. With a shift in demand, the return on such investments would be lower and could even distract developing country producers from important markets in the South. Multinational corporations seem to have reacted faster than governments and donors by adjusting their production to the emerging markets' consumers needs. The papers of this Special Issue aim to provide some understanding and related policy conclusions on these questions.

#### **4 Overview of the papers**

The following section provides an overview of the nine papers of this special issue, with a focus on the main dynamics in the sectoral value chains, the implications of shifting end markets and how these trends affect development outcomes.

The first two papers assess end market and upgrading dynamics in commodity GVCs. Raphael Kaplinsky and Masuma Farooki set the stage by discussing longer-term shifts in global demand that have accelerated during the recent global economic crisis. They show that from the mid-1980s the Northern dominance in global demand began to wane, driven by two sets of inter-related developments: first, the very rapid growth of productive capabilities in the two large Asian Driver economies, China and India; and second, the

maturation of structural weaknesses in many of the previously dominant Northern economies that resulted in a global economic crisis in 2008/2009. If these two trends are prolonged (which the authors see as likely), the outcome will be sustained growth and demand in China, India and other low-income countries, and stagnation in the historically dominant Northern economies. This change in the drivers of global demand will have major impacts on the location of production and consumption in the global economy in the 21st century, with crucial implications for the capabilities accumulated by low-income producers feeding into GVCs. Supporting evidence for these trends is provided by the timber sector in Gabon, the cassava sector in Thailand, and the palm oil sector in Malaysia. Given the nature of demand in low-income countries, shifts in markets from the North to the South will likely lead to sustained demand for commodities, lower levels of processing and value added in low-income producing countries, and a reduced significance of standards and sophisticated demand preferences for exports to these developing economies.

How do these trends affect development objectives in low-income countries? The outcomes are uncertain, and depend on specific sector and country contexts and policy responses. On the positive side, enhanced demand from Southern economies will provide significant export opportunities; it will involve more labour-intensive process and product technologies; and it will offer lower entry barriers since demand will be less sophisticated and standards less significant. In particular, the latter may make it possible for lower-income countries and small- and medium-sized enterprises to enter GVCs. On the negative side, however, achieving higher standards can contribute to upgrading and to the development of capabilities; declining value added and processing along the chain can lead producers to be trapped in pockets of static comparative advantage and undermine developing countries' move into higher value added activities.

Niels Fold and Marianne Nylandsted Larsen present the main dynamics and implications of shifting end markets in the global agro-industrial value chains for 'tropical' crops – both traditional export crops (coffee, cocoa, and tea) and 'new' crops (fresh fruit), with a focus on upgrading opportunities for smallholder production in Africa. The authors identify two dominant trends: first, the simultaneous emergence of an intensified rivalry and cooperative strategies among lead firms in different nodes of the chains; and second, new requirements on retailer-driven markets in the North and the expansion of new markets in the South. The former markets have numerous standards for high-quality, high-priced products combined with the development of new niche markets for ethically concerned consumers, while the latter markets are primarily characterised by insignificant or non-existent standards for quality and food safety.

Turning to the development dimension of these trends, the authors conclude that prospects for African smallholder upgrading via retailer-driven strands of GVCs are steadily decreasing due to stricter requirements for supplier compliance with food safety and quality standards. This results in a constant pressure upstream for increased monitoring and control over production, economies of scale and willingness to take up more low-profit functions outsourced from lead firms. Thus, entry barriers for smallholders are high except for the relatively few smallholders who supply 'ethical' products to concerned consumers in the North. In this context, the paper stresses the need to re-think the policy fixation on exports to Northern markets. It suggests building up national institutions with the ability to stimulate smallholder incorporation and to foster volume upgrading linked to expanding and less demanding markets in the South and emerging economies in the North. These markets not only offer outlets for lower quality

goods, but also potentially function as ‘training grounds’ for the upgrading of both smallholder production and supportive national institutions.

The following two papers assess end market and upgrading dynamics in apparel GVCs. Stacey Frederick and Gary Gereffi assess upgrading trajectories of leading apparel exporters as they adapt to two shocks that have intensified international competition in this sector: the end of the Multi-Fibre Arrangement (MFA) quota system for textiles and apparel in 2005; and the global economic recession of 2008/2009. These events have been coupled with the consolidation of the global supply base in several large Asian economies, and a reconfiguration of global supply chains whereby leading apparel suppliers have strengthened their market share in the industry. On the country side, China has been the big winner and other Asian suppliers including Bangladesh, Indonesia, India and Vietnam continue to expand their roles in the industry. US regional apparel suppliers, most notably Mexico and Central America, have fared quite poorly in response to the MFA phase out and the global economic crisis. Among the factors favouring China compared to its Latin American competitors is a much greater diversification of its export markets. Whereas Mexico and Central America are almost exclusively reliant on the US market for apparel sales, due in part to regional trade agreements that have provided them with preferential market access, China has an exceptionally high level of export diversification, with just over half (53%) of its apparel exports going to the US and EU-15 markets. In general, the leading Asian apparel exporters tend to be far more diversified than their Latin American counterparts, which has allowed them to spread the risk from an over-reliance on slumping US or EU-15 markets. In addition, some of the larger, more advanced apparel suppliers such as China, India and Turkey are also reorienting production from export markets to large domestic and nearby regional markets.

The broader lesson of the Asia and Latin America comparison for development outcomes in the apparel GVC is the need for functional upgrading beyond assembly to various levels of ‘full-package’ production in the major apparel exporting economies. The desire of global buyers to reduce the complexity of their supply chains, keep costs down and be responsive to fluctuating consumer demand has spurred the shift from cut, make and trim (CMT) assembly operations to full-package production (also known as original equipment manufacturing or OEM) in all leading apparel exporting countries. To move into full-package supply, a strong textile connection is essential, and institutional support is often required to facilitate these backward linkages. A key policy implication in the Latin American context is that the rules of origin in US regional trade agreements for North America and Central America that favour procurement from US textile firms have tended to impede the development of local textile capabilities in the least developed countries in the region, leading to truncated upgrading efforts.

Mike Morris, Cornelia Staritz and Justin Barnes focus on shifting end markets in the apparel sector in Sub-Saharan Africa (SSA) and assess the implications for upgrading of integration into two distinct global apparel value chains in Lesotho and Swaziland. The first is the value chain characterised by Taiwanese investment that was motivated by MFA quota hopping and preferential market access through the African Growth and Opportunity Act (AGOA) and feeds into the US market by supplying long run, basics products to large US retailers. The second is the value chain characterised by South African investment and feeding into the South African market. While several Taiwanese investors left in the context of the MFA phase-out and the global economic

crisis, South African manufacturers entered and a new apparel value chain operating under very different dynamics than the US retailer-driven value chain has emerged.

Differences with respect to ownership patterns, end markets, governance structures, retail demand, and investor motivations and perceptions of main challenges have a major impact on upgrading possibilities. From the perspective of upgrading and sustainability, ownership patterns, local embeddedness and market diversification matter. The emergence of South Africa as an alternative end market and the different value chain dynamics operating in the South African retailer-governed value chain open up new opportunities from those of the AGOA/Taiwanese-dominated value chains. Whether the South African firms actually take advantage of the possibility offered by this value chain is the challenge facing the Lesotho and Swaziland industries and governments. Only so much local upgrading and capability and skill developments are likely to emanate from the dynamics driving the South African-based value chain. Fundamentally, the upgrading and innovation challenge is one of appropriately directed and capacitated industrial policy, with the dual aim of expanding the base of the skilled labour and management pool, and fostering a culture to raise the operational competitive levels of their manufacturing operations.

The next two papers assess end market and upgrading dynamics in electronics GVCs. Timothy J. Sturgeon and Momoko Kawakami assess recent trends in the global electronic hardware industry and their implications for upgrading opportunities for firms from developing countries. The authors present company, cluster, and country case studies to illustrate how supplier capabilities have developed in the context of electronics GVCs, and they identify persistent limits to upgrading experienced by even the most successful firms in the developing world. Four models used by developing country firms to overcome these limitations are presented:

- 1 global expansion through acquisition of declining brands (emerging multinationals)
- 2 separation of branded product divisions from contract manufacturing [original design manufacturing (ODM) spin-offs]
- 3 successful mixing of contract manufacturing and branded products (platform brands) for contractors with customers not in the electronic hardware business
- 4 the founding of factory-less product firms that rely on GVCs for a range of inputs, including production (emerging factory-less start-ups).

Each of these new models has been enabled, to a greater or lesser degree, by the rise of new markets and new kinds of consumers in developing countries.

Loren Brandt and Eric Thun examine how a shift in the end point of GVCs alters the prospects for industrial upgrading in a developing economy through an analysis of the mobile telecom sector in China. China is both the largest producer and the largest consumer of mobile handsets in the world. China's role as the 'world's factory' is well known and mobile handsets are no exception. What has changed over the last decade is the scale of consumption. China has become the world's largest market for mobile phones. The paper analyses the extent to which the rise of the Chinese domestic market for handsets has furthered the development efforts of indigenous Chinese firms. The relative market share of domestic and foreign mobile handset firms has fluctuated widely over the last decade. These changes are explained through an analysis of two primary variables: the evolution of technology in the sector and the evolution of market demand.

When firms from developing countries integrate in GVCs oriented to high-income countries, they face both a technology and a marketing gap. When the end point of these value chains shifts to their home markets, not only do their shortcomings lessen, the foreign firms that they compete with begin to face technology and marketing gaps of their own. Thus, domestic firms have been able to take advantage of both increasing modularity (to outsource components that they lacked the technology to produce) and their superior knowledge of low-end market segments to expand sales vis-à-vis foreign firms. But these advantages are temporary: high levels of modularity lead to intense competition and low profits among domestic firms, and foreign firms rapidly improve their market knowledge. The core challenge for domestic firms is translating temporary advantages over foreign competitors into investment in design capabilities and a shift away from purely modular relationships that provide a sustainable source of competitive advantage. State policy, particularly in how it shapes end markets, plays a critical role in supporting these efforts.

Timothy J. Sturgeon and Johannes Van Biesebroeck assess recent trends in automotive GVCs, analysing the role of developing countries in global production and consumption. The authors focus on how the recent global economic crisis has accelerated pre-crisis trends towards greater importance of the industry in the developing world. More rapid growth of car ownership is the impetus, but the co-location and close interaction of suppliers and lead firms in this industry, along with political pressure for local content and vehicle development, are important catalysts. Opportunities to move up in the value chain for suppliers in emerging economies have proliferated and are likely to become even stronger now that an increasing number of new models are developed specifically for markets in developing countries. The regional structure of production in the industry has largely confined the impact of the crisis within each major producing country/region.

While it appears that some large developing countries, especially China and India, are gradually gaining more independence and autonomy as their automotive industries and markets gain size and importance, and vehicles are designed locally to fit domestic customer requirements, supplier countries such as Mexico and countries in East Europe remain as dependent appendages of adjacent regional production systems. Case studies on China, India and Mexico provide an overview of different roles that developing country suppliers have in automotive GVCs, and the development paths and role of domestic firms. These three countries have relied to varying degrees on foreign direct investment by lead firms from mature economies to jump-start their industries. Two features of the Chinese industry position that country best for future development:

- 1 the leveraging of a well-developed supply base both locally in Shanghai, and abroad
- 2 a domestic market that is sufficiently large to spur the development of vehicles tailored to local tastes.

Karina Fernandez-Stark, Penny Bamber and Gary Gereffi analyse offshore services GVCs and show how developing nations have been able to seize growth opportunities in this dynamic industry. Offshore services are extremely varied, and existing typologies have highlighted the categories of information technology outsourcing (ITO), business process outsourcing (BPO), and knowledge process outsourcing (KPO). From a GVC perspective, however, upgrading occurs both within and between these categories of offshore services, which provide developing countries with multiple entry points into the

industry. While developed countries consume the vast majority of global services, demand from developing economies is beginning to grow. India, which in 2009 had 45% of the global market share for offshore services, has itself begun to focus on higher-value activities, as new low-income countries are joining the industry at multiple points in the chain. Indian firms have expanded in the South to serve both domestic and export markets. Some of the larger, non-Indian firms in the South have been able to leverage comparative advantages of price, time zones and expertise to provide services at the regional level, a new offshore services market that is expanding rapidly. In order to capture the gains of this evolving market, many developing countries are pursuing new policies of workforce development to encourage upgrading. Although the quality and quantity of human capital remains the key factor in the location of offshore services, formal education is being supplemented by demand-driven training. In addition, compliance with required international professional certifications and performance standards underlies the upgrading trajectories of developing countries within the ITO, BPO and KPO segments of the offshore services value chain.

The last paper by Khalid Nadvi assesses the GVC of the football manufacturing industry and interactions between technological upgrading and labour standard compliance. Football is the most popular global sport and the manufacturing of footballs is a billion dollar industry heavily dominated by major global brands. Over the past fifteen years there have been significant changes in the geographies of production and demand. China has consolidated its position as the world's largest football manufacturer, taking market share from Pakistan, the world's second biggest producer. On the end market side, newly emerging markets have appeared but the EU and the US have remained dominant. Also, the nature of the GVC has changed which can be seen in consolidation at the supplier firm level in China as well as Pakistan. These shifts have been triggered by interactions between labour standard compliance and technological upgrading. Social compliance efforts have altered the nature of production, with the leading brands no longer willing to source from suppliers who sub-contract production to home-based locations. Thus, in Pakistan more regulated forms of labour organisation have emerged in designated stitching centres and in large integrated factories. Similarly, in China supplier consolidation by the leading brands has meant the growing role of large producers. In addition to labour standard compliance, the football sector has seen important forms of upgrading in terms of product development and the use of new process technologies that have also affected the geography and nature of production.

What are the implications of these developments for Pakistani producers? The Pakistani football industry has largely managed to confront the substantial challenge it faced on labour standard compliance, particularly child labour during the mid 1990s. However, social compliance is a necessary, but not sufficient, condition to continue to compete in the global football industry and supply the major global brands. In terms of technological upgrading, the Pakistani industry has seen little evidence of new product development or shifts from hand stitching to mechanised forms of production. Pakistani producers continue to hold a niche for high quality, premium hand-stitched production, but at the same time improvements in machine stitching, developments in the production of aerodynamic thermo-moulded footballs, and the presence of high quality hand stitching in China has meant that Pakistan's market niche is being eroded. To respond to this the Pakistani industry needs to upgrade, which requires technological effort at the level of individual firms and for the industry cluster as a whole.

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