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SOUTH ASIA

South Asia Competitiveness: Synthesis of the Four Case Studies

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Acknowledgements

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5. Introduction: Synthesis of the Four Industry Case Studies

1. Motivation and Approach

This first Chapter of Volume II of the South Asia's Competitiveness report presents the synthesis of the four industry case studies presented in the following Chapters of Volume II (Apparel, Electronics, Automotive and Agribusiness). The main findings from these four case studies have also been incorporated as part of Volume I of the report which presents the overall findings of the report.

These industry case studies are an essential part of the overall report because they allow to better understand the drivers and constraints of competitiveness in South Asia by showing the linkages between the external environment of firms and their behavior within a well-defined industry where industry dynamics (e.g. competition) can be analyzed and performance benchmarked. As such, they are of great help to understand the relative importance of external factors in driving/constraining firm's performance/productivity. Also and crucially, industry case studies enable to assess the impact of industry specific factors/policies which traditional cross-cutting analysis are ill-equipped to get at.

And indeed, the main finding from the four industry case studies is that industry-specific policies, also called product market regulations, are the main constraint to South Asia's realizing its great untapped competitiveness potential. These policies include restrictions on trade, prices, products (standards) and markets that have protected firms from exposure to global good practices (automotive and agribusiness) or have limited firms' capacity to adopt these practices (apparel and electronics).

Manufacturing case studies were selected because the region's performance has been lagging in manufacturing relative to services. These particular manufacturing case studies were selected not because it was felt that these were "winning industries" for South Asia. They were selected because they are important and representative of different types of manufacturing industries. In effect:

- Apparel is the largest globally traded labor intensive industry in the world and a key opportunity for low skilled workers, women in particular, to move out of low productivity rural jobs. Labor intensive require little capital, thus providing fast growth opportunities for SMEs.
- Electronics is becoming the largest and fastest growing globally traded industry in the world, offering opportunities to both low skilled and skilled labor. Electronics is quickly replacing apparel as East Asia's main manufacturing export. This type of industry requires the capacity to assemble seamlessly inputs coming from around the world at great scale and efficiency levels.
- Automotive is also a large global industry with a strong domestic base. It is a capital intensive industry where skills and linkages between players as part of clusters are key success factors.
- Although increasingly traded, agribusiness remains mostly a domestic/local industry which is crucial for all countries and which has the opportunity to improve livelihoods in rural areas by linking farmers to processors and traders who are willing to pay a premium for higher quality products as well as by providing off farm job opportunities through supply and demand effects.

The country coverage of each industry case study (see Table 1 below) was determined based on its importance, as well as resources and data availability. For each industry case study, we also included relevant good practice benchmarks from outside South Asia – mostly from East Asia which shares many of the same characteristics as South Asia and has been performing better.

Table 1: Country coverage of the four industry case studies

	Afghanistan	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka	China	Vietnam	Thailand
Apparel		X		X			X	X	X	X	
Electronics		X		X				X	X	X	
Automotive				X			X		X		
Agribusiness	X	X	X	X	X	X	X	X			X

The analytical approach followed for these case studies relied on both quantitative and qualitative analysis carried out under the following framework:

- The first step consists in assessing the competitiveness performance of the industry in each country by comparing its performance in terms of output, trade, productivity and cost with the other selected South Asian countries, as well as the good practice comparator countries from outside the region (see Table 1). This first step relies primarily on quantitative analysis using national statistics for output, WITS for trade data, and enterprise surveys (national surveys as well as the standardized World Bank enterprise surveys) for productivity and cost.
- The second step consists in analyzing the drivers of productivity and cost at the firm and industry level, including scale, skills, technology and innovation, agglomeration economies within clusters, and linkages along local and global value chains. This step combines results from enterprises surveys (including the innovation and labor force modules of the World Bank enterprise surveys) and in-depth firm interviews. It also includes, in the case of apparel, a survey of global buyers to understand what drives their decisions beyond cost and quality – e.g. short lead times as well as compliance with social and environmental standards.
- The third step addresses constraints in the external environment of firms that limit their capacity or incentives to take advantage of these drivers. This step combines in-depth firm interviews with the analysis of the impact of external factors (e.g. infrastructure constraints and trade regimes) on firms' behavior and performance.
- The fourth and final step consists in developing policy recommendations to remove the constraints and exploit the drivers of competitiveness. This final step is inspired by the policy choices taken by the more successful countries in the region and elsewhere – e.g. the bonded warehouse regime which facilitated access to imported textiles for Bangladesh's apparel exporters. It also includes, in the case of apparel, an estimate (based on a gravity model) of how improved competitiveness (fostered by new policies) would affect output and jobs.

The remainder of this chapter presents the main findings from the four case studies on the steps described above: competitiveness performance analysis, drivers of competitiveness, and the constraints to competitiveness together with the policy recommendations to address them.

2. Competitiveness Performance Analysis

The competitiveness performance of South Asian countries in the selected industries is assessed first based on output and trade outcomes, and second based on the productivity and cost performance of firms.

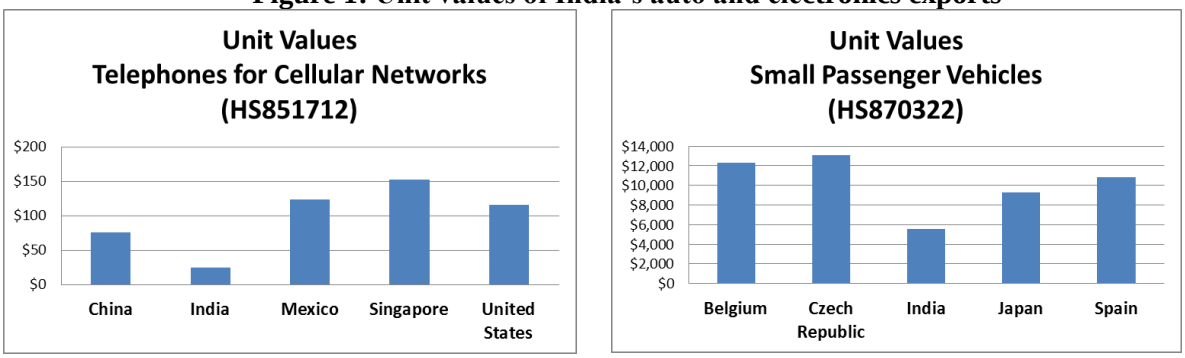
a. Output and trade

Overall, the region's performance in manufacturing output and trade has been markedly below East Asia's, despite sharing many of the same characteristics and having a growing labor cost advantage. The share of manufacturing GDP has been stagnant at 15% compared to 35% for East Asia. Manufacturing exports as a share of GDP has also been lagging at around 20%, compared to more than 30% for East Asia. South Asia's share of global goods exports is only 2.4%, compared to 14.7% for East Asia (both regions account for roughly 30% of the world's population). Furthermore, the region's exports are biased towards capital-intensive and commodity goods (e.g. refined oil, metals, chemicals, rubber and cereals), compared to East Asia which excels in labor and skill-intensive goods (e.g. apparel, electronics and automotive). Finally, the region also tends to export lower value goods as shown in Figure 1 below. The results from our case studies reflect this overall bleak picture, with some important bright spots showing South Asia's great untapped potential:

- Apparel. The region accounts for 12% of world's exports, compared to more than 50% for East Asia. Country performance differs markedly. Sri Lanka and Bangladesh, due in particular to effective import facilities for exporters, perform at East Asia's level in terms of exports per capita ($216 and $147, respectively), while India and Pakistan are at an order of magnitude lower ($10 and $23, respectively).
- Electronics. South Asia accounts for less than 1% of world exports in this large and rapidly growing industry, compared to 22% for China alone. Vietnam shows what can be achieved in this sector with FDI and good trade logistics – in less than ten years it went from virtually no exports to $150 per capita exports (compared to $250 for China and only $3 for India which is South Asia's best performer). Leading foreign investors are showing great interest in Bangladesh which need to make the industrial land available to host them together with their suppliers like China and Vietnam did.
- Automotive. South Asia's performance in terms of automotive output has been somewhat stronger than the other sectors, due to large and fast growing (and protected) domestic markets. As in electronics, South Asia has yet to become a significant player in export markets. India is showing some signs of competitiveness in the auto parts segment, which is more exposed to international competition than automobiles. Auto parts exports have been growing at 15% a year since 2009, with India now accounting for 1% of world's exports (compared to 10% for China).
- Agribusiness. Output is low in South Asia's agribusiness sector, and both domestic production and exports are dominated by basic commodities that undergo only limited processing. South Asia accounts for less than 3% of global food exports, compared to 15% for East Asia. However,

some bright spots show the region's potential, including exports of high value branded tea from Sri Lanka and basmati rice from India, as well as growing exports of high value horticulture products from Afghanistan, Bhutan and Nepal which have outstanding geo-climatic conditions for such products.

Figure 1: Unit values of India's auto and electronics exports



b. Productivity and cost

The region's overall poor performance in terms of manufacturing output and trade is mirrored by low firm productivity which has impaired competitiveness despite the region's growing labor cost advantage. As shown by Table 2 below, the results from our case studies confirmed the finding from Volume 1 which points at the low productivity performance across South Asia relative to East Asia.

Table 2: Labor productivity in the industry case studies (Annual Value Added/Worker, US$)

	Bangladesh	India	Pakistan	Sri Lanka	China	Vietnam
Apparel	2,500	5,700			15,200	2,700
Electronics	9,300	6,700		24,700	22,400	6,300
Automotive		7,000	3,000		19,000	4,000
Agribusiness	2,500	6,800		3,800	26,000	7,500

Source: World Bank Enterprise Surveys

South Asia's productivity performance also exhibits high levels of dispersion. Table 3 below shows the coefficients of variation of total factor productivity (TFP) by sector, calculated for Bangladesh, Sri Lanka, Nepal, relative to India. Results reveal substantial scope for gains from reallocation in Nepal in agribusiness – where firms in the lowest decile of the TFP distribution are more than 5 times less productive than those at the highest decile. In Bangladesh and Sri Lanka, apparel, substantially exposed to competition through exports, show lower dispersion of productivity levels.

Table 3: TFP dispersion (coefficients of variation) by sector and country

(Relative to India)	Bangladesh	India	Sri Lanka	Nepal
Agribusiness	0.64	1.00	1.56	66.97
Textiles	1.79	1.00		
Apparel	0.65	1.00	0.98	
Basic Metals	2.75	1.00		
Other Manufacturing	1.49	1.00	2.95	8.19

Source: World Bank Enterprise Surveys

The region also performs worse than East Asia in other, increasingly important dimensions of competitiveness, including quality, lead time and compliance with social and environmental standards (Figure 2, from the apparel case study).

Figure 2: South Asia less competitive than Southeast Asia in non-cost areas

Country	Buyers' Perceptions of:		
	Quality	Lead Time & Reliability	Social Compliance & Sustainability
China	1	1	3
Bangladesh	5	5	6
India	6	6	5
Vietnam	2	2	2
Cambodia	4	4	4
Indonesia	3	3	1

Source: Based on data from (Birnbaum, 2013) and the buyers' and stakeholders' surveys conducted for this study.

These shortcomings more than evaporate the region's growing labor cost advantage compared to China (see Table 4 below):

Table 4: Average apparel monthly earnings (US$ per hour)

Bangladesh	Sri Lanka	Pakistan	India	China
0.51	0.55	0.58	1.06	2.60

Source: Stiches to Riches (page 25)

As with output and trade, there are bright spots (leading firms) showing the region's untapped potential:

- Productivity in both apparel and the automotive industry is significantly higher among exporters than non-exporters as exposure to global good practices fuels operational improvements (discussed in the next section). For example, value added per worker is $8,900 among Indian

apparel exporters, compared with $3,800 for non-exporters. In Sri Lanka, large, export-oriented firms have high productivity levels and sophisticated production processes (National Stakeholders, 2014; Wijayasiri & Dissanayake, 2008).

- Some domestically-oriented firms also exhibit high levels of productivity and/or quality. For example, Maruti is not far from Japanese levels of efficiency and quality, Samsung's Noida plant ranks second among thirty similar Samsung plants from around the world, Pepsico sources quality potatoes from thousands of small-holders through contract farming arrangements, and KRBL achieves high productivity through scale (it has the largest rice milling plant in the world) and product innovation (discussed in the next section). This contrasts with the vast majority of (subscale) firms which operate at low productivity levels, often as part of the informal sector.

3. Drivers of Competitiveness – the experience and contribution of leading firms

This section summarizes the experience from the more than 50 leading firms in South Asia interviewed in the context of the four industry case studies. Many of them are from South Asia and include some of the main apparel exporters (e.g. US Apparel-Pakistan, Orient Craft-India, Pacific Jeans-Bangladesh and MAS-Sri Lanka), leading auto parts manufacturers (e.g. Bharat Forge, Hi-Tech Gear, MSSL and HTGL from India), notable agribusiness firms (e.g. Fauji Foundation - Pakistan, Dilmah - Sri Lanka and KRBL - India) as well as emerging world class South Asian firms even in the relatively new electronics sector (e.g. Dixon Technologies and Micromax from India). Most of these firms started from very modest beginnings – e.g. Dilmah started in 1974 with 18 staff but now has 35,000 employees, while US Apparel started with four sewing machines in the 1930s.

Foreign firms continue to play an important role in complex, capital- and knowledge-intensive activities such as car assembly (e.g. Maruti Suzuki in India and Hyundai in Pakistan), electronics (Samsung in India and Tos Lanka, a subsidiary of Toslec from Japan, in Sri Lanka) and agribusiness (Hindustan Lever, Nestle and Pepsico, which have transmitted leading edge knowledge to tens of thousands of farmers).

Beyond their direct contributions, leading firms are also having major positive effects through the knowledge and support they provide to suppliers and the competitive pressure they put on all firms in the industry. Their example and competition compel other firms to improve, and signals to the international investor community what can be achieved in the country.

As discussed above, these leading firms have demonstrated that world class levels of efficiency and quality could be achieved in South Asia across all the studied industries. This section discusses their experience and contribution along the main drivers of competitiveness/productivity, including technology adoption and innovation, economies of agglomeration, and diffusion of knowledge through clustering and participation in global value chains.

a. Technology adoption and innovation

Leading firms are demonstrating that world class and innovative products can be developed in South Asia by South Asian firms – e.g. Dilmah and KRBL are recognized as premium tea and rice brands globally, and MAS has developed a range of high performance sportswear based on their innovative synthetic fabric. Some of these firms are turning global through the acquisition of other leading firms abroad – e.g. Bharat Forge has acquired automotive companies in Germany and has managed to break

into design, engineering, R&D, testing and calibration. In electronics, Dixon is leading a new generation of productive and innovative Indian firms in home appliances, with two R&D centers located around Delhi.

In some cases, the government played an important facilitating role – e.g. Pacific Jeans from Bangladesh said that the system of bonded warehouses and back to back letters of credit provided by the government in the 1970s got the industry going by providing it access to critical imported inputs. In the case of KRBL, the Indian government played a critical role in the development of the PUSA-1121 Basmati rice variety.

Overall, and despite relatively good overall internet access in South Asia, the use of important internet management strategies such as e-commerce and marketing varies markedly across countries especially in sectors which are relatively less exposed to international competition such as agribusiness (see Table 5 below). Table 5 also shows that small firms rely much less than larger firms on ICT.

Table 5: ICT index by country, sector, and size

Categories	Bangladesh	India	Nepal	Pakistan	South Asia
Agribusiness	47	136	19	91	73
Apparel	101	106	40	113	90
Electronics	186	142	65	103	124
Automobile	50	127	100	94	93
Size					
Small	21	108	39	58	57
Medium	44	129	101	91	91
Large	124	158	150	131	141

Note: ICT index is standardized to average 100 and deviation 100.
Source: World Bank Enterprise Surveys data

b. Agglomeration economies and diffusion of knowledge through clustering

Agglomeration economies are the benefits that arise when firms and people locate near one another (e.g., in cities and industrial clusters). There are five sources of agglomeration economies: access and sharing of inputs/services (increasing returns to scale), labor market pooling (better match between employers and employees), knowledge spillovers (exchange of ideas), market effects (concentration of demand encourages agglomeration) and economies of consumption (consumers enjoy variety).

The biggest benefits from agglomeration economies were found in the automotive industry, where geographic proximity to the customer has supported efforts to upgrade product, process and function. "*We make the decision to collocate based on several factors. Is the job big enough in size to justify colocation? Is the OEM reputed enough to learn from? Is there potential to increase share of wallet? Is there potential to learn something new completely?*" said the MSSL senior executive (auto parts). In fact, the Indian and Pakistan automotive industries are concentrated in major clusters (e.g. Karachi, Lahore, Chennai and Pune). Table 6 below shows the positive correlation between productivity and the

propensity of automotive firms of being located next to other automotive firms (localization) – this result is robust across sector classification (either two-digit or three-digit ISIC code).

Table 6: Agglomeration Economies in the Indian Automotive industry

Dependent Variable: TFP	Two-Digit	Three-Digit
Localization District	0.0913***	0.0492***
	(0.028)	(0.019)
Observations	1,253	1,253
R-squared	0.0114	0.0066

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

It is too early to see agglomeration effects in South Asia's nascent electronics industry. But these effects can be seen in the rapidly growing electronics industry in Vietnam. For example, 70 suppliers from Korea located next to Samsung's plant in Vietnam and Intel is developing a training institute in partnership with the government to upgrade the skills of workers and local suppliers.

Leading firms (e.g. the Mahr Group and Wolplus Incorp) and their suppliers in the leather apparel cluster in Sialkot benefit from close proximity, which facilitates labor pooling and knowledge diffusion and provides international buyers a critical mass of offerings to encourage travel to this remote place in Pakistan. Buyers' access was further facilitated by the development of an international airport and exhibition center privately financed by the cluster.

Leading firms' linkages with local suppliers also has a positive impact on firms in the agribusiness industry. In the case of the basmati rice variety Pusa 1121, KRBL transferred crucial market information to farmers by ensuring that they produced the "right" product for the overseas markets. In Bangladesh, Aftab Bahumuki Farms Limited (ABFL) introduced contract farming with poultry farmers, and contracted farmers recorded a significantly higher level of output (11,783 kg/year) than the non-contract farmers (6,763 kg/year).[73] In Bhutan, Mountain Hazelnut Ventures (MHV) was established in 2010 to plant and process hazelnuts. The company imports hazel tissue cultured plantlets and seed from a related operation in China, which are distributed among farmers. After three years of operation, 2,000 ha have been planted and 5,000 farmers trained. Nestle in India has helped 190,000 farmers increase the quality of their milk and access/develop formal dairy markets in urban areas.

c. Learning from the best and improving continuously by linking to global value chains

Some of the leading South Asian entrepreneurs acquired their knowledge by studying and working abroad (e.g. the founder of Dilmah Tea). The Desh-Daewoo joint venture, which included the intense technical and managerial training of 130 Bangladeshi in Daewoo's Pusan plant in 1979, established the foundation for the next generation of Bangladeshi entrepreneurs. Similarly, many of the leading Indian auto part companies acquired their knowledge as suppliers to foreign companies (e.g. Bharat Forge and

[73] Begum, I.A. 2008. Prospects and potentialities of vertically integrated contract farming in Bangladesh. Department of Agricultural Development Economics, Hokkaido University, Japan.

MSSL from Maruti-Suzuki and Hi-Tech Gear from Hero-Honda). The same is true of MAS through its close partnership with its main customer (Victoria Secret).

These companies grew and continued to develop their capabilities over time by participating in export markets (e.g. apparel) or very competitive domestic markets (e.g. auto parts and electronics following the reduction in import tariffs). Quoting from a senior executive at Hi-Tech Gear: "*From an operational perspective, exports challenge companies to design, develop, manufacture and supply products to discerning customers in global markets. This in turn motivates companies to scale up the value chain, I wanted to find the most discerning customers, whether in India or abroad. I would bend over backwards to work with them because I found I learnt the most when I worked with OEMs who held very high standards*."

Developing trusted relationships with leading international customers also provided the platform for further expansion. MSSL, for example, expanded from basic plastic components to building tooling and injection molding machines.

To compete in global markets, these firms made significant investments in acquiring skilled manpower at all levels and meeting international standards. Workers at Tos Lanka undergo training in Japan for a period ranging from three months to one year. Just as many of these leading firms acquired their capabilities as suppliers to original leading firms, these firms in turn are having a major positive impact on their own suppliers. For example, MSSL requests their CTO to visit the supplier and work closely with them to define and guide product specifications.

The main constraints reported by these leading firms are (see the industry case studies for more details):

- Orient Craft (India) and US Apparel (Pakistan) mentioned the difficulties they have in importing man-made fiber as their number one constraint – echoing the voice of the apparel export associations in these two countries. This led them to focus on cotton based textiles and integrate vertically to ensure quality textiles – a costly solution not available to SMEs in the sector. Conversely, Pacific Jeans (Bangladesh) and MAS (Sri Lanka) reported that the ability to import fabric duty free was critical to their success.
- In the automotive sector, when enquired about their main challenge to growth, the Chairman of Bharat Forge said, "*Talent*." – echoing the voices of other leading auto-part manufacturers.
- In electronics, Samsung mentioned the inverted tariff structure in India and the difficulty in accessing industrial land in Bangladesh as the main constraints on its development in South Asia.
- In agribusiness, leading firms mentioned difficulties faced in importing key inputs, market regulations and the poor skills of farmers as major constraints.

4. The main constraints identified in the four case studies and how to remove them

The main constraints found across the four industry case studies (apparel, electronics, automotive and agribusiness) are industry-specific policies, also called product market regulations. These policies include restrictions on trade, prices, products (standards) and markets that have protected firms from exposure to global good practices (automotive and agribusiness) or have limited firms' capacity to adopt

these practices (apparel and electronics). These constraints can be summarized as follows, see Table 7 below:

(i) Trade related issues are the most important constraints on competitiveness/productivity – e.g. difficulties exporters face in importing inputs at world market prices (apparel), poor trade logistics and inverted tariffs (electronics) and very high effective protection rates (automotive and agribusiness). Trade related issues also include major barriers to regional trade as well as barriers to internal trade within India, which affects all industries.

(ii) Industry-specific product market regulations are important constraints in automotive (standards) and agribusiness (standards, subsidies and restrictive regulations on prices and markets).

(iii) The lack of managerial and technical skills is a constraint in automotive and electronics, as well as agribusiness in the case of farmers.

(iv) Difficulties to access well located and well serviced industrial land is a very serious issue for FDI (electronics and apparel, especially in Bangladesh) and for clusters of SMEs stranded in city centers in all countries (apparel).

Table 7: Main constraints to competitiveness identified in the industry case studies

	Apparel	**Electronics**	**Automotive**	**Agribusiness**
Trade barriers	**Very important**	**Very important**	**Very important**	Important
Product standards and market restrictions			Important	**Very important**
Lack of technical and managerial skills		Important	**Very important**	Important
Difficulties to access industrial land	Important	Important		

Other cross cutting constraints (e.g. access to finance, political instability, crime, taxes, corruption and infrastructure) were not found to be as important. Table 8 below summarizes the results from the World Bank Enterprise Surveys for formal firms. It can be seen from the table that most obstacles in most countries are rated between 0 and 2 (0 being “No obstacle” and 4 being “Very severe obstacle”).

Corruption was found to be the most serious cross-cutting issue followed by political uncertainty (especially in Afghanistan, Bangladesh and Nepal), taxes, access to finance and infrastructure.

Smaller and informal firms would be more seriously impacted by difficulties to access finance and infrastructure. Finally, the lack of adequate facilities (e.g. safe transportation and daycare) as well as restrictions on flexible work time (e.g. women are not allowed to work at night in factories) constrain women employment.

Table 8: Obstacles reported by firms (ranging from 0 as "No Obstacle" to 4 "Very Severe Obstacle")

Obstacles \ Countries	Afghanistan	Bangladesh	Bhutan	India	Nepal	Pakistan	Sri Lanka	Total
Finance	2.05	1.75	1.40	1.16	1.53	1.30	1.60	1.37
Political	3.03	2.87	0.39	1.11	3.47	2.04	0.92	1.72
Crime	2.55	0.94	0.59	0.59	0.88	1.66	0.73	0.91
Taxes	1.71	1.35	1.22	1.40	0.94	1.63	1.35	1.41
Corruption	2.57	2.31	0.65	2.15	1.80	2.42	0.83	2.12
Informal Sector	1.53	1.02	0.64	1.04	1.29	1.25	1.50	1.11
Infrastructure	2.41	1.43	0.90	0.99	1.60	1.89	1.14	1.27

Source: World Bank Enterprise Surveys - Afghanistan (2008 & 2014); Bangladesh (2007 & 2013); Bhutan (2009 & 2015); India (2014); Nepal (2009 & 2013); Pakistan (2007 & 2013); Sri Lanka (2011).

We discuss in turn below the main constraints identified in the industry case studies together with the policy recommendations to alleviate them.

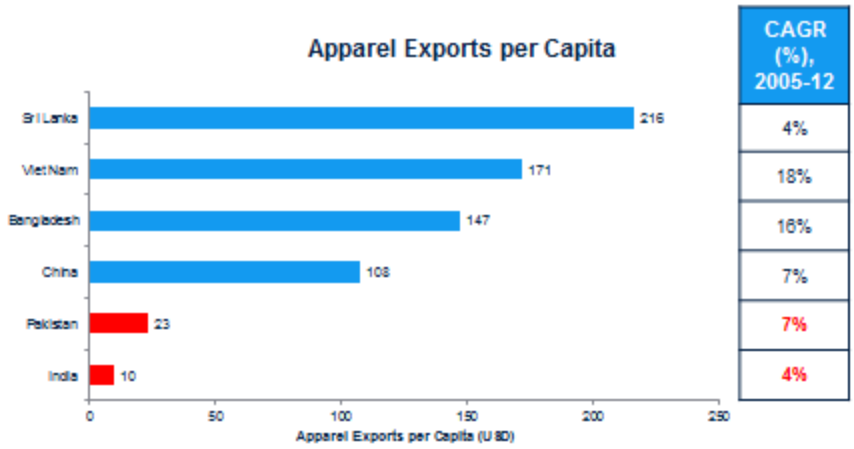
4.1 Removing trade barriers

As can be seen in the table above, trade barriers have been found to be collectively the main constraints on South Asia's competitiveness in the four manufacturing case studies. Key policy measures that would ease the constraints imposed by trade barriers in the four industries include: (i) improve procedures that enable exporters to import inputs free of duty; (ii) gradually reduce high effective protection rates, (iii) remove inverted tariff structures; and (iv) improve external and internal trade logistics.

4.1.1 Facilitating access to imported inputs for exporters

Differences in how exporters access imported inputs go a long way in explaining how Bangladesh and Sri Lanka can operate at "East Asian" levels of export performance, while India and Pakistan operate at a much lower level (Figure 3).

Figure 3: India and Pakistan far behind in apparel exports



Source: Exports data are from the UN COMTRADE database. Population figures are from World Development Indicators, World Bank.
Note: Total Apparel Exports are a sum of HS 61 and 61. Exports are based on world imports from partner countries; data retrieved on 3/6/14.

India's and Pakistan's apparel export associations have put liberalizing the import regimes for inputs at the top of their list of policy recommendations. The duty drawback schemes that are supposed to enable exporters to import their inputs duty free are plagued with red tape, leading to high costs as well as long and uncertain delays which are not acceptable to global buyers. For example, in Pakistan the process for importing inputs involves multiple and overlapping regimes requiring physical verifications of business premises, calculation of 'input wastages' through physical checking, and the drawing of samples of imported inputs and goods meant for export at the time of both import and export (such issues were also found to affect the agribusiness and automotive industries in Pakistan).

Because of the high tariffs on man-made fiber (MMF), the problems with duty drawback schemes essentially limit exporters to cotton based garments, which are declining globally relative to MMF and concentrated during the summer season. As a result, apparel exporters are also affected by low capacity utilization - Indian apparel factories are operating at only 6.5 months annually, compared to the global average of 9 months (Jordan et al., 2014).

Duty drawback schemes for apparel exporters work well in Bangladesh because of an extensive system of bonded warehouses. That system does not work well in other industries (e.g. the footwear industry in Bangladesh has great difficulties importing leather) as the Ministry of Finance is reluctant to issue bonded warehouse licenses outside apparel because of fear of "import leakages" and loss of tax revenues (operating a single window for approving imports with end to end automation together with a risk-based inspection regime would considerably reduce such risks). A duty drawback scheme is not needed in Sri Lanka, as apparel producers enjoy zero import tariffs on textiles and the time required to clear customs is typically counted in hours as opposed to weeks. This has enabled Sri Lankan's apparel exporters to diversify and develop high value apparel.
Difficulties with duty drawback schemes were also found to affect the electronics industry in India (the extremely cumbersome procedures around notification 25/99 discourage firms from using it) and the auto parts industry in Pakistan.

Recommendation #1

Reform duty and tax remission for export (DTRE) schemes to facilitate access to imported inputs for exporters

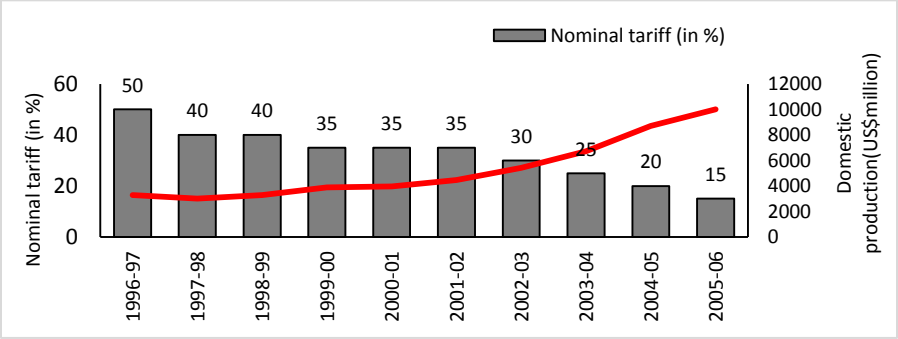
4.1.2 Gradually reducing high effective protection rates

Import tariffs have remained high in South Asia's automotive and agribusiness industries, which has enabled firms with low levels of productivity to continue operations.

The automotive case study shows that the sector in India and Pakistan is now ready to move from a "domestic growth under protection" model to a more sustainable "productivity driven global growth" model. High tariff protection (60% on final cars in India, 75% in Pakistan) has attracted market-seeking original equipment manufacturers (OEMs), which in turn has helped to develop supplier networks. But these high levels of protection are now allowing large productivity gaps to persist in the sector, with most OEMs (together with most of their suppliers) having subscale/fragmented operations operating at low capacity utilization and with quality standards that fail to meet international benchmarks.

The Indian auto parts and commercial vehicles segments, like the assembled car segment in China, show that a gradual reduction in tariffs can boost productivity and lead to increased growth. For example, the Indian auto parts sector witnessed a gradual reduction in tariffs from 60% in the 1990s to an average of 12.5%, which was accompanied by a tripling in output (Figure 4).

Figure 4: Domestic production of auto parts and nominal tariff reduction in India



As discussed in the previous section, Indian firms that export auto parts are becoming world leaders by combining low labor costs with rapidly improving capabilities. These firms first acquired their technical and managerial skills from leading domestic OEMs (e.g. Maruti Suzuki and Hero Honda), followed by a continued process of improvements fueled by decreasing protection and increasingly demanding foreign customers.

Automotive is a sector where pressure (or the lack of it) on an OEM flows to its suppliers. Greater competitive exposure on OEMs, and their being forced to achieve global good practices, would have positive knock on effects on firms along the entire value chain. Foreign OEMs will have to bring updated and customized designs, instead of selling last-decade models to Indian consumers. For example, increased competitive pressures on local OEMs following China's accession to WTO increased suppliers' productivity levels.[74] And, similar to the experience of auto parts and commercial vehicles in India, import competition led to an increase in production (automotive output grew by an average of 25% a

[74]Humphrey, J. & Memedovic, O. (2003). "The Global Automotive Industry Value Chain: What Prospects for Upgrading by Developing Countries." Vienna: UNIDO Sectoral Studies Series.

year between 2002 and 2005, and net trade in cars rose from -$672 million to $5.3billion, while import tariffs on cars were being reduced from 90% to 25%).

Similarly, the agribusiness industry should benefit from the gradual reduction of import tariffs, which are high across South Asia as compared to East Asia (Table 9):

Table 9:Tariffs in South and South East Asia on imported agricultural products

Agricultural Products	Simple average Bound Tariff	Simple average Applied MFN rate
Afghanistan	--	7.1
Bangladesh	192.0	16.8
India	113.5	33.5
Nepal	41.5	13.8
Pakistan	95.5	15.4
Sri Lanka	50.0	25.7
Thailand	38.9	29.9
Vietnam	19.1	16.2
Indonesia	47.0	7.54
China	15.8	15.6

Source: http://tariffdata.wto.org/TariffList.aspx

4.1.3 Removing inverted tariff structures

Lower duties on final goods than on parts favors imports of final goods over domestic manufacturing. This issue was found to affect the electronics industry in India[75] as well as parts of the automotive and agribusiness industries of Pakistan.

The first Information Technology Agreement (ITA-1) eliminated import duties on more than 200 ICT related tariff lines, and excluded most parts and components required for the manufacture of these

[75] Subramanian and Modi, 2015

products from duties. However, duties were not eliminated on "dual use" materials - those used in other industries (importantly copper, aluminum, glass and plastics). While the Indian Government issued a notification (notification 25/99) providing exemption from duty if the end use is for a product covered under the ITA, the procedures required to claim this exemption are so cumbersome that companies are discouraged from applying. Imports of medical equipment also face a duty of 5 percent while materials for their production face a tariff of 7.5 percent, which discourages domestic production of the final good.

Another issue concerns India's trade agreements with several countries (e.g. Singapore, Thailand, Malaysia, Korea and Japan) that provided for duty-free access for final goods of interest to them, without always reducing tariffs on parts and components (where these countries may not have had local manufacturing). For example, tractors can be imported from Japan with a 5.5% tariff and from Thailand with zero tariff, while tariffs on the inputs (axles, wheels, gears, pumps, engines) vary from 7.5 to 10%.[76] Furthermore, inputs attract a 12.5% countervailing duty, while outputs do not. Also, there is a special additional duty of 4% on inputs for important consumer product categories like refrigerators, air conditioners and washing machines, while exempting the final product.

Inverted tariff structures also exist in the agribusiness and automotive industries in Pakistan. For example, finished poultry products are imported in Pakistan at zero duty from Malaysia and at 16 percent duty from China, yet duties on the inputs for local poultry processors are 15-30 percent, in addition to the sales tax (GST) of 17 percent. The Poultry Association estimates that these tariffs increase costs by 5 percent.

Thus, South Asian countries should continue to reduce and simplify import tariffs while developing alternative sources of fiscal revenues (e.g. GST/VAT, income and property tax).

Recommendation #2

Gradually reduce import tariffs towards a common low baseline to increase exposure and access to global good practices and remove inverted tariff structures

4.1.4 Improving external/internal trade logistics

Reducing external trading clearance times

South Asian firms are highly dependent on imports, and report that customs clearance is subject to lengthy and unpredictable delays. To compensate, firms are forced to hold higher inventories (which undermines cost competitiveness in this very lean industry), and are subject to delays in production and increased turn-around times that can severely erode competitiveness. In India, the average time reported to clear customs varied from 2-10 days for large firms, and 14-21 days for SMEs. The World

[76] This issue is described in the FICCI report of July 2015.

Bank's Doing Business report reports that it takes more than twice as long to clear customs in South Asia than in East Asia, with Sri Lanka being the only country operating at East Asian levels (Table 10).

Table 10: Time to import – Border and Documentary Compliance (hours) – Doing Business 2016

Afghanistan	India	Bangladesh	Pakistan	Sri Lanka	Vietnam	China
432	350	327	294	130	170	158

Source: Doing Business 2016 (15 metric ton container of auto parts – HS 8708)

An important reason for these delays is related to schemes aimed at providing exemptions from the remaining high and distorted tariff structures discussed above – e.g. the ineffective DTRE schemes in apparel and the unsuccessful attempt to address the inverted duty structures problem through the exemption notification (25/99). These procedures are cumbersome and time consuming, and often require significant back-and-forth due to conflicting interpretations and ambiguities in product classification. The result is that suspicion has become built into the system, as have opportunities for rent seeking. One electronic firm stated that "*"The customs bureaucracy is very difficult to handle when we import various equipment and that creates a big disincentive for anyone venturing into this market."* Another interviewee said that: "*To gain one rupee in customs duties the country is losing thousands*."

Addressing the tariff issues discussed above would go a long way at reducing cost and delays at customs. There are also a number of broader trade facilitation measures, including commitments made under the WTO Trade Facilitation Agreement, that would speed up clearance processes at the border in South Asia. Important examples include providing for fully electronic submission of documents, improving coordination of border management agencies, and establishing an effective and quick grievance redress mechanism (the current administrative mechanisms take very long, and firms are scared of reprisals).[77] Further, Governments may wish to pilot an advance ruling system for the electronics sector as a start, which could then be extended to other sectors.

Recommendation #3

Complete custom reforms (e.g. single electronic window, risk based inspection) to facilitate external trade

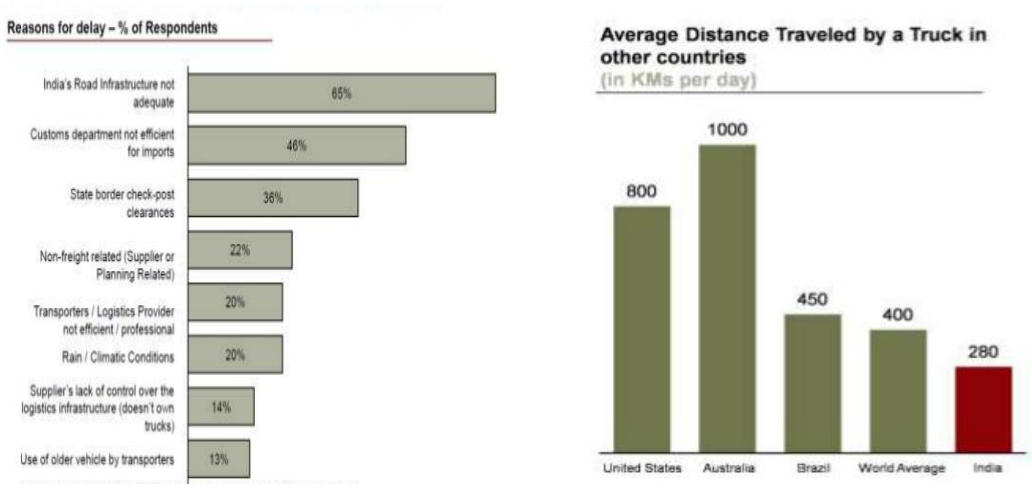
Improving internal trade logistics

Poor internal logistics also reduce South Asia's competitiveness. Firms in India reported that while it takes 11 days for a container to travel from Shanghai to Mumbai, it takes 20 days for goods to travel from Mumbai to Delhi. Poor infrastructure is one reason, but a careful survey shows that a quarter of the journey time is spent at check posts, state borders, city entrances, and other regulatory stoppages (Figure 5, left panel). Crossing two state borders between origin and destination can add as much as a week to the uncertainty in delivery schedules. Average distances covered are low, in part because documentation requirements for internal transit are burdensome, and barriers at the borders create opportunities for delay and rent-seeking (Figure 5, right panel). To deal with uncertainty over delivery of

[77] Ernst (2014)

inputs, firms in four industries (auto components, textiles, electronics, and heavy engineering) report maintaining 27 percent higher inventories on average. Total logistics costs, including inventory costs and lost sales, account for 14 percent of total costs for electronics firms, which is high by international standards.

Figure 5: Customs Clearance in India



Source: *Jordan and Kamphuis (2014)*

An electronics exporter in Tamil Nadu reported diverting his shipment by several hundred kilometers, not using the high-quality and nearby Cochin port, simply to avoid the Tamilnadu-Kerala border crossing. Global firms looking to enter India worry about trade logistics too. According to a US supplier entering India, "When entering new markets the key concern is supply-chain factors such as inbound transport costs for raw materials and outbound transport costs to get the product to the customers. That can make or break the pricing " A German automotive Tier 1 supplier based in India said, "'Labor cost advantage usually comes with logistics cost disadvantage in India."

Quoting from the India Development Update published by the World Bank in October 2014, **"Implementation of the GST is the most crucial reform that could address today's logistics challenges.** The GST offers a unique opportunity to rationalize and re-engineer logistics networks in India, given the inherent inefficiencies with taxes based on the crossing of administrative boundaries. Under the GST, the variety of different and cascading taxes, many of them locally administered, will be replaced by a unified taxation system. This will abolish the need for reconciliation of taxes when crossing state borders, eliminate the cascading effect of the Central Sales Tax (CST), and ensure that inter-state and intra-state transactions incur the same tax liability by allowing firms to claim full credit on input purchases. The GST will free up decisions on warehousing and distribution from tax considerations so that operational and logistics efficiency determines the location and movement of goods. Freight and logistics networks will realign according to the location of production and consumption activities. This will create the hub-and-spoke models that are needed to improve freight and logistics performance. "

Recommendation #4

Unify GST and VAT to facilitate internal trade (India)

4.2 Removing regulatory impediments to private investments

Overly regulated domestic markets are a serious constraint on the agribusiness industry, especially in India.

Several outdated regulatory barriers, such as the Agriculture Produce Marketing Act (APMC, first promulgated in 1956) and Essential Commodities Act (from 1955), hinder the development of storage and processing infrastructure in India. In particular, stock limits and price limits can be imposed with penalties that include potential jail sentences of up to seven years[78]. Not surprisingly, the private sector has been hesitant to engage in storage.

Such Acts also provide for strict control over the marketing of agricultural produce via market committees. Produce can only be traded through the market, or for some crops (e.g. sugar cane) direct purchases are allowed but are subject to a fee. As a consequence, there is no competition from private markets, services are poor, and the setting of fees is opaque.

The positive impact of market liberalization can be seen in Maharashtra and Tamil Nadu (India) as well as in the Sindh Province of Pakistan, where the 1939 Act was replaced by the Sindh Wholesale Agricultural Markets Act, 2010. The new Act abolished notified market areas and market committees, and allowed private markets and direct buying. Private initiatives have emerged as a result. One example is being developed by the Pakistan Agricultural Coalition, who is establishing a chili trading platform in Kunri, Sindh Province with the goal of introducing a more direct linkage between grower and buyer in order to reward quality.

The agribusiness case study discusses many other instances of regulations that slow down the evolution of the industry towards higher value products demanded by domestic and international markets. Examples include price caps combined with minimum support prices on commodity products which discourage investments in higher quality products, and subsidies on fertilizers and water which tend to benefit larger farmers and sustain low productivity and environmentally damaging practices. Such subsidies should be gradually phased out and replaced by active support to the smaller farmers to help them produce higher value produces (e.g. horticulture) with more efficient techniques (e.g. drip irrigation).

[78] The ECA is not applied evenly across all states: in 2014 Maharashtra was apparently not applying stock limits to onions and potatoes and UP is not enforcing the Act. http://www.business-standard.com/

Recommendation #5

Complete the reform of agricultural markets (e.g. APMC) and prices (e.g. Essential Commodity Act) to promote competition and investment in higher value products

Recommendation # 6

Replace blanket agricultural subsidies (e.g. Minimum Support Price, fertilizers, water and power) by support targeted at the smaller/poorer farmers to promote productive and sustainable agricultural practices

4.3 Improving product standards

Product standard issues range from regulatory safety and environmental issues (very important in the automotive and agribusiness industries for both domestic and export markets) to private quality standards where the government has more of a supporting than a regulatory role (discussed in section 4.3 on skills and innovation, below).

Improving product standards in the automotive industry

There are no worldwide automotive standards, but India and Pakistan are behind the widely accepted EU and US regulations by at least five years. Domestic and foreign firms in India are not prepared for the latest international standards, and thus face constraints when they try to compete globally. According to a European regulations expert, *"The Indian companies are technologically late. Foreign auto companies are recycling their current technologies in India. Changes will require heavy investment, and in unstable market, there are risks. No surprise that the auto market actors in India are not pushing hard."*

To make matter worse, there have been frequent changes in regulations pertaining to emission norms in India leading to heavy losses. For instance, in the North-Eastern states, Euro II/BS-II norms were scheduled to be implemented in 2005. However, the government changed this decision due to lack of fuel availability, and went back to Euro I. During this time, OEMs and part suppliers who had adapted their technologies to work with Euro II needed to go back to Euro I. In the words of a senior executive at Maruti, India's leading OEM, "*We really need more certain and stable policies in India. Policy stability is a must to orientate the automotive in consistent directions - i.e. avoid back and forth changes for the type of fuel, petrol or diesel engines that mislead industry investments."*

Thus, the policy on industry standards and where it is headed should be clearly articulated. For instance, the industry needs to know ahead of time the medium term vision for petrol versus diesel to forecast production and adapt processes. The stance on Euro 4 and Euro 5 introduction, consumption test conditions to orient choices for transmission solutions, and crash-test alignment on foreign requirements milestones are all necessary to plan changes.

Improving product standards in the agribusiness industry

Sanitary, phyto-sanitary (SPS) and food safety regulations are the main product standard issues in the agribusiness industry across South Asia. While the problems differ across countries, a general concern among processors and traders consulted for this report is that food safety regulations often are rigid, not in pace with scientific advancements, and not in line with WTO's Agreement on Sanitary and Phyto-Sanitary measures. In Bangladesh, India, and Pakistan, the regulatory authorities are divided among ministries or other agencies, with overlapping responsibilities and without coordination (e.g. livestock and plant health falls under the Ministry of Agriculture and food safety under the Ministry of Health). Enforcement of regulations is reportedly inefficient or lacking, and food safety laboratories are not recognized by international bodies and lack the capacity for certain tests, such as for pesticide, mycotoxin and antibiotic residues.

These problems impair the system's ability to ensure the safety of food products for consumers, while impeding firms' access to foreign markets. For example, in July 1997 the EU banned shrimp imports from Bangladesh due to unsatisfactory safety of products. Fortunately for the industry, FAO was already working with the processors and the Government to implement HACCP principles throughout the chain, so the food safety concerns were addressed over the next 5 months. These efforts not only helped reclaim the lost market, but also enabled Bangladeshi firms to charge a higher premium for their products (Cato and Sunasinge, 2003). Similarly, in May 2014 the EU imposed a temporary import ban in all 28 EU member states on Indian Alphonso mangoes and four vegetables[79], as a result of what the European Commission described as "significant shortcomings in the phytosanitary certification system of such products exported to the EU". The EU lifted the ban 6 months later, after facilities had been upgraded, new handling practices implemented, and the capacity if inspecting staff improved to a satisfactory level.

Complying with quality standards and food safety requirements can be both challenging and costly, in particular for smaller-scale actors, and the Government can therefore play an important role as supporter and facilitator. The provision of public goods such as SPS and food safety infrastructure (harmonized regulations, certified testing facilities, and information and training) can help small actors comply with food safety requirements.

Interviews with lead firms around South Asia revealed various weaknesses in food safety/SPS regulation:

- National standards do not comply with international norms (e.g. WTO Agreement on Technical Barriers to Trade and WTO Agreement on Sanitary and Phyto-sanitary Measures) and therefore

[79] Eggplant, the taro plant, bitter gourd and snake gourd

impede market access for exporters. The international recognition of the apex authorities and of monitoring laboratories is patchy.

- Farmers' ability to achieve the standards required by the industry or exporters is weak.
- Implementation of regulations and the technical capacity of institutions and their inspection agencies need to be upgraded.
- The large number of regulatory authorities leads to confusion over areas of responsibility. There may be regional discrepancies within countries, where responsibility has been devolved to state or provincial level leaving uncertainty over responsibilities and technical regulation regimes that don't meet international standards.
- Voluntary standards and mandatory technical regulations are not always clearly separated, and the representation of the private sector in the formulation and implementation of standards is insufficient.
- There is no high level oversight of the national quality infrastructure or the technical regulation framework, and thus no co-ordination and collaboration across ministries to ensure WTO compatibility. In Pakistan a National Quality Policy[80] was formulated in June 2014, but its current status is not known.

The World Bank Group Toolkit on Food Safety prescribes eight fundamental pillars to reforming food safety, including: i) food safety should be secured along the entire food chain; ii) regulation by itself cannot ensure food safety; iii) in a food safety system, primary responsibility (and liability) for the safety of food rests on food business operators; iv) the role of consumers should be strongly emphasized; v) a preventative and risk-based approach should be the basis for regulatory reform, decision making, control, and self-control of food safety; vi) the role of International standards and scientific justification is key; vii) the impact of food safety reform on trade should be carefully considered; and viii) co-ordination and collaboration are vital.

Recommendation #7

Converge towards international product standards (safety/environment) to increase exposure and access to global good practices as well as increase the protection of consumers and the environment

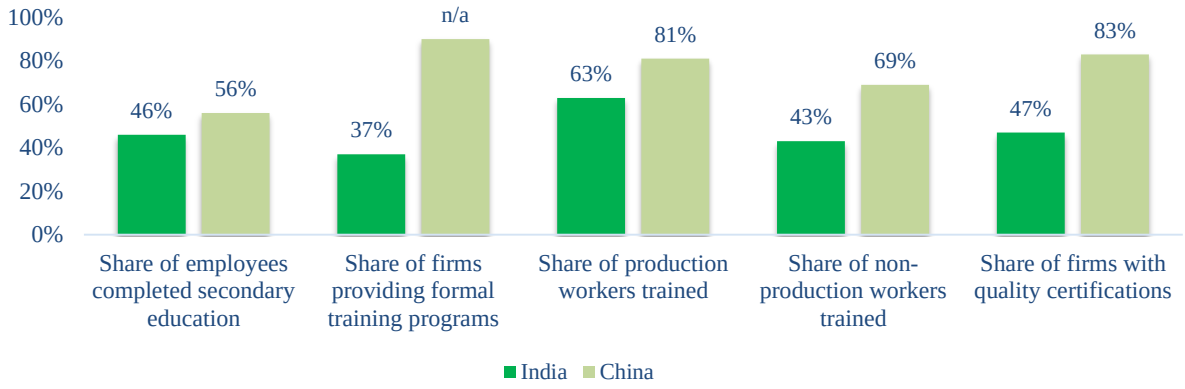
4.4 Developing skills and fostering innovation

Developing technical and managerial skills is important for productivity, especially in the automotive and electronics industries. For example, only 43% percent of nonproduction workers in the automotive sector in India are formally trained, compared to nearly 70% in China (see Figure 6).[81] According to the CEO of one of the fastest growing Tier 1 exporters, "Skill gaps among managerial staff are a big headache and we have started in-house skilling centers to overcome this issue."

[80] See also Policy paper on sanitary and phyto-sanitary management and controls in Pakistan. Ministry of National Food Security and Research, Government of Pakistan (2014)

[81] Nonproduction workers include (a) managers and supervisory personnel with responsibilities for the performance of shop floor supervisors; (b) employees in sales, transport management, advertising, credit and collection executives, and purchasing, financing, and legal personnel; and (c) employees on the payroll of the manufacturing firm engaged in the construction of major additions or alterations utilized as a separate work force.

Figure 6: Overview of skills in Indian and Chinese firms



Source: Enterprise Survey (India 2014, China 2013)

As final products become more complex, the manufacturing processes increasingly require a more diverse set of skill sets. There is evidence that in developing countries, skill sets are leaning toward higher technological content through upgrading skills on the job or in-service within the same industry.[82] In China, 90 percent of auto firms provide training to their employees, as opposed to 37 percent in India.

The returns to investment in training can be large – international evidence shows that a 1% increase in training is associated with 0.6% increase in value added per hour.[83] In South Asia public investment on training has been low and of poor quality, comparing unfavorably with competitors. For example, vocational education programs in India can accommodate only 5% of secondary school graduates, while China has the infrastructure to train half of all secondary school graduates. The quality of training is also an issue. Across the region, the development of new programs and curricula is difficult in public institutions. Quality is further hampered by the lack of industry participation in training.[84] In China, the public sector finances hiring and training programs, as well as employee housing, which is seen as critical to acquiring sufficient manpower, enhancing productivity, and sustaining long-term competitiveness. Industrial parks have on-site, well-equipped technical and vocational colleges and secondary schools, with market-driven curriculum and management. Vietnam provides subsidized training for employees in soft skills, technical English, technical skills as well as on-demand training. Further, companies can set aside 10% of annual taxable income for R&D. This sharing of skilling costs between the state and private companies can significantly encourage investment, especially for companies with a long term vision.

4.3.1 Improving skills through public private partnerships

Government can and should play a leading role in the development of technical and vocational skills. In Sri Lanka, human resources and skill development are a key component of Government policies (National Stakeholders, 2014). Apparel-specific training institutes build on the country's high general

[82] Berman and Machin 2000.
[83] Dearden, Reed, and Van Reenen, 2006
[84] BCG (2013)

education level, with education free from kindergarten to the university level for the majority of the population.

This training, however, cannot be limited to pre-service training from public TVET institutes that have shown mixed success in India and Pakistan. On-the-job training is the most effective way to acquire skills (superior to government-led programs and own investment of the worker), although it has some skill bias towards existing needs. Large Pakistani apparel firms report that they carry out in-house training for most of their workers (Nabi & Hamid, 2013).

Large hi-tech companies played a pivotal role in filling the training gap in Vietnam's electronic industry through quality on the job training, and by forming lasting linkages with academic and other research institutions. Facing an acute skills shortage (similar to the problems in India), Samsung, LG and Intel trained thousands of employees by striking agreements with universities, digitizing and open-sourcing materials and setting up 'training the trainer' programs with leading Vietnamese and US universities. This has helped their workers and suppliers work better with customers, solve problems on the factory floor early on, and pivot towards exports-oriented growth. In India and Pakistan, policies to encourage large companies to train more workers within their own company and in supplier firms have great potential for positive outcomes.

4.3.2 Improving skills and fostering innovation through linkages

Besides skills mismatch, large firms report challenges in finding suppliers who can meet their standards. Samsung demands that suppliers meet nine categories of requirements, including technical, labor and environmental requirements. Suppliers need to increase attainment of systems certifications such as QS9000 that are becoming prerequisites for supplier selection by leading firms. Automotive Tier 1 suppliers make a detailed assessment of the development responsibilities that smaller suppliers are capable of taking on. Some combination of ACMA, Auto Skill Development Corporation (ASDC), the Quality Council of India (QCI) and other services could help firms improve their adoption of quality tools and certifications.

The Karachi Tools, Dies and Moulds (KTDMC) is a good example of how governments can, in partnership with the private sector, support such linkages. Following a US$4 million initial public investment, KTDMC is now self-sustainable, and is the only institute in Pakistan with a heat treatment facility. KTDMC is also a pioneer in 3D scanning for quality and inspection. In India, such support is provided by the Technology Centers of the Ministry of Micro Small Medium Enterprises (MoMSME) at the cluster level.

In the agribusiness industry, there are well-known examples of contract farming used to improve farming practices, for example in the introduction of dairy farming in Rajasthan and the cultivation of potatoes for processing in Bangladesh and India. Menthol exports from India provide a spectacular example of creating a new industry through contract farming. The establishment of mint cultivation as a smallholder crop was only made possible by the initial investment of a private company. Once the industry became established, the further development of varieties and agronomy were carried out by public institutions. After years of stagnation, CIMAP initiated its 'Improved Technology for Menthol Mint (Mentha arvensis) Essential Oil in India' project in 1993 and within a few years the introduction of

new varieties together with agronomic research brought higher yields and oil recovery than previously attained. The development of short cycle varieties was key in allowing the farmers to fit mint cultivation between the *rabi* and *kharif* crops in the rice-wheat or rice-potato/pulse crop cycles. The Fragrance and Flavor Development Centre (FFDC) at Kannauj took over the distribution of planting material and organization of extension and training. This public-private collaboration has resulted in an industry that today supports at least half a million families and captures 80-90 percent of global menthol exports. At current prices (INR930/kg) raw mint oil adds over US$700 million every year to the rural economy in Uttar Pradesh.

Recommendation #8

Promote public private partnerships (PPPs) to upgrade skills and innovation, and to improve the relevance and efficiency of public support

4.4 Facilitating access to industrial land

Difficulties in accessing well-located and well-serviced industrial land is a very serious impediment to attracting export-oriented FDI (electronics and apparel) and for clusters of SMEs that are increasingly constrained within rapidly growing cities (apparel).

In South Asia like in many other regions, public support to facilitate access to industrial land can be justified by difficulties in the land market that will take a long time to resolve (e.g. lack of secured land titles), the need to provide public infrastructure, as well as financing and coordination challenges discussed further below. Public support can also be justified as well-located and well-managed industrial zones can help overcome negative externalities (e.g. pollution) and foster positive externalities (e.g. help attract leading investors and generate agglomeration economies and cluster effects). Historically, public support has been provided in most countries through industrial zone developments. These have had a mixed record of success, as many of the public zones were not located in appropriate locations or have been poorly managed (e.g. PSIC zones in Pakistan Punjab), while not enough quality industrial land was provided in the most suitable areas.

The lack of appropriate industrial land is most acute in Bangladesh, which has resulted in lost FDI opportunities. Export-oriented foreign investors expect to have easy access to land that is convenient (e.g. next to a world class port) and well-serviced (power, water, ICT, etc.), at attractive conditions and with room to spare for their suppliers. These firms have a choice of countries and will not spend two years trying to secure the right land. For example, in 2011 Samsung requested 250 acres in an export processing zone to develop an electronics hub in Bangladesh ($1.25bn investment, 50,000 workers). The investment did not materialize because adequate land was not available in BEPZA zones. The investment instead went to Vietnam, where Samsung now directly employs 100,000 workers. Unfortunately, Samsung is only one of many leading foreign firms which were not able to invest in

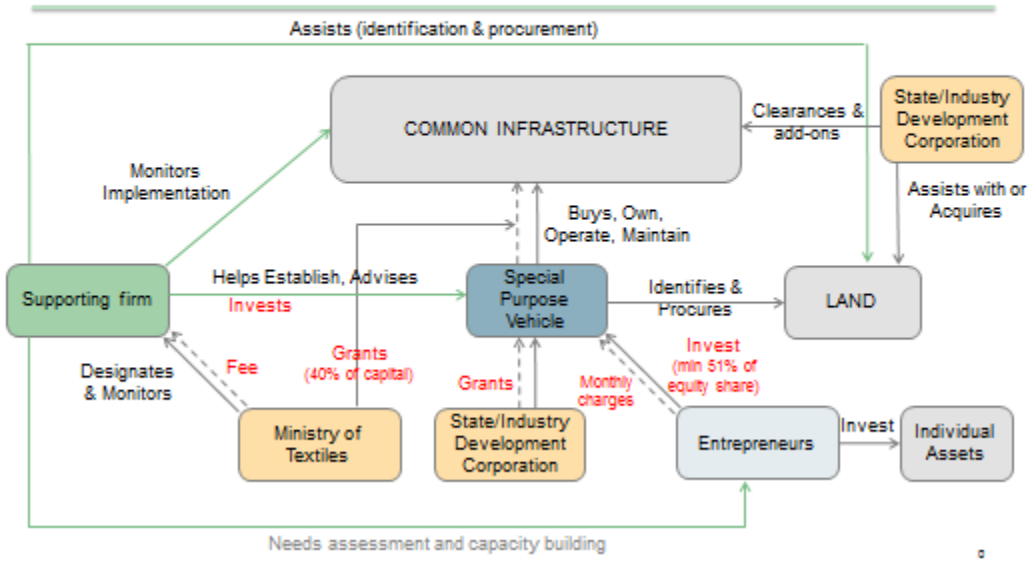
Bangladesh due to the lack of industrial land. Recognizing the importance of the issue, Bangladesh has launched the development of new zones through public private partnerships. A good starting point would be for the Government to resolve the 15 year old conflict with the Korean Export Processing Zone, which has kept idle 2,500 acres of prime industrial land next to the Chittagong port.

The importance of facilitating clustering around lead investors has been well understood in India in the case of the automotive industry. Indian States have competed fiercely to attract major OEMs with attractive tax incentives and land deals – with the risk of leading to a "fiscal race to the bottom", sub-optimal investment locations and industry fragmentation.

Access to industrial land is also an issue for the numerous clusters of SMEs that are increasingly constrained within rapidly growing cities. These SMEs lack the space to grow, and face difficulties in ensuring the security of their workers (e.g. the Rana Plaza disaster in Bangladesh) and complying with environmental standards (e.g. the leather apparel cluster of Sialkot in Pakistan). Moving SME clusters from cities to suburban industrial zones poses both a financing and coordinating challenge that governments can help with.

India has developed an interesting public private partnership solution to address the coordination and financing issues associated with moving an urban SME cluster to an industrial estate outside the city. In the Scheme for Integrated Textile Parks, ILFS (a company of mixed public and private ownership) helps SME clusters set up Special Purpose Vehicles, find appropriate land and secure the required financing. ILFS also provides managerial and technical training to the members of the cluster (see Saleman, Jordan, 2013 and Figure 7).

Figure 7: India's Scheme for Integrated Textiles Parks (SITP)



Industrial zones can help SMEs cluster around their main customers (e.g. automotive and electronics) as well as have access to common facilities for R&D and testing facilities, waste disposal, and recycling – for example, the Combined Effluent Treatment Plants in the upcoming leather and apparel parks in Punjab, Pakistan.

Local governments in China went one step further by developing, in partnership with private sector zone developers, the concept of the "Plug and Play" industrial zones (Figure 8). These zones provide SMEs with ready to use standardized industrial buildings, thereby considerably reducing their investment needs. These "Plug and Play" industrial zones also provide decent worker housing close to the factories, which considerably reduces the time and costs for transportation and lodging, thereby allowing workers to save a larger portion of their earnings – a major source of increased motivation.

These "Plug and Play" industrial zones have been particularly helpful in hosting workers migrating from poor areas, especially women – "Plug and Play" industrial zones host 150 million migrant workers in China, of which 60 percent are women[85].

Figure 8: Plug and Play Industrial Parks in China = Growth Escalator for SMEs and Workers

- **Scale: 2000 industrial parks**
- **Partnerships:** between local governments private zone developers/managers
- **Features:**

Low cost standardized factory shells	• Considerably reduce SME investment cost (no need to invest in land and building)
Free housing for workers next to the plant	• enables workers to save money and time (80% saving rate) – a productivity driver

Source: Light Manufacturing in Africa (World Bank, 2012)

It is interesting to note that many of the modern industrial clusters in South Asia remain located within or near large urban centers (e.g. Dhaka and Chittagong for apparel in Bangladesh, Delhi/Noida and Chennai for electronics in India, Karachi and Lahore for automotive in Pakistan).

This help explains the result at the aggregate level that agglomeration benefits in South Asia come primarily from urbanization rather than specialization effects (see Volume 1) as the cases show that most specialization happen within the context of large cities. The cases also show the emergence of

[85] Fostering Women's Economic Empowerment Through Special Economic Zones (page 103), World Bank 2011

specialization within smaller/specialized cities – e.g. the apparel cluster in Lahore, the automotive clusters in Pune and Aurangabad. This is the prelude to the next wave of economies of agglomeration which should be driven by smaller/specialized cities like it happened in China and more developed regions as primary cities become too congested and expensive.

To enable this natural/desirable evolution, South Asian governments should continue to invest in infrastructure to better connect and equip secondary cities as well as pursue the decentralization agenda. One critical aspect of this decentralization will be to delegate authority over land markets (including over property tax) to (elected) local governments to provide them with the authority, the resources and incentives to promote industrial development.

Recommendation #9

Resolve the dispute with the Korean Export Process Zone to free up 2,500 acres of badly needed prime industrial land (Bangladesh)

Recommendation #10

Promote PPPs for Plug and Play industrial zones to facilitate access to land to FDI and SME clusters, promote women employment and reduce industrial pollution

Recommendation #11

Empower (through infrastructure investment and decentralization) secondary cities to become the next engines of industrialization

4.5 Promoting women employment

Table 11 below shows that women employment is very low in industry, especially in India and Pakistan.

Table 11: Share of women in full time production workers

China	Sri Lanka	Vietnam	Bangladesh	India	Pakistan
38%	31%	28%	21%	11%	1%

Source: World Bank Enterprise Surveys

The constraints on women employment in India and Pakistan include labor policies that restrict night work by women as well as limits on flexible hours which affect women disproportionately. This is particularly an issue in capital intensive industries (e.g. automotive, electronics and parts of the agribusiness industry) which need to operate two or three shifts to reduce fixed costs. In such industries, workers are expected to work the night shifts in turn which makes the employment of women very difficult because they cannot work at night as per the law.

Other constraints include the lack of physical facilities, for example gender-specific toilets, day care facilities and safe transportation, to ensure the security and well-being of female workers.

Like China, Bangladesh has developed women-friendly industrial zones, including the provision of grievance mechanisms and counseling services, and 63 percent of the workers in Bangladesh's export processing zones are women. Sri Lanka offered fiscal incentives (the 200 Garment Factories Program) to encourage apparel factories to locate in rural areas, which greatly facilitated the employment of women. Female employment in Sri Lanka and Bangladesh was also greatly enabled by significant progress in women's education, the critical first step towards economic empowerment.

Recommendation #12

Review labor policies to promote/facilitate women employment (e.g. more flexible work time)

Table 12 below summarizes the twelve main recommendations from the four industry case studies – they apply to all countries and industries unless otherwise specified. They are grouped along the three main drivers of competitiveness/productivity discussed in Volume I – see Section 3.2 of Volume 1for a consolidated list of the policy recommendations emanating from both Volumes.

Table 12: Summary of Recommendations

Recommendation	Rationale
Policies to better connect to GVCs	
1. Reform Duty and Tax Remission for Export (DTRE) schemes	Facilitate access to imported inputs for exporters
2. Gradually reduce import tariffs towards a common low baseline	Increase exposure and access to global good practices and remove inverted tariff structures to promote investment
3. Modernize customs (e.g. single electronic window and risk based inspection)	Facilitate external trade
4. Unify GST and VAT (India)	Facilitate internal trade
5. Complete the reform of agricultural markets and prices	Promote competition and investments in higher value agricultural products
6. Replace blanket agricultural subsidies by support targeted at the poorer farmers	Promote productive and sustainable agricultural practices
7. Gradually converge towards international product standards (safety & environment)	Increase exposure and access to global good practices as well as improve the protection of consumers and the environment
Policies to support innovation and productivity	
8. Promote PPPs for skills and innovation	Improve relevance and efficiency of public support
Policies to maximize agglomeration benefits	
9. Resolve the dispute with the Korean Export Processing Zone (Bangladesh)	Free up 2,500 acres of badly needed prime industrial land
10. Promote PPPs for Plug and Play industrial zones	Facilitate access to land to FDI and SME clusters, promote women employment and reduce industrial pollution
11. Connect and equip secondary cities and empower them through decentralization	Alleviate congestion in primary cities and leverage competition between local governments

12. Remove rigidities on flexible work time	Enable/promote women employment

***

1. Apparel in South Asia: Based on the "Stitches to Riches" report

1.1. Executive Summary – "It is necessary to import in order to export"

Apparel is the largest labor-intensive manufacturing industry in South Asia, and is a major employer of women. Although South Asia's apparel sector benefits from many of the same favorable conditions as East Asia's, performance in South Asian apparel remains well below that of East Asia. For example, South Asia accounts for 12 percent of global exports, compared with 43 percent for China alone. South Asia has the opportunity to significantly boost employment in apparel, capitalizing on lower wages than in East Asia, especially in China. However, increasing apparel exports to global markets will require meeting ever more stringent buyers' conditions in terms of cost, quality, lead time, reliability and social/environmental compliance.

The objective of this study is to identify the policy changes necessary for South Asia to capitalize on this opportunity. We review the apparel sectors in Bangladesh, India, Pakistan and Sri Lanka, and compare them with Vietnam and China. The report uses quantitative data (analysis based on a gravity model, enterprise and buyer surveys) and qualitative information (interviews with leading firms) to identify changes in policies that would enable South Asia to meet the requirements of global buyers.

Low productivity and poor trade logistics make it difficult for South Asia's apparel sector to compete in global markets, despite a cost advantage due to lower wages than other major exporters. Leading firms exhibit that world class operational performance can be achieved in South Asia by investing in training and technology. These firms overcame constraints in the external environment by achieving economies of scale, and in the case of India and Pakistan, by integrating vertically to avoid barriers to sourcing high-quality inputs on the global market.

Problematic duty drawback schemes in India and Pakistan make it difficult and time consuming for exporters to import textiles, imposing delays that are unacceptable to global buyers and increasing exporters' concentration in lower quality, cotton-based apparel. This is the main reason for the markedly inferior export performance in India and Pakistan compared to Bangladesh (which has a very effective system of bonded warehouses to facilitate duty free import of textiles) and Sri Lanka (which has no import duties on textiles) – see table 1 below.

Table 13: Apparel exports per capita (US$, 2012)

Sri Lanka	Vietnam	Bangladesh	China	Pakistan	India
216	171	147	108	23	10

Sri Lanka should continue to improve its trade logistics to become the main regional hub for apparel. Bangladesh should expand its system of bonded warehouses beyond apparel to include other labor intensive industries such as footwear, where growth has been constrained by a lack of easy access to imported inputs. Bangladesh should also free up much-needed industrial land by resolving the dispute surrounding the 3,000 acre Korean Export Processing Zone in Chittagong. All countries should promote "Plug and Play" industrial zones with ready to use industrial buildings (to help SMEs grow out from

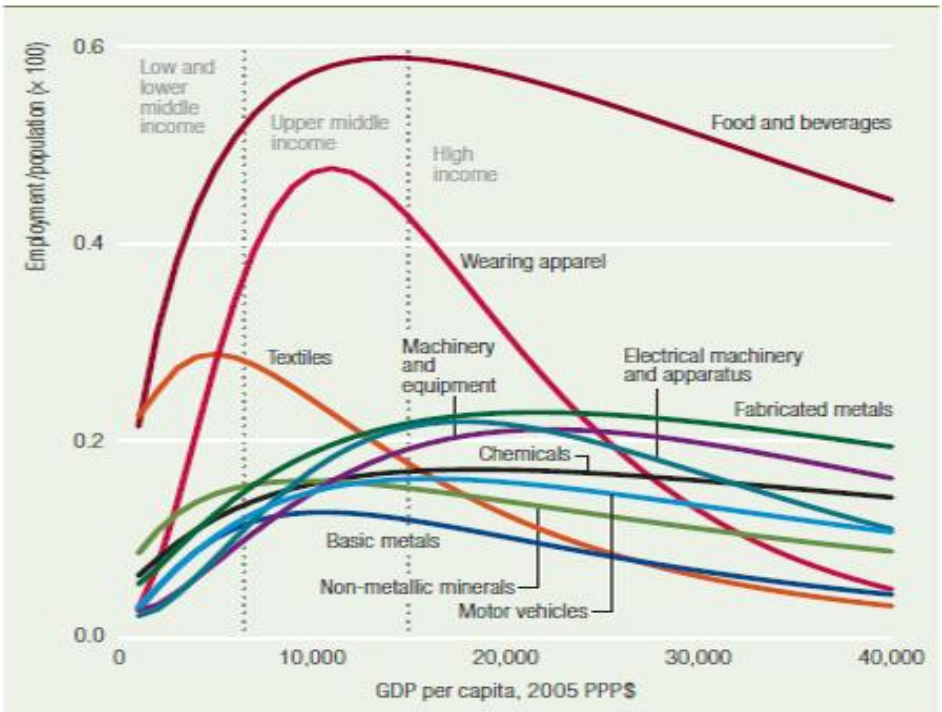
substandard buildings in cities) and facilities to promote women labor force participation, as female workers would be the main beneficiaries of growth in apparel production.

1.2. Motivation and Approach

a. Motivation

The apparel sector is one of the most important employers in developing countries (figure 1). Export-oriented apparel production—which has long been a key industry in South Asia—has the potential to generate 'good' jobs that contribute to rising living standards and poverty reduction. In particular, increased apparel exports tend to boost female employment in the formal sector, and provide workers higher wages than they can earn in agriculture or other informal sectors (Lopez Acevedo and Robertson, 2012). Women employed in the formal sector tend to have fewer children, which reduces population growth and improves children's health status, while women are more likely than men to dedicate their income to the health and education of children (The World Bank, 2015). Increasing decent jobs for women is critical for South Asia, where close to one million individuals enter the workforce each month. Currently, only about 30 percent of working-age women participate in the labor force, although female labor force participation rates vary considerably across the region (60 percent in Bangladesh, 40 percent in Sri Lanka, 30 percent in India, and 25 percent in Pakistan).

Figure.3: Share of employment by industry along the development path



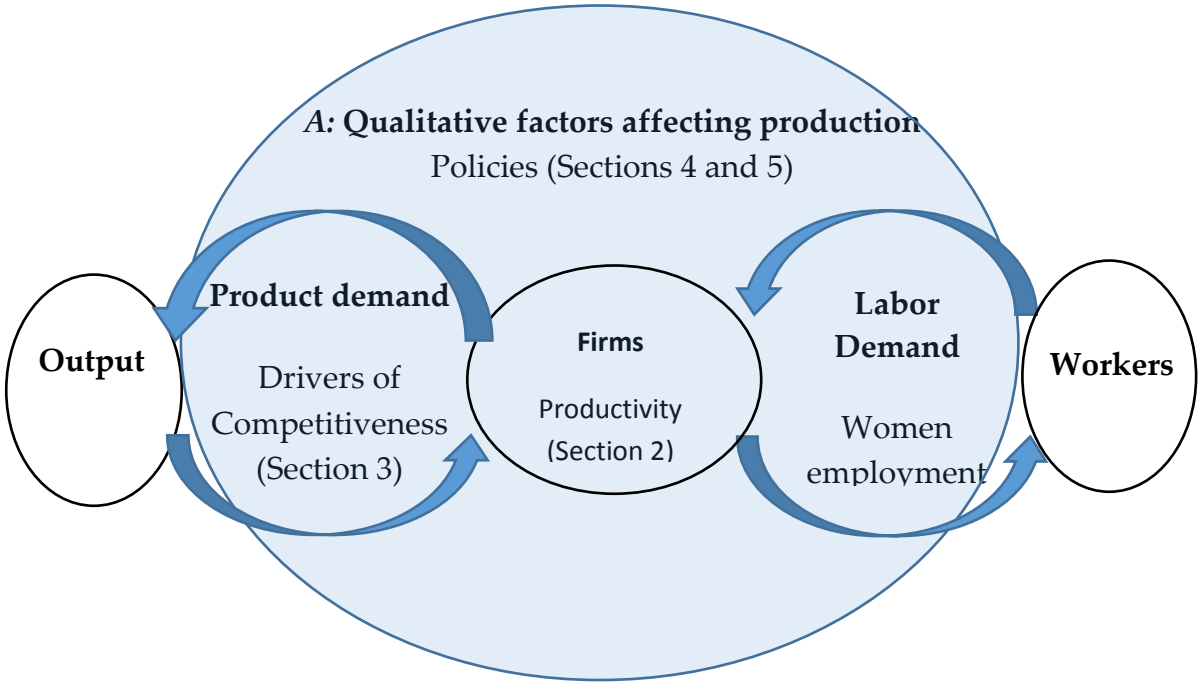
Source: UNIDO (2013).

Rising wages in China may improve South Asia's competitive position in the global apparel market. China accounted for 41 percent of global apparel exports in 2012 (up from 25 percent in 2000), compared to only 12 percent for South Asia. However, China is moving up the value chain into higher-value goods, and out of apparel. A 2013 survey of leading global buyers in the sector found that 72 percent of respondents planned to decrease their share of sourcing from China over the next five years. To seize this opportunity, South Asia will need to compete not only on cost but also on quality, lead time and social/environmental compliance, which are increasingly important for buyers.

b. Approach

This study focuses on the apparel sectors in Bangladesh, India, Pakistan and Sri Lanka. It draws on the experiences of selected East Asian countries, particularly Vietnam and China, as comparators. The analysis centers on the drivers of productivity for a typical firm, the impact of global market trends on the demand for products, and how policies in South Asia influence the capacity and incentives of firms to meet this demand.

Figure 2: Overarching analytical framework



The study is based on a combination of qualitative surveys, quantitative data and interviews. Product demand is assessed based on a global buyers' survey that identifies key factors shaping buyers' preferences, and thus firms' competitiveness, in both South Asia and East Asian countries. The impact of policies on the capacity and incentives of firms to meet this demand is analyzed using a series of databases, including the World Integrated Trade Solutions (WITS), Commodity Trade (COMTRADE), Office of Textiles and Apparel (OTEXA), United Nations Conference on Trade and Development (UNCTAD), Trade Analysis and Information System (TRAINS), World Development Indicators (WDI), International Finance Statistics (IFS), Labor Force and Household Surveys, World Bank Enterprise Surveys (with information on productivity) and national-level firm data. Interviews were conducted of

major players in the global apparel value chain, including buyers, leading firms and apparel exporter associations in South Asia, as well as unions/workers' groups, sector experts, policy makers and international organizations such as the International Labor Organization (ILO).

1.3. Performance Analysis

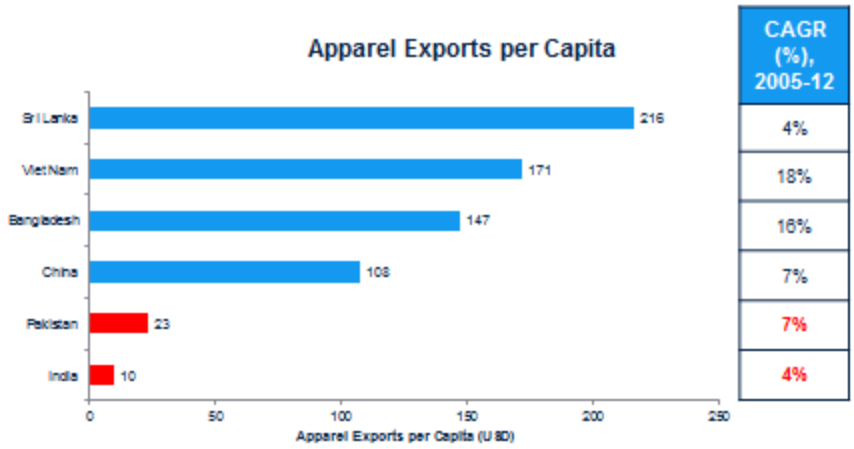
The performance of apparel sectors in India and Pakistan is poor. Per capita exports amount to one-tenth the level in Bangladesh, Sri Lanka, Vietnam and China. The two countries' apparel sectors have a narrow product range, as restrictions on the import of man-made textiles increases apparel producers' reliance on natural fibers. And performance in quality, lead times, reliability, and social compliance is below average. While wages in India and Pakistan are relatively low, this does not compensate for lower productivity than their competitors.

a. Output and trade

The apparel industry is one of the largest export sectors in the world, due to the size of global demand and the structure of production. Global value added ($355 billion in 2012) is managed by lead firms that undertake higher value-added activities such as design, branding, and retail, but outsource most manufacturing to a global network of suppliers. While the United States and EU-15[i] together accounted for 63 percent of apparel imports, the labor-intensive nature of production means that apparel manufacturing firms are usually located in developing countries. In 2012, exports represented 68 percent of the industry, and developing countries constituted 14 of the top 15 apparel exporters (UN COMTRADE).

Despite possessing a large workforce and ready supply of some raw materials (cotton/textiles), South Asia's share of the global apparel market was only 12.3 percent in 2012, compared with 43 percent for China. While Sri Lanka and Bangladesh perform at levels comparable to East Asian countries in per capita terms, Pakistan and India have historically exported at levels that are an order of magnitude lower, and recent growth rates are insufficient to catch up (Figure 3).

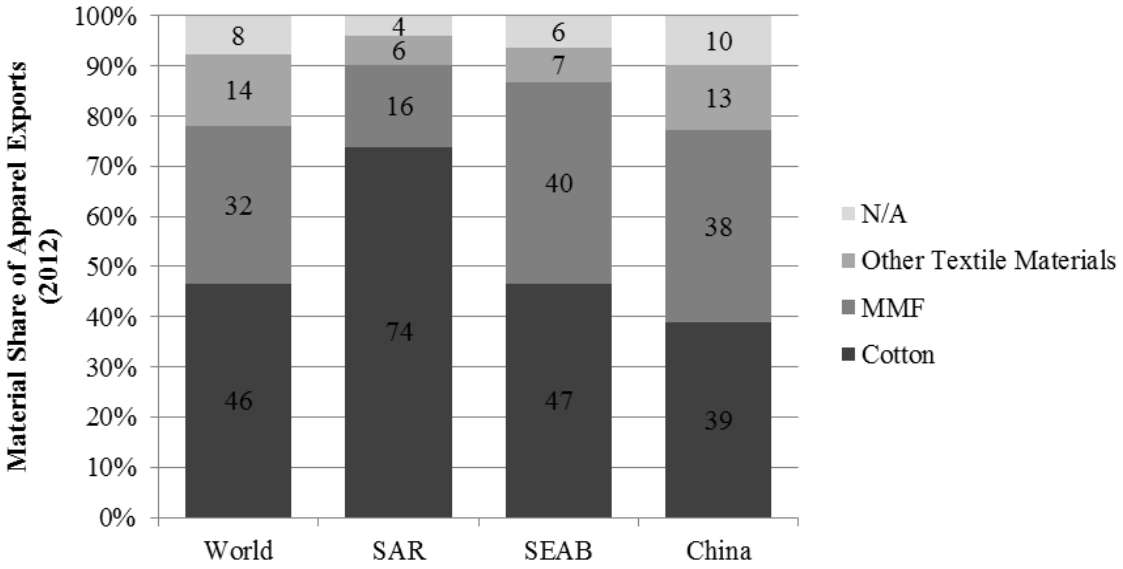
Figure 3: India and Pakistan far behind in apparel exports



Source: Exports data are from the UN COMTRADE database. Population figures are from World Development Indicators, World Bank.
Note: Total Apparel Exports are a sum of HS 61 and 61. Exports are based on world imports from partner countries; data retrieved on 3/6/14.

The main reason for this poor performance in India and Pakistan, and thus in the region, is an excessive concentration in cotton fibers, largely due to the difficulties involved in importing man-made fibers (see Figure 4 and discussion in section 4).

Figure.4: SAR, unlike its competitors, focuses heavily on cotton
(Composition of Apparel Exports by Region and Fiber Type, 2012)



Source: UNSD (2014c).
Note: Exports represented by world imports; classifications created by author. SAR = South Asia Countries. SEAB = Southeast Asian Benchmark Countries (Cambodia, Indonesia and Vietnam). MMF =

Man-made fiber.

Export unit values for most apparel products are low in South Asia (Table 2). Bangladesh exhibits low unit values but high volumes. India has slightly higher values but low volumes while Pakistan has both low unit values and low volumes. Sri Lanka, similar to China, manages to combine high unit values with high volumes (on a per capita basis).

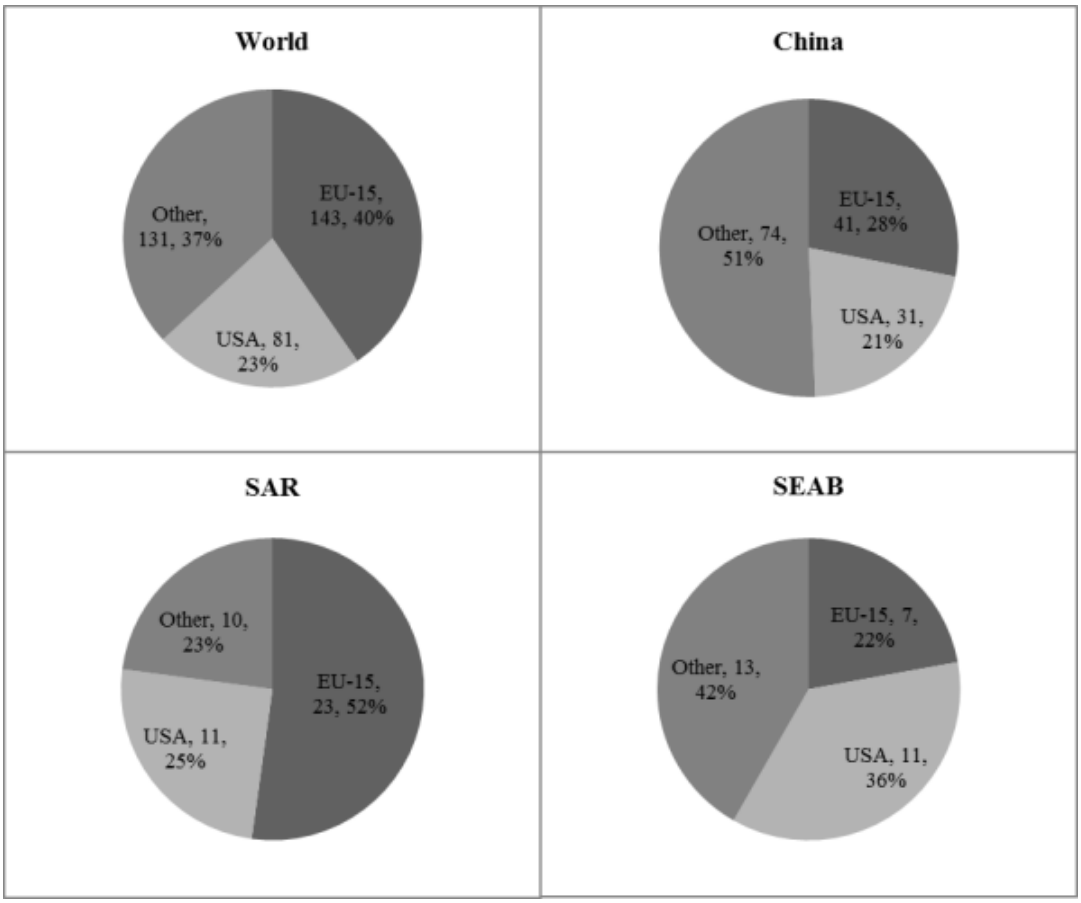
Table 14: World unit value cost comparison, 2013												
	World Unit Values (based on Number of Items, 2013)						World Export Rank, by Product Category, by Value (2013)					
Export Rank/ Indicator/ Country	**Trousers (1)**	**Sweaters/ Sweatshirts (2)**	**Knit Shirts (3)**	**Coats (4)**	**Woven Shirts (6)**	**Dresses & Skirts (7)**	**Trousers (1)**	**Sweaters/ Sweatshirts (2)**	**Knit Shirts (3)**	**Coats (4)**	**Woven Shirts (6)**	**Dresses & Skirts (7)**
1 China	$6.5	$7.7	$4.1	$17.4	$7.2	$8.5	1	1	1	1	1	1
3 Bangladesh	$6.3	$6.2	$2.9	$13.3	$6.2	$5.0	3	3	3	4	4	9
6 India	$6.9	$5.2	$3.8	$16.0	$7.8	$8.6	11	8	5	13	3	3
11 Pakistan	$8.2	$4.8	$2.8	$7.8	$6.7	$6.1	9	11	14	14	29	33
10 Sri Lanka	$7.5	$6.3	$4.6	$16.7	$9.2	$8.4	13	17	15	24	10	12
5 Vietnam	$7.0	$4.6	$4.6	$20.5	$7.2	$6.8	5	4	6	3	7	5
8 Cambodia	$6.3	$5.5	$3.9	$10.9	$6.2	$5.3	7	6	9	8	11	10
7 Indonesia	$6.0	$4.6	$4.2	$16.9	$7.6	$6.9	6	7	8	5	6	6
World	$7.8	$7.0	$3.9	$19.8	$8.3	$9.7						

Source: UNSD (2015); unit values based on number of items; unit values include cotton and MMF products. Numbers in parentheses after product categories indicate the product categories rank in 2013 in global apparel exports.

The region is also less diversified than East Asia in terms of end markets (Figure 5). Diversifying end markets increases growth prospects and reduces the risk of any shocks to destination economies. This may be especially important as the top two markets (the United States and the EU-15) are mature and experiencing a slowdown in demand. The EU and US markets account for 77 percent of the region's exports, compared to 58 percent for the SEAB countries (Cambodia, Indonesia and Vietnam) and 49 percent for China (UNSD, 2014a). Within the region, Sri Lanka's apparel exports are the most diversified, which is especially positive given its greater focus on niche products, followed by Bangladesh.[ii] Pakistan's level of diversification is about average for the region, while India is heavily concentrated in a few economies.

Figure 5: China's exports are the most diversified by end market

(share of exports by value and region, 2012)

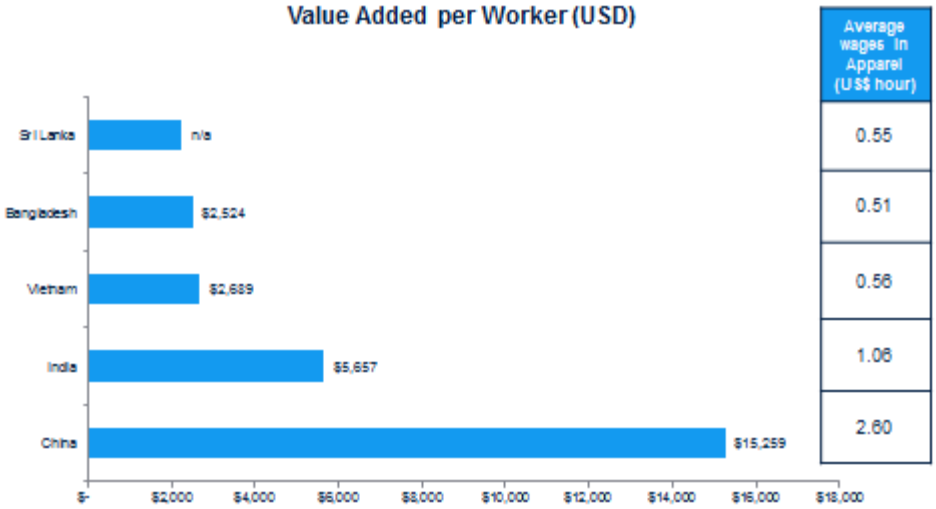


Source: UNSD (2014a).
Note: Numbers in figure above reflect export values in billions for 2012 followed by share

b. Productivity and cost

Wages in the South Asian apparel sector are well below that of China, but the difference in productivity levels is much greater (Figure 6). Labor accounts for only one-fifth of the total cost of apparel production. Raw materials and other inputs to production, over which each apparel supplier has limited influence, make up two-thirds of total costs (rent and utilities account for most of the balance). Fabrics are the most expensive input in apparel production, and the quality of textiles is directly related to the quality of the final product. However, textile production is more capital-, skill-, and scale-intensive than apparel production, which can pose a challenge to establishing domestic suppliers in South Asia (Staritz & Frederick, 2014). Furthermore, the global apparel industry is quickly diversifying across a broad range of textiles (man-made fibers in particular) in which the most efficient producers are located overseas. Thus, efficient import regimes, characterized by rapid clearance through customs and low duties (or effective duty drawback systems) are critical for export competitiveness. Sri Lanka and Bangladesh have achieved considerable progress in improving their import regimes, while India and Pakistan have not reformed their regimes.

Figure 6: Low wage advantage lost to low labor productivity



Source: World Bank Enterprise Surveys

Productivity is higher among exporters than non-exporters largely because exposure to global good practices fuels operational improvements (discussed in the next section). For example, value added per worker is $8,900 among Indian apparel exporters, compared with $3,800 for non-exporters. In Sri Lanka, large, export-oriented firms have high productivity levels and sophisticated production processes (National Stakeholders, 2014; Wijayasiri & Dissanayake, 2008), as well as a more highly-skilled labor force, than in most other Asian countries (National Stakeholders, 2014). The high level of skills can be attributed to a good general education system, as well as education and training facilities for the apparel sector at different levels, including university degrees in technical areas and design.

China's experience shows that increases in productivity, driven by improvements in firm/cluster performance**,** can maintain competitive apparel prices in the face of rising wage levels. Despite significant increases in wages, the average price of Chinese apparel exported to the United States in Fall 2013 was lower than in either 2012 or 2008 (Flanagan, 2014a). And Chinese apparel manufacturers rank well above South Asian firms in dimensions of service other than price, such as quality, lead time and reliability, and social compliance and sustainability, factors that are important to global buyers (Table 3).

Table 15: South Asia less competitive than Southeast Asia in non-cost areas

(Country Comparison: Non-Cost Related Factors Impacting Performance)

Country	Buyers' Perceptions of:		
	Quality	Lead Time & Reliability	Social Compliance & Sustainability
China	1	1	3
Bangladesh	5	5	6
India	6	6	5
Vietnam	2	2	2
Cambodia	4	4	4
Indonesia	3	3	1

Source: Based on data from (Birnbaum, 2013).
Notes: Based on buyers' and stakeholders' surveys conducted for this study. Countries were ranked from 1-6 on each factor, with 1 being the best and 6 being the worst. Ranks for quality and lead time/reliability are the same. Green indicates the top two countries, where the factor is not a constraint on competitiveness; yellow is for the middle two countries and indicates some problems; red is used for the bottom two ranking countries and indicates that factor is an important constraint.

Quality: Besides being cost-competitive, suppliers must also be able to consistently offer quality products. Quality is influenced by the raw materials used, the skill level of the sewing machine operator, and the thoroughness of the quality control team. Based on combined results from the buyer surveys and interviews, countries can be placed in three groups according to the quality of apparel production, in order of strongest to weakest: (1) China, Vietnam, and Sri Lanka; (2) Indonesia, Cambodia, and Bangladesh; and (3) India and Pakistan.

Lead time and reliability: Lead time[iii] and reliability are greatly affected by the efficiency and availability of transportation networks and customs procedures. Based on survey and interview results (Birnbaum, 2013; Global Apparel Buyers, 2014), the countries can be placed in three groups, in order of strongest to weakest: (1) China, Vietnam, and Indonesia; (2) Sri Lanka and Cambodia; and (3) Bangladesh, India, and Pakistan. China has consistently had the shortest lead times throughout the last decade (Muzzini & Aparicio, 2013; World Bank, 2005, 2013b). Factories in China are cited as having the best productivity levels, technology, speed, and production capacity, supported by well-established industrial clusters and infrastructure systems (Frederick & Gereffi, 2011).

Social compliance and sustainability: These criteria have become central to buyers' sourcing decisions in response to pressure from corporate social responsibility (CSR) campaigns by NGOs, compliance-conscious consumers and, more recently, the increased number of safety incidents in apparel factories. Non-compliant countries risk damaging their country brand. In Cambodia, government brutality that led to the death of four workers induced major buyers to cut back orders or threaten to leave (Barrie, 2014). In Bangladesh, concerns over factory safety and the associated adverse publicity have deterred some buyers (Birnbaum, 2014a).

Although environmental concerns and sustainability are more of a concern for the textile industry, they also pose issues for apparel, particularly in the areas of dyeing and finishing. Countries were ranked according to the result of surveys on both social compliance and sustainability (from Birnbaum 2013), which generated similar results as the data from our global buyer's survey. The countries can be placed into the following categories, in order of strongest to weakest: (1) Sri Lanka, Indonesia, Vietnam, and China; (2) Cambodia; and (3) India, Bangladesh, and Pakistan.

The most important labor-related issue in all four South Asian countries concerns the rights of workers. A lack of freedom of association and collective bargaining, and thus unionization, contributes to low wages, long work hours, a large share of contract and informal employment (particularly in Bangladesh and Pakistan), and poor building and occupational health and safety standards (National Stakeholders, 2014). In addition, the limited capacity of organizations responsible for labor inspections impairs monitoring of the enforcement levels.

1.4. Drivers of Competitiveness

The achievements of the lead apparel firms in South Asia demonstrate the region's considerable potential to innovate and raise productivity.

a. Factor utilization

Apparel is a labor intensive industry with low barriers to entry, and most successful firms in South and East Asia started very small and grew quickly out of retained earnings following intense competition with their peers. For example, US Apparel of Pakistan, now employing more than 15,000 workers, started with a handful of stitching machines in 1974; Orient Craft from India employs 35,000 workers, started with one 200 square meter factory in 1976. The keys to success remain to be low labor costs and high labor productivity, efficient use of materials and high quality of manufacturing. High labor productivity was achieved through training and performance incentives, for example incentives to reduce absenteeism. Companies often relied on foreign experts (for example, Bangladesh benefited from Sri Lankan expertise) to develop technical and managerial skills, or benefited from training abroad (for example, a generation of Bangladeshi entrepreneurs were trained in South Korea by Daewoo in the 1980s). Orient Craft of India, like most Chinese apparel manufacturers, helped reduce costs and motivate workers by setting up housing close to the factory, which reduced the time and money involved in commuting and facilitated the employment of migrant workers including female workers. Although the returns to scale are relatively low in apparel, larger players enjoy economies of scale in purchasing, environmental compliance, research and development, marketing, administration and training. Smaller players can compensate by operating as part of a cluster of firms (discussed further below).

b. Technology adoption and innovation

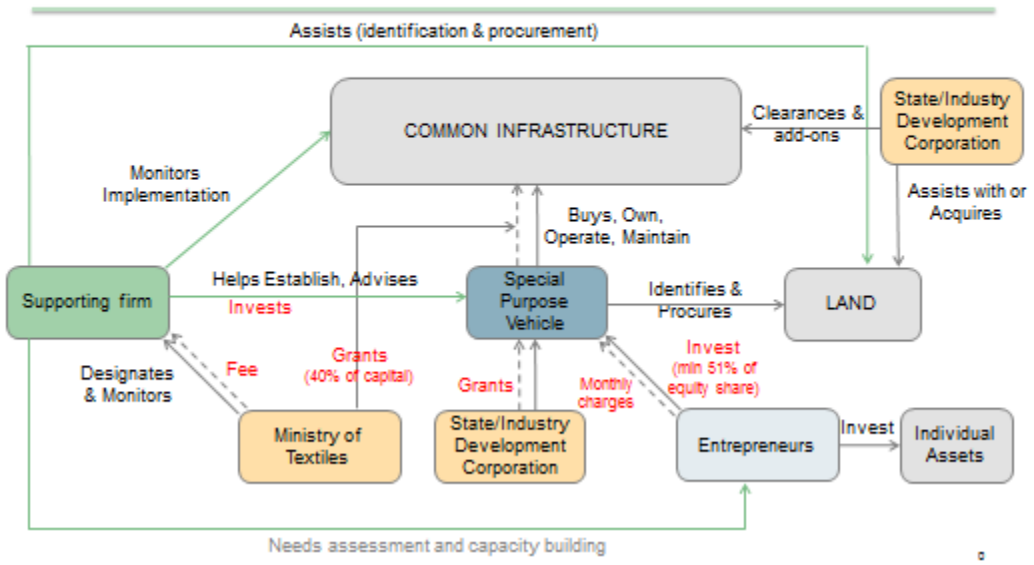
Computerized cutting machines are essential in reducing material waste, and also are used for grading and marking (e.g. Pacific Jeans of Bangladesh). Skills are often acquired through the machine suppliers (e.g. Orient Craft) and innovation generated in partnership with buyers. For example, Pacific Jeans of Bangladesh and MAS of Sri Lanka developed their new products in partnership with leading brands from the United States, the EU and Japan. Technology is also used to increase compliance with environmental standards (a must to sell to leading brands). For example, Pacific Jeans recycles its waste water through a very efficient effluent treatment plant. MAS of Sri Lanka has been developing innovative, high performance sport gears by investing heavily in research and development, as well as

by importing world class textiles from around the world. US Apparel of Pakistan, which had difficulties in finding high performing textiles, developed its own textile production. As a caveat, this is not a perfect solution to problems in obtaining textiles, as it narrows the range of products the firm can offer, and is not feasible for the many smaller apparel manufacturers in Pakistan.

c. Agglomeration economies

Smaller apparel manufacturers can compensate for their size disadvantage by operating in clusters. This allows them to achieve economies of scale in marketing and thus attract large buyers. For example, Chinese buyers can find all they need in one trip to the Sialkot cluster in Pakistan. Clustering can help reduce transportation costs involved in obtaining inputs and selling outputs, as well as commuting costs for workers. Clustering can enable smaller players to comply with environmental standards by locating around a combined effluent treatment plant, like in Gujarat and Tamil Nadu. Clustering can also facilitate small and medium enterprises (SMEs') access to ready-to-use industrial facilities, reliable utilities, good transport infrastructure, security, training, housing and administrative facilities, as in the Chinese Plug and Play industrial zones. A major challenge facing South Asian SMEs in labor intensive industries is how to improve performance and compliance with social and environmental standards by moving from informal clusters in dense urban centers (e.g. Dhaka) to formal industrial areas in the suburbs. The Indian government's Scheme for Integrated Textiles Parks (SITP) has helped clusters of SMEs overcome the coordination and financing issues involved (Saleman, Jordan, 2013). Figure 7 highlights the scheme.

Figure 7: India's Scheme for Integrated Textiles Parks (SITP)

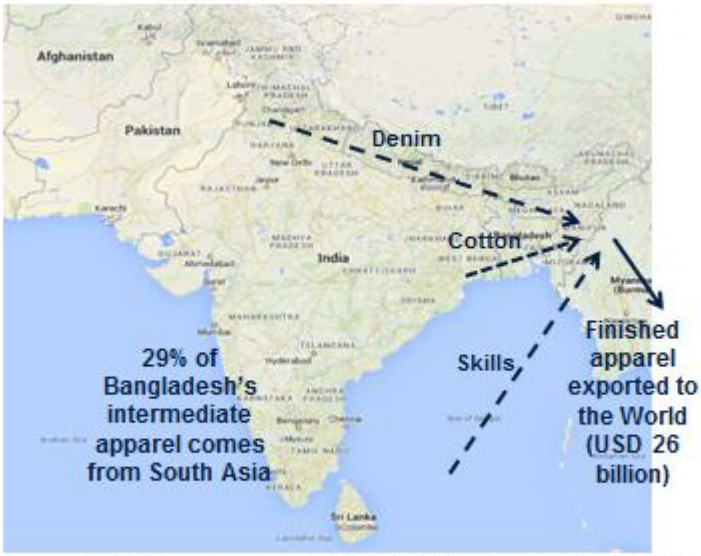


d. Linking to Global Value Chains

Catering to demanding customers drives exporters to achieve manufacturing excellence and move up the value chain by increasingly absorbing the functions of design, branding and retailing, starting with their home market. The leading firms in South Asia (e.g. Pacific Jeans, MAS, Orient Craft and US Apparel) have emulated the transition achieved by leading apparel firms in China and Turkey. As discussed in the

previous sections, linking to global value chains requires access to the best possible inputs at the best possible price through seamless, efficient and predictable import procedures. For example, imported inputs for Sri Lankan exporters clear customs in a matter of hours while it takes weeks in India and Pakistan. The South Asian value chain is increasingly a source of competitiveness, especially for Bangladesh which imports its cotton from India, its denim from Pakistan and its technical experts from Sri Lanka (Figure 8).

Figure 8: Regional Value Chain Key to Bangladesh's Success



Source: based on data from GVC analysis conducted for the Flagship by Michael Fernandes and Lara Loewenstein.

1.5. Constraints on Competitiveness

The main set of constraints facing South Asian apparel production involves trade policies and inadequate logistics, which greatly affect cost, quality and lead times. The second most important constraint concerns access to land, which limits participation by large foreign investors (who have a choice of countries to go to) and the ability of SMEs to move out of cramped city centers. Finally, the employment of women is limited by policies preventing overnight/overtime shifts and a lack of facilities to ensure their safety and well-being.

a. Poor trade logistics – especially for imported textiles to India and Pakistan

The capacity to import easily and cost-effectively textiles from around the world is increasingly important to succeed in the fast-moving apparel industry.
High import tariffs on cotton and man-made fibers (Table 4), combined with ineffective duty drawback mechanisms, have been the main reason for poor performance by apparel firms in India and Pakistan. These policies have skewed exports toward cotton garments, which are heavily concentrated in the global spring/summer season, thus reducing

capacity utilization (apparel factories in both countries operate only 6.5 months annually, while the global average is 9 months--Jordan et al., 2014).

Importing textiles into India is problematic. Most manmade fiber imports are subject to a customs duty of 10 percent,[86] in the mid-teens for imports from Korea, China and other principal producers due to anti-dumping measures. Furthermore, excise duties on the production of manmade fibers are 12 percent, while natural fibers (cotton, wool and flax) are exempt.[87] Total duty and tax rates for some fabrics reach about 30 percent.[88] Exporters can be competitive in global markets only if they are exempt from these taxes on inputs. However, the provision of exemptions is prone with difficulties. The categorization of different inputs is subject to interpretation and negotiation, creating risks for firms importing critical inputs for the production of garments with tight production schedules. When duties are paid up-front and exporters apply for a drawback, problems arise because the drawback is calculated on the cost of materials less the amount of duty paid—and no drawback on trim items is permitted. Administrative procedures are quite rigid. For example, one firm described how it might obtain pre-clearance to import synthetic fabric listed at a certain weight, but since fabric production is inherently unpredictable, the actual consignment could contain a few items at a slightly different weight. Rather than accepting minor differences from the original application, customs officers would hold up the consignment on the grounds of applying a different tariff rate, or on suspicion of tariff violation (which carries very heavy fines). In the meantime, the firm would be unable to complete production, even if these fabrics were only a small share of inputs (Jordan, Kamphuis, 2014). Similarly, in the advance license scheme no duty is paid on imports used in export products, but compliance with procedures is extremely difficult and any error results in heavy fines (Birnbaum, 2013; National Stakeholders, 2014).

Import barriers also affect the textiles industry which can only source purified terephthalic acid (PTA), which is essential to the production of polyester or synthetic fibers, from two Indian firms (one of them owns 79 percent of production capacity) (Jordan et al., 2014).

[86] CBEC, "Custom Tariffs 2012-2013," http://www.cbec.gov.in/customs/cst2012-13/cst1213-idx.htm.
[87] Central Board of Excise and Customs (CBEC), "Central Excise Tariff 2012-2013," http://www.cbec.gov.in/excise/cxt2012-13/cxt_1213-idx.htm.
[88] E.g., polyester staple plain weave and polyester filament. Birnbaum, "Benchmark Study India," p. 101.

Table 4: South Asia has higher import tariffs than Southeast Asia

(In percent)

Product category	Bangladesh	India	Pakistan	Sri Lanka	Cambodia	China	Indonesia	Vietnam
Yarn								
Cotton (5203–5207)	5–10	10	5–25	0	0	5–6 (2)	5	5
MMF (5401–5406/ 5501–5511)	5–25	10 (1)	0–10	0	0	5	0–5	0–5
Woven fabric								
Cotton (5208–5212)	25	10 (1)	15–25	0	7	10–14	10–15	12
MMF (5407–5408/5512–5516)	25	10–12.5 (1)	15	0–15	7	10–18	10–15	12
Knit Fabric (60)	25	10 (1)	20–25	0	7	10–12	10	12
MFN Avg. Applied Duties (2014) Textiles	19.4	12.2	16.6	3.5	5.5	9.6	9.2	9.6
	12.9				8.5			

Source: OTEXA (2014); WTO (2014).

Notes: Certain products are also subject to specific rupees per unit duty rates. Tariff rate quotas allow for imports of cotton and wool in limited quantities at reduced duties, ranging from 1 percent to 9 percent. Imports exceeding set quota levels are assessed at a much higher rate of duty.

The situation in Pakistan is also problematic, even for exporters. Although the duty and tax remission for export program (DTRE) in Pakistan provides for post-export remission of duties and taxes on inputs, it does not work in practice. It can take some two to four months for textile imports, which imposes delays and uncertainties in production that are not acceptable to global buyers (Nabi & Hamid, 2013). As a result, the Pakistani apparel industry is dominated by the production of low value, cotton-based garments, using poor quality textiles sourced domestically. The following is an extract from an expert evaluation of the duty drawback system in Pakistan[89]:

> "The present system of suspension of duties and taxes is governed by several Statutory Rule Orders (SROs) issued under Customs Rules 2001 for 'DTRE and Manufacturing Bond Licensing' and 'DTRE Approval'. The approval process involves multiple, parallel and overlapping regimes; plethora of steps at each stage of which concerned officials have wide discretions; the system itself is not clear and with no standard operating procedures; intermediaries falsify the supporting documentation which maximizes the economic rent. The system involves physical verifications of business premises; calculation of 'input wastages' through physical checking by the Input Output Co-efficient Organization (IOCO); drawing of samples of imported input goods and output goods meant for exports at the time of import and export – an archaic procedure;

[89] Evaluation completed by Ahmad Khan (former Member of the Federal Board of Revenue of Pakistan) as part of technical assistance provided by the World Bank to the Government of Punjab, Pakistan (July, 2014)

suspension or cancellation of DTRE by the Regulatory Collector as he may deem fit; extensive documentation requirements, and centralization of authority and approvals.

The system complexities have led to extensive delays in processing of applications for DTRE, Manufacturing Bonds Licensing, and payment of DTRE claims resulting in the firms being unable to: timely import the quality inputs and meet their export orders; receive their blocked funds as well as pay the economic rent to the concerned officials rendering these enterprises (and the export sector as a whole) non-competitive - hence, there is need for fundamental changes in the present system of duty suspension schemes."

The apparel export associations of India and Pakistan have prioritized the reform of the import regime for textiles. These issues are placed at the top of their "wish lists" to the government. The first proposal submitted by India's Apparel Export Promotion Council (AEPC) during an inter-ministerial workshop held in April 2013 reads as follow:

"Enlargement of the garment export basket by manufacturing garments (knitted and woven) from fabrics which are not widely available in India – Issuance of duty credit scrip (offsetting custom duties) on import of specialty fabrics at the rate of 5% for the export performance in the year 2012- 13 and in the entire 12th five year plan."

In contrast, Sri Lanka has eliminated all import tariffs on textiles. Bangladesh has high tariffs on apparel inputs, but a system of more than 2000 bonded warehouses has achieved rapid, duty-free import of textiles for exporters (including SMEs), which has been critical to the country's success in apparel. Nevertheless, import restrictions continue to hamper the growth of other labor intensive industries. Not being able to import easily duty free inputs was the main complaint of Apex, Bangladesh's leading footwear exporter. As a result, and despite its labor cost advantage, Bangladesh has only 0.1 percent of the world market share in footwear (compared to 5.2 percent for apparel). Apparel in Bangladesh, which accounts for 80 percent of the country's export, is thus the exception which confirms the rule!

Table 5 shows that Sri Lankan customs performs at East Asian levels, while Bangladesh does not fare much better than Pakistan and India outside the apparel sector (the measurement is based on the import of a container of auto parts – HS 8708):

Table 5 (Hours to process an imported container through customs, Doing Business 2016)

Sri Lanka	China	Vietnam	Pakistan	Bangladesh	India
130	158	170	294	327	350

b. Difficulties in finding well located and well serviced industrial sites

Easy access to conveniently-located and well-serviced industrial land is critical to attract large foreign investors who have a choice of country.

The situation is particularly problematic in Bangladesh, which does not have any large lots available in its conveniently located and well serviced industrial zones. As a result, large foreign investors have shifted investment to other countries (quote from The Financial Express, 16th of November, 2014):

"We had been receiving lots of big investment proposals from the world's leading electronics, automobiles, garment, footwear and other technical products makers till 2012. The flow of such proposals now is lower than before," a director of BoI told the FE, preferring anonymity. He said the big investors like Samsung, KANANN Group, Velbon Corporation 3G Group were hammering them to manage plots in EPZs or to buy lands within the proximity of Dhaka-to-Chittagong belt. They failed to manage. "Persuasion of the industrial giants to manage industrial plots in Bangladesh has nowadays slowed down. So far as our information, at least five of those big investors have now got enlisted with the investment authorities of Myanmar and Vietnam and some other with others".

Access to conveniently located and well serviced industrial land is also becoming important for small domestic investors who are under increased pressure to comply with higher labor and environmental standards and are also looking to secure access to a reliable power source. Relocating informal apparel clusters from city centers to industrial zones is beneficial, but poses difficult financing and coordination issues at least initially (Box 1).

Box 1: Relocating to a Bangladeshi industrial zone

Over the past few decades, the sporadic rise of ready-made garment factories in Bangladesh has taken place without adherence to a global compliance regime. Policy makers are debating ways to improve the situation, including encouraging firms to relocate to an industrial zone. A recent World Bank study suggests that the relocation should pay off over time. The study was conducted through interviews with medium-sized firms in Dhaka city that employ 500–2,000 workers (about 90 percent of them were women). The study found that relocation involved the costs of buying land or renting factor premises; moving or buying equipment; transporting inventory, raw materials and equipment; halting and shifting production; rebranding, logistics of a new address, and printing business cards and letterheads; and financing relocation expenses for workers or severance packages. These costs have to be compared to the potential benefits, including access to improved infrastructure and adequate transportation facilities, good connections to ports, clustering of businesses to improve the ease of access for buyers, and improved access to necessary facilities (such as bonded warehouses, wet/dry facilities, banks, and services).

c. Constraints on female employment

Although women make up a significant share of employment in apparel in most countries around the world, this is not the case in India and Pakistan where female employment in manufacturing is very limited (Table 6):

Table 6: Proportion of female workers among full time production workers

China	Sri Lanka	Vietnam	Bangladesh	India	Pakistan
38%	31%	28%	21%	11%	1%

Source: World Bank Enterprise Surveys

The constraints to female employment in India and Pakistan include labor policies which restrict night work by women as well as limits on flexible hours which affect women disproportionately. Other constraints include the lack of physical facilities to ensure the security and well-being of female workers. Such facilities include gender-specific toilets, day care facilities and safe transportation.

Bangladesh has developed women-friendly industrial zones, including the provision of grievance mechanisms and counseling services - 63 percent of the workforce in Bangladesh's export processing zones consist of women. Sri Lanka offered fiscal incentives (the 200 Garment Factories Program) to encourage apparel factories to locate in rural areas, which greatly facilitated the employment of women. Female employment in Sri Lanka and Bangladesh was also greatly enabled by significant progress in women's education which is the critical first step towards economic empowerment.

d. Other constraints

With the exception of the policies restricting flexible/night work time which restrict women employment as discussed above, labor regulations were not found to be a major issue to apparel employment in South Asia. Minimum wages remain low, and firms have found ways to motivate workers through incentive schemes. It is interesting to note that Sri Lanka, which shares many of India's "infamous" labor regulations, still manages to have the strongest export performance of all countries considered in this chapter in per capita terms (including China).

Limited access to finance does not affect apparel due to its labor intensive nature– the cost of machines represents less than 5 percent of production cost. As discussed earlier, successful firms were able to grow very fast through retained earnings.

Table 7 summarizes the main constraints for each of the four studied South Asian countries:

Table 7: Main Constraints by Country

	India	Pakistan	Bangladesh	Sri Lanka
Access to imported inputs	XX	XX	✓	✓
Access to serviced industrial land	X	X	XX	✓
Access to women employees	X	X	✓	✓
Access to skills	✓	✓	✓	✓
Access to finance	✓	✓	✓	✓

Legend:	✓	Not a Constraint	X	Constraint	XX	Major Constraint

1.6. Policy Recommendations

Facilitating imports for exporters

Gradually eliminating duties on textile imports, as was done successfully in Sri Lanka, will help facilitate imports for exporters. In the interim, India and Pakistan should reform their duty drawback systems. One possibility is to rely on bonded warehouses, whereby exporters can import raw materials and inputs—which are kept in the bonded warehouse—without paying duties and taxes. This is the scheme Bangladesh used with great success in the apparel industry, which it should expand to other labor intensive manufacturing industries, such as footwear. The duty drawback scheme should rely as much as possible on technology and risk-based inspections to limit the scope for interpretation and the risk of abuse by those looking to illegally benefit from the system which has been a legitimate concern of the textiles industry and fiscal authorities.

Regional, bilateral, and multilateral trade agreements could also be used to reduce import tariffs. These agreements are less preferable than unilateral reductions in tariffs and duties, because they may lead to trade diversion (that is, when trade is diverted from a more efficient producer to a less efficient one). But they may be easier to achieve politically than unilateral reductions.

South Asia is one of the least integrated of global regions—intra-regional trade accounted for less than 10 percent of total trade in 2012. Political tensions, particularly between India and Pakistan, have slowed implementation of the South Asian Free Trade Area (SAFTA). In contrast, Southeast Asian competitors are part of the Association of Southeast Asian Nations (ASEAN), which was formed in 1967. ASEAN has negotiated zero or reduced tariffs with other key textile suppliers and apparel end markets, including China, Japan, Australia, and Republic of Korea.

Liberalizing the import regime also would attract more foreign direct investment (FDI) to India and Pakistan, which receive lower FDI flows than Bangladesh and Sri Lanka. Historically, US investors played a key role in the initial setup of the apparel industry in Sri Lanka through joint ventures with local entrepreneurs. In Bangladesh, investors from Sri Lanka and Korea helped improve access to capital and technology.

Facilitating access to land for FDI and SME clusters

Clustering strategies with industrial parks can reduce lead times by co-locating multiple steps in the chain and providing one-stop resources for common procedures. Clustering can also help provide infrastructure and facilitate compliance with stringent labor and environmental standards. We discuss in turn below the efforts pursued by India, Pakistan, Sri Lanka and Bangladesh to facilitate access to land and how they could be strengthened:

- India has tried to provide better infrastructure through industrial parks, although only a small share of firms benefit from these initiatives (Saleman & Jordan, 2013). In 2005, the government announced the Scheme for Integrated Textile Parks (SITP) to consolidate individual units in clusters and provide state-of-the-art infrastructure to local and international manufacturers. SITP was created by merging two schemes initiated in 2002 (the Scheme for Apparel Parks for Exports Scheme and the Textile Center Infrastructure Development Scheme). There are now 27 operational parks, and 13 more have been approved (TEXMIN, 2015). Investments in the EPZs have an export focus (Aggarwal, 2007, 2010). Going forward, the government should cooperate with the private sector to develop more facilities to promote female employment within the zones – e.g. child-care centers, local housing and safe transportation.

- Pakistan is pursuing a similar approach with the support of Textile and Garment Cities (launched in 2004) to provide key infrastructure and common facilities, but the long-awaited clusters have only recently begun to emerge (Flanagan, 2014b and MINTEX, 2012). Thus far, only two garment cities (one each in Faisalabad and Lahore) are operational. The Karachi Garment City and Pakistan Textile City are still contending with numerous problems (litigation, non-supply of gas, water, electricity, and lack of funding), but Karachi is slated to be developed on a fast track basis (GoP, 2015). Provincial Governments are now taking the lead to promote improved industrial zones in partnership with the private sector – e.g. the Apparel Park next to Lahore. As in India, facilities should be provided to encourage the employment of women, who hold only 13 percent of the jobs in Punjab's large industrial zones.

- Sri Lanka is promoting industrial relocation of the apparel industry to handle labor shortages. The 200 Garment Factories program has shown that from a social standpoint, female workers benefit from working in factories located close to their villages. Sri Lanka recently tried to tap into the more remote and war-torn areas in the North and East with incentives for apparel investments – the success of this program will also depend on improvement of the road infrastructure (National Stakeholders, 2014).

- Bangladesh is now promoting private industrial zones and several should become operational over the next few years. In order to release the acute shortage of available industrial land in the short term, the government should quickly resolve the dispute with the Korean Export Processing Zone which has stranded 3,000 acres of vacant industrial land next to the Chittagong port. Bangladesh is also trying to move unsafe production units to formal clusters, in response to the Rana Plaza disaster (World Bank, 2013b). Recent interviews with Bangladeshi firms show that relocating ready-made-garment factories to an EPZ can benefit firms in many ways, including on the social front (see Box 2). For example, male workers in Bangladesh are attracted to EPZs due to the contract security (Zohir 2001a), and EPZs have been found to attract additional female workers (Zohir 2001b) – female employment in the BEPZA zones stands at 63 percent.

All South Asian countries should learn from the Chinese experience where strategically located cluster development programs have been a key feature in developing the apparel industry, with apparel concentrated in the coastal regions. China has developed more than 1000 industrial zones following a gradual process of experimentation and decentralization, fueled by competition between provinces and local governments and led by private sector zone developers. One very successful model is the "Plug and Play" industrial zone, which provides ready built standardized factory buildings where SMEs can move in overnight by simply "plugging" their machines and paying rent. This model considerably reduces the moving costs facing SMEs, and encourages the employment of migrant workers and women through daycare facilities and affordable housing next to the factories. "Plug and Play" zones have been instrumental in enabling China's SMEs to grow and employ more than 150 million migrant workers, of which 60 percent are women[90].

Promoting female employment and compliance with social and environmental standards

South Asian countries should put in place labor policies which promote flexible work time and women employment, while guaranteeing fundamental workers' rights. Buyers are under growing pressure to ensure compliance with labor standards, with increasing focus on adequate health and safety conditions following the Rana Plaza and Tazreen factory fire incidents in Bangladesh. Recently, Bangladesh passed a labor law that allows employees to form labor unions without approval by the factory owner. In 2014, there were more than 120 registered garment trade unions, compared to only three in 2012-13.[iv] Greater internal pressure from labor unions should improve monitoring of compliance with health and safety standards.

[90] Fostering Women's Economic Empowerment Through Special Economic Zones (page 103), World Bank 2011

Box.2: Bangladesh takes steps to boost compliance

Wages and working conditions have long been a source of concern in Bangladesh's apparel sector. Strikes and labor unrest were frequent following the Rana Plaza disaster in April 2013—the single worst incident in the history of the apparel industry, which killed around 1,200 people—and other incidents such as the fire at Tazreen Fashions in November 2012. In response to these incidents, the industry, in collaboration with the government, foreign buyers, and development partners, has agreed to several policy measures to improve factory safety and social compliance.

One recent initiative is the Accord, signed by mostly European apparel buyers along with two global trade unions. This is a legally binding agreement between buyers and unions, in which companies commit to conducting independent inspections and developing stronger worker-management committees in factories. It also includes financial obligations by buyers to help suppliers pay for safety upgrades (Anner, Bair, & Blasi, 2013; Gifford & Ansett, 2014). Another recent initiative is the essentially voluntary Alliance for Bangladesh Worker Safety, largely backed by North American buyers. Together, these two initiatives cover nearly half of the country's total factories (1,600 factories for the Accord, and 600 for the Alliance).

These initiatives are a positive step, but they have also been criticized for focusing primarily on large firms and on fire and building safety, rather than other major labor issues. To cover the remaining firms, the government and representatives from local employers' and workers' organizations have signed an integrated National Tripartite Plan of Action (NTPA) under the guidance of the International Labor Organization. A "Better Work" program for the ready-made garment industry has also been announced. Achieving success in these programs will be challenging, as major changes in firm operations and substantial funds will be required. It is estimated that about half of the country's apparel factories—mostly small and medium-sized firms that depend on subcontracting from large factories—will have difficulty adopting international standards and may be forced to close (ADB, 2014).

In recent years, South Asian countries—with Sri Lanka at the forefront—have ratified a number of ILO conventions on labor conditions, such as workers' safety. Interviews with firms in Sri Lanka highlight the importance they place on safety and enforcing the no child labor policy. However, compliance is poor in some cases across South Asia, despite formal adoption of labor standards and international conventions. Studies of the ILO's Better Work program find that the highest rates of noncompliance across countries globally involve paid leave, social security, employee benefits and inaccurate payments (ILO, 2014). Policies to improve monitoring and penalizing noncompliance could improve the situation. On that front also, the promotion of plug and play industrial zones would considerably reduce the social and environment compliance cost for SMEs as well as facilitate monitoring.

The box below summarizes the main recommendations by country:

Box.3: Main recommendations by country

Bangladesh

- Reduce import barriers, including tariffs, to ease access to inputs for exporters in other labor intensive industries (e.g. footwear), leveraging the successful bonded warehouse scheme in the apparel industry
- Resolve the dispute with the Korean Export Processing Zone to unlock 3,000 acres of prime industrial land in Chittagong
- Promote Plug and Play industrial zones for SME clusters, which will help SMEs comply with social and environmental standards

India

- Reduce tariffs and import barriers to ease access to man-made fibers for exporters
- Promote Plug and Play industrial zones for SME clusters, leveraging the successful SITP model
- Ease restrictions on flexible working arrangements, promote facilities to increase the security and well-being of female workers as well as continue to invest in the education of women as the first critical step towards their economic empowerment

Pakistan

- Reduce tariffs and imports barriers to ease access to man-made fibers for exporters
- Promote Plug and Play industrial zones for SME clusters, which will help SMEs comply with social and environmental standards
- Ease restrictions on flexible working arrangements, promote facilities to increase the security and well-being of female workers as well as continue to invest in the education of women as the first critical step towards their economic empowerment

Sri Lanka

- Continue to improve transport infrastructure to promote development of the industry in the North and East of the country
- Continue to improve trade logistics to position the country as a regional apparel and textile trade destination for quality apparel

Implementing these recommendations could have a major social impact by increasing female employment

Boosting growth in the apparel sector will help South Asia create millions of better jobs, particularly for women. The impact on employment of increases in output in textiles and apparel, which are labor-intensive industries, is greater than in other industrial sectors. In Bangladesh, growth in the apparel sector leads to more rapid female than male employment: a one percent increase in foreign sales is associated with a 0.04 percent increase in female employment, compared to a 0.02 percent increase in male employment (figure 8).[v]

Figure 8: Export growth in Bangladesh has a greater impact on female than male employment

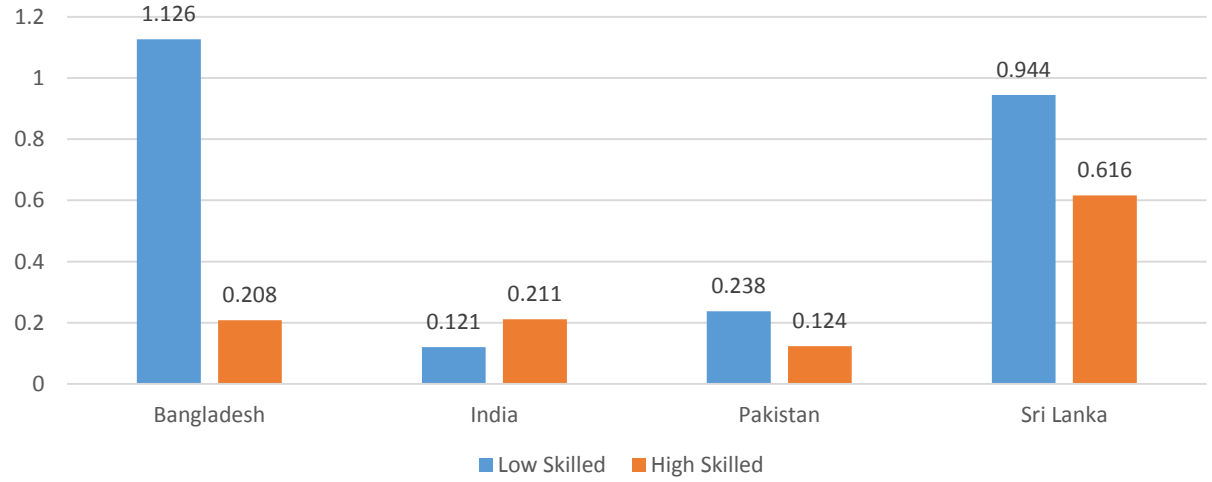
(percentage change in employment with respect to a 1 percent change in exports by gender, percent)

Source: Calculations based on Bangladesh Establishment Surveys.
Note: Annex 4E provides detailed regression results.

Further, since apparel is a relatively low-skilled industry, these employment opportunities should benefit in particular low skilled women employed in very low paid jobs in rural areas. In effect, our analysis shows that in Bangladesh and Sri Lanka, where the labor market for women is well functioning, low-skilled women are more likely to increase their labor force participation compared to high-skilled women in response to an increase in wages (figure 9).

Figure 9: Higher wages could especially draw low-skilled women into the labor force

(Marginal change in female labor participation with respect to an increase in wage by skill type, 2012 or closest year)



Source: Calculations based on household and labor force surveys of various years.

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2. Electronics in South Asia

2.1. Executive Summary

The electronics sector has played an important role in the development trajectories of several newly industrialized economies. Surprisingly, South Asia is not currently a significant player in the sector, though electronics presents a substantial opportunity for the region. Addressing the constraints that have prevented the growth of this sector could help South Asia raise growth and create good manufacturing jobs.

South Asia's lack of competitiveness reflects inadequate provision of public goods rather than high labor costs. In fact, low labor costs remain the region's primary source of competitiveness, as the best firms combine lower wages than in East Asia with comparable labor productivity performance due to investments in good management systems and worker skills. Instead, many of the problems relate to policy, regulatory and infrastructural weaknesses that raise trading costs and increase lead times. Such constraints are extremely serious in an industry that is based on global networks. A particular issue in India concerns lower tariffs on finished goods than on necessary inputs, which discourages local production in selected products. In Bangladesh, a key constraint is the limited supply of large tracts of well-located and readily-available industrial land for large investors. In general, greater investment in R&D and in training workers could significantly increase productivity and returns in the South Asian electronics sector. The renewed interest of global electronics investors in the region – in India and Bangladesh in particular – shows that a few critical measures to address these constraints could help put the region on the global electronics map.

The analysis focuses primarily on India and Sri Lanka – the two countries which already have a critical mass of companies in the electronics sector – and touches on Bangladesh and Pakistan. In an effort to keep the analysis focused, the study looks only at two of the largest sub-sectors: telecommunications and consumer electronics. The study combines data from secondary sources on the drivers of competitiveness with in-depth stakeholder interviews. It has been suggested by some experts that while the "high-volume, low-cost" manufacturing that characterizes these sub-sectors remains important, for South Asia as a latecomer, new opportunities may be opening up for "low volume, high value strategies." [91]

This case study identifies both reasons for success and limits on the growth of electronics in South Asia, and recommends policies to enhance its growth. The next section discusses potential benefits of the electronics sector in South Asia, followed by an analysis of sector performance. We then turn to a discussion of the drivers of competitiveness in the electronic sector and the major constraints on performance. The concluding section summarizes policy recommendations to unblock the barriers to investment in this industry and fast-track its growth.

2.2. Motivation

[91] Ernst (2014)

The electronics sector is one of the world's largest industrial sectors and has made a substantial contribution to global growth. Global trade in electronic products, including communications and information communication technology (ICT) equipment and electronics-based consumer products, was estimated at $1.4 trillion in 2012, having grown 5.9 percent a year between 2008 and 2012.[92] From 1980 to 2000, the sector contributed from 0.2 to 0.5 percentage points to annual economic growth in nine OECD countries (between 0.3 to 0.9 percentage points if one considers just the 90s).[93] The sector's contribution to economic growth might have been even higher in developing countries, which benefited from access to more advanced technology in the developed world. The sector is an important driver of innovation and productivity, a source for the accumulation of technological capabilities and a catalyst for trade and investment. For example, the electronics industry – as the biggest sector in terms of output and exports – drove rapid industrialization in Singapore and Taiwan from the mid-1970s to 1990s.[94] Electronics are a major driver of innovation: 29% of all R&D investments in one thousand firms surveyed by Bozz & Company were devoted to electronics.[95] The share of electronics in R&D investment is even higher in some specific sectors, especially automotive (see the separate case study).[96] Moreover, electronics production is an important source of employment. The ILO estimates that the sector employed 18 million people worldwide in 2010.[97]

The sector presents growth opportunities for developing countries. An important feature of the sector is that production is highly fragmented, with value often added in a variety of countries before goods and services make their way to end consumers.[98] The ability to shift parts of the value chains to low-cost locations has created opportunities for developing countries to participate. Electronics companies from the developed world first started relocating to Malaysia, Singapore, Taiwan and Thailand during the 1970s and early 1980s, followed by China, Indonesia and the Philippines, primarily to take advantage of lower labor costs. In recent years, Vietnam has become an important producer for similar reasons. In 2013, information technology and electronics accounted for 7% of Vietnam's exports. This shift has allowed developing countries to increase their contribution to global value added in the electronics sector from 11% in 2000 to 30% in 2010.[99] Asia has been a major beneficiary and has become an important manufacturing hub, mainly due to its low labor costs, established supply base and proximity to key final markets.[100]

***Networks of international electronics firms are already in place in South Asia*.** Several multinational electronics firms (Samsung, HP, IBM, Motorola, Lenovo, Flextronics and Foxconn) are present, or have announced plans to invest in the region, and many large firms have set up R&D centers with world class capabilities in South Asian countries to support global operations. This activity has been encouraged by South Asia's large, fast-growing markets (for example, the electronics market in India is expected to grow at 24% p.a. to reach a market size of $400 billion by 2020)[2] and the potential of the South Asian diaspora with deep knowledge and extensive networks in the global electronics industry.

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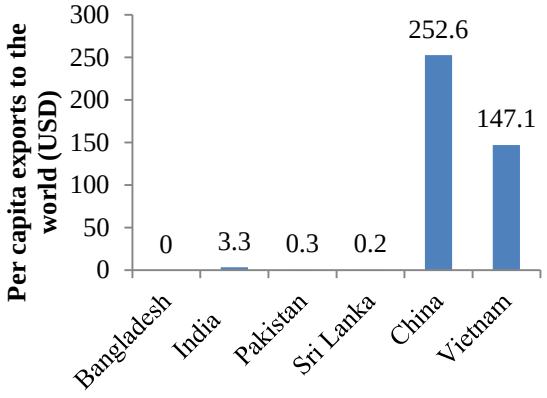
[92] Staff calculations based on UN COMTRADE data. The classification of electronic products is from Sturgeon and Memedovic ([not in references]).
[93] Collechia and Schreyer (2001).
[94] Poh-Kam (1995).
[95] Bozz & Company (2008) apud Bampi (2009)
[96] Oliver Wyman (2007) apud Lima (2012)
[97] ILO, 2014 (A)
[98] See for example Fernandez-Stark et al, 2011;Sturgeon and Kawakami et al, 2011
[99] J Manyika et al, 2012.
[100] ILO, 2014 (B).

However, South Asia could have benefited more from the global shift of electronics manufacturing. Other countries that started from a much weaker position have forged ahead and established themselves as new global players in electronics manufacturing exports. For example, electronics exports in South Asia are small compared to that in East Asian countries (figure 1). India is only the 14th largest electronics producer globally, behind countries such as Mexico (8th), Brazil (10th) and Thailand (12th).

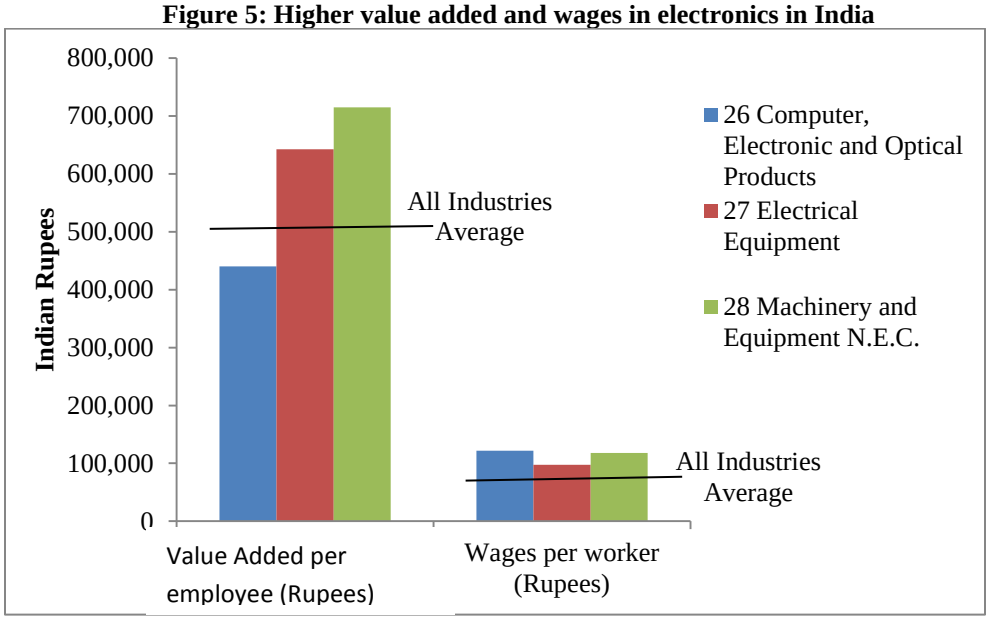
Figure 4: Electronics production is low in South Asia



Source: UN COMTRADE; Staff estimates based on WBG Enterprise Surveys

Electronic manufacturing could help South Asia create more and higher value added manufacturing jobs. The sector is included in the list of Governments' priority manufacturing sectors in virtually all countries of South Asia, for its potential to generate growth, exports and good jobs for workers (especially women) with basic academic and technical knowledge. In India, productivity and wages in the electronics industry are higher than the average for all industry (see Figure 2 below). Not surprisingly, electronics are an important part of the Government's "Make in India" and "Digital India" campaigns. In Sri Lanka and Pakistan too, the sector is being promoted on a priority basis.

Figure 5: Higher value added and wages in electronics in India



Source: Annual Survey of Industries, 2009-10, India

2.3. Performance Analysis

This section considers South Asia's performance in terms of output and trade, productivity and cost, as well as other key dimensions of competitiveness in this industry such as processing times and innovation.

Output and trade

South Asia has achieved only limited progress in increasing exports of electronics products. The region's share of global exports of electronics products remains very low (table []). And the share of electronics in South Asia's exports has increased little since the start of the new millennium (figure 3). The limited performance of South Asia's electronics sector is best viewed by an analysis of the experience in India and Sri Lanka.

Table 1: South Asia's share of global electronics markets is low

World Market Share (%)		**2004**	**2014**
Bangladesh	Electronics	0.002	0.003*
India	Electronics	0.153	0.347
Sri Lanka	Electronics	0.011	0.009
Pakistan	Electronics	0.012	0.012

*2011, last year for which the data is available

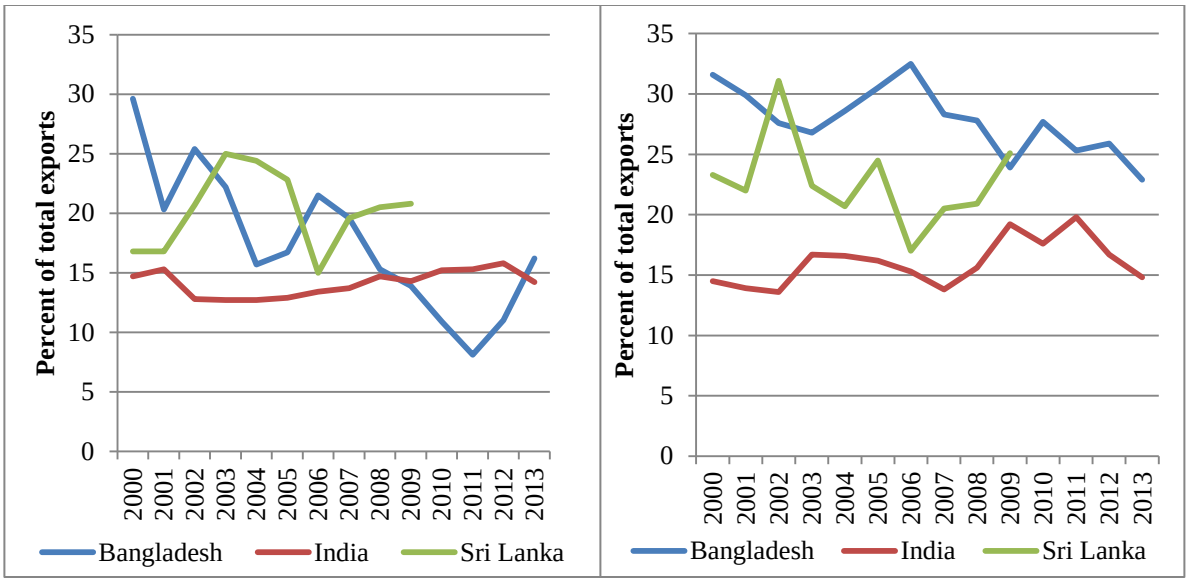
Figure 3: Electronics Exports from South Asian Countries is Low and Stagnating

Final Electronics Exports

(Percent of total exports)

Intermediate Electronics Exports

(Percent of total exports)



Source: Staff calculations based on UN COMTRADE statistics

Electronics manufacturing in India was initially controlled by Government. The Indian electronics industry dates back to the 1960s. While the focus initially was on space and defense technologies, over time this gradually shifted towards consumer electronics – radios, black and white TVs, and other audio products. Color TVs started being produced in the 1980s. Till the 1980s, state-owned enterprises like Bharat Electronics Limited (BEL) and the Electronic Corporation of India Ltd (ECIL) dominated the sector, while the entry and operations of private players in the sector was controlled by the Department of Electronics.[101] The mid 1980s and early 1990s saw sustained and rapid growth in the sector. Many large international brands began partnering with Indian firms to enter the market.

Barriers to private sector electronics production were lowered as part of India's market liberalization program. Licensing requirements for consumer electronics were abolished in 1996. In addition, tariff and non-tariff barriers were slashed as India opened its economy to the outside world. India signed the Information Technology Agreement (ITA), in which participating countries agreed to bind and then eliminate all customs and other duties and charges on identified information technology products by the year 2000. India eliminated tariffs on 38 per cent of the ITA products by 2000 and the rest by 2005. Trade agreements with Singapore, Thailand, Malaysia, the ASEAN, Korea and Japan also reduced import tariffs. [102] Imports of electronics increased rapidly, and the number of domestic firms in the sector fell (Annex 1).

Indian electronics manufacturing has been struggling in the domestic market. In 2011, domestic production met only 36% of India's consumption of electronics products, and 49% for electronic components, with the rest being met through imports. If present trends continue, this share is likely to come down further.[103] Indian manufacturers are losing ground even in areas where they were historically important. For example, according to the Indian Printed Circuit Board Association, currently

[101] Any changes in product line or increased output for a product already approved required permission from DOE
[102] Hoda and Rai (2014)
[103] Ernst (2014)

roughly two thirds of the domestic market is being served through imports, while India's share of global printed circuit board (PCB) output is only 0.7 percent.[104] International firms such as Panasonic, Sony, LG, Samsung have taken a substantial share of consumer electronics, the largest segment of India's electronics market, which is now dominated by imports from China. Even bulky items like air conditioners ($1.6 billion market), refrigerators ($400 million) and washing machines ($158 million) are imported fully assembled into India, not to mention smaller goods like mobile phones ($1.9 billion)[105].

However, Indian manufacturing is showing signs of increasing market share in some areas. Indian exports of components and products have grown rapidly in areas such as mobile telephones, audio players and sound equipment, and display technologies. In consumer electronics and mobile telephony, international brands like LG and Samsung have established significant manufacturing facilities, and Indian companies like Micromaxx are increasing their presence. There is also a developing eco-system to support faster growth. More than 50 electronic manufacturing services/original design manufacturers operate in India, including global players like Flextronics and Solectron, as well as Indian firms such as Deltron, TVS Electronics and Sahasra. Some international players, notably Foxconn, have recently announced their decision to enter India (Box 1).

Box 1: Foxconn enters India

Foxconn, the world's largest contract electronics manufacturer, has signed a $5 billion deal to set up R&D and hi-tech manufacturing facilities in western India within the next five years. The $5 billion pledge is the largest foreign investment into India's tech manufacturing sector and a boost for the government's "Make in India" program designed to spur domestic manufacturing. The Taiwan-based firm, which manufactures for a host of global device brands like Apple, BlackBerry, Amazon, Motorola, Xiaomi and Sony, has the bulk of its factories in China.

Separately, leading Chinese smartphone maker Xiaomi announced that it will now manufacture its devices in India in partnership with Foxconn. The factory will be based in the southern state of Andhra Pradesh.

Going by the recent spate of announcements, Foxconn is becoming one of the most aggressive foreign investors in India. Last month, the company announced that it would inject $20 billion into India's solar sector along with Japan's SoftBank and India's own telecom firm, Bharti. Reports suggested that another Foxconn joint venture with billionaire Gautam Adani's Adani Group could focus on making iPhones and iPads.

Also, Foxconn is rumored to have allocated billions of dollars for India's e-commerce and technology startups, and is said to be close to finalizing a $500 million investment into online retailer, Snapdeal.

Setting up manufacturing centers in India could be Foxconn's attempt to build an alternative to its manufacturing base in China, where market growth is slowing and wages are rising. Foxconn said it intends to set up 10-12 plants and employ a million workers in India by 2020.

[104] Indian PCB association (2008)
[105] Figures in brackets are imports in 2012/13

Source: Forbes Asia (http://www.forbes.com/sites/saritharai/2015/08/10/foxconn-could-make-india-its-next-manufacturing-base-after-china-investments-suggest/)

Manufacturing is clustering around a few locations. The electronics industry in India initially grew around three major centers, Bangalore, Mumbai/Pune and Delhi/National Capital Region (NCR). Bangalore emerged as a hub early on, with major public sector plants in defense and telecommunication being located there. In recent times, Bangalore also has attracted private sector firms in computer and industrial products. Bombay/Pune and the NCR have become major manufacturing centers, and have emerged as favored destinations for MNCs. The NCR region, in particular, has a large concentration of small scale factories making consumer electronic products and computers. More recently, Hyderabad and Chennai have become important manufacturing locations.

Electronics manufacturing in India is largely small scale and oriented to serving the domestic market. A field survey of the manufacturing units and industry associations at different regions of the country in 2008 showed that 84% of firms were in the small scale sector. While the electronics component sector was largely in the formal sector, communication equipment and computer peripherals were largely in the informal sector. Fully 95% of local manufacturers did not have any foreign direct investment. The involvement of these firms in international trade was also moderate - 41% are engaged in exports.[106] It is unlikely that this picture has changed significantly since the survey was taken.

Sri Lanka's electronics industry is small. The electronics industry in the country started with manufacturing vacuum tubes and radios. Manufacturing now is concentrated around electronic components, which includes printed circuits, electronic circuits, transistors, valves, cathode tubes, refrigerators and freezers, lamp holders, telephone sets, and audi/video equipment and parts. The industry currently contributes about 2% of the country's export revenues and absorbs over 15,750 workers.[107] The apparel industry, in comparison, employs more than 8 times that number. The workforce is drawn from a pool of skilled young men and women with basic academic and technical knowledge.

Sri Lanka's electronics industry is also stagnating (Figure 2). The major decline has taken place in the telephone equipment segment, where exports fell by more than 80% between 2008 and 2013. India remains a major destination for electronic exports from Sri Lanka, particularly for primary goods (insulated wire). The EU, the United States and Japan are also important export destinations. However, Sri Lanka's preferential access to Indian markets under the Indo-Sri Lanka Free Trade Agreement has eroded, as MFN tariffs in India have fallen and India has entered into trade agreements with other countries (see Box 2).

Box 2: Preference Erosion in the India Sri Lanka Free Trade Agreement

The India – Sri Lanka Free Trade Agreement (ISFTA) was signed in December 1998 and became operational in March 2000. The agreement covered all items except those deemed sensitive by each country. India committed to an immediate elimination of 1,351 tariff lines, and a gradual phase out for a further 2,797 items. The duty concessions under the ISFTA

[106] National Productivity Council
[107] Presentation on electrical and electronics sector, export services division, Sri Lanka (2015)

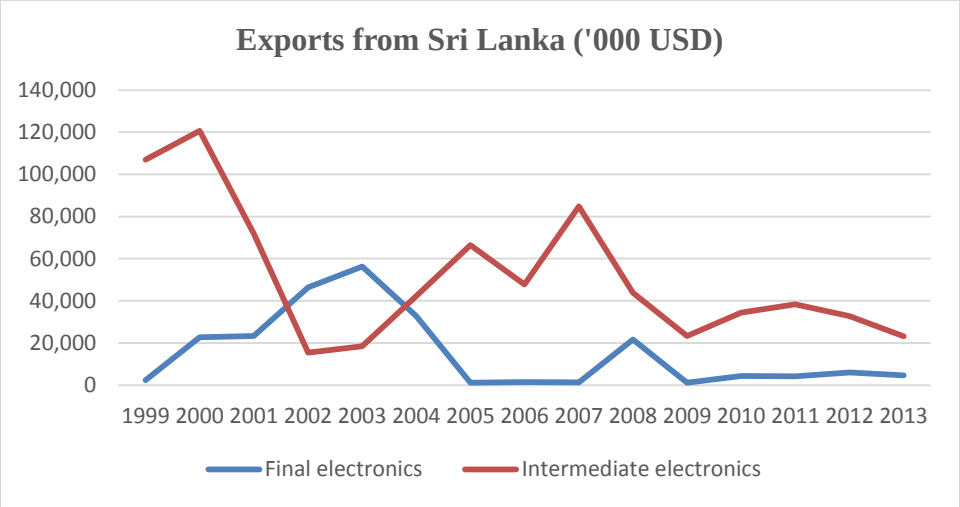
conferred considerable benefits to Sri Lanka compared to MFN tariffs.

The immediate effects of the FTA were very positive for Sri Lanka. Its exports to India surged from US$58 million in 2000 to US$566 million by 2005. The composition of exports also shifted from primary products towards processed goods such as copper products, vegetable oils, pharmaceuticals, and white goods such as air conditioners and refrigerators. However, particularly in the case of copper products and vegetable oils that witnessed the largest increase, exports appeared to be driven by tariff arbitrage by Indian investors seeking to get around the India's high MFN tariff rates.

The benefits of tariff arbitrage began to decline after 2006, as trade liberalization in India led to a gradual erosion of the preference conferred on Sri Lankan exporters. In the electronics sector, the gradual implementation of the ITA-1 completed in 2005 saw tariffs coming down for identified information technology products to zero. India also entered into trade agreements with a number of ASEAN countries, most importantly with Thailand. Under the "early harvest" provision of this FTA, duties on a range of electronic goods were eliminated in September 2006. Electronics had not been a traditional export item from Sri Lanka to India. Thus, even while electronic exports to India saw a small increase in the early years of the ISFTA, the quick erosion of preferences relative to a very competitive Thailand - before buyer relationships, markets and supply chains could be fully developed - meant that the increase could not be sustained.

Both Sri Lankan and foreign firms are active in the sector. An estimated 70 electric and electronic component manufacturing factories are operating across Sri Lanka. Nearly a quarter of these employ less than 20 workers, but an equal number employ 300 workers or more. Some are Sri Lankan owned companies, such as IE Electronics which manufactures electricity meters and transmission equipment. Others, like Tos Lanka and Nippon Marudhi Lanka, are foreign-owned. The most recent entry to the Sri Lankan market is Okaya Denk a major global player in electronics that specializes in manufacturing of noise suppressors. Lanka Harness manufactures a range of automotive harnessing and electronics for Toyota in Japan. The sector is moving towards the higher quality end of the spectrum. The industry is attracting sophisticated buyers from electronics manufacturing services partners operating in Japan, Europe, North America and India.

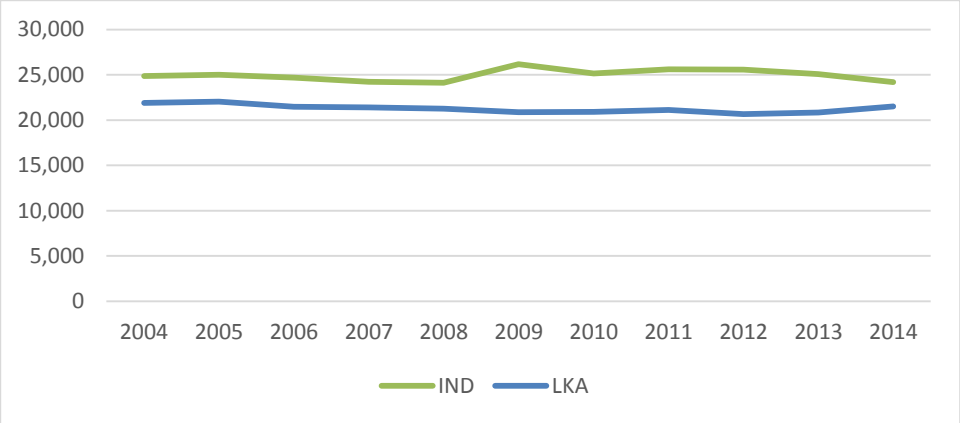
Figure 2: Electronics exports from Sri Lanka have fallen since 1999



Source: WITS, Staff Estimates

The quality of Indian and Sri Lankan exports remains unchanged. A measure of sophistication (PRODY)[108] shows the quality of Indian and Sri Lankan exports remained practically constant (figure 4).

Figure 4: Sophistication of Electronics Exports from India and Sri Lanka (PRODY)



Source: Staff calculations based on UN COMTRADE statistics

Productivity and cost

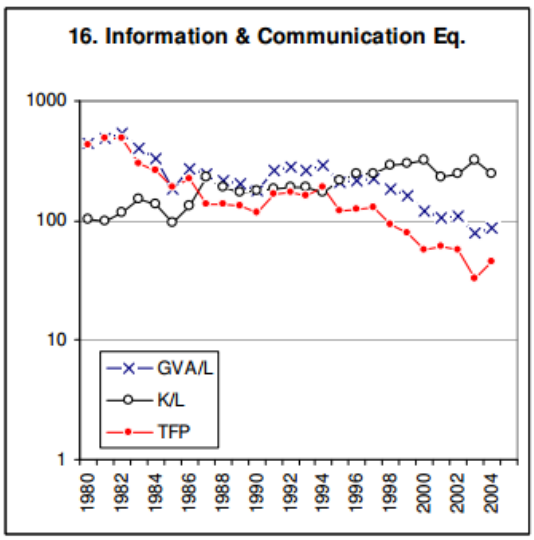
The lack of competitiveness of South Asian electronics manufacturing after the early 2000s was apparently not due to low labor productivity or high costs. Labor productivity and total factor productivity (TFP) growth in information and communication equipment was higher in India than in China through the 1990s (Wu et al. 2007). However, growth came down steadily, and by the mid-2000s, India had lost much of its initial advantage (Figure 4, left panel).[109] Similar evidence comes from Ark et al

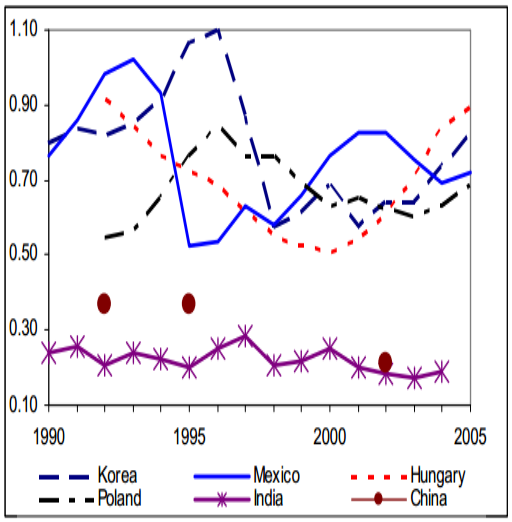
[108] PRODY is a weighted average of the per capita GDP of countries producing electronics goods.
[109] Xu et al. (2008)`

(2008), who find that India had higher labor productivity and lower labor costs than China through much of the 1990s. China however saw rapid increases in labor productivity that took it to a level above that of India by the mid-2000s. Nevertheless, higher compensation levels meant that unit labor costs Chinese manufacturing were slightly higher than in India (Figure 4, right panel). Leading firms in India estimate that productivity at their plants is comparable to Chinese levels. Samsung, in fact, mentioned that their Noida plant is among their three most productive units worldwide. Similarly, enterprise surveys show that productivity in Sri Lanka is high. Sri Lanka has a higher value added per worker in the electronics sector than China (USD 24,701 vs. USD 22, 382—figure 4, left panel).

Figure 4: Labor Productivity in India's Electronics relative to comparators

India/China Comparative (China=100) Unit labor Costs





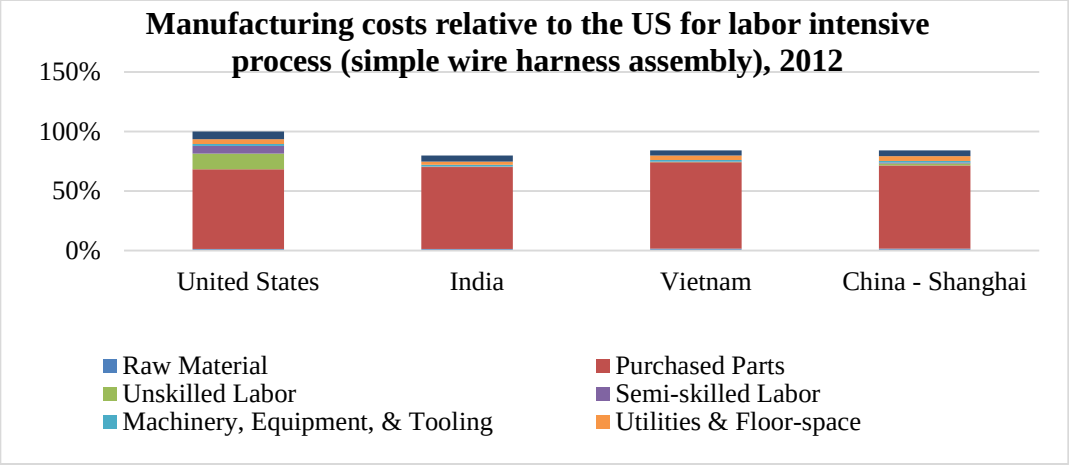
Source: Wu et al (2007) Source: Ark et al (2008)

GVA/L = Gross Value added per worker, K/L= Capital to Labor ratio, TFP=Total Factor Productivity

The main cost disadvantages derive from factors outside the factory. Cost comparisons, obtained from a global manufacturer with facilities around the world, shows that manufacturing costs in India are 80% of those in the United States, and importantly, slightly lower than in China and Vietnam (Figure 5). In large part India's cost advantage derives from its low labor costs. However, "Selling, General and Administration (SGA)" costs, which reflect costs outside the factory, are relatively high.[110] The largest driver of costs is the cost of purchased parts. Any tax, policy, regulation or inefficiency that raises the cost of purchased inputs (including trade logistics and trade policy as discussed later) could have a large impact on the sector's competitiveness.

Figure 5: India has a cost advantage in labor intensive processes

[110] SGA is the sum of all direct and indirect selling expenses, which includes salaries (excluding those related to the production itself), advertising expenses, rent, and all expenses and taxes related to selling the product.

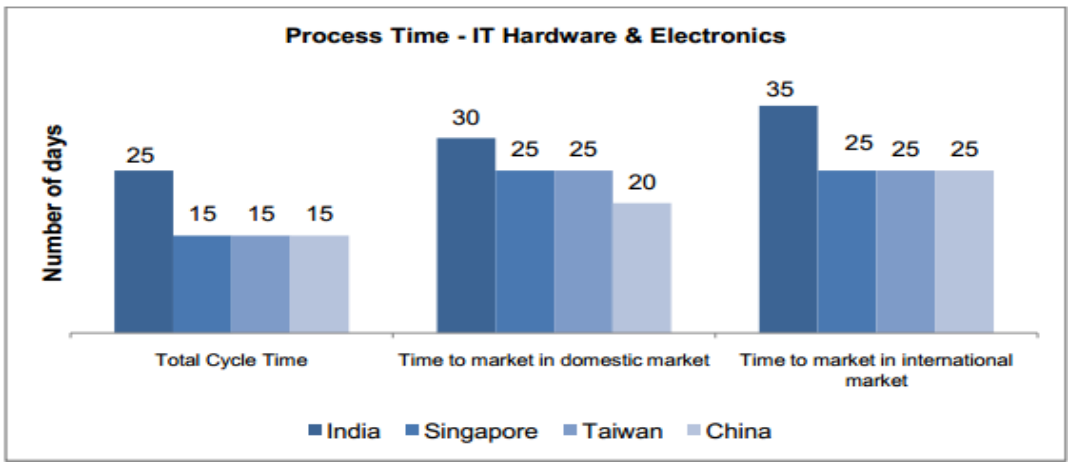


NB: Data is from auto parts manufacturer but is representative of costs in electronics sector

Processing times put South Asia at a disadvantage. The ability to rapidly start and scale up production of new products and deliver these to the market can sometimes be a more important consideration for firms than the cost of production. Countries that are able to achieve faster turnaround time gain significant competitive advantage, especially in the more innovative, cutting edge products. This is where South Asia may be at a disadvantage. Processing time is higher in India than in other big electronic manufacturers like China, Singapore & Taiwan (figure 6).

As will be developed later, one reason for this are delays in procuring imported raw materials and components that lead to delays in production. Further, delivery time from ports to factories, and then from factories to final destinations, adds to the overall time required to bring products to market.

Figure 6: Process times for IT Hardware and Electronics



Source: D&B Analysis

***South Asia also lags in innovation, which is another key success factor in this sector*.** Most electronic firms in South Asia report some spending on innovation: of 301 electronic firms included in the World

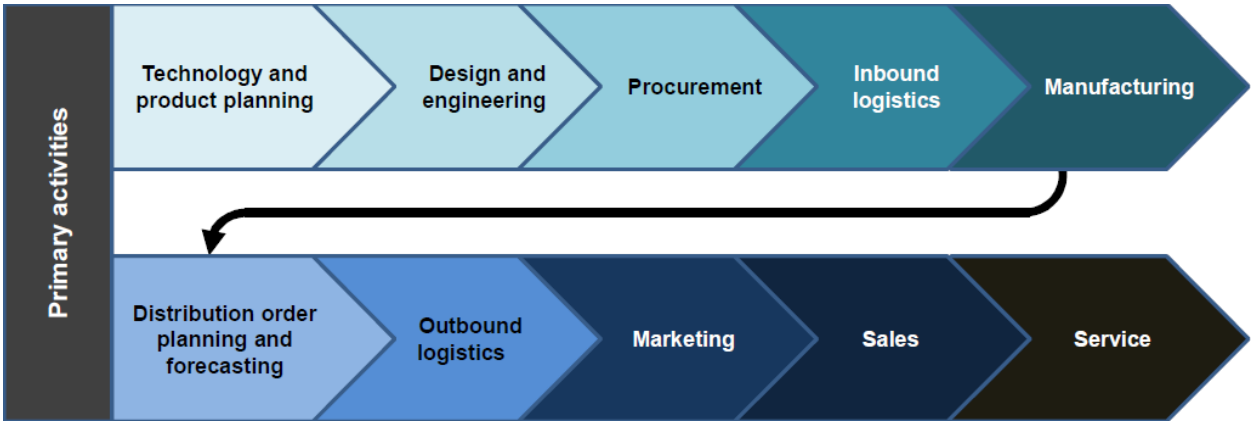
Bank Enterprise Survey, 69% reported spending on innovation. However, innovation expenditures were low in a global context: only 1.1% of sales in large firms employing more than 100 workers, and 4.7% in small firms. The low level of expenditures on innovation is disappointing, given that the impact of innovation on productivity is large. An increase in the share of new products in firm's sales by 1% is associated with a productivity increase of 2.6%, which is extremely high (on average in other countries this elasticity is one tenth of this level).[111] The percentage of new products in firm's sales was 7.5% on average.

2.4. Drivers of Competitiveness

The global electronics industry is highly competitive, innovative and fast moving. Between 2004 and 2009 global GDP rose by 2.2% annually, but electronics production rose 4.9% per year.[112] Rapid growth was accompanied by rapid change in the main market players. For instance, IBM was the largest firm in this industry in 2005, but dropped to 5th in 2015. During the same period, Samsung Electronics started as the 5th largest but ended as the first. Apple was not ranked in the top ten in 2005 but is currently the second largest.[113]

Rapid growth presents a number of challenges for all stakeholders, who face constant pressure to keep up with new developments. Companies need to be innovative and flexible, and government policies need to support this. In the absence of success in innovation, companies, regions, and countries can find themselves confined to low value added activities within the highly fragmented global value chains (GVCs) that dominate the sector. Policy should support movement towards higher value added niches within GVCs, rather than simply encouraging participation in the sector.[114] Finally, globally, the industry is very lean. Excess inventory or transit time anywhere in the value chain can result in value loss, which can be a severe disadvantage in such a fiercely competitive industry. Thus, cost and speed - in production and logistics- are both important determinants of competitiveness. The following discussion of the strategies of successful South Asian firms in the electronics sector is based on detailed interviews conducted with large lead and contract manufacturing firms.

Figure xx: Electronics Value Chain



[111] Hall and Mohnen, 2013 estimate this elasticity at around 0.25 based on a survey of literature. However, most of the outcomes in this survey are based on papers from developed countries. Investigating it for developing countries, Crespi and Zuniga (2012) results suggest an elasticity ranging from 0.24 to 1.92.
[112] World economic growth is from WBDI and electronics production growth is from Lima (2012).
[113] Ranking Global 500 – Fortune CNN.
[114] Sturgeon (2015)

Source: Korea Associates Business Consultancy Ltd (2012)

FDI has played an important role in firms' success. Some of the most successful firms in India and Sri Lanka are foreign, with investors bringing in technology, capital and foreign market linkages. For example, Samsung entered India in the early 1990s when the sector was just opening up, through a joint venture with Videocon (an Indian white goods manufacturer). Initially the company produced TVs and computer monitors. This approach helped it overcome many uncertainties associated with entering a new market, and allowed it to benefit from Videocon's market presence. At the same time, Videocon benefited from Samsung's technology and capital. Similarly, Tos Lanka (see box 2), one of the largest electronic assembly firms in Sri Lanka, is a wholly owned subsidiary of Toslec Co., based in Kyoto, Japan. Toslec Co. is one of the leading manufacturers and suppliers of electronic components to Matsushita Electronics, Hitachi Media, Richo Elemex, Nihon Densan, Japanese Storage Battery Co. Ltd., and Rohm Company, and brings with it these market connections. These examples highlight the important role of FDI in international production networks.[115]

Linking to large markets is important for growing the sector. The bulk of electronics manufacturing in India is sold domestically, and manufacturers point to growing domestic consumption as the main reason for investing in electronics manufacturing. International markets, however, are important in some segments. For example, a domestic producer of medical equipment emphasized the importance of global partnerships and international markets- *"For us the major reason for expanding manufacturing is to develop partnerships with global industry leaders*."[116] In Sri Lanka, the domestic market is smaller and most successful firms have an export focus. While exports to India are not growing, the industry is focusing on attracting sophisticated buyers from Japan, Europe and North America.

Box 2: Tos Lanka Company (Pvt. Ltd.)

Tos Lanka is Sri Lanka's largest electronic assembling solution company. It commenced operations at the Biyagama EPZ in 1998, with an initial investment of Rs 220 million. Tos specializes in the Surface Mounted Technology (SMT) assembly of printed circuit boards, electronic guitar tuners and effectors, coils and electronic components for the automotive industry. The products are exported to Japan, the United States and the EU.

The factory has manual and automated electronic assembly lines, supported by chip mounting and wave soldering plants, together with extensive testing facilities. Female workers dominate the 240-strong workforce . The company has invested in training and development of staff to manufacture electronic products and components to international standards. Workers at Tos Lanka undergo training in Japan for a period between three months to a year. The majority of the work force has been trained in Japan under AOTS/JASTECA scholarships in quality-oriented manufacturing processes.

The company has also established its own Research and Development section, and looks forward to accessing the huge Indian market through the Comprehensive Economic

[115] See for e.g., World Bank 2005, UNCTAD 2013, Hoda and Rai (2014)
[116] Ernst (2014)

Partnership Agreement (CEPA).

Appropriate choice of products, aligned with market conditions and sources of competitiveness, is critical. Most successful companies in India seek to compete as low-cost producers, predominantly for lower-end, more mature market segments. Some see potential in producing in segments that are declining globally, but where the large domestic market provides opportunities to concentrate global production (examples include CFL bulbs and feature phones). Presumably for these segments production costs, rather than speed, are the main driver of competitiveness, and Indian companies feel their productivity and costs compare well with China. Sri Lankan firms, on the other hand, are moving towards producing more sophisticated electronic manufacturing products and services that can be exported to the large, lucrative Western markets. The adoption of ISO certification, Restrictions of Hazardous Substances and Waste Electrical and Electronic Equipment regulations, and decent labor standards in conformity with ILO requirements have helped it compete in these markets.

In-house R&D capability is a driver of competitiveness. Successful firms report that investments in developing R&D capacity have enabled them to compete on quality as well as cost. This is consistent with the empirical finding that returns to innovation are high in South Asia. In particular, firms identified their ability to innovate and customize products to South Asian conditions (for example, unreliable power and water supply) as a big advantage vis-à-vis Vietnam. It is likely that the advantage conferred is more important for consumer white goods, than for products which are bulk manufactured and require less customization, for example, mobile phones.

Clustering has helped get around infrastructural weaknesses. Firms in South Asia prefer their suppliers to locate in close proximity to their plant to facilitate quality control and reduce transport-related uncertainties in the supply chain. As a result, clusters of firms have emerged around plants, which is an important part of overall efficiency. In turn, companies support vendors through vendor development programs aimed at upgrading quality; and through providing product designs. For example, clusters of suppliers are emerging around Samsung's main plants in Noida and Chennai.

Private investments in labor skilling are necessary. Most firms in both countries feel that skill levels of workers need to be improved, and invest significantly in doing so. For example, Samsung runs an apprentice program, and up to a year may be required to bring workers up to speed. This is among the longest training times for their plants around the world. Similarly, workers at Tos Lanka undergo training in Japan for a period ranging from three months to one year (Box 2).

Successful firm may benefit from Government subsidies, but do not report them as critical. For example, Samsung benefited from tax breaks under Uttar Pradesh's "large plant" policy scheme, and both the Noida and Chennai plants originally received customs and excise tax benefits by being designated as Special Export Zones (SEZs). However, Samsung had its land re-designated as a Domestic Tariff Areas (DTA), at the cost of losing these benefits, as it was not ready to comply with performance standards set on SEZs. A majority of firms interviewed in Sri Lanka reported receiving no benefits or incentives from Government. It appears that investment decisions are based on fundamentals, and incentives are important only at the margin.

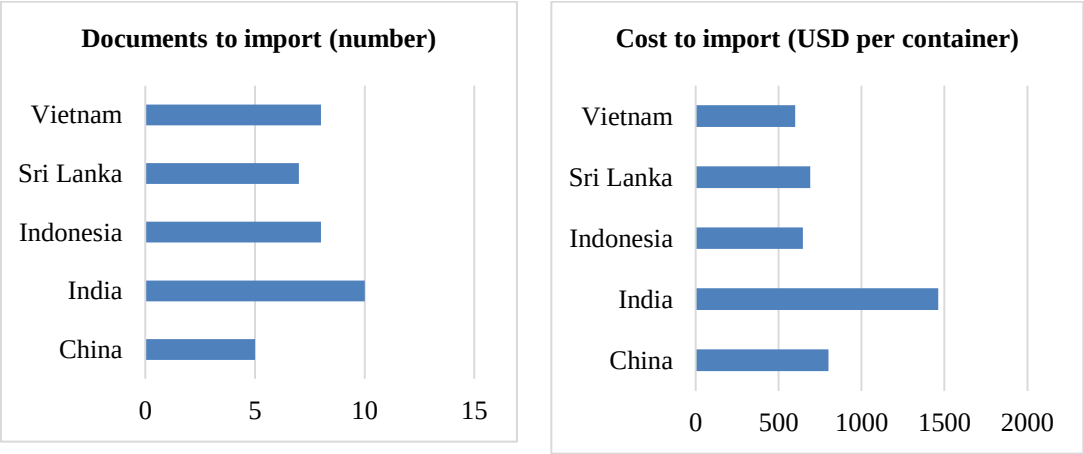
2.5. Constraints on Competitiveness

This section discusses the main constraints to improved productivity/export performance in South Asia. The previous section identified non-labor costs, processing time and low innovation as constraints that have prevented South Asia from integrating more into global electronic chains. This section examines some of the factors behind this.

Cross-cutting investment climate constraints do not show up as significant in enterprise surveys in the electronics sector. A regression analysis based on a survey of enterprises across Bangladesh, India, Pakistan and Sri Lanka (see Annex 6, table 3) reveals little correlation between cross- cutting investment climate issues (for example, corruption, political instability, tax rates) and productivity in the electronics sector. This accords well with the observation that the sector has done well even in countries where the overall environment may not have been as conducive as others (for example, Vietnam), so long as certain basic pre-requisites for the sector –ease of trading, logistics and flexibility- are taken care of.

Lengthy and unpredictable import clearance reduces the competitiveness of South Asian electronics production. South Asian firms are highly dependent on imports, and report that customs clearance can take considerable time and is unpredictable. Firms compensate by holding higher inventories, which undermines cost competitiveness in this very lean industry. Inadequate customs services also delay production and increase turn-around times that, as noted earlier, can severely erode competitiveness. In India, the average time reported to clear customs varied from 2-10 days for large firms, and 14-21 days for SMEs. Lengthy clearance times in part reflect cumbersome and time-consuming procedures (e.g. due to conflicting interpretations and ambiguities in product classification) involved in obtaining exemptions to import tariffs on raw materials and parts & components by IT product manufacturers (exemption notification 25/99). Mechanisms to address grievances also can take considerable time, and companies fear reprisal, for example through losing their trusted trader credentials. One firm stated that *"The customs bureaucracy is very difficult to handle when we import various equipment and that creates a big disincentive for anyone venturing into this market."* Another interviewee said that: "*To gain one rupee in customs duties the country is losing thousands*." Sri Lanka performs better than other countries in South Asia on trade facilitation, but compares slightly unfavorably with its East Asian competitors. According to the Doing Business study 2016, it took 72 hours and cost $300 to import into Sri Lanka, compared to 64 hours and $268 in Vietnam, and 50 hours and $233 in Thailand.

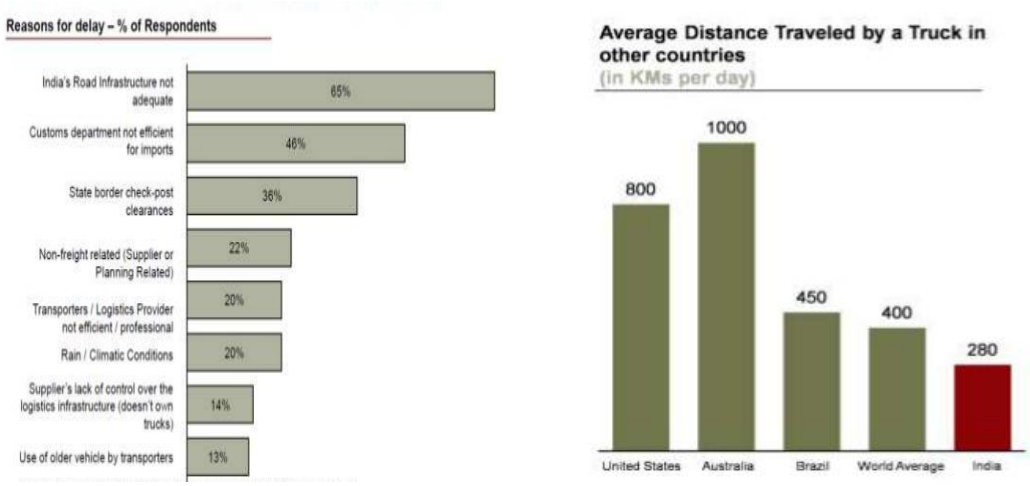
Figure 7: High cost of importing in South Asia vs. Comparators



Source: Doing Business, 2015

Internal logistics are long and unpredictable, raising inventory costs. Fast and reliable logistics are extremely important for a lean industry like electronics. However, even after goods exit the port, poor internal logistics are affecting competitiveness. Indian firms reported that while it takes 11 days for a container to travel from Shanghai to Mumbai, it takes 20 days to travel from Mumbai to Delhi. Poor infrastructure is one reason, but a careful survey shows that a quarter of the journey time is spent at check posts, state borders, city entrances, and other regulatory stoppages (Figure 8, left panel). The existence of two state borders between origin and destination can add as much as a week to delivery schedules. Average distances covered are low, in part because documentation requirements for internal transit are burdensome, and barriers at the borders create opportunities for delay and rent-seeking (Figure 8, right panel). In order to deal with the resulting uncertainty, firms in four industries (auto components, textiles, electronics, and heavy engineering) report maintaining 27 percent higher inventories on average. Total logistics costs- including inventory costs and lost sales- account for 14 percent of total costs for electronics firms, high by international standards.[117] Foxconn CEO Terry Gou commented on TV that "*Your (Indian) infrastructure will be a big limitation. Today I was told it will take 20 minutes to reach you, but it took 1 hour 20 minutes because it rained*."[118] Similarly in Sri Lanka, the rural infrastructure remains underdeveloped with neglected roads and rail lines which undermines rapid inland movement and hinders development of the electronics sector in areas where land may be cheaper and more readily available.[119]

Figure 8: Customs Clearance in India



Source: *Jordan and Kamphuis (2014)*

Inverted tariff structures in India are a constraint in selected products in India. Expenditures on parts is by far the largest contributor to costs in electronics manufacturing (figure 5), so duties levied on imported parts and components (P&C) can have a significant impact on domestic production costs of the final good. Lower duties on final goods than on parts will favor imports of final goods over domestic

[117] World Bank (2014)
[118] http://www.hindustantimes.com/business-news/now-foxconn-looks-to-set-up-payments-bank/article1-1385877.aspx
[119] UN ESCAP 2011

manufacturing that relies on imported P&C. This negative protectionism has been mentioned repeatedly by sector firms, and recently received attention in policy circles in India.[120] Four areas are of concern:

(i) The Information Technology Agreement-1 (ITA-1) provided exemptions on import duties for parts and components used in information technology products, except for "dual use" materials - those used in other industries (importantly copper, aluminum, glass and plastics). This problem has been recognized by the Government of India, and a notification (notification 25/99) provides duty exemption for dual use materials if the end use is for a product covered under the ITA. However, as discussed above, the procedures related to claiming this exemption are so cumbersome that companies are discouraged from taking advantage, which may lead to a preference for importing the final good.

(ii) Imports of medical equipment face a duty of 5 percent, while materials for their production face a tariff of 5–7.5 percent.

(iii) India's trade agreements with Singapore, Thailand, Malaysia, the ASEAN, Korea and Japan resulted in an inverted tariff structure for some products. However, the Government has addressed some of these, most recently in the Budget of 2014/15 (as in the case of LED TVs).

(iv) Finally, a special additional duty of 4% is imposed on inputs for important consumer products like refrigerators, air conditioners, and washing machines, while imports of the final products are exempted from duty (see Annex 2). As a result, big brands may prefer to import these finished goods from their affiliates in East and South East Asia, rather than manufacture them in India.[121] As one manufacturer explained, "*Import content on our products is close to 52%, and due to the higher duty structure on components, the overall disability is 30-40% on the final price of the product.*"

Significant investment is required by firms to ensure an adequate supply of skilled workers. The availability of cheap and adaptable labor is one factor that makes South Asia attractive as a manufacturing destination. However, capitalizing on South Asia's advantage in workers requires significant investment in training and improving people's productivity. The returns can be large – international evidence shows that a 1% increase in training is associated with 0.6% increase in value added per hour.[122] The question is who makes this investment? In South Asia public investment on training has been low and of poor quality, comparing unfavorably with other competitor nations. For example, vocational education programs in India can accommodate only 5% of secondary school graduates, while China has the infrastructure to train half of all secondary school graduates. The quality of training is also an issue. Across the region, the development of new programs and curricula is difficult in public institutions. Quality is further hampered by the lack of industry participation in training.[123] In China, Government finances hiring and training programs, as well as employee housing, which Government sees as critical to acquiring sufficient manpower, enhancing productivity, and sustaining long-term competitiveness. Industrial parks have on-site, well-equipped technical and vocational colleges and secondary schools, with market-driven curriculum and management. Vietnam provides subsidized training for employees. Programs include soft skills, technical English, technical skills as well as on-demand training. Further, companies can set aside 10% of annual taxable income for R&D. This sharing of skilling costs between the state and private companies can significantly encourage investment, especially for companies with a long term vision.

[120] Subramanian and Modi, 2015
[121] Hoda and Rai (2014)
[122] Dearden, Reed, and Van Reenen, 2006
[123] BCG (2013)

Policy clarity and responsiveness in South Asia is lower than competitors. The fast moving nature of the electronics sector presents unique challenges for policy makers, who need to constantly stay abreast of developments and respond quickly to emerging challenges. The slow responsiveness of regulations that hampers firm agility was reported as one of the biggest constraints on sectoral growth in both India and Sri Lanka. A major challenge for any company that considers investing in electronics manufacturing is the multiple clearances needed for setting up a manufacturing facility. India ranked 155 out of 189 economies in terms of starting a business in Doing Business 2016. Sri Lanka ranked better (98), but it nevertheless cost 18.7% of income per capita to set up a firm, compared to 6.4% in Thailand and 4.9% in Vietnam. Firms also complain about the lack of coherence in the regulatory framework, excess paper work, and a multiplicity of laws, which are often unclear (for example see box 5). Complex and burdensome tax structures and regulations that impose substantial compliance costs affect all types of companies, but particularly affect SMEs and start-ups (according to firm surveys). Government policies, that in themselves were often quite good, were also impaired by weak implementation capacity. By contrast, other countries with large electronic manufacturing sectors often focus significant Government attention on easing the regulatory problems facing firms. Vietnam, for example, has a designated deputy PM dedicated to easing problems in the electronics sector. Finally, South Asian firms complained about poorly targeted incentives that do not counter specific locational disadvantages, are not aligned with what other competitors are offering, and too often are associated with complex procedures that reduce access (see Annex 3 for a comparison of incentives offered).

Box 4: The Medical Devices Sector in India

The Indian healthcare market has been growing by 15% per year and is set to reach $150 billion in size by 2017. Market spending on medical devices and equipment has grown faster, at an impressive rate of 17% per year in recent years, and constitutes 9% of the overall market size. The sector remains heavily dependent on imports, which accounted for 65% of sales in 2011. Multinationals have around a 65% share of the market and dominate the hi-tech equipment and devices. Many of these, for example GE, Siemens and Philips, have established subsidiaries in India. In addition, there are around 700 Indian manufacturers primarily focusing on low-margin, low-technology products like disposables and medical equipment. Two thirds of these are SMEs. Like most developing countries, India is also predominantly a manufacturer of Class I and II devices, i.e. devices that are not considered to be high risk and that do not need extensive clinical trials.

Increasingly, foreign medical device companies are outsourcing activities to India, as a way of reducing costs in manufacturing, R&D, clinical trials and other medical services. The activities being shifted include business operations for the South Asian region, contract manufacturing of components by Indian companies for global markets, developing software for advanced imaging equipment, R&D to customize products to South Asian conditions, and clinical research and trials. This presents an opportunity for India to increase domestic manufacturing and become a more important participant in global medical device value chains.

At the same time, a number of issues are hindering growth of the industry. Part of the issue derives from the demand side. Barriers that limit access of a large percentage of people in India to healthcare and medical technologies include lack of awareness, screening diagnosis, trained surgeons and affordable technologies. Further, the government spends only about 1 percent of GDP on health in a country where the majority of patients are from low income households.

The industry is also faced with significant lack of clarity in terms of regulation and predictable access to market. The regulatory framework in India applicable to medical devices is inadequate. The Indian government has regulated only a few types of medical devices. These are being regulated by deeming these medical devices as "drugs" and regulating them through the Drugs and Cosmetics Act, 1940 ("Act") and the rules framed there under viz. Drugs and Cosmetics Rules, 1945 ("Rules"). All other types of medical devices are unregulated, meaning there is no government oversight on their manufacture, import, distribution and sale. The country lacks comprehensive legislation specifying standards of safety and quality for medical devices. The absence of this framework creates uncertainty in the operating environment, results in inferior quality products flooding the market and putting price pressures on genuine manufacturers, and hampers the standing of the Indian market.

Source: ValueOn Shore (2015)

Land is a constraint for large investors and clustering, especially in Bangladesh. Clustering of lead and supplier firms in close proximity is an important source of efficiency, and allows for greater quality control (Box 5 lists benefits of clustering for individual firms). However, clustering in South Asia is rendered difficult because buying land at suitable locations is often an arduous and expensive task. Verification of titles is complex and procedures for purchasing land take time. It is difficult for large companies to assemble enough small plots of land. The scarcity of adequate land is also reflected in very high prices. Companies prefer to locate close to major markets or ports, but some Indian and Sri Lankan peri-urban areas are among the most expensive in the world.[124] The practical solution to these issues has been industrial zones, which played a central role in the development of manufacturing, electronics in particular, in East Asia. The lack of readily-available and well-located industrial land is probably the main constraint on the development of the sector in Bangladesh. For example, in 2011 Samsung requested 250 acres in an EPZ to develop an electronics hub in Chittagong ($1.25 billion investment, 50,000 workers). The investment did not materialize because no more sizeable land was available in the BEPZA zones, and land in the mostly empty Korean Export Processing Zone is under dispute. By contrast, Vietnam has been able to provide large, readily-available tracts of land to large investors as well as their suplliers. One of these, Samsung was able to locate there along with 76 of its Korean suppliers, and now directly employs 100,000 workers .

Box 5: The Benefits of Clustering for Firms

- Reduced dependence on unreliable logistics for lead and supplier firms allowing for predictable supply and tighter inventories
- Anchor firms can maintain stronger quality control over suppliers
- Increased bargaining power with infrastructure providers can potentially improve access to essential infrastructure or help lower mitigation costs, for example through clusters negotiating a dedicated power distribution station
- Easier access to soft infrastructure such as mentoring and sharing of knowledge among entrepreneurs
- Improved access to and cost of finance thanks to the pooling and credibility effect of the cluster

[124] Saleman and Jordan (2013)

- Lower skilling costs through provision of common training facilities

2.6. Policy Recommendations

Cut tariffs all the way up the supply chain to remove the inverted tariff structure in India: There is a strong case for India to continue its trade liberalization and lower tariffs all along the supply chain. As noted earlier, the partial relief given through Notification 25/99 is difficult to implement, and such tariff reductions could help provide an impetus to domestic manufacturing.

In the interim, Government could take steps to reduce the administrative burden involved in obtaining exemptions (see box 6). Lowering tariffs could also benefit P&C manufacturers across South Asia, including in Sri Lanka and Bangladesh. For exports, the destination principle of indirect taxation incorporated in the WTO rules means that import duties and charges levied on the parts and components imported for use in the manufacture of finished goods that are later exported, are either exempted or refunded through drawback schemes when the actual exports take place. In order to make this easier, South Asian Governments may wish to consider provision of bonded warehouse facilities for firms exporting electronic goods.

Improve trade facilitation measures and infrastructure: There are a number of broader trade facilitation measures, including commitments made under the WTO Trade Facilitation Agreement that would speed up clearance processes at the border in South Asia. Key measures include fully electronic submission of documents, improved coordination of border management across responsible agencies, and establishment of an effective and quick grievance redress mechanism.

Box 6: Options for streamlining the implementation of Notification 25/99

1. Presently the application for obtaining the concessional rate of duty is to be submitted to the Assistant Commissioner or Deputy Commissioner of Central Excise through the Range Superintendent. This causes undue delay in clearing consignments, and a good number of cases involve demurrage.
   The application should be countersigned by the Range Superintendent instead of

the Assistant Commissioner or Deputy Commissioner of Central Excise

2. The procedure involves executing a bond for the differential amount of duty, which has to be given individually against each consignment or a running bond for the total amount required for a year. The procedure for extinguishing this bond is also not clear and very cumbersome. Applications are made for each item, separately for each port of import, for requirement of three months.
   This is a tedious and repetitive procedure and it is recommended that yearly applications be permitted.

3. Intimation is required to be given to Central Excise within 24 hours of material receipt and the material cannot be used until it is verified.
   This restriction could be removed, allowing provision of monthly information on the items received to be filed.

4. Central Excise Department verifies the records and input to output ratio, and issues the End Use Consumption certificate. This procedure takes a long time and serves no purpose, as most items covered under notification No.25/99 can be used only in the manufacture of the related end product. The end result is delay, stock out and stoppage of production.
   Se*lf-certification / Chartered engineer certification based on the input output ratio and /or norms for consumption of the raw materials should be accepted. It is also recommended that the firms' records may be accepted for issuing the consumption certificate and the format for this record and the input output ratios may be fixed when a new product is introduced. These can be reviewed and reconfirmed once every year by Central Excise.*

5. *The import of raw material/inputs by local manufacturers of Electronic Components and assemblies should be routed through a green channel procedure, based on self-certification. Established and regular manufacturers with a good track record should be provided a Green Card for quick processing of their consignments. There should be no need for any Certificate or Bond, and only a consumption report may be required periodically to confirm genuine use of the imported material.*

Source: ELCINA (2015)

Make land available for specialized clusters, delivered in ways that respond to organic firm demand: An important consideration is to get the location right**.** Interviews suggest that manufacturers seeking to link up to global supply chains prefer to locate in areas that are close to ports, to speed up supply chains and reduce dependence on local infrastructure. Setting up clusters in such areas – either as SEZs or industrial parks – that are large enough to house lead firms and suppliers would help attract electronic manufacturers. Investors would also like to see world class infrastructure developed around and within the cluster, especially to link it with the port and to major markets. Another requirement, particularly from SMEs, is for common facilities for R&D and testing facilities, waste dumping, and recycling. Provisions for worker housing within or close to the cluster is important. Manufacturing facilities tend to be located outside urban areas to take advantage of lower land costs. However, ensuring an adequate supply of labor requires them to pay to transport workers to the sites or to create facilities for them to stay close by, both of which raise costs. An inventory of existing Government-owned land that could be made available quickly could be used to allocate parks that are not doing well in their specified purpose for electronic manufacturing. Allowing parcels of land that are close to, though not contiguous, with each other to be classified as a SEZ could deliver benefits of clustering without the difficulties of acquisition. In India, there is a need to remove hurdles and create incentives for states to reclassify and reuse land. In Bangladesh, a good starting point would be for the Government to resolve the 15 year old conflict with the Korean Export Processing Zone, which has led to 2,000 acres of prime industrial land, in a prime location next to the Chittagong port, staying idle.

Make a concerted effort to strengthen both vocational training and curricula for higher-level skill development required for electronics manufacturing: Governments in South Asia should invest more in improving technical and vocational infrastructure (Box 7 shows the example of training in China). Companies can be provided incentives for investing in worker training and R&D. However, introducing major design and managerial reforms into public delivery systems is more critical. This would include, for example, significant involvement of employers in designing curricula and training to ensure greater responsiveness to sector needs. Companies could run "train the trainer" programs for public institutions and help them by offering students live work projects. Another important reform would be to give institutions greater autonomy in deciding training programs, to enable them to respond to changing trends in this fast moving sector. Innovative solutions are needed, for which international experience could serve as a guide.[125]

Box 7: China's approach to providing skills to its workforce

Over the years, the Chinese government has invested extensively in vocational education. The quality of training in Chinese vocational institutions is good, mainly due to extensive industry participation, favorable government policies and a flexible curriculum. The key stakeholders in the ecosystem work hand-in-hand. Chinese courses require students to undergo a full year of training for a diploma, ensuring that students are better equipped to be absorbed immediately into the job market.

Similarly, to make sure that the faculty always keeps abreast of the latest industry practices, the Chinese government has made it compulsory for vocational trainers to spend at least a month

[125] World Bank, 2006.

every year in manufacturing companies. Additionally, China has made it very easy for vocational students to move back into general academic programs by sufficiently covering general academic skills in vocational curricula.

Chinese firms take employee training, one of the top levers to attract best talent in a competitive market, very seriously. This is reflected in the fact that Chinese manufacturers spend twice the amount on training and development than do their Indian counterparts.

Source: BCG (2013).

Facilitate policy implementation through process changes and institutional innovation: A major issue firms in the region report is the lack of effective dialogue with Government. Policy makers should consider building national monitoring and problem-solving processes and institutions to effectively respond to emerging issues. They could encourage "industrial dialogues" that involve not only large flagship firms, but also young firms that seek to create and commercialize new products and processes, as well as other stakeholders such as university and public R&D labs. These should go beyond being just "talk shops", and should be linked to meaningful, action-oriented committees. One innovation could be to use the large South Asian diaspora to mentor and guide policymakers and firms in developing the electronics sector in the region (Box 8).

Box 8: Leveraging the diaspora to build bridges

In the 1960s and 1970s, Taiwan and the United States had a textbook first world-third world relationship. American businesses invested in Taiwan primarily to take advantage of its low-wage manufacturing labor. Meanwhile, Taiwan's best and the brightest engineering students came to the United States for graduate education and chose to stay to pursue professional opportunities. Many ended up in Silicon Valley.

This relationship changed significantly during the 1980s. By the late 1980s, engineers began returning to Taiwan in large numbers, drawn by active government recruitment and the opportunities created by rapid economic development. At the same time, a growing cohort of highly mobile engineers began to work in both the United States and Taiwan, commuting across the Pacific regularly. Typically Taiwan-born, U.S.-educated engineers, these "astronauts" had the professional contacts and language skills to function fluently in both the Silicon Valley and Taiwanese business cultures and to draw on the complementary strengths of the two regional economies A closely knit community of Taiwanese returnees became the bridge between Silicon Valley and Hsinchu. These social ties, which often built on pre-existing alumni relationships among graduates of Taiwan's elite engineering universities, were institutionalized in 1989 with the formation of the Monte Jade Science and Technology Association.

Monte Jade's goal is the promotion of business cooperation, investment, and technology transfer between Chinese engineers in the Bay Area and Taiwan. Although the organization remains private, it works closely with local representatives of the Taiwanese government to encourage mutually beneficial investments and business collaboration. This transnational community has accelerated the upgrading of Taiwan's technological infrastructure by transferring technical know-how and organizational models as well as by forging closer ties with Silicon Valley. Observers note, for example, that management practices in Hsinchu companies are more like

those of Silicon Valley than the traditional family-firm model that dominates older industries in Taiwan.

As a result, Taiwan is now the world's largest producer of notebook computers and a range of related PC components including motherboards, monitors, scanners, power supplies, and keyboards. In addition, Taiwan's semiconductor and integrated circuit manufacturing capabilities are now on a par with the leading Japanese and U.S. producers, and its flexible and efficient networks of specialized small and medium-sized enterprises coordinate the diverse components of this sophisticated infrastructure.

Taiwan has also become an important source of capital for Silicon Valley start-ups—particularly those started by immigrant entrepreneurs who historically lacked contacts in the mainstream venture capital community. Formal investments from Asia (not including Japan) were more than $500 million in 1997. These investors often provide more than capital. According to Ken Tai, a founder of Acer and now head of venture fund, InveStar Capital:"When we invest we are also helping bring entrepreneurs back to Taiwan. It is relationship building . . . we help them get high level introductions to foundries (for manufacturing) and we help establish strategic opportunities and relationships with customers."

The growing integration of the technological communities of Silicon Valley and Hsinchu offers substantial benefits to both economies. Silicon Valley remains the center of new product definition and design and development of leading-edge technologies, whereas Taiwan offers world-class manufacturing, flexible development and integration, and access to key customers and markets in China and Southeast Asia

Source: Saxenian (1999)

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Technical Annexes

Annex 1

Trends in Registered Manufacturing of Electronics and IT Hardware Industry in India

Characteristics	1990- 91	2000-01	2001- 02	2003-04	2004-05	2005-06	CAGR		
							Total Period (1990-91 to 2005-06)	Period I (1990-91 to 2000-01)	Period II (2000-01 to 2005-06)
Number of Factories	1591	1583	1432	1314	1371	1359	-1.05	-0.05	-3.01
Number of Workers	96770	97270	87274	85540	91416	103129	0.43	0.05	1.18
Total Persons Engaged	158991	151130	135387	132941	138300	151102	-0.34	-0.51	0.01

Source: National Productivity Council

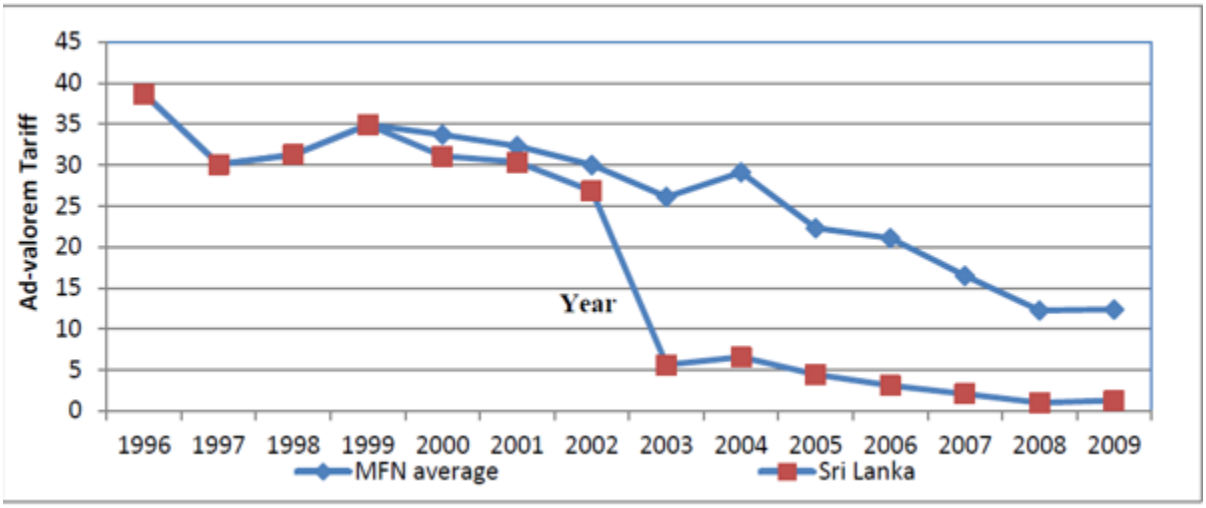
Annex 2

Schedule of Tariff concessions under India Sri Lanka FTA

Granting Country	Tariff Cuts	Items description
Sri Lanka	0 per cent removal of tariff	for items in Annexure D of the agreement . Around 1180 items were there in negative list(annexure D)
	100 per cent removal of tariff	for items in Annexure F-1 of the agreement . Total number of items under this category 319
	50 per cent removal of tariff followed by phased out removal of tariff	for items in Annexure F-II of the agreement (the margin will be deepened to 70 per cent, 90 per cent and 100 per cent respectively at the end of first, second and third year of the entry into force of the agreement). Total number of items under this category 889.
	Residual List	for remaining items by not less than 35 per cent before the expiry of three years. 70 per cent before the expiry of sixth year and 100 per cent before the expiry of eighth year. Total number of items under this category 2724.
India	0 per cent removal of tariff	for items in Annexure D of the agreement (Negative List) . Total number of items under this category -429
	25 per cent removal of tariff	for items in Chapters 51-56, 58-60, 63. Total number of items under this category-233
	100 per cent removal of tariff	for items in Annexure E of the agreement .Total number of items under this category-1351
	50 per cent removal of tariff	Up to 15Mn. Kgs. Of Tea, 2 Mn. pieces of garments, and 6 Mn. pieces of garments using Indian fabrics. On utilization of unrestricted quota, an additional quota of 2 million pieces out of 8 Mn. pieces is permitted .
	50 per cent removal of tariff followed by phased out removal of tariff	for remaining items (margin will be increased upto 100 per cent in two stages within three years. .Total number of items under this category-2799

Annex 3

India's Average Applied MFN and Preferential Tarff under India Sri Lanka FTA



Source: Choudhary et al (2013)

Annex 4: Duty Inversions impacting the Electronics Sector in India

FINAL PRODUCT							RAW MATERIAL						
Sl. No.	HS Code	Product Description	Current Basic Custom Duty	Current SAD (Special Additional Duty)	Current CVD (Counter Veiling Duty)	Is the final product imported under an FTA in India at concessional duty?	Sl. No.	HS Code	Product Description	Current Basic Custom Duty	Current SAD	Current CVD	Is the raw material imported under an FTA in India at concessional duty?
A	84182100	Refrigerator	10%	0%	12.5%, 35% rebate when importing on MRP	Thailand, Veitnam, Indonesia Philippines, Singapore,	1. Compressor	8414.30 00	Compressor	7.5%	4%	12.5%	NA
							2. Roll Bond Panel	8418.99 00	Roll Bond Panel	7.5%	4%	12.5%	NA
							3. Isocynate	2929.10 90	Isocynate	10%	4%	12.5%	Japan
							4. Cyclopentane	2902.19.00	Cyclopentane	10%	4%	12.5%	NA
							5. Glass	70071900	Glass	10%	4%	12.5%	NA
							6. Fan Motor	85013210	Motor	7.5%	4%	12.5%	NA
							7. CFM	7210.70 00	CFM	7.5%	4%	12.5%	Korea
							8. Timer	90292090	Timer	10%	4%	12.5%	NA
B	84501100	Washing Machine	10%	0%	12.5%, 35%	Thailand, Vietnam,	1. Motor	85013119	Motor	10%	4%	12.5%	NA
							2. Drive	84834000	Drive	10%	4%	12.5%	
A	84182100	Refrigerator	10%	0%	12.5%, 35% rebate when importing on MRP	Thailand, Veitnam, Indonesia Philippines, Singapore,	1. Compressor	8414.30 00	Compressor	7.5%	4%	12.5%	NA
							2. Roll Bond Panel	8418.99 00	Roll Bond Panel	7.5%	4%	12.5%	NA
							3. Isocynate	2929.10 90	Isocynate	10%	4%	12.5%	Japan
							4. Cyclopentane	2902.19.00	Cyclopentane	10%	4%	12.5%	NA
							5. Glass	70071900	Glass	10%	4%	12.5%	NA
							6. Fan Motor	85013210	Motor	7.5%	4%	12.5%	NA
							7. CFM	7210.70 00	CFM	7.5%	4%	12.5%	Korea
							8. Timer	90292090	Timer	10%	4%	12.5%	NA
B	84501100	Washing Machine	10%	0%	12.5%, 35%	Thailand, Vietnam,	1. Motor	85013119	Motor	10%	4%	12.5%	NA
							2. Drive	84834000	Drive	10%	4%	12.5%	

Source: FICCI

Annex 5: Key Incentives Offered in SEZs for Electronic Manufacturing

	Fiscal Incentives	Logistics	Other Features
Sri Lanka	**Duty free** imports of capital goods and raw materials	Processing of import/export documents, on-site examination of cargo	Subcontracting for urgent production orders between SEZ companies
	Exemption from VAT and Ports and Airports Development Levy (PAL)	Temporary export of captial goods for repair	Total foreign ownership permitted
	Exchange control exemption	Non-export oriented companies are entitled to import project related capital goods free of Customs Duty, during the project implementation period	
Bangladesh	**Duty Free** imports of machinery and raw materials, construction materials and 3 motor vehicles; duty free exports	Export and import permits issued same day; customs clearance at plant	100% foreign equity allowed; full repatriation in case of exit
	Tax holiday for 10 years, concessionary tax for 5 years after; exemption reduced throughout 10 years: 1st and 2nd year 100%, 3rd year 80%, 4th 70%, 5th 60%,6th 50%, 7th 40%, 8th 30%, 9th 20% and 10th year 10%		No restrictions on issuance of work permits on project related foreign nationals and employees but limited up to 5% of total employees; 50% Rebate of income tax on salary income of expatriates for 5 years
	80% exemption of VAT on all utility services consumed inside the zone; 50% exemption of stamp duty and registration fees	Option to relocate from one EPZ to another	

	for registration of leasehold land/ factory space; Exemption from dividend tax for 3 years, exemption from capital gains tax	SEZ is considered a customs bonded area	Secure land and factories for rent; electricity, telecommunications, gas and water facilities
Vietnam	**Tax holiday** for four years. Then corporate income tax increases to 5% for years 5-13 and then to 10% from years 13-15. Rate then reaches country-wide tax rate of 22% (will be lowered to 20% in January 2016). Rate stays at 10% for 30 years if the project is large and involves a new technology in an incentivized sector (ICT)	On site electronic customs clearance	Companies pay reduced tax (10%) on income from corporate **workforce training** for the lifetime of the project
	Duty free import of equipment and machinery, transport vehicles for workers including 24 or more seat motor vehicles and boats, components and spares for both categories of goods, components, raw materials, and construction materials that cannot be produced domestically. Also import duty and VAT exemption on goods used in scientific research and technological development	**One stop shop**: approval of work permits (for foreigners), construction permits, environmental assessments, and investment certificates	**Subsidized training** for hired and pre-hired employees. Programs include soft skills, technical English, technical skills as well as on-demand training
			Access to preferential loans (up to 70% of the project's total investment) and grants (up to 30% of the project's total investment)
	Export duty and VAT exemption on high technology products (full list in tab titled "Vietnam High Tech Products")		Companies can set aside 10% of annual taxable income for R&D

India	**Duty free import** of required machinery, production lines and related equipment; import and domestic procurement of component parts as required for the final product	On-site customs clearance, post and telegraph office, satellite data link facility required for software exports	The minimum area requirements for multi-product SEZs is now reduced from 1000 hectares to 500 hectares, or from 100 hectares to 50 hectares for sector-specific SEZs and SEZs with one or more services
	VAT rebate of 100% on exported India sourced components		Minimum area requirement of 10 hectares for SEZs proposed to be set up exclusively for electronic hardware and software
	Corporate Income Tax exemption on export income for first 5 years, 50% for next 5 years thereafter and 50% of the ploughed back export profit for next 5 years	**Noida SEZ Logistics:** NSEZ has been declared as an Inland Container Depot (ICD) under the Customs Act, 1962 to facilitate inward/outward movement of cargo	Unit may now opt out of a SEZ by transferring its assets & liabilities to another person by way of transfer of ownership, including a sale of the SEZ Unit.
	Exemption from Service Tax, Minimum Alternate Tax, Central Sales Tax, State Sales Tax and other levies as extended by the respective State Governments	**Madras SEZ Logistics:** SEZ firms can file their bills of entry from their factory. The Preventive Wing of the SEZ's customs division has 11 staff members, 24/7 to process goods entering the zone from abroad or elsewhere in the country	**Single window** clearance for Central and State level approvals
	Subsidy of 20% for capital expenditures		**External commercial borrowing** by SEZ units up to US $ 500 million in a year without any maturity restriction through recognized banking channels

(Foreign Invested Companies)	**Corporate income tax** exemption for first two years of operation. Foreign-owned firms pay half of corporate tax rate for ensuing three years (15%). Tax rate is 10% for certified firms that export at least 70% of production. Potential additional three-year extension at 10%. Rate eventually rises to normal tax rate of 25% (Including national and state taxes). High-tech enterprises that invested in or after 2008 can also apply for a two-year tax holiday followed by three years of a 12.5 percent rate	Transportation service provided from a Chinese company to a foreign company is subject to 0% VAT; VAT for international logistics can be exempted. However, each company has to apply at the tax bureau for VAT exemption	Foreign invested companies must apply for foreign exchange registration with SAFE. These companies can take on foreign debt without SAFE's approval. However, the total amount of foreign debt cannot exceed the difference between registered capital and total investment amount
	Land use fee will be cut in half for five years for certified exporters that import state-of-the-art technology		
China	**Integrated circuit production** companies receive a five-year corporate income tax holiday, followed by five years at 50% the normal rate (25%) when slated for at least 15 years of operation, and when total investment exceeds RMB 8 billion or where produced ICs have a width of less than 0.25µm		Foreign invested companies can repatriated profits once taxes have been paid in full, dividends have been declared, and losses from previous years of operation have been made up
	If **R&D expenditures** increase by 10% from the previous year, companies are eligible for 50% corporate income tax deduction		

Source: Staff, based on publicly available information

Annex 6: Data and analysis of innovation and obstacles to productivity

Table 1: Innovation Expenditures by Electronic firms in South Asia

Size	No. of Electronic Firms	% of Firms with Innov. Exp.	Innovation Expenditure per Sales
SMEs (<100)	202	67.3%	4.7%
Large (>=100)	99	73.7%	1.1%
Total	301	69.4%	3.5%

Table 2: Avg. of Expenditures and New Products over Sales for Electronics in South Asia

Size	Machinery	Non-Machinery	Total	New Products
SMEs (<100)	3.9%	0.9%	4.7%	6.1%
Large (>=100)	0.4%	0.7%	1.1%	10.3%
Total	2.7%	0.8%	3.5%	7.5%

Table 3: Obstacles to Productivity - Electronics

VARIABLES	(1) Labor Prod - All4	(2) TFP - All4	(3) Prod Growth - All4
Finance	-0.0146	-0.0066	-0.0105
	(0.015)	(0.015)	(0.009)
Political	0.0334	-0.0710	0.0146*
	(0.061)	(0.027)	(0.004)
Crime	0.0583	-0.0446	0.0208*
	(0.258)	(0.039)	(0.007)
Taxes	-0.0463	0.0938*	0.0053
	(0.234)	(0.022)	(0.007)
Corruption	-0.0193	0.0188	0.0116
	(0.022)	(0.024)	(0.007)
Informal Sector	-0.0598	0.0760	0.0262
	(0.142)	(0.034)	(0.020)
Labor Regulations	-0.0569	-0.1465***	-0.0402
	(0.111)	(0.009)	(0.018)
Workforce Education	0.0299	-0.0545	-0.0054
	(0.094)	(0.022)	(0.009)
Electricity	-0.0901	-0.0259	0.0080
	(0.031)	(0.039)	(0.011)
Constant	9.7807***	1.0413	-0.1110
Observations	609	422	521
R-squared	0.0598	0.0915	0.0716

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: CDM Model solved sequentially for Electronics in South Asia

Stage Dependent Variable	(1) 1st Stage Log(Innov. Expenditures/Sales)	(2) 2nd Stage Log(New Products/Sales)	(3) 3rd Stage Log(Labor Productivity)
Predicted Log(Expenditure/Sales)		22.2136*	
		(11.530)	
Predicted Log(New Products/Sales)			2.5828**
			(1.204)
Log(Size)	-0.0136***	0.3094**	0.1238
	(0.005)	(0.154)	(0.120)
Log(Age)	0.0136*	-0.3412**	
	(0.007)	(0.163)	
Export	0.0053	0.0182	
	(0.012)	(0.094)	
Foreign Status	-0.5074	8.9797	
	(0.000)	(0.000)	
Internal Funds	-0.0103	0.2042	
	(0.012)	(0.153)	
Duopoly / Monopoly	0.0080		
	(0.014)		
Capital Labor Ratio			0.0000
			(0.000)
Process Innovation			0.3063
			(0.274)
Organization Innovation			0.1889
			(0.203)
Constant	-0.0192	0.1755	10.0211***
	(0.046)	(0.356)	(0.892)
Observations	290	295	155
R-squared			0.1243

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The analysis of the drivers of productivity based on the World Bank Enterprise Surveys confirms that size and export status are positively associated with productivity in this sector across Bangladesh, India, Pakistan and Sri Lanka (see Table 5 below).

Table 5: Drivers of Productivity - Electronics

	(1)	(2)	(3)
VARIABLES	Labor Prod - All4	TFP - All4	Prod Growth - All4
Log(Size)	0.2155***	0.0660	0.0130
	(0.011)	(0.024)	(0.015)
Log(Age)	-0.1457	-0.0967	-0.0148
	(0.130)	(0.064)	(0.018)
Foreign	-0.3572	0.1694	-0.0375
	(0.544)	(0.428)	(0.201)
Exporter	0.2684	0.3433*	-0.0583***
Constant	9.7807***	1.0413	-0.1110
	(0.496)	(0.395)	(0.078)
Observations	609	422	521
R-squared	0.0598	0.0915	0.0716

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

3. From Fringe to Global: Improving the Competitiveness of the Auto and Auto Parts Value Chain in India and Pakistan

3.1. Executive Summary

The automotive sector in India and Pakistan is now ready to move from a 'domestic growth under protection' model to a more sustainable 'productivity driven global growth' model.

Both countries have used high tariff barriers to attract market-seeking original equipment manufacturers (OEMs), who in turn contributed to the development of supplier networks. The next challenge and opportunity for the sector is to become globally competitive.

Sustained high levels of protection for OEMs have permitted large productivity gaps to persist in the sector, with most OEMs (together with most of their suppliers) having subscale/fragmented operations operating at low capacity utilization, and with quality standards below international benchmarks. Investments in innovation, worker skills and R&D are also limited. High import tariffs (especially for parts) in Pakistan have meant lower productivity and domestic competition than in India. Across firms, spatial arrangement in clusters as well as linkages with global value chains (GVCs) are found to drive higher productivity.

The potential for the sector to become globally competitive is shown by the Indian parts manufacturers who ventured outside the comfort of supplying their protected domestic OEMs, insert themselves into GVCs, and become world leaders—for example, Bharat Forge which supplies most global car companies. These parts manufacturers became leaders by combining competitive labor costs with rapidly improving firm-level capabilities, having first acquired technical and managerial skills from leading domestic OEMs (for example, Maruti Suzuki and Hero Honda), followed by a process of serving increasingly discerning customers abroad and entering export markets with high standards. India also has the potential to become one of the main global centers for automotive research and development (R&D); for example, a large share of Bosch's global R&D is done in Bangalore, where it employs 15,000 personnel.

Responding to the main constraints that limit higher productivity in this sector, the key recommendations are thus to: (a) revise incentives for OEMs to improve their operational performance (as well as that of their suppliers) by gradually reducing the high level of protection on cars—experience shows that the gradual reduction of tariffs on auto parts and commercial vehicles in India did not lead to debilitation of these industries, but rather spurred growth and employment; (b) converge toward international environmental and safety standards, which will further encourage OEMs to adopt (and contribute to) international good practices; (c) remove the trade barriers within India which contribute to the fragmentation of the industry and higher operational costs; (d) provide assistance to help small and medium enterprises (SMEs) develop linkages to value chains and clusters, to improve their operations, adopt new standards, invest in skills, develop new products, and access export markets; and (e) support programs for innovative design and R&D activities in the value chain.

Such measures will enable the region to fulfill its great potential in this key and rapidly globalizing industry.

3.2. Motivation and methodology

The auto sector -including the auto parts industry- is a key contributor to jobs and economic growth in India and Pakistan. The Indian automotive sector is one of the top five industries in the economy in terms of factory gross value,[126] is the sixth largest producer of vehicles globally, attracted US$12.3 billion of cumulative foreign direct investment (FDI) between 2000 and 2015,[127] and supported 19 million people in direct and indirect employment in 2012. Pakistan's auto industry is the sixth largest manufacturing subsector; the passenger cars segment alone provided employment to 2–3 million people directly and indirectly[128] (the market for, and employment in, auto parts may be under estimated because of the large presence of informal firms).[129]

This case study focuses on the automotive sector in India, and to a lesser extent, Pakistan (the two main automotive producers in the region). We focus on the auto value chain, including OEMs (assemblers and final customers in manufacturing), Tier 1 firms (typically large firms who play the role of integrators and supply critical components), Tier 2 firms (suppliers of individual parts to Tier 1s and OEMs), and Tier 3 firms (raw material providers). We exclude services aspects of the value chain, such as dealer networks and after-service. The bulk of our attention is on passenger cars, which has by far the largest share of the vehicles markets, but we touch on commercial vehicles (India) as well as motorcycles and tractors (Pakistan) where useful. China, and in a limited number of cases Korea and Vietnam, are used as comparators.

3.3. Performance of the auto sector in India and Pakistan

Although the sector experienced rapid growth in both India and Pakistan in the 1990s and 2000s, growth has markedly slowed down in recent years, exports remain only a small fraction of production, and productivity is well below levels in East Asian countries, including China. The chapter discusses the performance of the sector with regard to output, trade, and productivity.

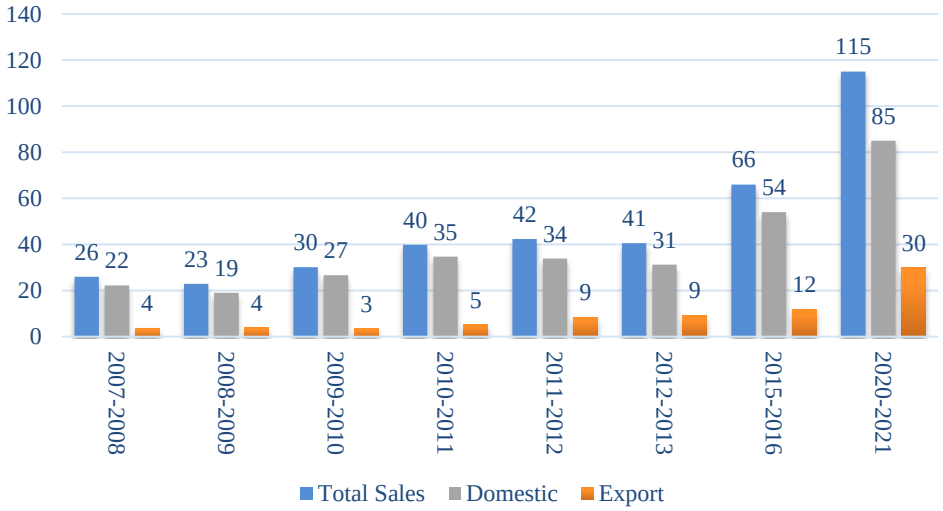
3.3.1. Output

A combination of size, growth, potential, and protection has made India one of the most attractive auto markets in the world, and several global OEMs from East Asia, Europe, and the United States have installed production bases in the country. The Indian auto industry grew at a compound annual growth rate (CAGR) of 11–15 percent between 2005 and 2015, with a marked slowdown since 2012. By volume, India ranks sixth among the world's markets for four wheelers, second for two wheelers, and eighth for commercial vehicles. In 2013, India claimed around 4 percent of global car production, the largest segment by value and volume,[130] and captured 9.3 percent of total growth in the auto industry from 2005-13. Although this is impressive considering past performance, China achieved a 26 percent share of global production in auto and accounted for over 80 percent of the growth during this period.[131] With penetration rates in India half the levels in China, a growing middle class, incomes improving faster than car prices, new investments in infrastructure and other favorable demand drivers, there is significant potential for further growth in India's automotive sector.

[126] SIAM and BCG Report 2013.
[127] Annual Survey of India (ASI) 2012–2013; Statistics from Department of Industrial Policy and Promotion (DIPP) 2015.
[128] Presentation on "Regional Competitiveness Study on Auto Sector," Institute of Development and Economic Alternatives 2015.
[129] Pakistan does not appear in the top 40 producers of OIAC ranking.
[130] SIAM Statistics Report 2015; ACMA Presentation 2014.
[131] LeBeau 2014.

Auto parts in India increased by 11 percent a year from 2010-2015, with 70 percent of production coming from the organized sector and a rising share of exports.[132] This submarket grew in absolute terms and in trade flows following the gradual reduction of import tariffs in 1990s. Size estimates of the auto parts industry vary, but it was estimated at around US$20 billion–US$41 billion in 2013, which is a large share of the overall auto market (see Figure 1).[133] The total number of auto parts producers is over 2,500, out of which 500–600 are in the organized sector and contribute to 70% of production (including exports). [134] Remaining production capacity served after-markets and commoditized parts markets, which are typically less demanding on quality standards. The Indian auto parts sector is characterized by a few large players that can produce at export quality, while functioning in a sea of highly fragmented, organized and unorganized firms.

Figure 6: Auto parts sales in India (in US$, billions)



By contrast, the production of passenger cars in Pakistan is only at one-third of the Indian level (on a per capita basis) and has been stagnant since 2006. However, motorcycle production has been rising. The penetration for passenger cars is 30-40 percent lower than in India. From a low base, the production of motorcycles has increased tenfold since 2001, reaching 2 million in 2014, since 2005 boosted by the entry of new firms, including Chinese 'clones.' However, Pakistan's motorcycle market is still being mainly supplied by Honda (50 percent) and a series of local brands. There are about 115 players in this market, and about 80 of them are currently active. Pakistan ranks within the top 10 in the world for motorcycles (in volume).

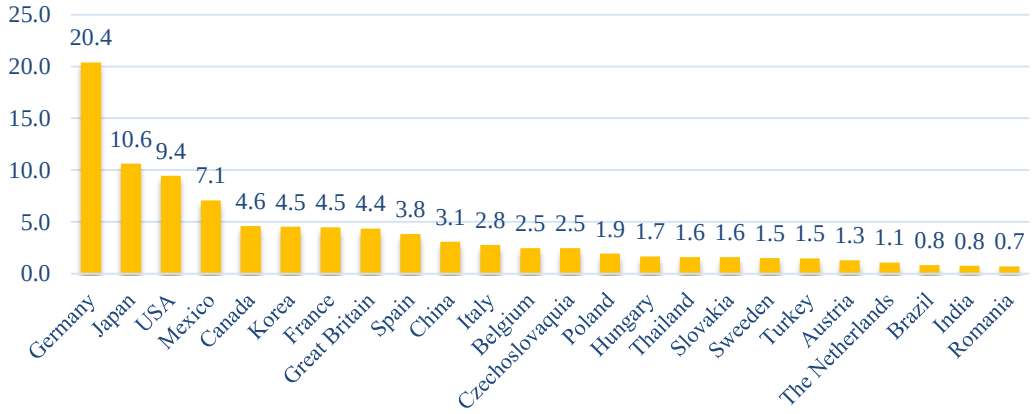
3.3.2. Trade

The shares of production devoted to exports in the Indian and Pakistani auto sector are low (Figure 2). Even though India is the world's sixth largest auto producer by volume, and auto exports increased at 18 percent per year over 2009-2013, India owns less than 1% of global export markets. This is attributable to India's large domestic market, as it is easier for auto firms to fulfill domestic demand than export (India exported less than 20 percent of its passenger vehicle production in 2013). Among BRIC countries, only China has been able to achieve a substantial share of the global

[132] ACMA Presentation 2014; Narayan, B.G. et al. 2008.
[133] SIAM BCG Report (2013) pegs it at US$20 billion while ACMA figures show it is US$39 billion. It probably falls within this range.
[134] World Bank Enterprise Survey, India 2014. Among the 500+ firms surveyed anonymously in the Enterprise Survey, 60–70% are auto parts firms, remaining includes large OEM players and other firms.

auto markets despite having a large and growing domestic market. The average auto firm in India exported only 5 percent of its total sales, compared to 16 percent in China. However, if we look at only 'exporting auto firms' in India, the share of exports to annual sales rises to 15–16 percent. Intra-region trade for India is not significant, with the closest largest automaker Pakistan being a relatively closed market. Pakistan did not feature in the top 40 exporters in 2014.

Figure 7: Share of exports in production in the automotive sector (in %, 2014)[135]



Auto parts have a higher share of exports to production compared to vehicles. Nearly 44 percent of auto parts produced in India is exported, as opposed to less than 20 percent of final cars. Exports of auto components increased by 15 percent a year from 2009-2014, [136] a higher rate than production growth. The OEMs and Tier 1 firms accounted for 80 percent of end customers, indicating high quality demands at the customer end. Less than a decade ago, only 35 percent of parts were going to the OEMs, with the rest going to the after-sale market. Even with this progress, India's share of global auto parts exports is only 1 percent, while China's is 10 percent and Korea's is 2.5 percent, implying a significant potential for further growth.[137]

The composition of India's automobile sector imports is driven by the tariff structure. The bulk of automotive imports are either commercial vehicles or auto parts, which are charged an import duty of 12.5 percent. [138] By contrast, the tariff on completely built units (CBUs) of passenger cars is as high as 60 percent (compared to 25 percent in China, and a mere 7.9 percent in Korea), so that most car imports are premium vehicles from Germany (41%) and UK (21%). Although imports of auto parts increased from US$8 billion in 2009 to US$13 billion in 2013–2014,[139] the net trade in auto parts has remained constant due to the concomitant rapid rise of exports.

High tariffs in Pakistan stifle automotive trade. The import tariff on motor vehicles in Pakistan is 76 percent, compared to 60 percent in India, and the tariff on auto parts is 35 percent, compared to 12.5 percent in India. The simple average tariff on all vehicle imports in Pakistan is 40 percent—

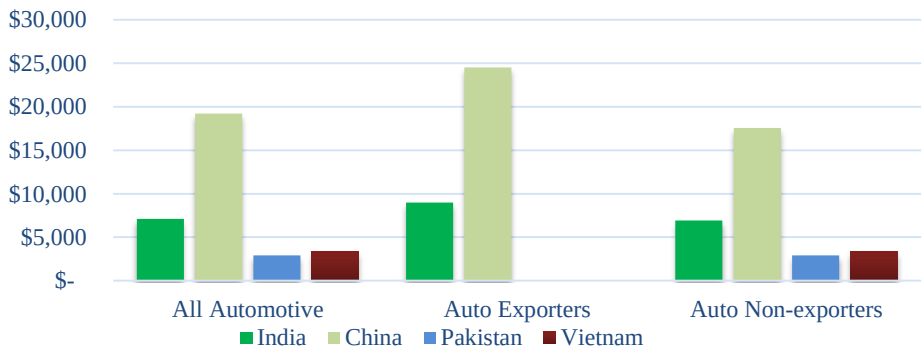
[135] WITS-UNCTAD, 2014
[136] ACMA and McKinsey Report 2014. WITS-UNCTAD puts auto part exports at US$2 billion in 2009 and US$6 billion in 2014.
[137] Ibid.
[138] However, in the 2015 budget, the government of India increased the import tariff on commercial vehicles to 40 percent to "help boost domestic production."
[139] Ibid.

almost double the average nominal tariff rate in India.[140] High tariffs have sharply limited the import of motor vehicles to only US$689 million. While most of the components used for local car manufacturing are imported, motorcycles and tractors largely are built with locally-sourced components because they rely on old technologies. At the same time, high protection has discouraged production for export. Pakistan's most noticeable exports in the broad automotive industry are tractors and auto parts—but at very low levels of US$36 million and US$22 million respectively. Furthermore, most of its exports consist of low value parts for the after-sale markets and tractors relying on old technologies, mostly destined to Afghanistan.

3.3.3. Productivity

Value added per worker in India's auto sector is higher than in Pakistan, but less than one-third the level in China (Figure 3).[141] China's higher productivity is not only due to its earlier start in developing the auto sector and its higher per capita income (and thus greater investment in automation than the relatively low-wage South Asian countries), but notably higher scale, capacity utilization, and quality. These factors are discussed in greater depth in Section 3. From 1993 to 2004, the growth rate of TFP in China's automotive sector was 6.1 percent per year, compared to only 1.1 percent in India, and the growth rate of labor productivity 9.8 percent per year, compared to 3.1 percent. [142]

Figure 3: Value added per worker (US dollars)[143]



The size, export orientation, and share of foreign ownership of auto firms are all positively associated with productivity in both India and Pakistan. The relationship between size and productivity, which is expected in the capital-intensive auto sector, is confirmed by the economic literature and in-depth field interviews in both countries.[144] Large auto firms in the two countries are able to achieve economies of scale, start captive skill development centers for managerial training, and spend more on innovation and R&D. Size is so critical in this sector that leading firms chose to locate close to their buyers to receive 'repeat, big orders', expand into international markets and follow a 'few models, high volume' strategy to achieve scale. However, in both India and Pakistan, restrictive labor regulations (firing laws), rigidities across labor markets and policies that influence

[140] TRAINS database, downloaded from WITS, September 28, 2015.
[141] World Bank Enterprise Survey, India 2014, which surveyed over 500 auto firms, including both OEMs and suppliers; World Bank Enterprise Survey, China 2013.
[142] Bosworth, Barry and Susan M. Collins. 2008. "Accounting for growth: Comparing China and India," *Journal of Economic Perspectives*, 22 (1) (2008).
[143] World Bank Enterprise Surveys (India 2014, China 2013, Pakistan 2013, and Vietnam 2009).The sample size for exporting firms in Pakistan and Vietnam is too small to give us figures for value added.
[144]. Economic literature that links size to productivity for India includes Bollard et al (2011) and Francis (2015).

size considerations, have contributed to a concentration of small and medium firms that neither grow nor exit the market. Exporting firms, most of which are large, also have higher productivity than firms producing for the local market (see section 3). Finally, foreign-owned firms tend to have greater access to advanced technology, which can provide an edge in productivity. Leading firms report that alliances with foreign firms through technological collaboration and/or joint ventures provide access to new technical knowledge.

3.4. Drivers of competitiveness (productivity) within and across firms

As the impact of labor and capital market rigidities on South Asian manufacturing have already been covered in the economic literature, this section will focus on firm-based and across-firm determinants of competitiveness. This section considers scale and capacity utilization, quality, skills, and innovation as drivers of competitiveness within firms, and spatial arrangement/clusterization and linkages to GVCs as drivers of competitiveness across firms. The mechanics behind these drivers will be illustrated via evidence collected from semi-structured surveys and primary interviews with the middle management, senior executives and plant-level technical staff of leading suppliers that managed to scale, innovate and get linked to GVCs. Motherson Sumi Ltd. (MSSL) and Bharat Forge are Tier 0.5/1 integrators that feature among the top global suppliers from India. Sandhar Technologies (Sandhar) and Hi-Tech Gears Ltd. (HTGL) are Tier 2 component suppliers that are leaders in their product categories. A more granular understanding of how leading firms succeeded is provided in boxes in the following section and may provide useful lessons for how policy can foster success in similar contexts.

3.4.1. Scale manufacturing and capacity utilization to reduce costs

Scale and capacity utilization at the plant level are critical to success in capital-intensive industries. In the auto sector, large firms (e.g. Maruti Suzuki and Hyundai in India) tend to be more profitable and resilient to downturns than less scaled firms. We consider OEMs separately from auto parts suppliers, given that they face different import tariffs. With the exception of commercial vehicles, the products of OEMs are protected by import tariffs of 60% in India and 80% in Pakistan, while tariffs for the auto parts market were reduced from 60% to a current rate 12-20% in India, but remain high in Pakistan.

3.4.1.1. OEMs

Despite the importance of size for competitiveness in the auto sector, most OEMs in India and Pakistan operate below efficient scale. Only four of the 18 OEMs operate at the industry standard for efficiency of 100,000 units per model. Most OEMs who are 100 percent foreign-owned started by introducing existing models as a quick go-to-market strategy. Introducing an existing model was 10–15 times cheaper (and many times faster) than investing in new design. For the most part, these models were mid-range or premium cars rather than high volume segments. Operating below optimum line capacity reduced profitability over time. In contrast, Maruti went for a *few models-high volume* strategy: at least 3 Maruti models achieve more than 200,000 units annually and are profitable. Hyundai, Honda, and Mahindra & Mahindra also have managed to cross the 100,000 break-even mark. Except for tractors, Pakistan suffers from subscale production and low capacity utilization in all segments. By contrast, in China, 25 out of 27 OEMs are functioning above this level.

In 2014, 47 models were produced at annual volumes higher than 100,000 units, including 22 models at more than 200,000 units[145].

To make matters worse, capacity utilization is low in many OEMs. India produced 4 million cars in 2013, compared to production capacity of 6 million. Bullishness about the Indian market is revealed in actions of companies like Ford, which despite losing around US$250 million in 2013**,** plans to invest US$1 billion in Gujarat for a new vehicle assembly plant.[146] A combination of excess capacity—exacerbated by a marked slowdown in demand since 2013—multiple models and fragmentation of these market segments has reduced profitability for global OEMs. In a bid to improve utilization rates, Volkswagen started using India as an export hub for Mexico—just to keep the plant operating at 75 percent levels.[147] GM announced they would shut down factories in India as they recorded one of their biggest losses in FY14: ~US$600 million.[148] Accumulated losses by GM were equivalent to the cost of setting up a car factory in India. Maruti, Honda, and Hyundai were the few OEMs that operated at efficient scale in 2014-2015 (see Table 1). Capacity utilization among the OEMs in Pakistan is below 50 percent, and scale is small as the total production capacity (280,000 units) is spread over 3 OEMs and 6 model platforms (see Table 2).

Table 1: Volume and capacity utilization of OEMs in India

Companies	Production capacity (in units)	Current capacity utilization (in percent)	Planned expansion (in units)	Timeline	Total investments (in rupees crore)	Exports (in units)
Maruti Suzuki	1,500,000	86.16	1,500,000	2017	37,000	121,701
Hyundai	700,000	87.41		Installed	9,471	191,221
Honda cars	240,000	82.27	60,000	2016	385	8,398
Mahindra	545,000	42.35	200,000	N/A	4,000	6,842
Ford	200,000	78	240,000	2016	6,200	81,703
Toyota	310,000	51.28		Installed	5,920	17,650
Fiat-Tata	200,000	5.2		Installed	4,113	39
Volkswagen	200,000	55		Installed	3,865	69,994
General motors	282,000	19			12,000	2,011
Hindustan motors	63,000	N/A		Installed	465	0
Mahindra Reva	30,000	N/A		Installed	N/A	N/A

[145] Maruti Suzuki Annual Reports (till 2015). Accessed on Aug 3rd 2015 from www.marutisuzuki.com
[146] Vats 2014.
[147] Roughly 50 percent of production out of VW's Pune plant is destined for exports this year
[148] Ibid.

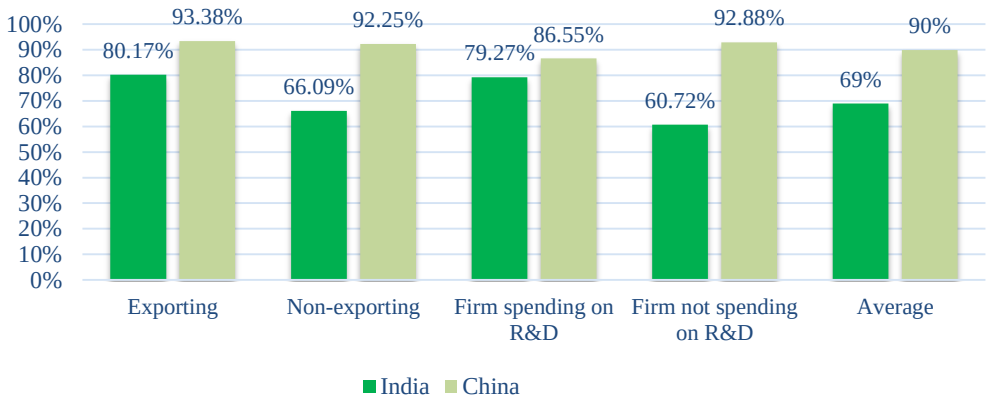
Mercedes-Benz	20,000	N/A		2020	1,200	N/A
Tata motors	500,000	33		Installed	6,000	3,757
Skoda-Audi	40,000	37.5 (Skoda)		Installed	888	0
BMW India	14,000	N/A			180	N/A
Isuzu	120,000	N/A		2017	3,000	0
Total	**4,964,000**		**2,000,000**		**253,350**	**622,470**

Table 2: Capacity utilization in key automotive categories in Pakistan[149]

	Capacity (Units)	Rate of Utilization (%)
Assemblers		
Cars	279,040	43.6
Motorcycles/Rickshaws	2,165,000	69.1
Tractors	67,000	110.2
Trucks/Buses	10,800	40.3

[149] Sources: PAMA (http://www.pama.org.pk/home/members), APMA (http://www.motorcycleexport.com/) Presentation on Automobile Sector EDB.

Figure 4: Share of firms with capacity utilization greater than 75% (India 2014 versus China 2013)



Source: World Bank Enterprise Surveys (India 2014; China 2013)

Indian and Pakistani firms achieve lower capacity utilization than their Chinese counterparts. Less than 70 percent of auto firms in India report capacity utilization rates of above 75 percent, while over 90 percent of Chinese auto firms exceed this level (figure 4). The gaps between China and India are smaller for exporting firms and for firms that invest in R&D. Local firms that do not export or do not invest in R&D have much lower capacity utilization than their Chinese counterparts.[150]

3.4.1.2. Auto **parts suppliers**

Surprisingly, in India more suppliers than OEMs have achieved efficient scale, high levels of capacity utilization, and participation in export markets. Typically, low capacity utilization among OEMs in a vertically-integrated industry like automobiles is reflected in low capacity utilization among suppliers. In India, however, low tariffs on imported auto parts encouraged (or sometimes, compelled) suppliers to expand their footprint in export markets to diversify customer risk and acquire new technologies.

Leading suppliers sought to reduce the buying power of their Indian OEM customers by diversifying through exports. For instance, in the 1990s, almost all of Motherson Sumi's (MSSL) turnover was bought by Maruti. MSSL decided to diversify its risk so that "No single customer, country, or component constitutes more than 15 percent of the turnover." Maruti, which had 85 percent of the total Indian market in the 1990s, now has less than 5–6 percent [151]. Bharat Forge followed a different strategy of investing in non-auto sectors such as oil and gas, railways, power, and defense, among others.[152] In 2013, revenue from non-auto sectors in India was close to 40 percent of the total. In addition, both MSSL and Bharat Forge acquired and set up subsidiaries in sophisticated auto markets outside India (for example, Germany). In a large domestic market with

[150] In the Enterprise Survey, it is not possible to separate firms by size due to sample size issues. However, there is significant overlap between export firms and size (large to medium).
[151] Motherson Sumi Systems Ltd. Reports (till present). Accessed on Aug 3rd from www.motherson.com
[152] http://auto.economictimes.indiatimes.com/news/industry/how-baba-kalyani-is-making-bharat-forge-diversify-into-non-auto-segments/31512531#./31512531?&_suid=144493277640507828256693732645.

few OEMs, Hi-Tech Gears Limited (HTGL) also realized it stood the risk of getting locked in to one customer, and started to diversify.

Diversification to exports may have improved profitability. According to a study of 95 Indian auto suppliers, firms in which exports accounted for a large share of sales from 2005 to 2013 achieved a significant rise in profits, while firms that did not export, or where the share of exports was low, saw a sharp fall in profits (Table 3). Field surveys confirm that diversification not only helped to manage volatility in local markets, it also helped these firms increase productivity.

Table 3: Change in gross margins of Indian auto part suppliers (2005 to 2013)[153]

Export as % of firm sales (2013)	> 40	15–40	< 15
Change in gross margin for auto supplier in India (2013-2005) %	+13	−29	−41

The reduction in import duties on inputs enabled leading suppliers to begin exporting. Sandhar initially focused on increasing the volume of production, largely for the domestic market. "Building exports was expensive for a small company like ours. It meant learning what those customers want. We had to invest in it through exhibitions, a legal framework, prototypes, travel, and technology. Inputs were expensive." The decline in import duties enabled Sandhar to improve quality and reduce costs through importing intermediate inputs, which helped to overcome some of the fixed costs of exporting[154].

Many auto-parts suppliers achieved increases in production by serving sophisticated markets. Instead of increasing sales through aftermarkets, these firms competed in standard export markets. "Many players at that time went into aftermarkets because barriers to entry were low and there was promise of high margins, but we avoided this route like the plague." shared the MSSL senior executive. Working for a demanding customer meant that the firm was forced to be efficient, adopt international standards, and keep costs down.[155] For Bharat Forge, exports started as early as 1995 to the former USSR. They focused on forging technologies. "Exports challenged us to design, develop, manufacture, and supply products to discerning customers in global markets. This in turn motivated us to scale up the value chain and adopt new technologies," said the Bharat Forge senior executive.

Exporting has been the key to productivity and growth. Essentially, firms that chose to ramp up production for export markets with demanding customers were able to diversify their customer base, achieve scale and improve efficiency. For several others, lack of scale and low capacity utilization among OEMs - and to an extent among auto-part suppliers - limited the scope for new technology adoption/automation, with increasingly detrimental effects on innovation, design capabilities quality and skills as one goes down the value chain.

[153] ACMA and Mckinsey 2014— percent change on EBITDA on index of 100 in 2005.
[154] http://www.businesstoday.in/magazine/special/indian-firms-key-suppliers-of-car-components/story/21374.html .
[155] http://forbesindia.com/article/work-in-progress/how-motherson-sumi-became-a-giant-auto-parts-manufacturer/34693/1.

3.4.2. Focus on innovation, design, and R&D

Firms that invested in the early acquisition of technology through alliances were better positioned to participate in GVCs (Box 1). Local firms who have become global suppliers cite investments in design capability as a key asset**.** Local Tier 1s who did not enhance design capabilities have begun to lose ground to those who became single source suppliers to global OEMs, as design and contract allocation becomes increasingly centralized and subcontracting of tasks increases. Markets in Slovak Republic, Brazil, and Poland have already witnessed a demotion of local Tier 1s into Tier 2s and Tier 3s. Global OEMs now expect design capabilities from firms at all levels of the value chain, because subcontracting makes sense only when the supplier can be held responsible for entire modules of tasks. During interviews, global Tier 1s mentioned that design capabilities are becoming critical factors in selecting Tier 2 subcontractors. Indeed, the global auto supply chain that was traditionally organized in tiers is facing a restructuring. Erstwhile Tier 1s are becoming *large* global firms, either specialized in complex systems or as integrators of several simpler subsystems, constituting formation of a 'Tier 0.5.' They are expected to have substantial responsibility in the design of these systems and to coordinate the supply chain necessary for their manufacturing and assembly[156]. In turn, firms that supply to the Tier 0.5s also need to take on design responsibilities for their submodules or components to become preferred partners. With a few exceptions, firms in India and Pakistan are not demonstrating sufficient and quick uptake of design capabilities, which is likely to impair their competitiveness and ability to link to GVCs.

Box 1: Leading firm case - Alliances for early investments in design and innovation

Breaking into GVCs requires technological innovation and high level design capabilities. It takes either a proven track record or knowledge of key technology to land a contract. After focusing primarily on supply of parts to Hero Honda for four years, HTGL wanted to acquire the technology necessary to diversify into exports. HTGL began a technical collaboration arrangement with Musahi (Honda Motors, Japan) to learn the new technologies involved in *precision forging*. It entered into a joint venture with GETRAG in the United States to manufacture timing gears (which had the advantage of GETRAG's experience and access to American machines) and became a manufacturer of parts for Cummins from the United Kingdom. They started manufacturing for TATA Cummins' unit in India, and now they produce for firms in Germany and the UK.

Leading firms became expert at absorbing the technology required to expand production of related products. Sandhar and MSSL began to produce inputs into their existing products to upgrade and expand their product lines. For instance, if they were making interior locks and needed zinc parts, Sandhar would improve their ability to work with zinc. "If we do a good job with locks, we would suggest we could handle their plastic needs. We had already built trust with the customer. That way, even if we haven't made that product before, they would give us the order," said the senior executive at Sandhar. Once MSSL had acquired a new technology and delivered to the customer, management would ask their engineers, "What more could we do with it? What would that take?" MSSL expanded from basic plastic components to building tooling and injection molding machines, to deliver complex plastic products. MSSL initially imported wires for their wire harness products, but then started to buy copper to manufacture wires. This allowed them to increase sales to existing customers and enter new products.

[156] Veloso and Kumar 2002.

Some firms found it profitable to adapt technologies through collaboration with leading OEMs, while others developed new technologies in-house. For those who took the alliance route, continuity in technology upgrades proved challenging. Some firms managed to upgrade their design capabilities. Bharat Forge is an example of a leading firm that has managed to break into design, engineering, R&D, testing, and other higher value-added services. In 2000, the company established an in-house R&D team to produce lightweight products which would enable lower energy consumption across business lines. "Some products that were largely imported, we can do it in house now," said the senior executive. Many small firms have found it challenging to develop integrated design and engineering functions. Sandhar would like to focus more on design and R&D. "We cannot say we have very meaningful R&D internally. It is an area for us to grow as its becoming more important." Leading firms are all committed to improving technology through R&D, but approaches differ.

Source: Author's interviews with firms during fieldwork

While the importance of design capability is rising, investment in R&D and commercialization of new products in India remain below the global average, and local suppliers rely primarily on build-to-print models. In most cases, specifications are provided by the customer and the execution is done by the local firm. Design abilities are closely linked to a firm's R&D capabilities. The average expenditure on R&D in Indian auto firms ranges between 0 percent and 2 percent of sales, which is much lower than the global average of 4.7 percent[157] (see Figure 5 and Figure 6). Interestingly, although R&D expenditures by firms in China are higher than in India, the difference is insignificant, indicating that China may also need to ramp up R&D. During field interviews, firms appreciated the importance of R&D for the sector, but very few had factored in increases in R&D outlays in their budget for the next fiscal year or were licensing technology from foreign firms. Many firms expected more support from the government on R&D. At the same time, foreign companies such as BMW, Mercedes, Renault-Nissan, Volvo, GM, and Honda have been exploring using India to set up R&D centers, in which intellectual property rights associated with the research would typically reside with the mother company overseas.

[157] Odgers Berndtson Search Intelligence 2014. Some of the expenses on Indian R&D are made to avail the tax/depreciation benefits of 200 percent, according to an auto supplier interviewed in Noida.

Figure 5: Expenditure on R&D (% of sales) in India[158]

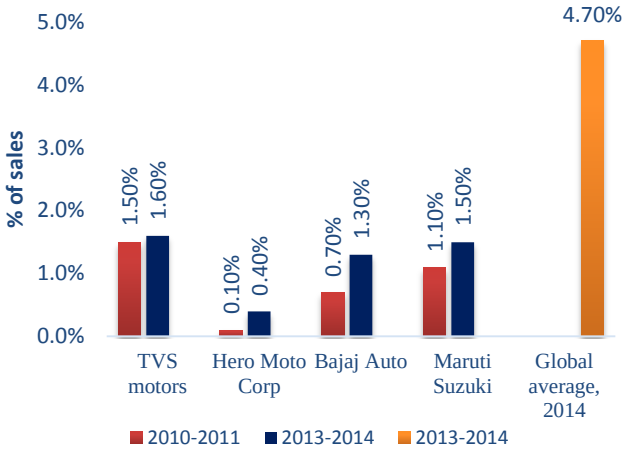
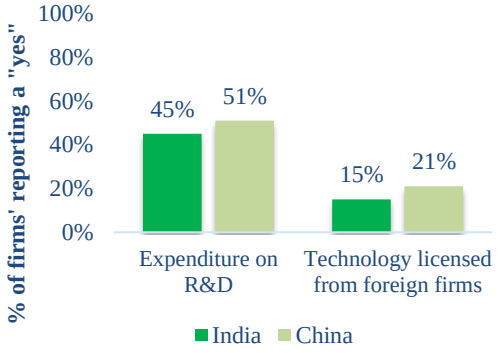


Figure 6: Expenditure on R&D (India v/s China)[159]



Box 2: Leading firm case - Strong governance frameworks with GVC partners for technical collaborations

Strong governance frameworks with innovation partners helped to manage complex, geographically diverse relationships. As their global activities expanded, MSSL, and Bharat Forge confronted some of the costs of cross-border collaboration: greater diversity in teams, frictions generated by cultural differences, and more complexity and costs involved in coordinating tasks. "The auto industry in India at that point was rife with examples of estranged partnerships and dysfunctional JVs," said the senior executive at MSSL. MSSL managed to deepen its technical collaborations with other firms. "We have a clear system of recruitment in the JV based on the business needs. A local who can work smoothly with locals fills the Chief Operating Officer (COO) position. The Chief Technology Officer (CTO) is chosen by our Japanese partner. The Chief Financial Officer (CFO) is a local and the Chief Marketing Officer (CMO) can be anyone," shared the senior executive. JV terms required the partner to put in cash so that it received a share of profits if the company did well. Such arrangements encouraged the tech partner to constantly upgrade its capabilities and share new developments. The senior executive of Bharat Forge said, "Reputation matters in this small community. If you get known as an extractive partner with one Japanese company, forget about partnerships with any other Japanese company."

Source: Author's interviews with firms during fieldwork

3.4.3. High levels of quality control among Tier 2 and Tier 3 firms

The tightness of quality controls is uneven at the Tier 2 and Tier 3 levels of the supply chain in India and Pakistan. In interviews with over 50 local auto firms in India, it emerged that high rejection rates may reduce profits by as much as 5 percent–7 percent. Internal rejection rates are harder to quantify, as they need to be gauged during the production process. More than 70 percent of suppliers, mainly Tier 2 and Tier 3 firms, were checking for defects at the end of line with few process controls in place. Site visits revealed that production systems were not set up so that defects

[158] Source: Odgets Berndtson Search Intelligence 2014
[159] Source: World Bank Enterprise Survey (India 2014, China 2013)

could be identified at source and debugging done in time to contain the domino effect of a mistake. In Pakistan, the problem is as bad, or even worse. An analysis done by a global auto expert finds the losses due to a lack of standardized processes, including quality controls, could reduce profits by up to 5 percent (see Table 6 in Annex).

Although some leading Indian suppliers are nearing world class standards, average external rejection rates among suppliers are above industry benchmarks. External rejection rates are easier to measure in terms of parts (or defects) per million (ppm) produced. As external rejection rates tend to be product specific, we draw on the example of seat makers in India.[160] The international best practice standard for seat makers is between 100 and 500 ppm. In India, two-thirds of suppliers were able to achieve these rates, and some of the leading ones are nearing 120 ppm. However at the tail end, one-fifth of suppliers are experiencing rates as high as 1,000 to 2,000 ppm.[161] High levels of defective parts also affect the end customer. External rejection rates are extremely high among Tier 2 suppliers who serve after-markets, where performance and quality requirements are achievable without huge difficulties. India's reliance on after-markets grew by 13 percent per year between 2006 and 2013. As 40 percent of the value added of a car lies in the Tier 2 and Tier 3 segment, the competitiveness of the auto industry depends on its ability to improve quality, deliveries, and competitiveness in these segments.[162]

The lack of authority of on-duty line managers to 'pull the line' in SMEs is partially responsible for high rejection rates. In more than 60 percent of auto firms interviewed, the on-line duty quality manager cannot stop the line at the first sight of a defect, but must gain permission from the SME owner. At the same time, the technical operator did not appear to possess the skills required to fix first-level line issues. Some factory managers mentioned that the use of contract labor and lack of continuity among technical operators made it difficult to develop the skills of the workforce. This led to 'longer learning times and greater reliance' on line managers who were already stretched. As most operators were not multi-skilled, the line manager had few options for replacements if an operator needed a break or fell sick. All these problems resulted in higher than usual line downtimes, longer breaks between changing lines, and lower capacity utilization— yet another issue faced by Tier 2 and Tier 3 firms. However, where the OEMs and Tier 1s worked closely with their Tier 2 and 3 suppliers, quality levels were better.[163]

The share of firms that are very poor performers is larger in India than in China, according to a comparative study by Sutton (2004). Pakistan has similar issues. In India and China, the leading Tier 1s and some Tier 2s are close to world class standards. However, the lack of quality management is driving very low competitiveness in many Indian SMEs. In Pakistan, too, there are many very poor performers, and quality issues are more pronounced than in India due to the low level of competition in the domestic market. Table 6 in the Annex summarizes the findings from the plant-level interviews conducted by an automotive expert with experience in managing plants in Japan, Korea, and China. Lack of scale had a critical impact on the bottom line of OEMs, while lack of standardization in process and quality control as well as unskilled managers posed significant

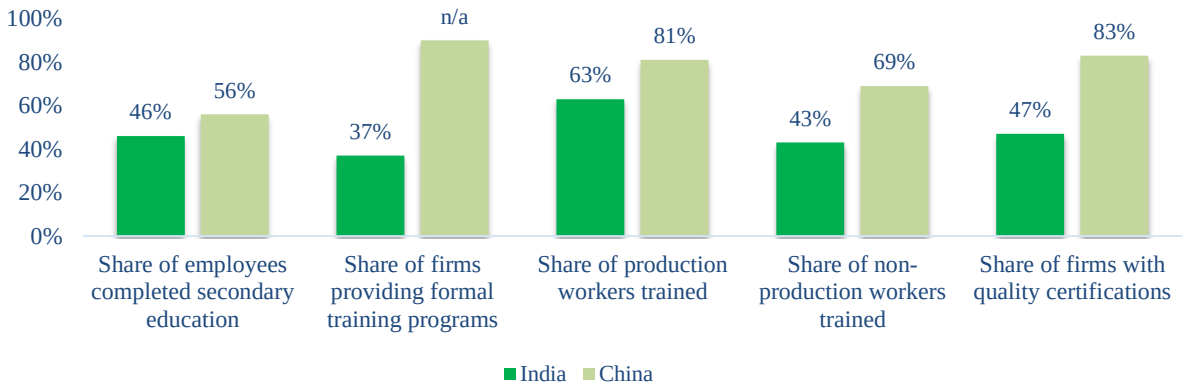
[160] Sutton 2004.
[161] Ibid; Bank site visits to Indian auto clusters in December 2014.
[162] From field interview notes—it is interesting that most of the firms blame their suppliers for high rejection rates, while they also admit that better process planning could partly reduce these defects.
[163] From field interview notes—high line downtime can also be caused by delays in external resources due to lack of reliable transport and infrastructure.

challenges for Tier 2 and 3 suppliers. Tier 1s come out in the middle, and need to be more uniform in achieving both volume and process standardization.

3.4.4. Investing in skilling of workers and managerial staff

Large skill gaps are prevalent among nonproduction workers, particularly managers. Only 43 percent of nonproduction workers in auto are formally trained in India, compared to nearly 70 percent in China (see Figure 7).[164] According to the CEO of one of the fastest growing Tier 1 exporters, "Skill gaps among managerial staff are a big headache and we have started in-house skilling centers to overcome this issue." A similar strategy was described by other leading firms in India (see Box 3). Only 47 percent of auto firms in India have internationally-recognized quality certification, compared to 83 percent in China. This difference is starker for SMEs, where quality is emerging as a severe constraint on productivity.

Figure 7: Overview of skills in Indian and Chinese firms



Source: Enterprise Survey (India 2014, China 2013)

Although there have been improvements, levels of pre-service and in-service training of auto workers are worse than in comparators. Pre-service training, going back to secondary and primary school education, inculcates important non-cognitive social and behavioral skills such as teamwork, leading, engaging, and managing that affect the overall efficiency of the shop floor. Nearly 60 percent of the full-time permanent employees engaged in the automotive sector in China have completed secondary school. Based on the Barro-Lee Educational Attainment Dataset, 18 percent of India's population has completed secondary education, while only 4 percent has completed tertiary education. India has done well in securing near universal primary education, but the quality of learning outcomes remains a major challenge.[165]

Box 3: Leading firm case- Investment in skilling workers and managerial talent

Leading firms made significant investments in acquiring skilled manpower at all levels to compete in global markets and meet international standards. When asked about their main challenge to growth, the chairman of Bharat Forge said, "*Talent*." Even though there were numerous publicly-

[164] Nonproduction workers include (a) managers and supervisory personnel with responsibilities for the performance of shop floor supervisors; (b) employees in sales, transport management, advertising, credit and collection executives, and purchasing, financing, and legal personnel; and (c) employees on the payroll of the manufacturing firm engaged in the construction of major additions or alterations utilized as a separate work force.

[165] World Bank 2015.

subsidized training programs, leading firms invested in their own training programs to ensure a constant supply of talented line managers, business managers, and technical floor-level workers. Bharat Forge developed a system called 'BFL Excellence System' to develop staff and introduce transparent performance management systems, among other goals. "We have leveraged our tie-ups with leading academic institutions to create a strong talent pipeline. Our efforts have resulted in creation of an over 7,000-strong global pool of skilled engineers and technicians," said the chairman. To improve labor productivity, MSSL uses a system of proprietary benchmarks called DO 33: improve everything by 33 percent.[166] Their philosophy is to benchmark against 'self' to maintain consistency in long-term strategies. To enable quick decision making at the middle manager level, every MSSL entity has a one-pager that summarizes receivables, rejection rates, and improvements over time. MSSL's CTO works closely with each supplier to define specs. HTGL has started a captive Skill Development Center (SDC) where they train their own workers. According to the senior executive, "We train workers and lose them to the OEMs. But we still train because the ones who stay are crucial for our productivity. Unskilled workers are cheaper but costs match up when their mistakes are financially accounted for."

Source: Author's interviews with firms during fieldwork in India

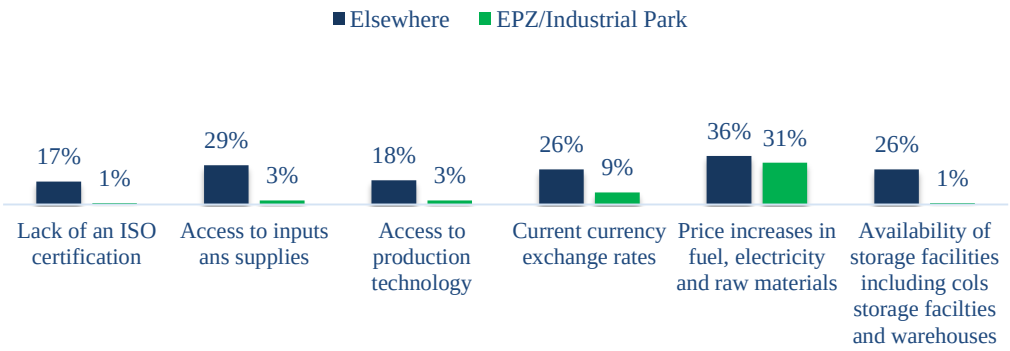
Fewer auto firms in India than in China provide formal training. With the final products becoming more complex, the manufacturing processes now increasingly require a diverse range of skill sets instead of just the traditional ones. There is evidence that in developing countries, skill sets are leaning toward higher technological content through upgrading skills on the job or in-service within the same industry.[167] In China, 90 percent of auto firms provide training to their employees, as opposed to 37 percent in India.

3.4.5. Agglomeration economies and spatial arrangement in clusters

The auto sector's spatial arrangement has evolved toward working in clusters, with entire supply chains co-locating. More than 80 percent of auto firms in India lie in clusters, including export processing zones (EPZs) or industrial parks, compared to 55 percent in other manufacturing industries. Evidence from interviews with the OEMs and Tier 1s suggests an unambiguous trend towards requiring suppliers to co-locate.[168] For auto firms, being located in clusters is positively associated with greater success in navigating business climate issues, lower operating costs, and higher capacity utilization. In a survey of over 500 auto firms, only 3 percent of firms located in clusters report access to production inputs as a major/very severe obstacle, in comparison to 30 percent of those outside clusters (see Figure 8). Similar differences are seen with respect to access to production technology, price increases in fuel, electricity and raw materials, and availability of storage facilities. Auto firms are also able to adjust their lead times more efficiently when located in the clusters (see Figure 9).

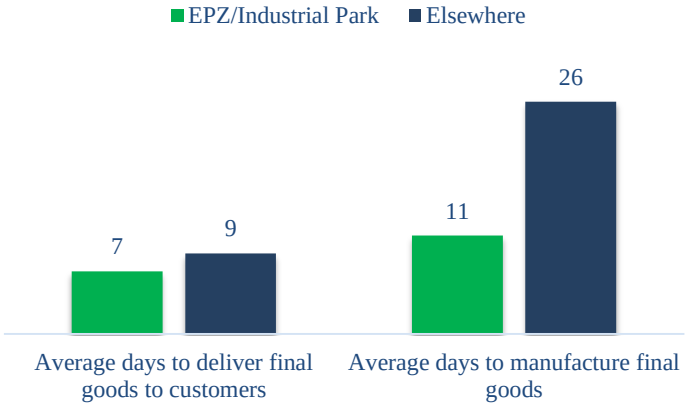
[167] Berman and Machin 2000.
[167] Berman and Machin 2000.
[168] Factor endowment theory developed by Hecksher and Ohlin applies here. Firms invest in locations where manufacturing expenses are the least. Co-location of suppliers brings down costs of transport, inventory, and taxes.

Figure 8: Operational constraints to firm performance (cluster versus elsewhere) (India 2014)



Source: World Bank Indian Enterprise Survey, India 2014.

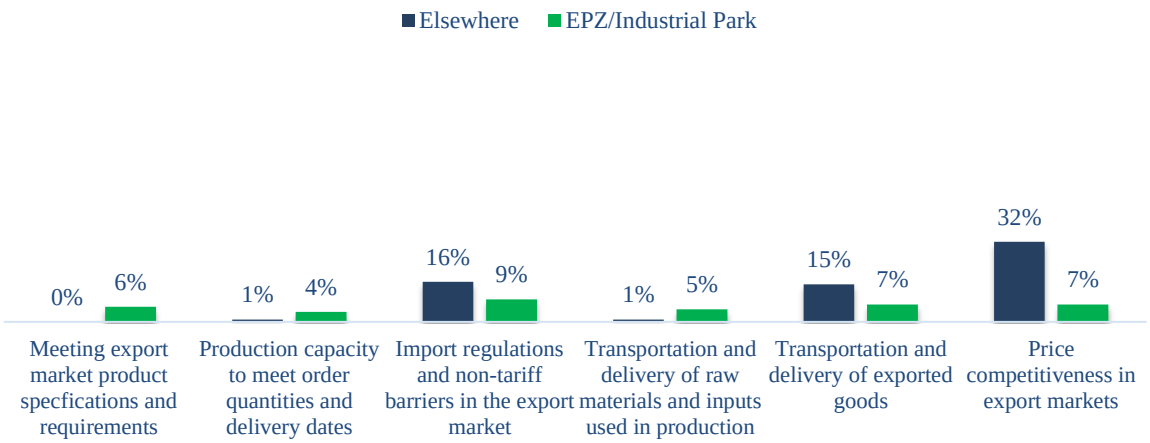
Figure 9: Lead times (cluster versus elsewhere) (India 2014)



Source: World Bank Enterprise Survey, India 2014.

Location in a cluster is positively associated with better results in exports and logistics performance. The average auto firm in a cluster takes less time than one outside to manufacture and deliver final goods. It appears that auto firms in clusters are able to reap the benefits of close proximity to ports, better information about custom clearances, and more connectivity to roads to deliver their goods to customers in less time (see figure 10). A lower share of cluster firms report trouble with transportation and delivery of exported goods (7 percent of cluster firms versus 15 percent outside) and competitiveness in export markets (7 percent versus 32 percent outside). It is possible that some combination of richer information exchanges about export markets, frequency of interactions among co-located players in the supply chains, common action among these firms, and proximity to transport and labor hubs are driving these results.

Figure 10: Constraints to export activity (cluster versus elsewhere) (India 2014)



Source: World Bank Enterprise Survey, India 2014.

A portion of the superior performance of auto firms in clusters may reflect the characteristics of the firms rather than the benefits of clusters. It is possible that only the better firms are chosen to locate with other firms, so that their superior performance reflects a selection bias. A *probit* analysis shows that a firm's characteristics explain some of the better performance, but not all.[169] Interviews with suppliers suggest that the residual may be due to benefits that accrue from being physically present in the cluster. Frequent daily interactions with OEMs facilitate knowledge transfers and business opportunities that are critical to the development of new products. These observations are consistent with findings from the literature that auto sector firms in India and Pakistan benefited from proximity to similar firms (see the survey in Rosenthal and Strange 2004 or Martin et al. 2011 for more recent results).[170] Estimations show that localization benefits are positively and robustly associated with firms' TFP: a 10 percent increase in the automotive sector labor force in a district is associated with a rise of 0.5 to 0.9 percent in firms' productivity (see Table 7 in Annex). Being in a cluster appears to have helped suppliers understand emerging customer needs better, develop new products, and increase their share of customers' purchases (see Box 4).

Box 4: Leading firm case - Locating close to customer

Proximity to the customer appears to have helped upgrade products, processes, and functions. Co-location allowed MSSL to hold frequent meetings with the OEM on existing products, and new requirements would sometimes emerge during the course of these discussions. "We make the decision to co-locate based on several factors. Is the job big enough in size to justify co-location? Is the OEM reputed enough to learn from? Is there potential to increase share of wallet? Is there potential to learn something new completely?" said the MSSL senior executive. The physical proximity of business managers to the plant and to each other enabled quicker product development. Similarly, proximity to the customer helped Sandhar become a fully integrated supplier of locks and mirrors, including design. According to the Sandhar senior executive, "A leading

[169] Examples of such characteristics are level of export orientation, firm size, using technology licensed from foreign owned company, capacity utilization rates, and so on.

[170] There are two types of agglomeration economies: localization and urbanization. While the former is measured by the total number of employees of the same sector in the same location, the latter is calculated by the total number of employees of other sectors in the same location. Both might affect productivity.

OEM was having trouble with one of its Indian suppliers doing US$2 million in revenue from locks. The locks however weren't meeting delivery or quality standards. During a lunch with them, the client mentioned this. He needed a new supplier and I proposed myself even though we had never made locks before." One thing led to another, and pleased with Sandhar's performance in metal sheets, Hero Honda helped them set up a technical collaboration with one of their lock suppliers in Japan. Sandhar reduced costs by integrating production in-house and became the single-source supplier of locks to the largest two-wheeler company in India.

Among OEMs, Maruti is known for helping suppliers grow. "We wanted our suppliers to do well, be profitable, grow. If they grew, they could deliver the volumes at the quality we needed at the costs we required," mentioned the ex-chairman of Maruti. Indeed, Tier 1s and Tier 2s that started as suppliers to Maruti in the 1990s have done well. Maruti currently has 300 Tier 1 suppliers and around 4,000 Tier 2s.

Source: Author's interviews with firms from fieldwork

Not all clustering increases long-term competitiveness. Sometimes, the choice of cluster location is driven by incentives offered by areas competing to attract OEMs, rather than efficiency. For example, one OEM shifted capacity to a hilly region in India in response to incentives, and pulled its suppliers along, resulting in high transport costs for all firms. Such examples of capacity fragmentation are not uncommon in both India and Pakistan. The auto industry's integrated nature uniquely positions it to impose co-location demands on suppliers, with the risk that suppliers divert substantial amounts of investments away from plant upgrading and building human capital into setting up yet another plant or acquiring land.

3.4.6. Linking to global value chains and learning from discerning customers

The few world class Indian auto parts firms are all linked to GVCs through exports and technology agreements. Firms with more export experience demonstrate higher productivity gains. This may reflect the greater ability of more productive firms to break into international export markets (Melitz 2003). However, economic literature, empirical evidence and interviews with leading firms in India suggest that access to large foreign markets has generated several benefits. First, it facilitates access to cheaper intermediate products, a wider variety of products, and a higher quality of foreign inputs which improve product range and quality. Second, it enables firms to achieve economies of scale. Finally, competitive pressures on firms that interact within GVCs, especially with those in mature markets, induce quicker adoption of modern, international standards, leading to deep knowledge transfers and technological spillovers (see Box 5).

Box 5: Leading firm case - Working with discerning customers in local and global value chains

Leading suppliers in India first acquired their technical and managerial capabilities from leading domestic OEMs like Maruti Suzuki and Hero Honda. With the birth of Maruti Udyog in 1983, several auto component manufacturers came into existence in India. MSSL started producing a humble t-coupler (a very small component) for Maruti. MSSL's big break came when Maruti Suzuki—Maruti's JV with Suzuki in India—was looking for a wire harness supplier (a bigger and more complex product). According to a senior executive at MSSL, "We did not have a background in automotive pre-Maruti. We were cable manufacturers in the industrial area of Noida. When Sumitomo, the Japanese supplier to Maruti Suzuki, entered India to supply wire harnesses, our proprietor spotted

an opportunity to enter a new and promising sector. Through a technical collaboration with Sumitomo, he set up a wiring harness in India. Within 1–2 years, the TC became a JV between the Indian and Japanese supplier leading to MSSL setup, a key supplier to Maruti." At that time, more than 85 percent of MSSL's sales were to Maruti. Similarly, in the 1980s Maruti was the key customer for India's largest forging company, Bharat Forge.

The story is similar for firms involved in two-wheelers. HTGL started as a preferred supplier of gear cutting tools to Hero Honda, another leading OEM JV (between Indian Hero and Japanese Honda). Although producing auto parts was a natural evolution, effective interaction with the large OEMs required improved soft skills. According to a senior HTGL executive, the industry was characterized by "close working relationships between suppliers, or ancillaries" where "many knew each other and families for years where we were located." After landing their first order with Hero Honda, HTGL moved into tubular parts, both aluminum- and steel-based **[correct?]**. The choice of this product segment was driven by the fact that steel (of the standard required by the OEM) was not available in India and hence, HTGL worked with the OEM to locate two steel suppliers. They began to supply 100 sets per day, facing a steep learning curve to meet the high standards demanded by the OEM. At the same time, Honda was getting some of its own suppliers to locate in India and the "interactive working relationship between HTGL, Honda's suppliers, and the OEM helped us [HTGL] learn rapidly." HTGL executive shared that, "I wanted to find the most discerning customers, whether in India or abroad. I would bend over backwards to work with them because I found we learnt the most when we worked with OEMs who held very high standards."

Source: Author's interviews from fieldwork in India

Compared to China, fewer OEMs in India and in Pakistan are linked to automotive GVCs. Less than 10 percent of Maruti's and 3 percent of Mahindra's output is for overseas markets even though there are few formal barriers to exporting. By contrast, all of the six largest producers in China are engaged in GVCs and cater to domestic production via joint ventures (JVs) with local and foreign firms spurring rich interactions and learning. Geely and Chery are examples of domestic Chinese OEMs that have been acting as contractors to European and American players even though they function in a large, growing domestic market such as China. As early as 2006, SAIC in China, a JV partner of General Motors (GM) and Volkswagen, announced plans to start exporting and competing with its JV partners in overseas markets (see Tables 12 and 13 in Annex). With the exception of Hyundai that exports more than 50 percent of its production from India, most OEMs focus squarely on the domestic market despite low capacity utilization.

However in the auto parts submarket, there are signs of specialization emerging in the type of component India exports versus what it imports. Exports include categories like chassis and engines along with a variety of smaller parts that are labor intensive, while imports are focused on higher technology content or scale purchases. Among the top export categories for India were gear boxes, hydraulic power steering, steering gear systems, wheels, drive axles, turbo chargers, gas compressors, crank shaft for engines, brakes, head lamps and other lighting equipment, and so on. Among imports were technology-intensive parts in engine, drive, transmission and steering parts, as well as some commodities (screws, rubber parts, and so on) where China is trying to increase imports to India. In general, the auto parts segment has been finding its place in GVCs through

specialized imports and exports, and high level of interactions with customers and suppliers in various end markets.

Indian auto parts suppliers are beginning to participate in the large automotive GVCs focused on end markets in North America and Europe. Mature markets in Europe accounted for the largest share of exports from India (38 percent), followed by Asia (25 percent), and North America (22 percent) in FY13. Being able to meet the standards (safety, environmental, other technical) required in mature markets is a good proxy for the level of sophistication of the domestic industry.

Compared to China, fewer OEMs in India and in Pakistan are linked to automotive GVCs. With the exception of Hyundai, that exports more than 50 percent of its Indian production, most OEMs focus squarely on the domestic market despite low capacity utilization.[171] By contrast, all of the six largest producers in China are engaged in GVCs and cater to domestic production via joint ventures with local and foreign firms.

The quality of auto exports from India has improved only slightly. According to a measure of export quality and sophistication (PRODY*),*[172] the quality of exports from India and Pakistan has remained low (see Figure 17 in Annex). A recent IMF study finds that the average level of sophistication for India's manufacturing exports is lower than for the rest of Asia, in sharp contrast to India's performance in the services sector.[173] For the narrowly defined product of small passenger vehicles, India's unit value is lower than that of developed markets (see Figure 18 in Annex).

3.5. Main constraints to improved productivity across the industry

Traditional cross-cutting investment climate issues do not seem to have a strong impact on the performance of the automotive sector. In the World Bank Enterprise Survey for India, constraints due to the political climate, crime, corruption, access to finance, taxes, electricity, labor regulations, and workforce education were all rated as either moderate or minor by firms. However, electricity, crime, and access to finance are found to reduce productivity (see columns 1 and 2 of Table 8 in Annex). Industry-specific factors may be more binding constraints. These are covered in four categories: trade policies by product (OEMs vs auto parts), industry standards (environmental, fuel, worker safety), logistics and taxes (central and state taxes, logistics), and lead firm-SME linkages (soft and hard factors).

3.5.1. Trade protection limits firms' exposure to global good practices

High levels of import tariffs for CBUs in India and Pakistan (see above) may initially have helped to attract foreign investors, but now appear to have constrained productivity for both OEMs and suppliers. ver time, high tariffs have encouraged OEMs to focus on the domestic market at the expense of exports, as demonstrated by India's growing production but low share of global exports. Gradually reducing tariffs to expose domestic producers to more competition may have efficiency-improving reallocative effects. While the extent of pass-through of lower prices depends on the nature of markups and market power,[174] it is likely that firms that are currently subscale will have to

[171] Hyundai exports to countries across Africa, Middle East, Latin America, Australia, and Asia Pacific. Maruti also has a mix of markets, including Indonesia, Japan, and Western Europe.
[172] PRODY is a weighted average of the per capita GDP of countries producing auto goods (including auto parts), with weights derived from Revealed Comparative Advantage calculations.
[173] IMF Working Paper 2015.
[174] De Loecker and Goldberg 2014.

bring down marginal costs and adopt efficient ways to defend their product spaces through 'within firm' reforms.[175] In the short run, less productive firms may have to fight to survive, but the more productive firms will see increased production from inter-firm transfers.

Trade liberalization in the automotive sector has generated substantial benefits. Tariffs on auto parts and commercial vehicles in India have fallen sharply since the 1990s, with increased production and exports (Figures 11 and 12). Competition exposed the auto parts sector to global good practices and pushed them to improve productivity to compete in world markets. Exports now comprise more than 40 percent of production, imports have grown and firms are able to trade with mature end-markets in GVCs. Millions of local jobs were created. Similarly, the decline in import duties on commercial vehicles has led to increases in production and employment, and the subsector currently shows a trade surplus. These precedents indicate that concerns of 'widespread job losses' and 'mass destruction of the auto industry' if tariffs are gradually lowered are unfounded.

Figure 11: Domestic production of auto parts and nominal tariff reduction in India

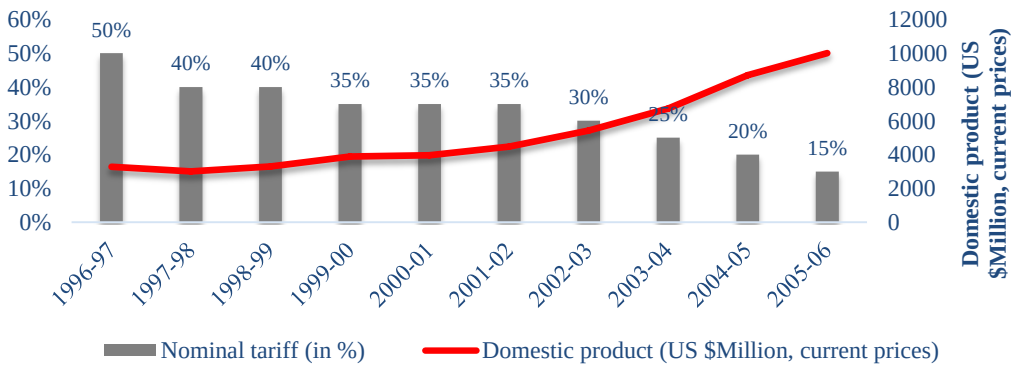
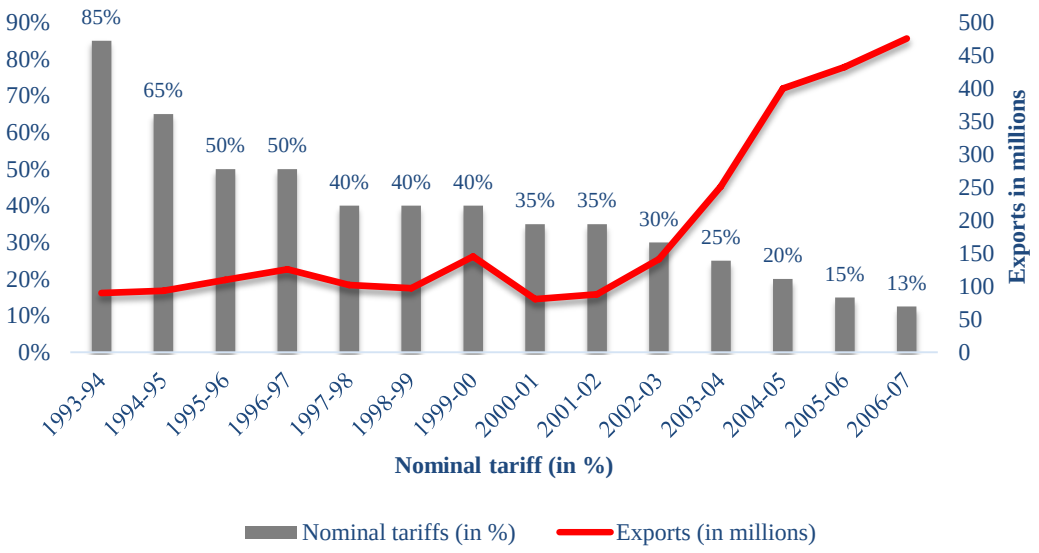


Figure 12: Exports of commercial vehicles and nominal tariff reduction in India

[175] Hsieh and Klenow 2009.



Source: WITS Database; ACMA; Narayan and Vashisht 2008.

Levels of protection remain higher on inputs than on final goods in the Indian tractor market, according to the FICCI report of July 2015. Tractors can be imported from Japan with a 5.5 percent tariff and from Thailand with zero tariff, while the tariffs on the inputs (axles, wheels, gears, pumps, engines) vary from 7.5 to 10 percent. Furthermore, inputs attract a 12.5 percent counter veiling duty while outputs do not. Such 'inverted tariffs' discourage local production of finished goods.
These issues require attention, even though the import duty on finished vehicles is lower than for passenger vehicles.

3.5.2. Unharmonized and obsolete industry standards also limit global exposure

The failure to meet international standards is limiting firms' ability to compete globally. India and Pakistan are at least five years behind the widely accepted EU and U.S. regulations**.** Gaps in harmonization of local norms with international standards reduce the need to invest in adoption of quality tools and develop managerial skills. Thus, domestic and foreign firms in India are not prepared to meet the latest international standards and face constraints when they try to compete globally. This is exacerbated by the late entry and uneven adoption of international auto standards in the local markets. Euro I, which was introduced in the EU in 1983, came to India in 1996 and even later to Pakistan. While Euro II was introduced in the EU in 1997, it was only applied throughout India by 2005. Norms around the Euro III equivalent in India are being adopted in stages across states. The situation is worse in Pakistan, which has not adopted Euro II norms. To complicate matters, India's supply chain has suffered from frequent changes and backtracking in regulations for fuel taxes and emission standards. And India has not met accepted industry standards for safety within firms, particularly around safety control systems and inspections. In a study conducted by Agrasar and SafeinIndia in the industrial town of Manesar, Gurgaon, pre-accident factors such as a near absence/lack of safety training, safety mechanisms in the machines and regular inspections emerged as leading reasons for injuries in the automotive sector.[176] Similar accidents were reported from Pakistan's automotive cluster during 2010 and 2014.

[176] Report published on www.safeinindia.org, 2016

3.5.3. Tax policies and inefficient logistics lead to domestic market fragmentation

Difficulties in transporting goods—across and within states—along with complex tax rules increase operating costs and encourages fragmentation of production. The average daily distance travelled by a truck in India is only 200–250 km, while the world average is 400 km. Conditions in Pakistan are similar. A goods truck in India spends only 40 percent of journey time in productive driving, with 25 percent spent at check posts, state borders, city entrances, and other regulatory stoppages (the remainder represents rest periods).[177] The commercial, excise, and VAT absorb the most time at checkpoints, for example to reconcile the sales taxes in one state with those in the other, such as the imposition of the additional 2 percent in Central Sales Tax. Firms reported an average of 2.7 days for inbound freight and 3.7 days for outbound freight spent in regulatory compliance, with a very large standard deviation of 2.2 days for inbound and 2.6 days for outbound. Direct effects due to delays and indirect effects on inventories and sales can make logistics 10–14 percent of the operating costs of manufacturing firms. Suchy high costs impair the competitiveness of automotive firms in India and Pakistan.

Auto firms reported that cumbersome tax administrative procedures and the complex interstate taxation structure severely constrained productivity. Over 20 percent of Indian and Pakistani auto firms reported tax administration rules and fragmented tax structures in India as one of their major/very severe obstacles, as compared to 10 percent or less of their Chinese counterparts. In India, there are significant interstate differences in tax systems. For example, in the state of Maharashtra, octroi taxes are levied on trucks carrying vehicles or parts made outside of Maharashtra to be consumed in the state. Firms in this state find it expensive to procure parts from outside, and those outside have had to invest in plants within the state—often inefficiently—to compete for sales. Such tax systems distort investment decisions by reducing the role of longer-term factors like infrastructure and human capital considerations[178].

Inefficient logistics also affect international trade. An exporter in Tamil Nadu in India reported diverting his shipment by several hundred kilometers, and not using the high-quality and nearby Cochin port, simply to avoid the Tamilnadu-Kerala border crossing. Inefficient trade logistics not only raise costs, but also hinder efficient asset utilization planning, increase inventory costs and impair export competitiveness. According to estimates by the Investment Information and Credit Rating Agency of India (ICRA) in 2004, Indian firms suffer a 20-30 percent cost disadvantage on account of taxation and infrastructure, which can vitiate the 5–20 percent labor cost advantage over comparable ASEAN-member countries, including Thailand. Last mile transportation remains an issue even for firms located in clusters, which are able to navigate barriers to trade logistics more effectively..

3.5.4. SME-specific challenges, including linkages with lead firms

SMEs - a significant proportion of the Tier 2 and Tier 3 supplier community - in the automotive sector find it difficult to address constraints to productivity themselves. Evidence from enterprise surveys and field interviews suggest that SMEs are less able than larger firms to address these

[177] Bhattasali et al. 2013.

[178] In another example proving this trend, two states in northern India were able to attract capital investments due to tax incentives. One state provided exemption from central excise for ten years of establishment as well as 100 percent income tax exemption for the first five years. A leading OEM in India reported having to close down its plants after setting up factories here—"Long transportation delays and lack of reliability of deliveries in a hilly state were a continuous burden over us."

constraints due to information asymmetries and coordination issues. Primary among SME-specific constraints are barriers to engaging with anchor firms, finding land near OEMs, obtaining finance, developing managerial skills/quality tools, and navigating investment climate issues.

Barriers to engaging with anchor firms are both hard and soft in nature. The major hard barrier is limited access to land near OEMs for smaller suppliers. Although OEMs and their main Tier 1 suppliers do not have difficulties finding land, SME suppliers are often trapped in rapidly-growing urban settings and lack the funds necessary to move closer to their main customers. At the same time, soft barriers are also important—absence of structured networking opportunities with anchor firms for suppliers trying to break into export markets, lack of information to anchor firms about emerging champions, and lack of clarity on how to meet the standards required to break into newer markets.

Managerial skills—both at the business and shop floor technical level—are poor. While there are public sector support programs in India and Pakistan aiming to help MSME's improve labor skills, SMEs face difficulties in obtaining information about them, and SME participation has been low. OEMs and Tier 1s are able to access skilled labor by either paying a premium or starting captive skill-development institutes. It does not appear that large OEMs and Tier 1 firms are taking an active role in helping fill training gaps for suppliers downstream.

Suppliers (mostly Tier 2s and Tier 3s) have not fully adopted quality tools. Suppliers either lack full knowledge about the right tools, or lack the right linkages with foreign and local companies required to learn. Large firms make little effort to help suppliers downstream develop key capabilities. Most Tier 2s and Tier 3s in India build-to-print without participating in the design segment of the value chain. Part of this is attributable to low levels of R&D investment, especially among Tier 2 and Tier 3 firms. This problem also exists for Tier 1s, who need to take on the role of integrators in global markets.

3.6. Suggested measures to remove key constraints and boost competitiveness

Improving productivity of auto firms in the region is necessary to move from being a fringe player to a truly global producer in vehicles and parts with deep connections to global good practices and GVCs. Key steps include reducing import tariffs on CBUs, and increased assistance to SMEs to help them improve performance, adopt new standards, develop new products, and access export markets. The chapter will discuss each of the proposed measures in turn below.

3.6.1. Gradually lowering import tariffs on final cars

Tariff protection for passenger cars and two wheelers should be brought down gradually to the level prevailing for components. This will reduce the 'induced attractiveness' of the home market in comparison with the international market, thus encouraging greater production for export markets and improvements in quality of product in line with international standards. In addition, the several firms that produce at inefficient scale will lose the protection of high duties and may exit or reallocate resources. It is likely that mergers and consolidation among firms may help to rationalize model ranges, scale operations, and bring costs down among firms. For firms that remain competitive in absence of the tariff effect, expansion or growth is likely.

Reducing tariffs would not result in a dramatic decline in local production. A senior executive of a global OEM felt it was very unlikely that his firm would service the Indian market mostly through imports if tariffs were reduced, Believing in the potential of this market, OEMs have already invested in large local plant capacities; these are sunk costs, and are unlikely to be closed for at least 10 years. India is particularly good in making certain types of cars that could not be made as competitively in the second best location regionally. OEMs are likely to respond to lower tariffs in India by a global rebalancing of their sourcing strategies. They might consider making India a *preferred production base*, boosting activities in some product categories, for example small passenger vehicles, for domestic and export markets, while serving the Indian medium vehicle segment completely through imports. In such a scenario, it is likely that local production could even grow. When tariffs were reduced on commercial vehicles, the OEMs ended up using the local production base to export vehicles to markets with similar preferences due to the cost advantages involved.[179]

Lower tariffs would improve productivity across the value chain and likely increase exports. In the automotive sector, pressure (or lack of it) on an OEM flows to its suppliers. More competitive exposure will mean that foreign OEMs operating in India will have to bring more customized designs instead of selling last-decade models to Indian consumers.[180] They will have to invest more in understanding consumer preferences, become operationally tighter, and reduce overcapacity. Countries that have closed their markets to Indian vehicle exports in retaliation for high tariffs may be forced to reconsider. In 2012, Sri Lanka retaliated against Indian trade policy by doubling its duty on Indian cars, [181] reducing India's $800 million in exports to near zero, according to the Society of Indian Automotive Manufacturers, SIAM. Parts suppliers may see increased demand for their products, thus increasing jobs.

Recent experience shows the potential for improvements following trade liberalization . The rise in competitive pressures following China's accession to the World Trade Organization (WTO) was felt throughout the value chain. Productivity levels increased among suppliers.[182] Automotive output grew by 25 percent a year and net trade in cars rose from US$672 million to US$5.3 billion between 2002 and 2005, while import tariffs on cars were reduced from 90 percent to 25 percent. Similarly, Pakistan should reduce its high tariffs on auto parts, learning from India's example, where a gradual reduction in import duties on auto parts helped suppliers get connected to GVCs and improve production and exports.

3.6.2. Converging toward global environmental and safety standards

Greater predictability of rules on environmental and safety standards would enable firms in India and Pakistan to improve their planning. For instance, the industry needs to know ahead of time the medium-term vision for rules governing the use of petrol versus diesel to forecast production and adapt processes. Knowing the government's position on Euro IV and Euro V introduction, consumption test conditions to orient choices for transmission solutions, and crash-test alignment with foreign requirements is necessary to plan changes. A long-term, growth-oriented, stable policy road map for the automotive industry is critical to align domestic regulations with international

[179] In China, GM, the foreign sales leader, uses Chinese factories to make nearly 99 percent of its cars sold within China rather than import cars (25 percent import duties exist). This level of localization is much more than the 60 percent local content regulation stipulated by the government of China and a lower import tariff than India, of 25 percent.
[180] Chen 2012.
[181] NDTV Profit 2012.
[182] Humphrey and Memedovic 2003.

requirements. At the domestic level, India needs to harmonize emission norms across states to be in step with global standards. Similarly, Pakistan needs to adopt the latest standards and communicate changes ahead of time to automakers.

Changes in pollution and crash test regulations will need to include provisions for India and Pakistan's (large) existing fleet of cars.. At the very least, India's objective should be to fully address Euro IV / Bharat IV specifications in three years. At the same time, the end of life (vehicle scrappage) policy and emission norms should be revisited. Vehicles that are being used well beyond the end of their expected life typically have higher emission content, lower fuel efficiencies, and lower safety standards. As the volume of cars in India rapidly increases, inefficient cars and commercial vehicles should be retired to limit the rise in pollution and accident levels. The government of India is contemplating an incentive scheme to encourage surrendering old vehicles, which would create demand for new and clean vehicles.

Safety norms for workers should be improved, especially in supplier factories in both India and Pakistan. Initiatives are required to improve safety consciousness and competence among workers, supervisors and senior management in supplier companies. Safety training for workers and management, an improvement in supply chain safety audits from OEM/Tier 1 manufacturers, and sharing of best safety practices would improve safety. This approach has been used successfully with cooperation among OEMs/Tier 1 firms and the government in the Slovak Republic under their supplier development initiative.

Box 6: Promoting green vehicles in India and Pakistan

More support for green technology, for example, electric cars and hybrid vehicles, is recommended. This is a relevant for India and Pakistan, which are young markets and not key producers of petrol and gas. Governments around the world in major auto producing nations have begun to invest in green vehicles and think of ways to stimulate demand in this category. In Korea, the government is stimulating demand through public procurement and infrastructure (for example, plans for electric public buses in the future, electric car charging stations) and subsidies for buyers and renters. For example, in India, this could take the form of launching university/industry projects in hybrid power trains, electric vehicles, and in fuel cell vehicles, at least partly funded by the government.

3.6.3. Integrating the domestic market

Successfully implementing the Goods and Services Tax (GST) and the common Value Added Tax (VAT) across states is the number one priority in India to simplify transport and tax administration. GST is a unified administration, which would eliminate the need for reconciliation when crossing checkpoints at every state border. GST at the center, along with a common VAT at the state level, would greatly reduce interstate variations in taxes and subsidies.

India also needs to quickly improve the state of its infrastructure. The network of roads throughout the country, including in rural areas, should be expanded and its quality improved. Improving the connectivity of railways is also important. Some ports, for example Chennai, should have the capacity to handle deep-sea vessels, and current levels of port congestion should be reduced. Power availability and quality should be increased, so that local firms do not bear the high costs of backup generators and losses due to power outages. All these problems have been discussed extensively, but continue to afflict all manufacturing sectors.

3.6.4. Providing support to SMEs and improving linkages in clusters

Tier 1 and Tier 2 suppliers can become innovation leaders due to their low-cost models. To achieve this, they need more support to engage with leading anchor firms, build effective teams, increase adoption of quality tools, and actively develop an 'R&D mindset' to tackle design-related tasks. This section reviews lessons for India and Pakistan from successful countries' programs to strengthen supplier linkages.

3.6.4.1. Enabling environment and linkages

Improvements to the enabling environment would help suppliers thrive and become exporters. Global experiences show that an intermediary institution (an aggregator), such as a cluster management body, can strengthen linkages between suppliers and lead firms. With the exception of a few leading suppliers, many SMEs in India and Pakistan face difficulties in linking with larger firms and in understanding how to achieve product requirements. In the Slovak Republic, the former Yugoslav Republic of Macedonia, and South Africa, the government and the national investment promotion agency set up broad-based technical assistance programs, with the automotive cluster/zone management body becoming the channel of delivery, in close collaboration with the large anchor firms. In Macedonia, anchor firms outlined their needs (quality requirements, product types, pricing comparisons with imports), which the Technological Industrial Development Zones (TIDZs) then used in designing training programs for suppliers. This program built a database of suppliers' profiles and supported a website with information about products and services available from local suppliers and requested by investors and anchor firms. By playing the role of an aggregator and connecting many suppliers with a few anchor firms, programs like TIDZ in Macedonia attempt to reduce information gaps in the supply chain and improve coordination and common action among peer-suppliers.

Some anchor firms in South Asia have played the role of aggregators and supported supplier development. After the liberalization of the licensing regime in the 1990s, Maruti started a program to train component manufactures in the technical and managerial skills required to deliver components that met Maruti's design requirements, in turn helping Maruti climb the value chain.[183] Minimum local content requirements provided the initial trigger, in addition to the cost advantages of sourcing locally rather than importing. Anchor firms' adopting an aggregator role has been useful in supporting SMEs, but this has been accomplished by only a few OEMs in India and Pakistan. Leading OEMs also have supported their suppliers by negotiating for land on their behalf, although suppliers attempting to build their links to lead firms still face difficulties in obtaining land. In general, OEMs report that they rely on either imports or a few good suppliers for their inputs, as most Indian firms cannot quickly provide the goods they need at the right quality and price.

India and Pakistan should focus on improving the capacities of intermediary institutions to support suppliers' engagement with anchor firms. Lessons from global programs suggest that an effective intermediary requires close links with investors. Intermediary personnel may require training in understanding engineering and quality issues, and in being commercially minded. Intermediaries need to understand the problems SMEs face, but also work with large foreign and domestic anchor firms.

[183] Okada, A. 2004. Skills Development and Interfirm Learning Linkages under Globalization: Lessons from the Indian Automobile Industry, World Development, Vol. 32, No. 7.

3.6.4.2. Skilling the workforce (business and technical)

All levels of workers—technical and managerial—in the sector would benefit from more quality training. Public and private Technical Vocational Education and Training (TVET) institutes in India and Pakistan have had mixed success in delivering pre-service training. On-the-job training is more effective than government-led programs or independent efforts by workers, although it has some skill bias toward existing needs. SMEs need to attract and retain high-caliber engineers. Family-owned enterprises require short-term, rapid delivery courses in quality management, accounting, and Kaizen, as well as longer-term programs to strengthen human resource management. Mechanical engineering, information technology, and advanced composite materials are important technical areas, given the increasing electronic content of car production and the shift to weight-saving materials. Marketing, languages, supply chain, and purchasing are key business skills to access export markets. Establishing educational partnerships and upgrading university and vocational curricula in procurement, supply chain, and marketing competencies (including e-marketing and e-commerce) will be important to help business managers communicate with global firms. Firms should forge more robust linkages with local/technical universities.

Large companies should play a larger role in delivering these skills in the auto value chain. For example, a stable business climate, attractive financial incentives like tax rebates, improved infrastructure, and international trade pacts encouraged foreign firms to locate manufacturing plants in Vietnam. Facing an acute skills shortage (similar in nature to that in India), Samsung, LG, and Intel trained thousands of employees through reaching agreements with universities, digitizing and open-sourcing materials, and setting up 'training the trainer' programs with leading Vietnamese and U.S. universities. These programs played a key role in the rapid growth of hi-tech sectors and skilled workers, and helped workers and suppliers work better with customers, solve problems on the factory floor early on, and access export markets. In India and Pakistan, policies that can encourage large companies to train their own workers and those in supplier firms have great potential for success.

In the textile and dairy sectors, mezzo-level partnerships with lead firms or aggregators have had more success than supply-side solutions in improving skills. Policy support in Bangladesh and Zambia played an enabling role in mezzo-level cooperation among firms to strengthen skills (Sharif 2014). In 1979, the establishment of export processing zones and easing of restrictions on FDI encouraged Daewoo, a leading Korean garment exporter, to collaborate with a local Bangladeshi garment start-up on technical training. Around 130 workers were sent to the Pusan factory in Korea for hands-on managerial courses, and they returned to set up 3 additional production lines, train 500 workers, and export 43,000 shirts.[184] Within two years, several of these managers left to start their own businesses, spurring entrepreneurship in the region. Such cooperation in skills delivery would have been unlikely without a supportive policy framework. A reform of the investment climate in Zambia led Parmalat—a leading dairy processor—to support the formation of the Palabana Cooperative to train informal milk producers in financial literacy and nutritional supplements for cow breeds.

The quality of primary and secondary education in India and Pakistan lags behind that in some emerging auto exporters. Social and behavioral skills, such as willingness to learn, reliability,

[184] Saraf (2014)

teamwork, and communication, are important to success for entry level workers performing complex tasks. These skills are learned during the early years in a person's life. Educational systems should focus on both academic achievement and non-cognitive skill sets, for example team work, leading, engaging, and managing.

Access to finance is not a major constraint on training in India and Pakistan. In both countries, central and state governments have allocated generous subsidies for public and private training provision. For instance, in the Punjab province of Pakistan, the Punjab Skill Development Fund (PSDF) allocates funding to public institutions and private providers (including firms) through competitive bidding. Similar mechanisms in India include the National Skill Development Corporate (NSDC) and industry-specific entities like the Auto Skill Development Corporation (ASDC). However, the provision of on the job training remains low. India and Pakistan need to create incentives to encourage skilling efforts, particularly by the large firms. At the same time, publically-funded training should include lifelong skills that contribute towards the job at hand, but are fungible.

3.6.4.3. Adoption of quality tools

Suppliers need to deepen their adoption of quality tools. The auto parts associations (for example, the ACMA in India and the PAAPAM in Pakistan) could create support teams to disseminate quality tools, for example design Failure Mode Effects Analysis (FMEA), process FMEA, Fault Tree Analysis, 5S, 5W2H, and Quick Response for Quality Control[185]. Most of the Tier 2 and 3 suppliers are 'sorting' rather than 'building' quality products. Both auto-parts associations are moving in this direction by creating quality circles, but much more effort is needed to increase supplier participation. Quality teams in Tier 1 suppliers could provide support to Tier 2 and 3 suppliers by setting up improvement plans, tracking progress, and helping with certifications. Some leading Tier 1s have used such methods to reduce costs, improve the reliability of parts, and to design new products with their Tier 2s.

Suppliers need to obtain systems certifications such as QS9000, which are becoming prerequisites for selection by leading firms. Tier 1 suppliers use certifications to assess suppliers' abilities to develop products, including the number and qualification of workers involved in development, the number of Computer Aided Design (CAD) stations and their software, the characteristics of the testing and prototyping facilities, and the knowledge of design methods and tools (for example, FMEA, Design for Assembly/DFA, and Quality Function Deployment). Keeping up with international and national standards/certifications on a continual basis is essential. In India, ACMA, the Auto Skill Development Corporation (ASDC), and the Quality Council of India (QCI) can help firms adopt quality tools and certifications. PAAPAM and other relevant central and provincial level bodies could take the lead in Pakistan.

3.6.4.4. Access to finance

The high cost of borrowing constrains the expansion of small parts manufacturers. Improving access to finance would help Tier 2 and Tier 3 companies invest in quality certification, compensate

[185] 5S was developed in Japan and stands for the Japanese words seiri (tidiness), seiton (orderliness), seiso (cleanliness), seiketsu (standardization), and shitsuke (discipline). The 5S concept is one of several lean manufacturing ("Lean") tools designed to improve workplace efficiency through facility-wide organization and cleanliness. Each of the 5S guidelines help managers and workers achieve greater organization, standardization, and efficiency—all while reducing costs and boosting productivity. 5W2H stands for 5 Ws and 2Hs or Who, What, When, Where, Why, How and How much.

talented management, and increase production. This problem is less serious for the larger firms, which can access low-cost credit lines.

3.6.5. Providing more support for design capabilities/R&D organization

More emphasis is needed on improving design capabilities within local firms to increase participation in GVCs. Tier 1 suppliers need to become end-to-end design and development suppliers, taking on the role of integrators**.** India has tremendous potential to become a global design hub. One Tier 1 established its global R&D center in the country to perform research for both its Indian products and global facilities. Other Tier 1s should consider launching a design center in India with test facilities to validate modifications, new suppliers, and later on, new projects.[186] Tier 1s who seek more global reach could collaborate with foreign firms to establish R&D facilities to perform adaptation and process R&D, as well as fundamental research. They could also sponsor PhD theses and capstone projects with academia to develop advanced solutions, prepare future industry leaders, and reinforce links with the university. Such funding should focus on students of engineering, chemical sciences, industrial design, and so on.

The Indian auto sector should adopt a structured development plan for collaborative R&D under the 'Make in India' initiative.[187] The goals for R&D should include better linkages among the OEMs and local suppliers/SMEs to encourage technical support programs among firms in the value chain (see recommendation on linkages in the cluster). Collaboration with engineering institutes, technology centers (TCs) in auto clusters, and the National Automotive Testing and R&D Infrastructure Project (NATRiP) could create a common, industry-specific R&D infrastructure, including laboratories-oriented material analysis, measurement systems, modeling software attuned to the needs of the cluster, and advanced research for new processes like tooling, machining, heat treatment, cutting tools, and so on. Support packages would facilitate technology transfer from universities, assistance from consulting companies on management improvements, brand development in GVCs, product standardization, and commercialization of firms' R&D.

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[186] This assumes existence of an operational Tier 2 supply chain to apply a product and process development approach, discussed in the recommendation on 'quality tools' later.

[187] Further work is needed to evaluate whether current R&D subsidies are helping SMEs or the larger firms who have the wherewithal to invest in R&D. In Korea, tax benefits on R&D were differentiated for SMEs versus non-SMEs. SMEs could claim up to a 25 percent deduction from income and corporate tax for research and human development costs related to general R&D activity, but non-SMEs could only claim 3–6 percent. It is possible that the current form of R&D subsidies is reducing investments in R&D by the larger firms. Other forms of support that could be explored are exemption from local tax on real estate owned by corporate in-house R&D institutes for SMEs ,and no tax charge on researchers' income derived from a research activity.

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6. TECHNICAL ANNEX

Table 16: Yearly volume of vehicles in India (2011–2020)[188]

Segments, India	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	% In 2015	% In 2020
A- Basic	1,347	1,420	1,169	1,161	1,316	1,441	1,445	1,573	1,669	1,759	31%	21%
B- Subcompact	1,228	1,253	1,338	1,529	1,714	1,986	2,361	2,754	3,150	3,604	40%	0
C-Compact	250	459	378	414	494	617	735	830	990	1,144	12%	14%
D-Midsize	14	13	8	9	11	13	17	19	23	28	0%	0%
SUV-SUV	22	29	31	33	53	93	153	203	245	291	1%	3%
P-Pickup	523	566	402	420	473	544	657	744	849	969	11%	12%
V-Van	239	288	185	182	220	277	312	383	454	528	5%	6%
E-Large	8	6	7	7	7	10	12	15	18	22	0.20 %	0.30 %
F- Large Plus	0.5	0.5	0.4	0.8	1	1.4	1.9	2.3	2.8	4	0.00 %	0.00 %
Total volume (in '000 units)	3,632	4,035	3,518	3,756	4,289	4,982	5,694	6,523	7,401	8,349		

Table 17: Top 15 largest producers by units produced in the global automotive sector[189]

Ranking	Country	2014 (units)	Market Share (%)	% Change
1	China	23,722,890	26.4	7.3
2	USA	11,660,699	13.0	5.4
3	Japan	9,774,665	10.9	1.5
4	Germany	5,907,548	6.6	3.3
5	Korea	4,524,932	5.0	0.1
6	India	3,840,160	4.3	-1.5
7	Mexico	3,365,306	3.8	10.2
8	Brazil	3,146,118	3.5	-15.3
9	Spain	2,402,978	2.7	11.1
10	Canada	2,393,890	2.7	0.6
11	Russia	1,895,474	2.1	-13.5
12	Thailand	1,880,007	2.1	-23.5
13	France	1,821,464	2.0	4.4
14	UK	1,598,879	1.8	0.1

[188] LMC Automotive Global Industry Database 2014.
[189] *Organisation Internationale des Constructeurs d'Automobiles* (OICA)

15	Indonesia	1,298,523	1.4	7.6
Global Production		**89,734,228**	**100**	**2.8**

Table 18: Vehicle volume exports for India, 2007–2013 (in '000 units)

Vehicles, '000 units	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*
Domestic sales	1,549	1,552	1,951	2,501	2,618	2,686
Exports	218	335	446	444	507	554
Total	1,767	1,887	2,397	2,945	3,125	3,240
Ratio Export/Sales %	**12%**	**18%**	**19%**	**15%**	**16%**	**17%**

Table 19: Drivers of productivity (firm based factors) – Automotive

Obstacles to Productivity-Automotive

Dependent variable	(1) Labor Productivity	(2) Total Factor Productivity	(3) Averages
Log (Size)	0.1251*	0.0685	123
	(0.018)	(0.018)	
Log(Age)	-0.0943	0.0057	19
	(0.017)	(0.011)	
Foreign	1.1602**	0.5994**	0.60%
	(0.064)	(0.015)	
Exporter	0.0914	-0.1168	11%
	(0.065)	(0.051)	
Constant	9.9365***	-0.4000	
	(0.040)	(0.121)	
Observations	833	364	952
R-squared	0.0564	0.0747	

Robust standard errors in parentheses *** p<0.01, **p<0.05, *p<0.1

Table 20: ICT Index for India and Pakistan by sector and size[190]

Categories	India	Pakistan	South Asia	Africa (Average)
Aggregate	131	84	81	65
Specific Sectors				
Food	136	91	73	90
Apparel	106	113	90	48
Electronics	142	103	124	109
Automobile	127	94	93	108
Others	132	81	78	64
Size				
Small	108	58	57	56
Medium	129	91	91	87
Large	158	131	141	126

[190] Based on calculations using Enterprise Survey calculations in Volume 1 (South Asia Competitiveness Report Chapter 2: ICT). ICT use and intensity are summarized by an aggregate index, a combination of the internet index and the computer and software index. ICT index is standardized to average 100 and deviation 100.

City Size				
Over 1 million	137	85	81	68
Under 1 million	126	77	74	56

Table 6: Loss estimate on firm bottom line due to various factors[191]

Items	OEM	Tier 1	Tier 2/3	Impact	Loss estimate
Production volume versus initial plan				Development amortization excess	Pay back?
				Equipment amortization excess If volumes <100k / year for small vehicles	Up to 15%
				Manpower excess & downtime	2%
Lack of flexibility				Long change over time	Capacity loss
				Investment dedicated to one or few references: sensitivity to need variations	Over investment
				Line downtime	Over investment
				Dedicated line	Over investment
				Manpower longer training	< 2%
No Process				Poor manpower flexibility	up to 3%
standardization				Long line debugging	Longer launch
				Quality issues	
				No learned lessons	Up to 5%
				Longer experience curve leading to productivity loss	
				Line duplication or longer change over time	2 to 5%
				Investment increase/ High amortization level	Over investment
				Process validation additional cost	Longer launch
No Product/Module				Manpower longer training	< 2%
standardization				Poor manpower flexibility	Up to 3 %
				Long line debugging	N/a
				Quality issues	Longer launch
				No learned lessons: long experience building	Up to 5%
				Longer experience curve leading to productivity loss	
				No Quality analysis and solution at the line level	2 to 8%
				No autonomy to stop the line at first defect leading to additional	1 to 3%
				added value on defected part	
				No auto control: additional Quality operators	Manpower increase
Lack of manpower				Operator is not able to fix the line issue for small problems	Line micro
education				no first level quality analysis and fix	stoppages

[191] Based on auto expert estimates from field interviews with over 40 firms based on comparisons with international good practices

				Line downtime due to the delay for external resources	Up to
				to address the line issue	5%
				No multi skills operators able to run the line with various	Up to 4%
				number of operators in the line	
				Long operator training	Indirect cost
				Need for micro management of the line	0 to 3%
				Long time before to reach production standards	from 2 to 6 %
Poor design for				Existing designs not addressing local needs leading to productivity issues	Depends on
manufacturing				Design not adapted to manual operations	Products
				Investment duplication & amortization increase	3%
Location				productivity loss due to finance constraint	Up to 10%
dissemination				Lack of volume flexibility	Depends on
(Cluster approach)				Excess of production capacity	products
				Engineering know how dissemination	Know how
				Slow experience transfer for engineering and Quality	loss
				Low competition level thanks to monosourcing in every cluster	Up to 10%
				Increase of middle management needs	Up to 3%
				Quality issue very costly to address due to volume of parts in the	Depends on
Overseas supply				transportation flow	products
				High inventory	Up to 30 days
				Exchange rate variations	N/a
				Inventory excess	4 to 6 days
Lack of transport				Transport cost: direct and indirect due to additional resources	x2
reliability				need to dollow part flows	
				Components and finished goods including cars, damaged during	Depends on
				the transportation	products
				Packaging cost to protect products against corrosion and mishanding	0 to 4%
Raw material				Import of HSLA steels	Up to 15%
purchase				Raw material costs for Tier 2 & 3 suppliers buying small volumes with limited negotiation power	Up to 5%

	Critical Impact
	Medium Impact
	Low impact

Rough estimate

Table 21: Results of agglomeration economies in firms' TFP[192]

[192] Latest World Bank Enterprise Survey Data for India and Pakistan

	1	2	3	4
Dependent Variable: TFP	Two-Digit		Three-Digit	
Localization District	0.0913***	0.0796*	0.0492***	0.0637**
	(0.028)	(0.042)	(0.019)	(0.032)
Urbanization District	-0.1195**	-0.1233*	-0.0887*	-0.1165**
	(0.049)	(0.073)	(0.046)	(0.053)
Diversity District		0.1962*		0.1387
		(0.107)		(0.117)
Competition District		-0.0146		-0.0250
		(0.110)		(0.048)
Constant	0.5810	0.3913	0.6586	0.6806
	(0.469)	(0.811)	(0.499)	(0.534)
Observations	1,253	1,253	1,253	1,253
R-squared	0.0114	0.0164	0.0066	0.0085

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 22: Obstacles to Productivity (external environment factors) - Automotive

	(1)	(2)	(3)
Dependent Variable	Labor Productivity	Total Factor Productivity	Averages
Finance	-0.0473**	-0.0034	1.10
	(0.002)	(0.013)	
Political	-0.0425	-0.0116	1.18
	(0.016)	(0.025)	
Crime	-0.0838***	-0.1441***	0.71
	(0.001)	(0.001)	
Taxes	0.1002	0.0417	1.43
	(0.034)	(0.024)	
Corruption	-0.0118	0.0648	2.24
	(0.002)	(0.020)	
Informal Sector	0.1136**	0.1059	0.96
	(0.003)	(0.023)	
Labor Regulations	0.0447	0.0741	1.03
	(0.017)	(0.013)	
Workforce Education	0.0099	0.0287	0.99
	(0.016)	(0.006)	
Electricity	-0.1273**	-0.0689***	1.52
	(0.004)	(0.001)	
Constant	9.9365***	-0.4000	
	(0.040)	(0.121)	
Observations	833	364	952
R-squared	0.0564	0.0747	

Robust standard errors in parentheses
*** p < 0.01, ** p < 0.05, * p < 0.1

Table 9: Indian automakers and JV partners, 2013

Indian automaker	Indo-foreign JV	Foreign carmaker in India

Maruti	Maruti Suzuki	
Hindustan Motors		
Mahindra & Mahindra		
Tata Motors		
		Hyundai
		Honda
		Ford
		Toyota
		Volkswagen
		GM
		Mercedes-Benz
		Fiat
		Skoda-Audi
		BMW India
		Isuzu

Table 23: Chinese automakers and JV partners, 2013

Chinese automakers	Sino-Foreign JVs	Chinese automakers	Sino-Foreign JVs
BAIC (Beijing Auto, Beigi)	Beijing Benz, Beijing Hyundai, Fotom Daimler	Hawfai	Hawfai Hyundai
Briliance Auto, Huachen Auto Group	BMW Briliance	Huraghai, SG Automobile	
BYD Auto, BYD Company	Shenzhen BYD Daimler	JAC (Jianghuai Auto)	
Chang'an Auto Chana Auto	Chang'an Ford, Mazda, Suzuki, Chang'an PSA	JMH (Jiangling Motor Holding)	Jiangling Ford

Changteng Auto		Jonway Auto	ZAP Jonway
Changhe Auto, Chang'an	Changhe Suzuki	King Long Motor	
Chery AutoCHTC Auto	Ooros	Lifan Motors	
CHTC Auto		Luzhou Wuling Motors	AIC-GM-Wuling
Dongfeng Motor, DFM	Dongf eng Nissan, Peugeot, Citroen, Honda, Yueda Kia	Qoros	
Dongfeng Yuton		SAIC	Shanghai GM, Volkswagen, GM, Wuling, Nanjing Iveco, Sunwin Bus
First Automobile Works (FAW)	FAW Volkswagen, Audi, GM, Mazda, Toyota	Shanghuan Auto	
Foday (Guangdon Foday Auto)		Sichuan Auto	
Foton, BAIC (Beigi Foton)	Foton Daimler	Shinotruk	
Fujian Motors	Fujian Berz	Soueast	Soueast Mitsubishi
GAC	GAC Honda, Toyota, Fiat, Mitsubishi	Youngman	Youngman-Neoplan, MAN AG, Proton
Geely	Volvo Cars	Yulon	
Gonow		Zhongxin	
Great Wall Motors		GAC	
Hafei Auto		Hawfai	Hawfai Hyundai
Haima		Huraghai, SG Automobile	

Figure 1: Sophistication of automotive exports from India and Pakistan (PRODY)

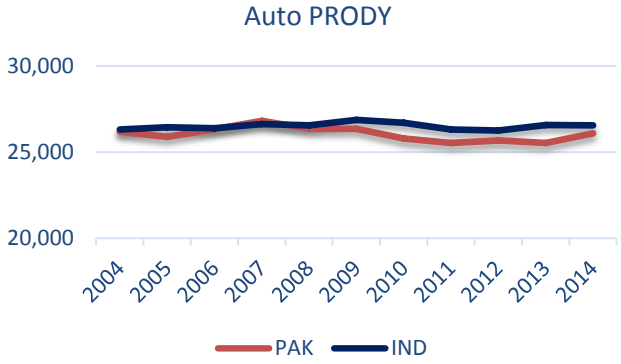
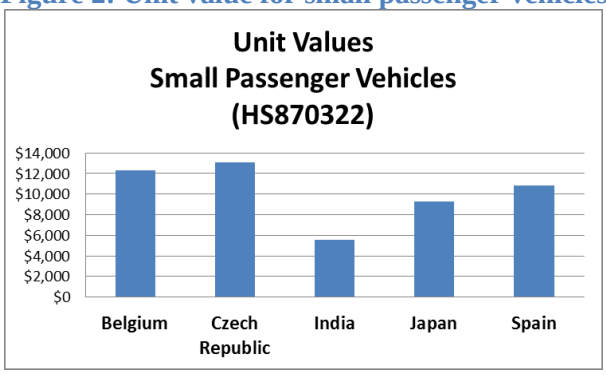


Figure 2: Unit value for small passenger vehicles



4. Agribusiness in South Asia

4.1. Executive Summary

Agribusiness (including agriculture) accounts for almost one third of South Asia's GDP and has the potential to almost double over the next fifteen years (reaching US$1.5 trillion by 2030). This increase will be driven by rapid growth in population, incomes and urbanization, as well as accelerated transformation of the sector towards higher value products and downstream activities. The highest growth will come from processed food and related services, such as food retail and restaurants which will create millions of productive jobs outside agriculture and positive backward linkages for farmers. Removing restrictions on trade, markets and prices would support this transformation; reforms in these areas are already showing promising effects. In addition, governments should continue to support smaller and poorer farmers, who may not benefit from this transformation. More targeted and pro-active support should be provided to raise productivity, rather than blanket subsidies and price controls that encourage the status quo and threaten the sustainability of the sector in the face of climate change (for example, large untargeted water subsidies).

6.1.1 How we went about the case study

The objectives of this chapter are: (i) to assess the region's agribusiness potential based on international benchmarks of productivity, output (including trade) and consumption along the main

value chains; (ii) to identify the main constraints through firm-level data analysis, analysis of the rice value chains, and interviews with 36 leading firms at the forefront of the agribusiness transformation; and (iii) to propose reform strategies based on stakeholder interviews (including producers and policy makers) and international experience. This chapter also relies on recent results from the World Bank's Enterprise Surveys covering thousands of agribusiness firms in South and East Asia, manufacturing census data from India, detailed trade data available for most countries, and several World Bank and FAO studies.

6.1.2 Content of the report

After a discussion of the motivation and approach, we review the agribusiness sector's performance in output, trade and productivity. The experience of 36 leading firms is used to understand the regions' potential, the drivers of competitiveness, and the policy constraints that limit these firms' ability to scale up and replicate elsewhere. The chapter synthesizes lessons from both successful and unsuccessful efforts at the firm and country level, to understand the sector's most pressing needs.

The chapter draws lessons from every country in the region – e.g. the innovative Agriculture Development Fund in Afghanistan to improve access to credit; the linkages between agribusiness and tourism in the Maldives and Nepal; the private sector's role in linking farmers to markets in Bangladesh, Bhutan, Pakistan and India; and the success of leading firms in India and Sri Lanka in developing premium global brands in rice and tea by investing in R&D.

Beyond the need to reduce and improve the targeting of subsidies, and to pursue market liberalization along the value chains, the chapter emphasizes the importance of encouraging investment; promoting inclusivity through backward linkages; building the knowledge agenda in the sector by promoting public-private alliances; and strengthening public and private sector leadership to develop and implement the urgently needed new policy paradigm.

4.2. Motivation and Approach

4.2.1. Motivation

South Asia's agribusiness value chain is large and has a strong potential for growth. Including agriculture, food processing and food related services (e.g. food retail and restaurants), the agribusiness value chain accounts for almost a third of South Asia's GDP. Future growth will be driven by population growth as well as rapid income growth and urbanization shifting the demand towards higher-value products (e.g. premium branded rice, horticulture and livestock), and to higher processing and food related services. South Asia's demand for agro-food products and services is expected to almost double over the next 15 years, reaching $1.5 trillion by 2030 (see Annex 1A).

Development of the agribusiness sector stimulates economic activity far beyond the farm, as post-farm activities such as logistics, processing and retail contribute about 55 percent of the total global value of the sector. Investments in agro-food processing result in higher input and income multipliers than in any other industry, and the employment effect is about 2.5 times that of other sectors (World Bank, 2014). Despite increasing trade in food products, the agribusiness sector in all countries remains primarily domestic for reasons of taste, convenience and preference for fresh food over frozen. Food processing is often the largest manufacturing industry – for example 90% in Afghanistan (World Bank, 2014).

Global experience shows that the development of agro-food value chains plays an important role in rural poverty reduction and in the creation of off-farm jobs, especially for women. The increased demand for higher value agricultural products and interactions with increasingly sophisticated buyers often increases the productivity and income of poor farmers (e.g. through backward linkages as discussed below). Furthermore, some of the agricultural products with the highest growth potential, for example dairy, can disproportionately benefit women.

Three main challenges stand in the way of capturing these opportunities in South Asia:

i. **The competitiveness/productivity challenge.** Low agricultural yield and high waste continues to plague the upstream parts of the value chain, while downstream activities remain small, informal leading to low productivity across South Asia. Outdated support regimes (support prices for cereals, farm input subsidies, etc.) impede diversification to more productive systems. Distorted trade policies also hinder competition, thereby rendering the sector insulated and limiting growth.

ii. **The small-holder challenge.** Agricultural production in South Asia is predominantly small scale, making it cumbersome for processors to secure a steady supply of quality products at reasonable cost. Concerns that large processors will by-pass smallholders by integrating vertically with intermediaries/aggregators or by importing the produce, coupled with fears that large processors would exploit smallholders, have led some governments to put in place counterproductive policies – e.g. restrictions on contract farming in Punjab, India and generous fiscal incentives for small-scale food processors in Bihar, India. Section 3 considers successful

examples of linkages between large processors and smallholders, and section 5 considers policies governments could use to foster these linkages.

iii. **The natural resources challenge.** Much of the region's agricultural development has come at a high cost in terms of natural resources. In particular, over use of water has been driven by substantial direct subsidies (e.g. irrigation charges in Pakistan only covers 10% of the cost) and indirect subsidies (e.g. free power enables farmers in Punjab, India to pump beyond sustainable levels). The stress on land and water resources is exacerbated by rapid income growth, urbanization, and climate change. Climate change also leads to interruptions in supply and volatile prices for the food industry.

4.2.2. Approach

Recognizing the interface between agriculture and agro-processing, this chapter focuses on how the South Asian agribusiness sector can be made more competitive within the context of agricultural development. The main goals are to:

(i) assess the potential of agribusiness in South Asia based on international benchmarking of productivity, output (including trade) and consumption along the main value chains;

(ii) discuss the main constraints standing in the way of this potential (mainly for agribusinesses but also in primary agriculture, given the inter linkages); and

(iii) propose strategies to remove these constraints while promoting sustainable agribusiness practices and fostering productive backward linkages between processors and smallholders

The analysis covers agribusiness in all eight member countries[193] of the South Asian Association for Regional Cooperation (SAARC). The term agribusiness encompasses all for-profit activities that connect the agriculture value chain, from farm inputs to retail, restaurants and hotels. To provide a broad overview of domestic and international competitiveness, a range of value chains (rice, meat, dairy, poultry, aquaculture and horticulture) are considered. First-hand interviews and fields visits in Afghanistan, India, Pakistan and Sri Lanka are combined with material from a wide range of reports and studies on the other countries, as well as data from enterprise surveys, government sources, and trade databases.[194] Interviews of 36 lead firms (see Annex 1B) covered their background, reasons for success, the difficulties encountered along the way (particularly with respect to issues affected by policy), and an overview of future plans for investment in expansion or diversification. The extent of any backward linkages to suppliers was explored to assess how the relationship can benefit producers, as well as the impact and reaction to prohibitions against direct purchasing (for example in the Indian Punjab).

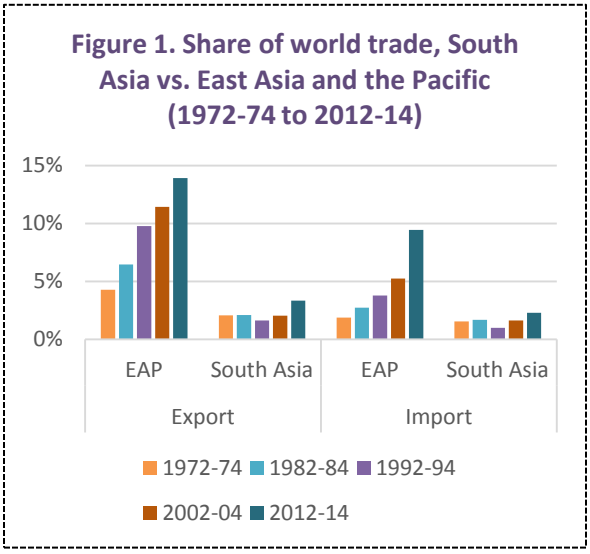
4.3. Performance Analysis

We discuss South Asia's performance in terms of the size of the food processing industry, trade, productivity and production cost.

[193] Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka
[194] See bibliography for detailed listing

4.3.1. Output and trade

South Asia is still predominately a producer of primary agricultural products, which are larger in value than food processing in all countries. Except for Pakistan other South Asian countries do not come close in terms of value added as a proportion of primary agriculture. Also, South Asia is poorly connected to the global food value chains both in terms of exports and imports. South Asia's share of world agro-food trade is only 3 percent for exports and 2 percent for imports, as compared to 14 and 9 percent, respectively, for East Asia (figure 1). South Asia's recent increase in export market share is driven by India (figure 2), mostly due to the removal of the export ban on rice (see below) hinting at revealed comparative advantage. All countries except Pakistan export more raw material than processed products. And with few exceptions, imports of processed agro-food products exceed exports, and are equal, or almost equal, to the value of primary agricultural products. This shows that the region has distinct regional taste and consumption pattern and also maybe considerable potential to increase production of agro-food products, both for domestic consumers and export markets.



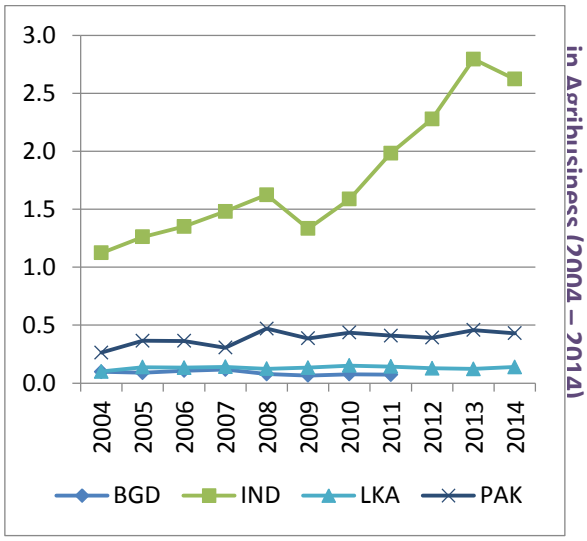


Figure 2: Export market share in Agribusiness (2004 – 2014)

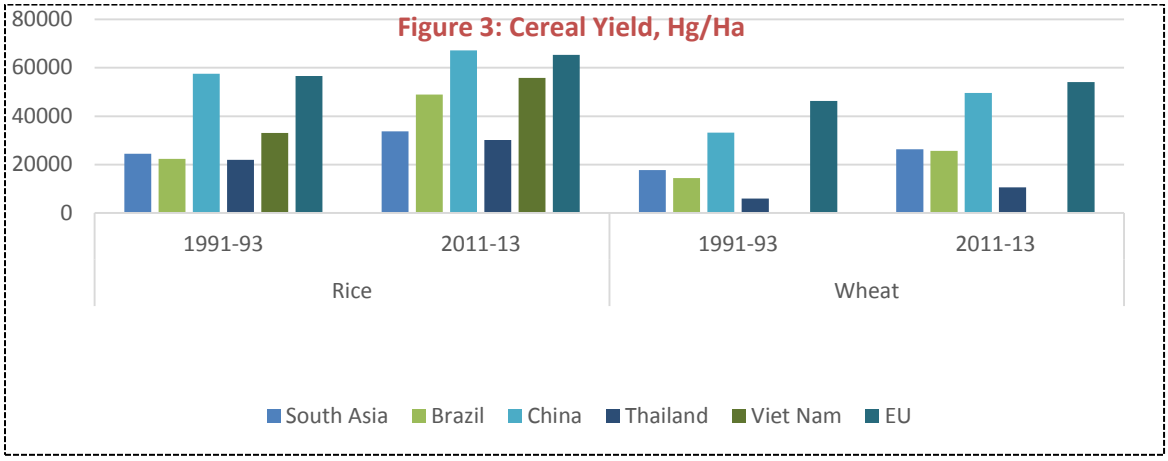
4.3.2. Productivity and cost along the agribusiness value chain

Productivity remains low in South Asia, especially in higher value agriculture products and processing activities. We discuss in turn South Asia's performance in lower value agricultural products (cereals), higher value agricultural products and food processing.

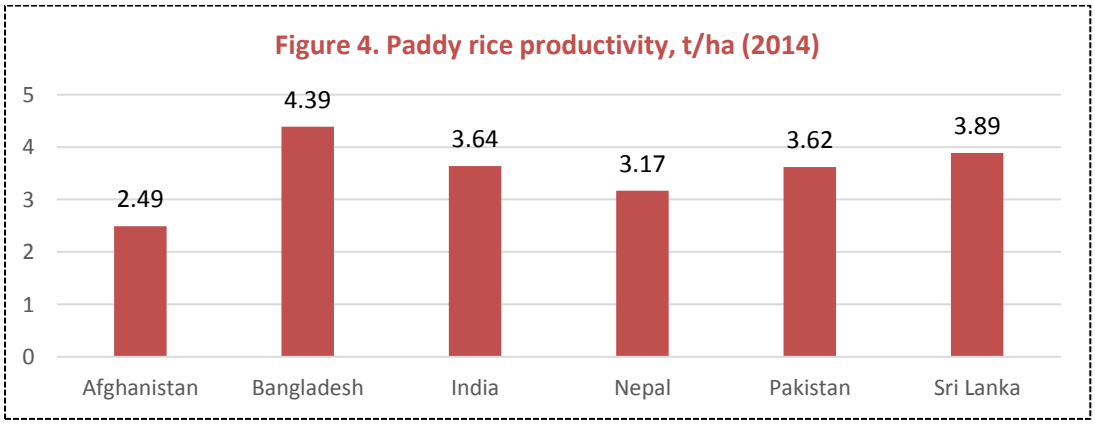
Cereals

South Asia's yield performance has improved as the result of longstanding, intensive support for cereal production. However, yields remain well below levels in other regions practicing intensive agriculture (such as China and the EU--figure 3), due to lower adoption of productive seeds and new technologies as

well as less efficient use of resources, water in particular.[195] Even though investment in irrigation has maintained growth, irrigated rice and wheat production face diminishing returns to investment in long run (for example, in India). Bangladesh and Sri Lanka have the highest average rice productivity in South Asia (figure 4), although yields vary considerably within countries depending on policies and the allocation of public investment.



Source: FAOSTAT,August 2015. *hg/ha is Hectogram per Hectare where hectogram = 100 grammes

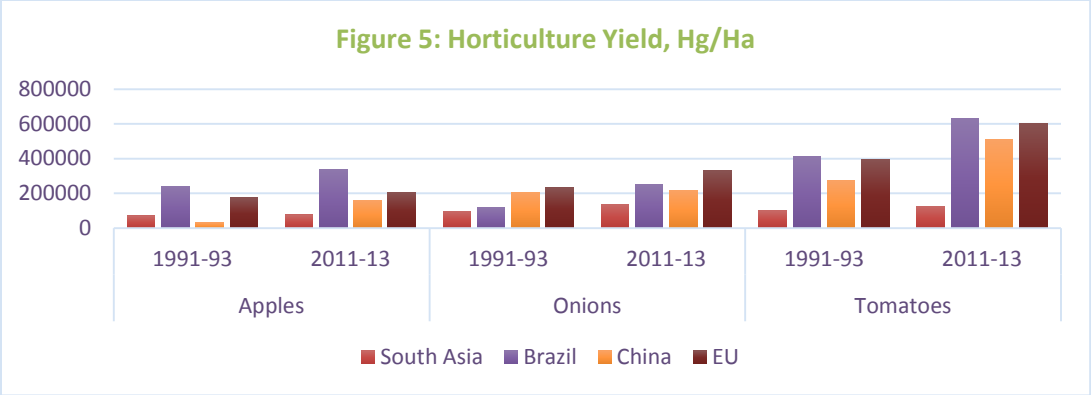


Source FAOSTAT; t/ha is tonnes per hectare

Higher-value agriculture products

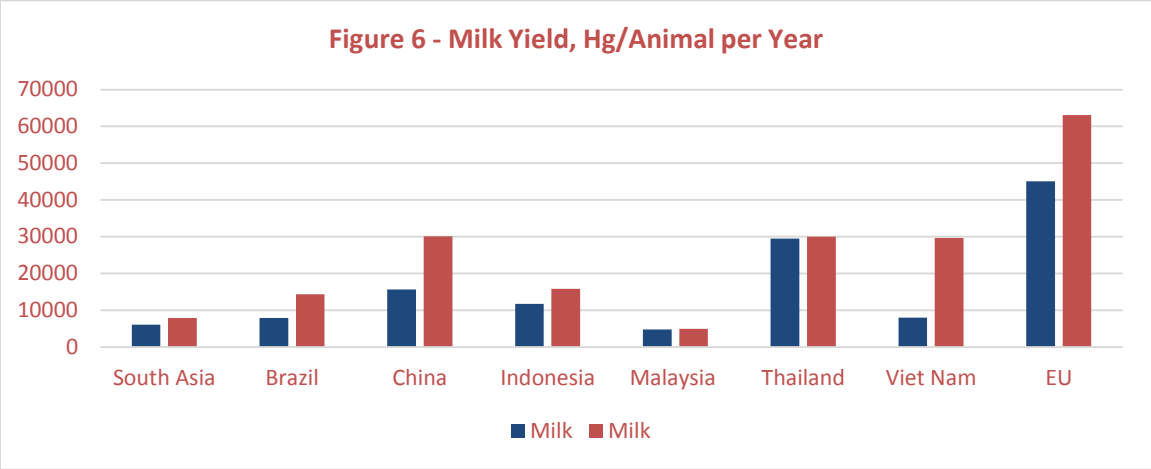
Horticulture yields are quite low in South Asia (figure 5), and this is compounded by high post-harvest losses due to poor transportation and inadequate storage.

[195] Underlying causes behind under-investments in new technology seems to be the low effectiveness of extension services and market incentives, including prices and proximity to markets, while efficiency in the use of resources seems to be linked to policies resulting in free water – including free electricity for pumping. However, it may be noted that countries in EU and China resource abundancy allows deployment of technology



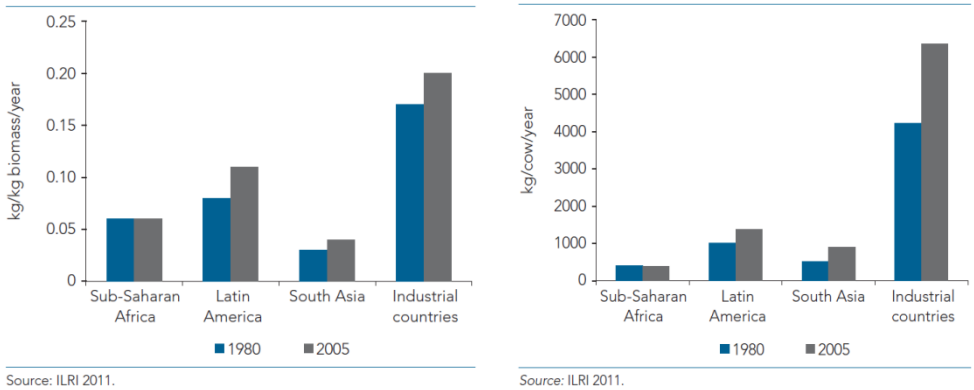
Source: FAO STAT, Aug 2015 *hg/ha is Hectogram per Hectare where hectogram = 100 grammes

South Asia has seen important increases in milk productivity over the past three decades, but yields remain very low compared with international giants such as China, the EU, Brazil and Indonesia (figure 6). South Asia's cattle meat productivity is the lowest in the world (figure 7).



Source: FAOSTAT, Dec 2015. Hg is Hectogram where 0 Hg = 1 Kg

Figure 7: Changes in livestock productivity, meat and milk (1980-2005)

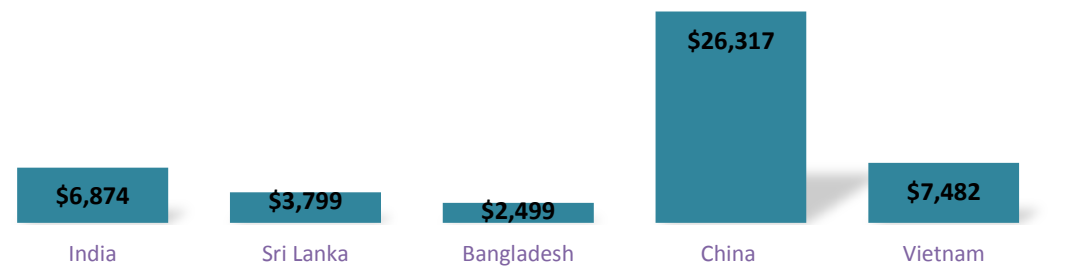


Source: Growing Africa Report. Hg is Hectogram where 0 Hg = 1 Kg. In the above figs, first figure pertains to meat and second pertains to milk

Agro-processing

Finally, South Asian countries also lag behind their East Asian neighbors in agro-processing. According to the World Bank Enterprise survey, labor productivity in Indian, Sri Lankan, and Bangladeshi food-processing firms ranges between 10 and 25 percent of Chinese firms' productivity. And only India is anywhere close to Vietnam's labor productivity, while agro-processing productivity in Bangladesh and Sri Lanka is only about a third to a half of Vietnam's level (figure 8).

Figure 8. Labor Productivity in Agribusiness Firms (output value / employee)



Source: World Bank Enterprise Survey 2014.
Note: China (2012) - 110 firms surveyed; Vietnam (2009) = 97 firms; India (2014) 382 firms; Sri Lanka (2011) 98 firms; Bangladesh (2013) 142 firms

4.3.3. Productivity drivers in South Asian agribusiness value chains

According to the World Bank Enterprise Surveys, the usual drivers of productivity, including firms' size, age, export status, foreign ownership, and propensity to innovate and agglomerate, are not significantly related to productivity in South Asian agribusiness value chains (Annex 11 Tables). This is likely the result of extensive import protection, regulations and subsidies that mute competition and reduce rewards to higher productivity or innovation (see section 4).

Half of the 507 firms interviewed had spent resources on innovation, including R&D, training, patents and acquisition of machinery and/or equipment. Investment in innovation equaled about 5.5% of turnover, and generated new products equal to about 10% of sales (table 2). This suggests that every 1% spent in innovation generated around 2% of participation of new products in firms' sales.

Table 2: Innovation Descriptive Statistics (Agribusiness)

Size	No. of Agrib. Firms	% of Firms with Innov. Exp.	Innovation Expenditure per Sales	% New Products in Sales
SMEs (<100)	402	48.51%	6.04%	10.05%

Large (>=100)	105	64.76%	4.00%	12.31%
Total	507	51.87%	5.50%	10.64%

Source: World Bank Enterprise Survey 2014

These results were analyzed using the CDM model of innovation, which is described in Volume I of this flagship. The model is used to assess the drivers of firms' innovation inputs (innovation expenditures over sales), the impact of these inputs on innovation outputs (new products over sales), and the relationship between these outputs and productivity. No significant relationship was found between innovation inputs and outputs, or between outputs and productivity (Table 3).

Finally, using a methodology from Martin et al (2011), the impact of agglomeration on firms' productivity was assessed at the district level in India (at the two and three digit sector classification using the ASI data--see Annex 11 table). Surprisingly, localization (agribusiness firms co-locating together) is negatively correlated with productivity. This result might reflect lower input prices enjoyed by isolated food processors than by a cluster of food processors competing for inputs. The analysis also shows a positive correlation between productivity and urbanization (agribusiness firms locating next to firms in other sectors), perhaps because agribusiness firms next to cities may be able to charge more for their outputs. Overall, it appears that value chain effects are more important than cluster effects in the agribusiness sector.

4.4. Drivers of Competitiveness

The development of South Asia's agribusiness will depend on firms' capacity to adapt new technology and inclusive business models, connect with consumers, and respond to changing demands. Lessons from lead firms can show how to foster the development of agribusiness and the role the public sector should play. Key issues include how lead firms introduce new technology, develop new products, leverage existing research, and collaborate with their communities to generate broader benefits to the sector.

Lead firms play an important role in establishing logistics and opening up markets. Perhaps most importantly, they set an example for what can be achieved, attract and spread knowledge, and have an innovative role in the area in which they operate. Lead firms in the agro-food sector:

- ⇨ provide access to markets, inputs, knowledge and finance to famers and promote integration into the value chain
- ⇨ create jobs directly, as well as indirectly in support services such as packaging, distribution and advertising
- ⇨ pay taxes and social benefits[196]
- ⇨ produce safe food
- ⇨ contribute to most of the high value agriculture exports
- ⇨ demonstrate what can be achieved in terms of productivity and innovation

[196] In Pakistan, income from agriculture is exempted from tax, which imposes a substantial loss of revenue for the budget.

- ⇨ may be significant in tackling environmental issues
- ⇨ share a mutual interest with their suppliers in the success of the value chain

This section summarizes the experience of 36 lead agribusiness firms in South Asia, representing the financial, production, process, logistics, and retail sectors.[197] These large, productive firms have been successful in their areas of operation and have a significant presence on the market. They represent the entire agricultural value chain and a broad set of sub-sectors, and they usually have forward/backward commercial linkages and engage with enterprises of all sizes. [198]

4.4.1. Learning and innovation

Innovation through the introduction or adaptation of global technology, from their own research, or from public institutions has been essential to the success.

4.4.1.1. Founder has technical knowledge

Due to innovative packaging approaches brought from abroad and continued investments in R&D, Sri Lankan tea company Dilmah has remained competitive despite rising wages among tea growers. Today, Dilmah Tea is Sri Lanka's largest exporter of tea and the sixth largest tea company in the world, exporting premium tea to more than 80 countries. It started in 1974 with 18 employees, and now has 35,000. The founder, from a middle class Sri Lankan family, acquired his skills during training in London in the fifties, where he spotted the opportunity of developing higher value tea by having the tea treated and packed in situ as opposed to being shipped as a raw commodity to London. Dilmah was able to circumvent traditional distribution channels by leveraging new premium channels such as high-end retail and hotel chains, as well as airlines. This innovation led to superior tea and in a much higher share of the value being created in Sri Lanka.

4.4.1.2. Partnerships with leading global firms

The Fauji Foundation is among the largest business conglomerates in Pakistan. Its product lines include Pakistan's leading cereal brand and a global fertilizer enterprise, both the result of collaboration with international companies. The Fauji Foundation was established in 1954, and entered into a collaboration in 1956 with the UK Quaker Oats company which brought manufacturing and marketing expertise. Fauji Cereals now has 80 percent of the breakfast cereal market in Pakistan. The interests of the group gradually diversified, and by the 1970s attention turned to the production of fertilizers. To acquire leading manufacturing and product development capabilities, a joint venture was established with the Danish chemical catalysis company Haldor Topsoe A/S to form the Fauji Fertilizer Company (FFC).

[197] More detailed write-ups from the interviews conducted with the 36 firms for this report can be found in Annex 1B.
[198] This section is based on interviews with lead agribusiness firms in India and Pakistan, as well as with government agencies, development partners and NGOs. Inputs to this section from the rice value chain are based on interviews with farmers, traders, commission agents and millers and wholesalers. Annex 1B lists the companies interviewed.

4.4.1.3. Making use of existing public research

At the turn of the past century, managers at KRBL attended a demonstration by the Indian Agricultural Research Institute (IARI) where a new "evolved" variety[199] of basmati rice, numbered 1121, was presented. KRBL staff were shown the variety's extraordinary cooking characteristics, which resulted in the longest cooked grain of any basmati type. Subsequently, KRBL acquired a small sample of 3.5kg from IARI, and in 2001 began growing it for reproduction even before the line had entered national trials. Three seasons later, when the variety was officially released as Pusa-1121, KRBL had 20,000 tons ready. Over the next three seasons a portion of the crop was saved for reproduction and a portion milled for test marketing. KRBL had already established a network of farmers, initially through contract production. The knowledge that KRBL would buy 1121 in the *mandis* reduced the marketing risk facing the farmers growing the new variety. The results of testing were overwhelmingly positive. Growers recognized the higher returns from higher yields on a shorter growing cycle, with a lower water requirement. And consumers in the Gulf markets found that a cup of milled rice gave 4.5 cups of boiled rice, compared to the more typical 4 cups. Adoption of the new variety spread rapidly to cover 84 percent of basmati plantings in Punjab and 68 percent in Haryana by 2013.

Plant breeding, and indeed much experimental research, is beyond the resources and capabilities of typical companies in the value chain, except those established to develop and exploit new technology as input suppliers. Plant breeding and other agronomic research is generally perceived as a public good that needs the support of public funding. That creates a dislocation between research and product development, and the dissemination of new varieties and novel technologies is slowed by high risk perceptions. Farmers are reluctant to grow a new variety, listed and certified or not, unless assured of a market.

Linkages between research institutes and the private sector can be encouraged through private-sector funding of research or through a foundation established to exploit research. There are a number of examples of this latter approach, such as the Fundación Chile[200] and the Negev Foundation[201].

4.4.1.4. Being forced to learn and innovate through competition

K&N, the Karachi-based fully integrated poultry enterprise, operates in Pakistan where 98 percent of chickens are sold live through the wet market. Despite solid growth, the formal market for processed chickens is small. Operating in this segment requires competing directly with global leaders such as McDonalds and KFC. Where these global chains were once customers of K&N, they began importing chicken parts at a lower cost than K&N could meet. At the same time, restrictions by US on imports of meat from Pakistan made it impossible to export halal chicken products to North America. The management of K&N opened a factory in New York State, and the exposure to international markets and world class suppliers has kept K&N at the leading edge of the processed poultry business.

[199] Only one parent was a basmati type
[200] www.fch.cl
[201] www.negev.org

The Indian seed industry was transformed from domination by public enterprises in the 1960s to a private sector-driven model by the 2000s. The first generation seed corporations (national and state seed corporations) played a critical role in delivering the seed to both commercial farmers and the small, marginal farmers. The next two decades saw structural changes with the entry of private sector firms that were predominantly family owned. The Indian government embarked on an ambitious reform agenda with introduction of the new seed policy in late 1980s and economy-wide reforms in early 1990s, which paved the way for the entry of the multinational seed giants in India.

Few multinational seeds companies began operations in India independently; instead, most entered into partnerships with domestic private firms. Initially the industry thrived on the genetic plant material supplied by public agencies such as the Indian Council of Agriculture Research and the State Agriculture Universities. Subsequently, the private seed sector achieved rapid growth and now supplies most of the hybrid seeds in the country. Several studies indicate that the market share of the private seed sector is as high as 70-90 percent in major commercial crops like cotton, maize, and vegetables. Similarly, the private sector supplies 60-80% of commercial seeds in self-pollinated crops like paddy (especially in the states of Punjab, Haryana, and Andhra Pradesh). Private sector participation has been encouraged by the low marginal cost and risk in producing paddy seed, and the potentially lucrative market for hybrid maize and vegetables. Recent trends also indicate increasing consolidation in the private sector.

India also strengthened the intellectual property rights (IPR) regime to comply with World Trade Organization agreements. The Protection of Plant Varieties and Farmers' Rights (PPVFR) Act, 2001 and the amendments of the Patents Act brought the domestic IPRs regime on par with the international regime as envisaged under the WTO. These initiatives have promoted increased choice to farmers, thereby enhancing access to quality seed material in rural India.

4.5. Driving development throughout the supply chain.

Lead firms in South Asia have had to develop linkages with smallholders, who dominate production of raw materials in the region. Firms have increasingly relied on joint ventures with smallholders, including in its most developed form contract farming. However, many other, more flexible arrangements exist to link numbers of small scale producers to a larger agri-business firm. While such arrangements are not without challenges, they also can be powerful means of disseminating new technology, introducing diversification, improving returns to farmers, securing timely supplies of the right quality for a processor or exporter, and eventually driving higher levels of productivity.

4.5.1. Facilitating smallholder access to markets

Lack of market information and logistical difficulties prevent small-scale producers in South Asia from accessing markets efficiently. Market information is essential to delivering the right product, in terms of quality or market expectation, at the right time and at the right price. Without a good understanding of these criteria, and preferably for more than one market, the small scale producer is seriously disadvantaged. Distance to market is another key constraint on the small scale farmer, who may not

have access to regular transport. Generally, distances to market in excess of four hours of travelling time act as a major deterrent to marketing perishable products. If the product is to be exported, the logistics and financing requirements are usually beyond the capabilities of the small scale farmer. In any event, further processing may be needed prior to export.

Linkages between producers and down-stream agribusinesses can open up market opportunities and connections that smallholders would otherwise find difficult, if not impossible, to reach. On the export side, the rice processors provide the small scale farmer with access to global markets. In the case of the basmati rice variety Pusa 1121, the rice processor KRBL transferred crucial market information to farmers by ensuring that they produced the "right" product for the overseas markets. In the banana trade, Desai F&V and its partners recognized the logistical difficulties of moving perishable and easily damaged fruits from the farms to the markets. By taking control of the logistics and managing the process from fruit formation onwards, Desai succeeded in supplying remote urban centers with quality bananas, and achieved the ultimate success of exporting Grade 'A' fruit.

Aftab Bahumuki Farms Limited (ABFL), established in 1991, is one of the leading poultry farms in Bangladesh. ABFL first introduced contract farming for commercial broilers on an experimental basis, by working with a select group of 20 farmers. The number of farmers involved had increased to 650 by 2003, but an epidemic of bird flu reduced the number of participants to 200. Since then numbers have risen again. While contracting helps the farmer to move from raising scavenging poultry to commercial poultry production, the principle attraction in the contract is the market access. An assured market and favorable prices circumvents the high transaction costs involved in finding markets, collecting market information and negotiation. A study[202] finds that contracted farmers achieve a significantly higher level of output (11,783 kg/year) than the non-contract farmers (6,763 kg/year), with higher labor productivity. The gross margins of 18.2 taka[203] and net returns of 17.2 taka for contract farmers were substantially higher than those of the non- contract farmer, 12.9 taka and 10.0 taka respectively. These improvements led to higher gross income for the poultry farms.

Linkages also form between producers and middlemen. In Bhutan for example, citrus and in particular mandarin has become the primary agricultural export. The future crop is sold at flowering time to contractors, who take responsibility for the crop as it develops. These contractors provide support to farmers and maintain the post-harvest logistics necessary to deliver a quality crop to the exporter. The contractors also act as assemblers on behalf of the exporters, who are unable to maintain relationships with large numbers of farmers. The position of the contractor is insecure, since farmers could form marketing groups with the ability to deal directly with the exporters. Mostly the relationships are informal and based on trust rather than contract.[204]

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[202] Begum, I.A. 2008. Prospects and potentialities of vertically integrated contract farming in Bangladesh. Department of Agricultural Development Economics, Hokkaido University, Japan.

[203] Taka is the currency of Bangladesh. 1 Taka ~ USD 0.013

[204] Further examples of linkages providing market access are shown in Annex 2.

4.5.2. Access to inputs

Lead firms are increasingly providing extension services, either exclusively or in tandem with the government and development partners. Pakistan's Government began including the private sector in extension in 1988, and most leading firms now participate (Riaz 2010).[205] Contracting a future harvest in return for receiving inputs on credit is another common model, often carried out without a written contract by traders and farmers. More formal arrangements are also set up where, for example, the buyer has need of a particular variety. One example is menthol production in Uttar Pradesh in India (see Section 5.3). In India, Pepsico provided potato varieties suitable for the processing of potato chips to thousands of small-holders supplying its processing facilities.

In Bhutan, Mountain Hazelnut Ventures (MHV) was established in 2010 to plant and process hazelnuts. The company imports hazel tissue, cultured plantlets as well as seed, from a related operation in China. These are distributed among farmers; in three years of operation 2,000 ha have been planted and 5,000 farmers trained. Commercial harvesting may begin this year. In a landlocked country with a population heavily dependent on subsistence agriculture, the opportunities for adopting change and accessing remote markets are extremely limited. This linkage between processor and farmers provides a rare opportunity for income generation in a challenging environment.

4.5.3. Access to finance

Linkages with downstream producers can improve farmers' access to finance. This is achieved directly through a variety of contract farming arrangements, with inputs provided on the basis of agreements to sell the output at a later date. There are indirect benefits as well, as banks are more willing to lend to farmers that have a contractual arrangement with a processor. Godrej Agrovet (GAVL), for example, is a diversified agribusiness company with interests in animal feed, oil palm plantations, agricultural inputs, and poultry. The oil palm plantation business works with 54,000 ha of smallholder production spread across eight states. The land is owned by the farmers, and GAVL provides assistance to them in switching to oil palm. GAVL buys fruits and crushes them to produce crude palm oil (with the potential to reduce the crippling dependence on imported vegetable oils). GAVL's involvement and in particular the guaranteed price arrangements, has encouraged banks to lend to farmers. GAVL has developed a standard financing model with the banks for the farmers.

Finally, agricultural insurance is not well developed in South Asia, and ABT, for example, provides insurance to their dairy farmers.

[205] Annex 3 provides more examples of some of the extension and advisory services provided by the interviewed Lead Firms.

4.6. Constraints on Competitiveness

The World Bank Enterprise Surveys can be used to analyze the impact of cross-cutting domestic investment climate constraints (political climate, crime, corruption, taxes, electricity, finance, labor regulations and skills) on agribusiness firms' productivity in all South Asian countries except the Maldives. Remarkably, the only constraints found to be significant are electricity (Afghanistan and Pakistan) and the political climate (Afghanistan and Nepal - see Annex 5 for more details).

Most of these challenges are related to agricultural policies that in the past were successful in increasing cereal crop production and improving food security, but that today are impede the growth of higher value food products and related services. The combination of import protection, restrictions on markets and prices, and extensive passive subsidies has stifled competition and rewarded the status quo. This is why the traditional drivers of competitiveness are not significantly related to productivity in most of South Asia's agribusiness (see section 2). This section provides an overview of the agribusiness policy constraints, and discusses the positive impact of recent reforms.

4.6.1. Trade policy and facilitation

Table 3: Tariffs on imported agricultural products

Agricultural Products	Average Bound Tariff	Average Applied MFN rate
Afghanistan	--	7.1
Bangladesh	192.0	16.8
India	113.5	33.5
Nepal	41.5	13.8
Pakistan	95.5	15.4

Almost all South Asian countries liberalized their external agricultural trade during the 1980s and 1990s. Sri Lanka led the way, with others following in the 1990s. The extent of liberalization varied, but in any event many countries reversed or reintroduced trade policies in the 2000s, shifting to a more inward looking stance. Non-tariff trade barriers are now pervasive and increasing.

6.1.3 4.1.1 Tariffs

6.1.4 Overall, bound tariffs206 in South Asian countries remain high (Table 4). While the applied MFN rates are significantly lower, the difference between actual and bound rates implies a potential unpredictability in national trade policies. Table 3 sets out the average tariffs on imported agricultural goods in South Asia.

The tariffs imposed by India on most agriculture categories are higher than in other South Asian countries. For example, the Indian duty on dairy products is 30%, compared to 25% in Pakistan and 10% in Nepal. Also, India maintains high tariffs on the imports of higher value added dairy products such as

[206] The bound tariff is the maximum MFN tariff level for a given commodity line.

cream, butter, yoghurt, cheese and sweetened milk powders. An analysis of MFN duty rates on basmati rice in countries which are leading exporters and importers is given in Table 4.

Table 4: Comparison of MFN Duty Rates on Basmati Rice

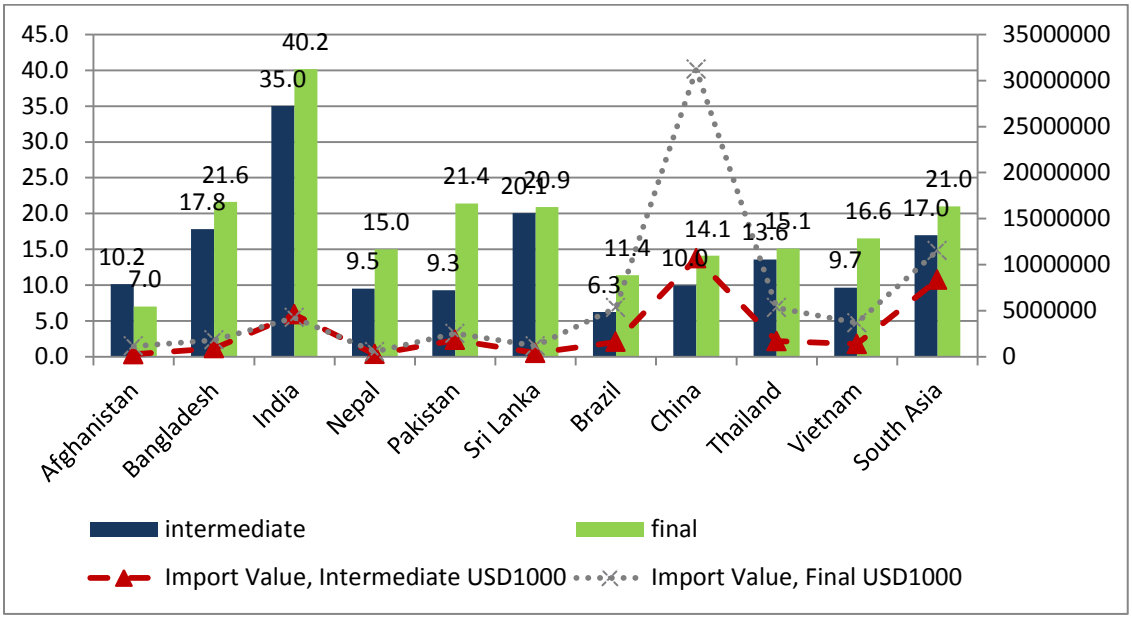
Import to Country	MFN Duty Rate	Sales Tax	Additional Duties & Taxes
India	80%	0	Landing charges (1% CIF) CESS (3% (Duty + CEX (Education & Higher Education CESS) + Countervailing duty))
Pakistan	10%	17%	
Bangladesh	10%	0%	AIT(Advance Income Tax) (5% CIFD)
UK	0% + €30.00 per tonne (1000 kg)	0%	
USA	0% + US$0.0083 per kg	Depends on State	
Iran	40%	8%	
Thailand	52% 7%		

http://tariffdata.wto.org/TariffList.aspx

The region's agriculture sector is also hampered by some instances of inverted tariff structures. For example, in Afghanistan the average tariff on intermediate goods is significantly higher than the average tariff on final goods, while imports are negligible (figure 9). Field interviews with stakeholders also point to highly inverted tariffs in particular subsectors. For example, Pakistan's import duty on finished poultry products from Malaysia is zero, and from China is 16 percent, but local poultry processors must pay 15-30 percent duty plus 17 percent sales tax (GST) on inputs. The Poultry Association estimates that these tariffs raise local producers' costs by 5 percent, and that reverting to the zero rating (pointing out that all foods in the EU and many other countries are zero rated) could lead to an additional slaughter by the processing industry of 20 million birds per year. This would increase domestic consumption and exports, raise government revenues by PKR 3.8 billion over five years, create over 14,000 jobs, and generate an extra PKR 7 billion for the allied industries of packing, marketing and ingredients. Similarly, the fruit juice industry in Pakistan faces import duties of 25 percent for glass and 20 percent for cans, compared with 10 percent on imports to India, and 5 percent on glass and 15 percent on cans on imports to

Nepal.[207] While exporters can often be reimbursed for import duties on inputs, the process is reported by processors in Pakistan to be slow.

Figure 9: Recent Average Intermediate & Final Tariffs along with Import Values *(2013 in case of Afghanistan, Bangladesh, India; 2014 in case of other countries in the Graph)*



Source: WTO Data, December 2015

4.6.2. Export bans

Government intervention in the export trade adds a level of political risk that is a strong deterrent to investment in large scale processing and export operations. As the world food price crisis unfolded, the Government of India banned the export of non-basmati rice in October 2007 in order to increase supply for its food distribution program. The ban was lifted temporarily, and was then reapplied in April 2008 and remained in place until 2011. As a result, none of the large, transnational rice traders invested in the Indian non-basmati trade. Once the ban on exports was lifted, India rapidly moved to become the leading exporter of rice in the world. More recently, new large scale mills with an export focus are being installed in Andhra Pradesh.

Export restrictions probably added to the rise in commodity prices, primarily by causing panic buying in importer countries.[208] Alternatives that would be less disruptive to external trade include the application of safety nets, such as cash transfer programs to the poor, the relaxation of import controls and release of stocks, and longer term investment to increase agricultural production.

[207] Import duties on juices in Pakistan vary from an MFN rate of 25 percent, to 20 percent on juices from China and 5 percent on product from the SAFTA. Some origins, for example Malaysia or Iran, also receive preferences on specific juices. For India the MFN rate for juice is 30 percent with a preferential rate for SAFTA of 20 percent. The Indian processor is at a significant advantage compared to its Pakistani counterpart.

[208] IFPRI (2010) Reflections on the global food crisis

4.6.3. Non-tariff barriers

Declines in tariff rates in South Asia, especially in India, have not been accompanied by strong growth in intra-regional trade. For example, while India is the largest or the second largest (after China) trading partner for all other SAARC countries, with 73% of all intra-SAARC exports, it only registers 13% of intra-SAARC exports. Also, India's exports to SAARC countries equal only 4.7% of its total exports, and India's imports from the region remain an insignificant 0.5% of its total imports (according to IT Trade Map data for 2011).

Non-tariff barriers have long been cited as one of the major reasons behind the low intra-regional trade. NTBs are far more pronounced in India and Pakistan than in the other countries. These barriers can broadly be categorized as the positive list approach, technical barriers to trade and sanitary and phyto-sanitary measures, trade facilitation and customs procedures, financial measures, para-tariff measures and visas. For example, Sri Lankan exporters express concerns over quantitative restrictions imposed by Indian authorities on certain products, e.g., hydrogenated vegetable oil. Afghan goods entering Pakistani territory either for Pakistan's market or for transshipment to other countries are subject to repeated inspections, leading to delays in shipment. Further, India's food safety and standards regulations (2011) provide a new definition for cheeses that prohibit the use of animal-derived rennet, and thereby exclude any cheese from the EU (see Annex 7 for the most common non-tariff measures in South Asia).

The external trade environment for agriculture in South Asia thus remains highly restricted, with important variations between countries. Bangladesh, Nepal, Bhutan and Afghanistan generally have open trade regimes, while trade policy in India, Pakistan and Sri Lanka is unpredictable and ad hoc, with multiple shifts in policy, often varying by commodity and export/import orientation.

4.6.4. Infrastructure

The efficient flow of product through a port and quality storage infrastructure are especially important for perishable products, where delay can mean partial or complete loss of a shipment. Up-country customs clearance and container sealing can simplify the process, but in Pakistan this is not available, while procedures at Karachi are considered cumbersome, particularly due to the lack of risk-based inspection. Several attempts are being made in the region to speed procedures and improve storage and transport infrastructure, for example the establishment of export processing zones in both Pakistan and Bangladesh.

4.7. Restrictions on domestic agricultural markets

The extent and severity of market regulations and the distortions they impose on marketing varies markedly across countries. Domestic markets and marketing function freely and efficiently in Bangladesh, Nepal, Bhutan and Sri Lanka, while agricultural markets in India and Pakistan still operate under regulations formulated many decades ago, which tend to significantly impede efficient, modern transactions. For example, the mandatory sale of produce in licensed markets with a limited number of licensed traders has over time created an imbalance in market power, impaired transparency, and limited direct purchase and contracting between agro-processors and farmers. In addition, all countries face problems in physical market and road infrastructure that significantly raise marketing costs.

Reforms have been introduced, but implementation has been uneven and their impact has been limited. Much more needs to be done, as the regulatory framework for markets and marketing is essential to move towards higher value added agricultural activities.

4.7.1. Market regulations

Most countries in the region have recognized the need for reforms in agricultural marketing. India and Pakistan, which have the most distorted marketing policies, are taking several steps to this end. For example, India introduced a model Agriculture Produce Marketing Act (APMC) in 2003, which provides for the creation of alternative marketing channels, thereby restricting monopolistic practices and encouraging the creation of efficient infrastructure by the private sector. Despite such attempts, the reforms have not been implemented fully by most states in India, as is also true for Pakistan.

The case of agricultural marketing in Punjab, India is an example. The Government of Punjab through Punjab Agro Foodgrain Corp (PAFC) engaged in contract farming from 2002-03 to encourage diversification away from rice. Success was limited, and the scheme was closed in 2012. In 2013 the Government of Punjab introduced the Punjab Contract Farming Act, which provides for buyer registration, dispute resolution, direct purchases through farms/markets and oversight by the Punjab contract farming commission. However, because the APMC Act has not been amended to allow for direct purchasing, contract farming is still not permitted. The APMC markets therefore remain in place and all rice, basmati and non-basmati, is traded through them. A number of taxes[209] remain in place, which in total amount to 14.5 percent of the sale value. By contrast, in Tamil Nadu the APMC was reformed and market fees and taxes have fallen.

Similar differences in policy regimes are observed in Pakistan. For example, the mandi in Pakistan's Punjab adopted its Agricultural Produce Markets Ordinance in 1978, which was virtually unchanged from the original Act of 1939 and provides for strict control over the marketing of agricultural produce via market committees. Also, produce must be traded through the market, mostly with a fee levied by the market. As a consequence, there are no private markets to compete with the established markets. There are about 150 fruit and vegetable markets and 150 grain markets in the Punjab. Services are poor and the setting of fees is opaque. With a limit on the membership of dealers and traders, there are allegations of collusion and misbehavior in the market. Mostly the problems affect the fresh produce supply chain, where excessive commissions reduce the return to the farmer and raise retail prices to the consumer. By contrast, in Pakistan's Sindh Province, the 1939 Act was replaced by the Sindh Wholesale Agricultural Markets Act, 2010. The new Act abolished notified market areas and market committees, and allowed private markets and direct buying. Private initiatives have emerged as a result. One such example is being developed by the Pakistan Agricultural Coalition, which is establishing a chili trading platform in Kunri, Sindh Province with the goal of introducing a more direct linkage between grower and buyer in order to reward quality. This new venture relies on bringing a number of actors together to provide a full range of quality services, including logistics, storage and an auction platform. If successful, the concept will be rolled out to other areas and for other crops.

[209] Sales tax 5 percent; Market fee 2 percent; Agents' commission 2.5 percent; other 5 percent(of MSP)

4.7.2. Other impediments to private investment in agricultural markets in Bihar, India

The state of Bihar attempted to improve the enabling environment for agricultural marketing, and in particular reduce rent-seeking, by repealing the APMC Act in 2006. This paved the way for the establishment of many private market yards, while trade in the formerly-regulated market yards continued. However, infrastructure services are deplorable in the market yards that are owned by the state and continue to be the major trading platforms. Basic amenities such as power, water, security, sanitation and general upkeep are inadequate, but no private investment will take place so long as the yards remain in state ownership. Unfortunately, Bihar lacks alternative channels for marketing produce. While Bihar ranks among the top vegetable and fruit producing states in India, the inadequate market network makes transactions onerous and costly for both producers and consumers.

4.7.3. Policy impediments to logistics

The Indian logistics industry has grown by 16 percent per year over the past few years, and was valued at an estimated US$ 130 billion in 2012-13.[210] The industry includes freight and passenger transportation via road, rail, air and water, as well as warehousing and cold-storage. It is estimated that the aggregate freight traffic is about 2-2.3 trillion ton kilometers. The costs of freight transport constitute about 16% of agribusiness industry turnover, and about 14% of outbound food grain industry turnover. Of the total warehousing space of about 1,800 million sq ft, the industrial and agricultural segments constitute about 86 per cent and 14 per cent, respectively. Two thirds of food storage is owned by the public sector. The lack of adequate storage infrastructure in India is one of the primary reasons for high costs and avoidable food wastage. Some of the constraints to development of higher value chains are enumerated below:

- *Inadequate storage infrastructure:* The Warehouse Development Regulatory Authority has recently estimated the existing capacity of storage at 118 million MT[211]. The planning commission estimates the current gap between agricultural warehousing supply and demand at 35 million MT. Currently, public sector agencies like the Food Corporation of India (FCI), Central Warehousing Corporations (CWC) and the various State Warehousing Corporations (SWC) have a storage capacity of 83 million MT, while the private sector has close to 19 million MT. To put the scarcity in perspective, food grain stocks held by the government totaled 80 million MT at last year's peak, according to the FCI annual report. India's current cold storage capacity at 25 MT is barely sufficient for 10 percent of fruit and vegetables produced in the country.

- *Skewed distribution of storage capacity:* Skewed distribution of the cold storage capacity is another issue, with North India having access to 56 percent of the total public storage infrastructure, compared to only 8 percent in Eastern India. Six major grain producing states account for almost 67 percent of storage capacity in the country. Bihar, Odisha, MP, Chattisgarh

[210] Report by India Brand Equity Foundation: Indian Logistics Industry- gaining Momentum; November 2013

[211] Report by committee for strengthening negotiable warehouse receipts by the warehousing development and regulatory authority in the country; Department of Food and Public Distribution ; February 2015, http://wdra.nic.in/FinalBook.pdf

and Jharkhand, which have recently become major grain producers, only account for 13 percent of storage capacity.

- *Lack of collateral management options:* Collateral management refers to financing of agricultural goods stored at warehouses, and is only in nascent stages in a few states in India. This presents a huge opportunity.

- *Inadequate freight infrastructure:* India's freight depends heavily on roads, despite the traffic being bulk in nature. With a conservative annual growth rate of 7.5%, India's freight traffic is projected to leapfrog by 2020. The poor quality of roads, trucking and port handling infrastructure will continue to impair service levels and transit times, and will hamper the competitiveness of agribusiness (among other sectors).

- *Regulatory Barriers:* Outdated regulations, such as the Agriculture Produce Marketing Act (first promulgated in 1956), and Essential Commodities Act (from 1955), have hindered the development of storage and processing infrastructure in India. In particular, stock limits and price limits can be imposed, with penalties that include potential jail sentences of up to seven years[212]. Not surprisingly, the private sector has been hesitant in engaging in storage. The tax regime in India does not encourage multi-modal logistics systems, which means that firms often rely only on road transport, despite the cost.

Recent measures, like the inclusion of agri-warehousing under priority sector lending by the Reserve Bank of India, several subsidy schemes (such as capital investment subsidy scheme offered by NABARD which ranges from 15-33 percent of project cost), tax incentives and the Warehousing Development Regulation Act 2007 (which will promote negotiability of warehousing receipts) are aimed at compensating for the high regulatory/penal risk discussed above. Similarly, several sub-national governments have introduced Private Entrepreneur Guarantee Schemes, under which the FCI guarantees hiring of warehouses for 10 years, in order to encourage private sector construction. But these are second best and expensive solutions, as a low risk, low cost environment would be superior to an artificially high risk, high reward/cost one.

4.7.4. Limits on retail competition and FDI in India

India's merchandise retail market, which accounts for nearly half of private consumption, is forecast to increase to US$1.4 trillion in nominal terms by 2021. Traditional brick and mortar stores make up 93% of the total retail market. Corporate brick and mortar retail caters to about 7%, and e-commerce about 0.1%.

[212] The ECA is not applied evenly across all states: in 2014 Maharashtra was apparently not applying stock limits to onions and potatoes and UP is not enforcing the Act. http://www.business-standard.com/

FDI in the retail sector is subject to some limits. Fully-owned foreign firms are allowed for single brand product retail trading, and in some states a maximum of 51 percent foreign ownership is allowed for multi-brand retail trading. In either case, Government approval is required, the availability of which varies from state to state. Andhra Pradesh, Assam, Delhi, Haryana, Kashmir, and Maharashtra, among others, permit foreign retailers while W Bengal, Bihar, Karnataka, Kerala, Madhya Pradesh, among others, do not. Global retailers such as Wal-Mart, Tesco Plc., Metro AG, Shoprite Holdings GAP, JC Penney, H&M, Karstadt-Quelle and Sears (Kmart) have expanded their presence in India. The variety of FDI approval policies has led to different degrees of competition among states. For example, unorganized players have improved their services in states that have opened doors to foreign firms, showing that competition can increase pressure for performance even among the unorganized local retailers who dominate the Indian retail landscape.

6.1.5

4.8. Restrictions on prices and products

Price controls are the most common intervention in regional agricultural markets, with a significant impact on agribusiness. The drive to food security in the 1960s and 1970s led to multiple public interventions to support the production of cereals, most notably output support prices and subsidized input prices. Although almost all countries in the region have achieved self-sufficiency in food production and have the potential to generate surpluses, these price policies have become politically very difficult to remove. Minimum Support Prices (MSP) in India (initially for rice and wheat, but in recent years expanded to cover a wide range of other crops) and support prices for wheat in Pakistan are backed by large procurement programs. Bangladesh announces minimum support prices, but with limited procurement (although procurement takes place mostly in the dry season irrigated *boro* rice crop, which limits the otherwise considerable potential for farmers to diversify in that season). Sri Lanka also announces minimum prices; while its procurement operations are limited, the policy continues to distort market prices.

4.8.1. Pricing restrictions and higher-value products

As discussed in chapter one, higher incomes and urbanization is increasing the demand for higher value food products such as fruits and vegetables, tubers, and livestock products such as meat and dairy. But even though this means important income opportunities for farmers, India is already unable to meet its domestic demand for higher value products. In part, this reflects policies which bias production towards non-basmati rice and wheat (World Bank, 2014). Importantly, Minimum Support Prices (MSP) for production discourages farmers from moving into higher value crops that would increase income and employment, and boost investment, for example in post-harvest infrastructure. In addition, the MSP discourages local processing, even when other incentives for processors are provided. In Bihar, the state Government provides investment support for the establishment of small-scale mills. However, the MSP on the input means that rice processors are not able to compete with the prices of imported rice from India's Western States, so that building mills is not profitable.

Table 5: MSP trends and cost comparators in India

Although only 23 percent of farmers in India actually benefit from MSP, the MSP together with heavily subsidized inputs (see section 4.4) provide a low-risk operating environment for farmers to continue to produce crops that may not be profitable under free market conditions. Table 5 shows the margins for MSP relative to production costs. Initially the MSP was directed at encouraging the production of rice to achieve food security. Lately, the MSP has become a means of supporting farmers and had led to surpluses that are now exported.

	C_2 cost (in ₹)		MSP (in ₹)		% margin over C_2	
	Paddy	Wheat	Paddy	Wheat	Paddy	Wheat
FY07	569	542	650	700	14	29
FY08	595	574	775	850	30	48
FY09	619	624	930	1,000	50	60
FY10	645	649	1,030	1,080	60	66
FY11	742	701	1,030	1,100	39	57
FY12	888	826	1,110	1,170	25	42

Note: MSPs fixed include bonuses, whenever announced, MSPs were generally fixed as per recommendations of CACP, with a notable exception of paddy in FY09 when it was fixed at R880+bonus of R50 agianst R1,050 recommended by CACP. Other exceptions being paddy (FY07) and wheat (FY08)
C2= Comprehensive costs incl. rent and interest on owned land and capital

Source: CAG, report no 7 of 2013 (tables 2.2 & 2.3)

In order to encourage the production of higher-value commodities, which are often more perishable than grain products and thus inherently carry more risk for producers and other actors in the supply chain, a level playing field must be created in the sector.

The wheat market in Pakistan is heavily controlled by the Government, which has several negative effects. For example, the quality standard used for public sector purchases of wheat is Fair Average Quality (FAQ), and specifies only the most basic criteria of moisture content and presence of impurities. By contrast, a miller might expect to buy on the basis of parameters such as test weight, gluten content, and falling number. These rudimentary standards provide no incentive to maintain quality during storage. The mills use a wheat washing or wet cleaning process that requires a lot of potable water and generates problems due to effluents and handling of the wastewater, and which is generally considered outdated and in some countries banned. The millers have little incentive to operate efficiently: since only flour mills are permitted to store wheat and subsidized wheat is supplied to the mills on a quota system related to the number of roller stands in the mill, millers can earn profits by reselling subsidized wheat when the market rises above the support price. In order to counteract such widespread practices the government monitors electricity consumption at the mills, but this encourages running the mills empty, with further wastage of water.

4.8.2. Unrecognized quality and food safety standards

Although the premium for better quality products can be high, food safety and quality standards can pose challenges for South Asian traders and exporters. Sanitary, phyto-sanitary (SPS) and food safety regulations are the main obstacles. The issues vary among countries, but a general concern among processors and traders consulted for this report is that food safety regulations often are rigid, do not reflect scientific advancements, and are not in line with WTO's Agreement on Sanitary and Phyto-Sanitary measures. In Bangladesh, India, and Pakistan, the regulatory authorities are spread across ministries or other agencies, with overlapping responsibilities and without coordination (e.g. livestock and plant health fall under the Ministry of Agriculture and food safety under the Ministry of Health). Enforcement of regulations is reportedly inefficient or lacking, and food safety laboratories are not recognized by international bodies and lack the capacity for tests for pesticides, mycotoxin and antibiotic residues.

The system lacks the capacity to ensure the safety of food products for consumers, and also reduces access to foreign markets that demand compliance with international standards. For example, in May 2014, the EU imposed a temporary ban on imports of Indian Alphonso mangoes and four vegetables[213], as a result of what the European Commission described as "significant shortcomings in the phytosanitary certification system of such products exported to the EU". The main concern was that pests found in Indian exports could pose a risk to agricultural production in the EU. The UK alone imports some 16 million mangos (US$9 million) per year from India, so the ban affecting all EU imports could have important effects on producers and actors in the supply chain. The EU lifted the ban 6 months later, after facilities had been upgraded, new handling practices implemented, and the capacity if inspecting staff improved.

Quality is also of concern to sector participants. A survey of traders in Bangladesh showed that the premium for both high quality and sanitary standards ranged from 10 to over 30 percent (although the study showed higher returns for quality than for meeting sanitary standards). Nevertheless, few of the traders that participated in the survey reported that they increased costs in order to improve quality. Similarly, an overview of agro-food processors in Afghanistan revealed that many operated with equipment dating back to the 1970s and few have invested in the quality assurance necessary to access foreign markets. Thus, although there is a potentially high international demand for Afghan fruit products (regionally renowned for their high quality), existing processing lines prevent such exports. Annex 8 provides an overview of challenges to food safety/SPS and quality cited by the interviewed companies.

In the longer term, inability to meet quality and safety standards may prevent South Asian products from being available in supermarkets as retail develops. Across the globe, middle-class consumers demand appealing packages, informative labels, and consistent quality and safety. Retailers impose higher standards (the most well-known example being the Global GAP standard) to ensure that these demands are met and to prevent any contamination throughout their complex supply chains. Increased consumption of animal-sourced food and processed products typically increase concerns over quality and safety. In South-Eastern Europe, however, horticulture producers also struggle to access these new markets, as not even their fresh produce

[213] Eggplant, the taro plant, bitter gourd and snake gourd

Box 1: Food safety in Nepal and the

Only 0.1 percent of the Nepalese budget is spent on food safety, and the country has only 5 food safety testing laboratories and 40 food inspectors[1] Adverse consequences for health and hygiene have limited the number of tourists visiting Nepal. Nepal's main export items, such as tea, honey, and coffee, are also affected. Nepalese tea was banned in Germany after pesticide residues were found in shipments. The coffee sector is also vulnerable, as Nepal's poor testing facilities are unable to certify the absence of pesticide residues. These higher-value products, and in particular Nepal's premium quality tea, are major foreign exchange earners, so that food safety risks are problematic for the economy as whole.

WBG's Toolkit on Food Safety prescribes eight fundamental pillars to reforming food safety: i) food safety should be secured along the entire food chain; ii) regulation by itself cannot ensure food safety; iii) in a food safety system, primary responsibility (and liability) for the safety of food rests on food business operators; iv) the role of consumers should be strongly emphasized; v) preventative and risk-based approaches should be the basis for regulatory reform, decision making, control, and self-control of food safety; vi) the role of international standards and scientific justification is key; vii) the impact of food safety reform on trade should be carefully considered; and viii) co-ordination and collaboration are vital.

Source: Food Safety Toolkit : Guiding Principles of Food Safety Reform, Published by Investment Climate-WBG ; March 2014

meets retailers' requirements for quality and shelf life. As a result, retailers often import fresh produce from export giants in the EU and Turkey.

At the same time, not all markets have the same requirements, especially not in low and middle-income countries, and farmers and firms should adapt their practices according to the requirements of the intended market. For example, the organized milk industry in Pakistan and India maintains international quality standards to produce a superior packaged product with minimal health risk to the consumer, and these standards are used in marketing the product. However, there is only a limited segment of the market prepared to pay for this level of quality assurance and therefore, raw and unpasteurized milk continues to be sold on the informal market to consumers. Although accessing high-end markets can potentially generate substantial revenues, it is unlikely that small actors have the capacity and resources needed to comply with the required standards. Instead, it is advisable to access new markets a step or two at a time.

Complying with quality standards and food safety requirements can be both challenging and costly, in particular for small-scale actors, and the Government can therefore play an important role as supporter and facilitator. The provision of public goods such as SPS and food safety infrastructure (harmonized regulations, certified testing facilities, and information and training) can help small actors comply with food safety requirements. An example of successful Government support in this area can be found in Bangladesh. In July 1997, the EU banned shrimp imports from Bangladesh due to unsatisfactory product safety. Fortunately for the industry, FAO was already working with the processors and the Government to implement Hazard Analysis Critical Control Point (HACCP) principals throughout the chain, and so the food safety concerns were addressed over the next 5 months. In this period, Bangladesh's shrimp sector lost US$15 million. The cost to upgrade the supply chain was around US$18 million in total, and included investments in new processing equipment, public laboratories, and technical skills. The annual maintenance cost for this is estimated at US$2.2million for the private sector and US$225,000 for the Government. However the benefits have included both reclaiming the banned market and further increases in exports following the HACCP implementation. The industry notes that it can now charge a higher premium, as shrimp from Bangladesh is no longer seen as a low-quality product (Cato and Sunasinge, 2003).

Since complying with SPS/food safety requirements and specific quality standards often necessitates investments in facilities, equipment, processes, and/or packaging, access to finance is often a prerequisite for successful implementation. The government can play a role as a guarantor of commercial credit lines targeting agribusinesses, but rule-based, transparent lending is essential.

4.9. Seed regulations and sector development

While it is prudent for Government to monitor the introduction of new plant varieties, the process often is cumbersome and deters technology infusion in the sector. Also, devolution of powers between federal and provincial governments and misinterpretations of law add to problems. In Pakistan, the devolution of responsibility for agriculture to the provincial level resulted in regional variations in interpretation and implementation of the 1976 Seed Act. In addition, the Act was drafted when there

was little private sector activity, so it did not provide an appropriate regulatory framework. As a result, private sector companies are largely unregulated/informal. The government of Pakistan's proposal for a new Seed Act will address a number of these issues, and it is viewed positively by the formal private sector.

Bangladesh has streamlined the seed certification process, based on the Dutch model.

The states also have responsibility for regulation of the seed industry in India. Several reform measures at the state level have encouraged private sector-led R&D, innovative approaches to seed multiplication (often introduced by multilateral seed companies and absorbed by the local seed industry) and the growth of a vibrant domestic seed industry that caters to South Asia and to Africa.

6.1.6

4.10. Land regulation and long-term investment in high value crops

Land is a challenge at several levels in South Asia. Access to readily available and affordable industrial land is increasingly a challenge, due to competition with rapidly growing cities for agricultural land. Access to land for productive farming is also problematic. Land holdings are small - on average 1.15 ha in India (down from 1.23 in 2005/2006) and 2.1 ha in Pakistan (2010 census), and land is often split between multiple parcels. For example, the average land holding in Nepal is 0.96 ha, but split between four parcels (Sharma, 1999). Although the population is growing, the changes in land sizes vary as more people move to urban areas. Nevertheless, pressure on agricultural land is high, and marginal land is increasingly taken into use. As a result, land depletion and soil salinity is increasingly a problem (World Bank, 2014). There is thus an urgent need to invest in more sustainable land management in South Asia. Also, with the on-going structural transition from a rural-based labor force to increasingly urbanized societies, it is important to maintain flexibility in land use to ensure that land resources can be accessed by sector participants.

At the time of independence, land systems in several South Asian countries mainly consisted of large landowners and poor landless farmers; consequently, reforms were initiated and have been implemented at various scale and with different results. One example is the sharecropping policy in Bangladesh, which has been in place since 1984 and was originally intended to facilitate access to land and improved inputs for landless, cash constrained farmers. The sharecropping system guaranteed landowners 30 percent of the harvest, or 50 percent if inputs had been provided. Studies showed that the use of high-yielding varieties increased among small-scale farmers as a result, but also that the applied "rent" has been extortive and that the system provided little incentive for farmers or landowners to invest in the land. Similar systems exist elsewhere in South Asia, e.g. in Bihar.

In India, land policy was under the purview of states. In some states, for example Tamil Nadu, Kerala, and West Bengal, reforms have favored smallholders. Overall, tenancy reforms and abolition of intermediaries tended to reduce poverty, while land consolidation tended to increase productivity. Interestingly, imposing a ceiling on the size of landholdings does not seem to affect either poverty or

productivity.[214] In other states, such as Punjab, reforms have focused more on ensuring tenancy rights, which have resulted in highly fragmented land with lower productivity. There are several places in South Asia where only limited progress has been made, because political pressures, a traditional caste system, or domestic conflict have impeded reforms and resulted in large, underutilized land holdings and the exclusion of large sections of the rural population from the land market.[215]

Overall, land users in South Asia have little incentive to invest in the land or to re-parcel land into bigger holdings for those who seek to expand their farming activities. Land re-parceling can often be a tedious activity, with exchanges of leases and land user rights taking place between multiple parties. It is therefore important that the right to use the land is conferred for an extended period. Similarly, investing in long-term land management and soil improvement requires assurance that the land will be available for a longer period of time. For example, the application of agro-forestry practices and the planting of shade trees, which will become increasingly necessary owing to climate change, require decades' worth of investments. Similarly, certain water harvesting infrastructure and pumping mechanisms have limited mobility, and any investor would require secure land rights, or alternatively long-term leasing agreements if the owner is not willing to invest.

4.11. Large, untargeted subsidies on inputs and unsustainable practices

Free water use, and subsidized electricity and diesel for irrigation, have encouraged inefficient use of water and depleted water resources, which is threatening the sustainability of agribusiness. Much of the region's irrigation depends on groundwater tables (e.g. 60 percent in India, of which 15 percent are already overexploited--World Bank, 2013). Water productivity in rice production in Bangladesh is particularly low, both compared with other countries in South Asia and internationally (World Bank, 2015).[216] Studies also show that the efficiency of water use varies between and within countries, depending on the level of subsidies.

Inefficient use of water is becoming an economy-wide issue. Agriculture's share of total fresh water use is very high in some countries (e.g. 98.6 percent in Afghanistan and 90.4 percent in India, compared with 65 percent in China and 55 percent for Brazil), and competition for water is likely to increase with growth in manufacturing and in household consumption (FAO Country Profiles, 2014).

Climate change will exacerbate these problems, and appropriate land management will be crucial for stable and sustained agribusiness growth. In the summer, extreme heat will affect 70 percent of the land area in the region, and variability in rainfall is projected to increase (although precipitation forecasts vary depending on scenario and timeframe). The combination of higher temperatures and variable rainfall, along with a rise in the sea level that will overflow costal zones and thus raise soil salinity, are expected to significantly reduce crop yields, even assuming improvements in technology. An increase in

[214] LSE: http://personal.lse.ac.uk/GHATAK/landref.pdf.

[215] Only in India, landless farmers make up for 25 percent of the agricultural labor force (http://planningcommission.nic.in/reports/articles/venka/index.php?repts=m-land.htm).

[216] The cost of resources is not included in the calculation of TFP discussed in section 2.

average global temperatures of 2 degrees centigrade is anticipated to reduce crop production by 12% compared to a baseline with stable global temperatures by 2050 (World Bank, 2013).

Several governments subsidize fertilizers, and until recently favored urea or nitrogen-based fertilizers over other fertilizers, resulting in overuse. India's large subsidies get the most publicity, but the subsidy bills of Sri Lanka and Bangladesh are also enormous – nearly as large as all public expenditures on agriculture. Pakistan does not have explicit fertilizer subsidies, but low prices on natural gas used in the production of urea provide an indirect subsidy. Nepal also has subsidized fertilizer prices, but the subsidy level is modest given the open border and heavy subsidies by India. The subsidy is mostly designed to offset high transport costs in the more remote parts of the hilly country.

Subsidies for water and fertilizers impose a great burden on public finances. In India, subsidies to the food sector amount to US$85 billion dollars annually.

A removal of subsidies should be implemented to charge the true cost of water and inputs, taking into account externalities, including with respect to the depletion of groundwater reserves. A road map with a clear, time-bound conversion of subsidies would help actors in the sector adapt to the new rules. A first step is to make direct subsidies on inputs and price controls conditional on complying with certain agricultural practices. A second step would be to replace supply side, blanket subsidies with a targeted demand side system leveraging technological progress (e.g. mobile payment and electronic ID).

Climate smart agriculture (CSA) comprises agricultural practices that (i) increase productivity; (ii) adapt production to climate change; and (iii) reduce emissions from agriculture. An example is deep placement of fertilizer, which can increase yields, reduce nitrogen pollution, and save costs on fertilizer application. Rice farming under this method in Bangladesh increased yields by over 30 percent. Similarly, alternative wetting and drying in irrigated rice cultivation in Asia has reduced water use by up to 30 percent and reduced greenhouse gas emissions by over 40 percent.[217] Other common CSA practices include introducing short-duration, drought-resistant and salt tolerant varieties, shared cultivation, zero tillage, rainwater harvesting and micro-irrigation, constructing ditches and contour planting, mulching, harvesting manure, and using cover crops.
These approaches must be consistent with local conditions, and generally require incentives or regulatory measures. A starting point for many countries, for example Sri Lanka, has been to develop so-called Climate Smart Agriculture Profiles, which map out current practices, emissions, and projected climate change implications for the sector, as well as existing financing and institutional requirements for adopting new practices.

4.12. Exposed, vulnerable groups

While an analysis of issues concerning exposed, vulnerable groups is far beyond the scope of this chapter, it should be recognized that policies are needed to ensure efficient and fair labor markets and protect human rights. In general, labor regulations and minimum wages do not apply to small farms with under 10 employees, which maintain flexibility in labor use. This situation keeps the rural labor market

[217] The Bank's Lima position paper Towards a Climate Smart Food System By 2030.

relatively free and allows flexibility to fit agricultural needs, such as seasonality. However, financial crises affecting poor families, non-availability of credit, and limited vocational training often force unskilled workers in rural areas to enter quasi-bonded work contracts with landlords who pay them lower than the market wage rate. Many workers are also bonded through debt obligations. Widespread child labor in rural areas is also a result of desperate family financial situations and the absence of schools.

4.13. Recommendations

The agribusiness sector provides the essential transition between production systems and consumption. This complex sector involves volatile production systems, global and domestic supply chains with different regulatory systems, varied quality regimes, trade access and subsidies, with unpredictable implications for income and employment. Nevertheless, agro-industry can have profound implications for shared prosperity. The primary conclusion, therefore, is to make policies for agro-industry central to the country and regional development strategy.

4.13.1. The urgent need for a new paradigm

Removing the constraints on the development of a competitive agribusiness industry in South Asia could have a dramatic impact on development, while failing to address these constraints could be disastrous, given the mounting challenges of depleting water resources and climate change. New approaches to supporting the poor and ensuring food security are essential to facilitate the removal of the blanket regulations and subsidies which prevent strong, sustainable agribusiness growth in South Asia. The development of large leading agribusiness firms does not need to come at the expense of farmers; many successful firms created backwards linkages to farmers and thereby generated benefits to the broader agriculture sector. At the same time, unleashing large scale agribusiness will not benefit all small farmers and could leave many of them even more vulnerable. There is thus a need to combine supply side reforms, public support to increasing agricultural productivity, and additional targeted support to the poorest farmers.

As countries move from agricultural-based to urbanized societies, agricultural policies generally move from production-oriented policies that emphasize social protection towards policies that support a more specialized, knowledge intensive sector, made up of larger entities that are responsive to market demands. At the same time, independent social safety net mechanisms should be developed to safeguard the poorest and most vulnerable in the sector. Several countries in South Asia are entering a transitional phase, where productivity increases in agriculture have allowed labor to be released into other sectors while generating consumer demand beyond that of food. However, in order for the domestic agribusiness sector to reach its potential in raising incomes and employment, agricultural policies must support sustainable agribusiness development that is responsive to consumer demands.

4.13.2. Strong leadership and data for the new paradigm

Successful agribusiness sectors have required strong, high-level leadership to develop and implement the agenda, which often affects the interests of powerful groups. Implementing subsidy programs is easier than reforming them, and creating a conducive agribusiness environment inevitably requires coordination among several different ministries (i.e. agriculture, trade/commerce, industry, and sometimes health, infrastructure, and environment). Achieving a comprehensive and internationally acceptable food safety regulatory framework, which requires a farm-to-fork approach, has proven challenging in many countries: food safety often falls under the Ministry of Health while SPS regulations are typically the purview of the Ministry of Agriculture. In several countries of South Asia, any such reform program will also involve close coordination with the Ministry responsible for social protection to safeguard vulnerable groups that might be at risk in this transformation.

Malaysia established a dedicated transformation team at the highest level, staffed with highly-skilled public sector and foreign experts, which had a mandate to drive a cross-sectoral agribusiness agenda and coordinate between ministries. The success of such efforts requires an on-going dialogue with the private sector (see Annex 6 on high level task forces). A good approach is to establish steering groups (preferably private sector led) with representatives from the different components of the value chains (including different sizes of farms, firms providing logistic services, and processors) and relevant public institutions to meet regularly with the Government-led agribusiness team to advise on how to overcome constraints in the subsector. Industry groups in South Asia, some of them well-organized like the Poultry Associations in India and Pakistan, do not represent the broader value chain and they do not have the formal role in policy formulation that these value chain steering groups hold.

Important lessons can be drawn from countries that have successfully developed their agribusiness sectors. A review of the Governments' roles in agribusiness development in Uruguay (See Annex 10), Indonesia and Malaysia provides examples of what governments should and should not do:

1. Stable macro-economic policies, a tolerable business environment, and a major emerging market opportunity (often led by China) were common to all three countries.
2. State support was largest in countries with high upfront investments in processing and tree crop establishment, combined with close coordination of production and processing.
3. Incentives that distorted relative prices, especially for production inputs, have had significant welfare costs. Cheap land in Indonesia favored deforestation rather than intensive agricultural production.
4. The more that state support is directed to individual firms, without well-defined rules determining eligibility for that support, the greater the risk of rent seeking. The best results were obtained when strong, rule-based governance prevailed, as in the case of plantation forestry in Uruguay.
5. Public-private partnerships directed involving smallholders achieved a more equitable distribution of benefits. For example, smallholders now produce nearly 40 percent of the palm oil in Indonesia.
6. Neighbor effects—when investment and technology spill into a country from nearby countries—were important in nearly all cases in reducing the costs of establishing the industry.

Strategy should look beyond the farm-gate into inputs, logistics, processing, and retail. It should also define clear roles for the public and private sectors, recognizing that these roles may change as the

sector transforms. For example, in areas with limited agribusiness development, it may be justifiable for the public sector to provide time-bound support to so-called first movers, whether local or foreign. Successful first movers can generate positive externalities in knowledge, skills, and market linkages. This initial support can be justified by the high startup costs and risks associated with developing new agribusiness value chains. State support can also be important in underwriting the high transaction costs of linking investors to smallholders in the startup phase.

Understanding the sector is key to successful and adaptive policy making, not the least to ensure efficient and transparent use of taxpayers' money. Policy making is a continuous process that must be constantly evaluated and revised as objectives are achieved and the agro-food sector evolves. Impact evaluations are critical, in part because policies may have inconsistent effects across sectors. For example, trade policies may impair production, or impede nutrition and economic development objectives.[218] Institutions such as extension services and market information systems play an important role in providing information to both private actors and policy makers. Farm, animal, and land registers can also be used to manage agricultural support policies. Integrated institutions also are required to monitor the impact of sector policies on water and soils. Importantly, the entities involved in developing agricultural policies should be separate from those responsible for payments and controls.

4.13.3. Investment and linkages

6.1.7

The private sector may be more effective than the public sector in tackling constraints on profitability. For example, Desai Fruit and Vegetables and its investors, have helped to "professionalize" the banana value chain in India and thus improved their competitive position. This kind of externality may justify providing incentives to strategic first movers.

Facilitating contract farming also can promote positive externalities. The term contract farming covers a range of different pre-harvest agreements, joint ventures, and pledges that link producers either upstream to the input suppliers or downstream to the processors. Upstream linkages can help input suppliers increase sales and improve farmers' access to credit and technical support. And downstream linkages can reduce buyers' costs and improve supply reliability, while providing farmers with an assured buyer for new and more profitable products, reduced transaction costs or higher prices. Alone and without links, the small scale farmer must cope with unmanageable production risk and market an irregular surplus in a spot market. Linkages can provide more robust support than any public service extension scheme.

Linkages are not without their disadvantages, and failure to meet contract terms can lead to a breakdown of trust. However, in general mechanisms for strengthening linkages generate far reaching benefits and ultimately lead to greater flows through the supply chain.

[218] For example, prohibiting exports of a grain commodity would discourage production, while reducing prices for that grain may divert consumption from other crops with better nutritional value.

Promoting linkages can supplement other initiatives to augment rural finance. In Afghanistan, the Agriculture Development Fund began in 2010 as a US$100 million USAID project to provide much needed long term financing along agribusiness value chains, at decent interest rates on a commercial basis (meaning the loans have to be repaid). The fund was rated as the most successful USAID project in Afghanistan, with a more than 95 percent reimbursement rate and 60,000 farmers benefiting. The fund is facing excess demand and discussions are underway to scale it up.

The key innovation of the ADF is to provide long-term loans to sophisticated business intermediaries along the value chains (e.g. agro-food processors), on the condition that they on-lend a portion to their suppliers-farmers. These intermediaries have the knowledge and incentive to lend to the most deserving of their suppliers, to ensure repayment. By contrast, commercial banks mostly cater to urban areas and lack such access and knowledge. The ADF has been operated by professionals with extensive experience in commercial banking and agribusiness from other countries, and incorporates financial products that are fully compliant with Sharia. This approach helps improve access to long term finance along the value chains (including for farmers) and encourages the development of linkages between farmers and processors.

Farming systems, products, markets, business environments and above all participants in agricultural value chains are extremely diverse, so there is no single model for success. However, an important principle is that contract farming must be built on a viable business model. Shepherd[219] , for example, notes that donors tend to view contract farming as a "development tool where commercial principles do not apply". Other elements (see World Bank Toolkit[220]) that determine success include the nature of the product (staples are more difficult than high-value cash crops), the nature of the participants or groups of participants, the presence of third party support, the shared risk and responsibilities defined in the contract, the pricing mechanism, and above all the management of the relationship between buyer and seller – see Annex 11 for an example of a successful contract farming initiative in Vietnam.

The development of trust is important because contract farming requires a long term commitment between two parties. In this respect the term "contract farming" is misleading[221] since it implies a dependence on a contract that can be enforced. In practice, enforcement is difficult on either side of the contract, and recently more emphasis has been given to alternative dispute resolution techniques of arbitration and mediation. Here the long term goals of the participants are given more importance than the immediate rights of a transactional exchange.

Overall, the role of government in support of contract farming lies in facilitation rather than regulation. Much has been written about the regulatory needs and the legislation required, but for the most part such measures (competition, employment and labor, environmental issues, safety and health, land) are already on the statute books. These policies might benefit from some refinement. However, in view of the diversity of contract farming schemes and the widespread use of informal contracts, it is unlikely that regulatory policies would be able to cover the breadth of contract farming relationships without

[219] Shepherd, A. (2013) An Introduction to Contract Farming. http://makingtheconnection.cta.int/node/206
[220] World Bank (2014) An analytical toolkit for support to contract farming. Internal Paper.
[221] "relational farming" might be preferable

being unduly prescriptive. Government support to the emergence of contract farming can develop on a number of levels[222]:

- Market promotion – trade and investment policy should be supportive of investment and development of exports, and encourage investment and competition downstream;
- Logistics – improvement of roads, especially at the farm level, and storage facilities in conjunction with private operators increase the ability of small-scale farmers to participate in contract farming;
- Seed import legislation – the inability to import improved planting material efficiently can impede upgrading production, particularly where the sponsor intends to introduce new varieties or new crops;
- Producer groups and cooperatives – policies and legislation to formalize producer groups can help lower procurement costs and facilitate the distribution of inputs and technical knowhow;
- Innovation and extension - innovation is key to competitiveness, and the ability to disseminate knowledge and technology through extension can be encouraged through cost sharing.
- Finance – access to finance is a persistent problem in the rural economy, and contract farming can increase farmers' access to finance.

4.13.4. **Public and private knowledge collaboration**

Innovation will always be difficult in an environment dominated by small scale farmers. The priority for the smallholder is survival, and without support the small scale farmer cannot afford to experiment with new crops or varieties. However, a downstream commercial partner ready to support production and buy the output can significantly reduce farmers' risk. There are well-known examples of contract farming being used to modify farming practices, for example the introduction of dairy farming in Rajasthan or cultivation of potatoes for processing in Bangladesh and in India.

The production and export of Indian menthol products stands as one of the most spectacular achievements in creating a new industry through contract farming. Smallholder mint cultivation, which is popular in northern Uttar Pradesh, was made possible by private sector investment in a speculative venture. Once the industry became established, the further development of varieties and agronomy were carried out by public institutions. After years of stagnation, CIMAP initiated its 'Improved Technology for Menthol Mint (Mentha arvensis) Essential Oil in India' project in 1993. Within a few years, the introduction of new varieties together with agronomic research increased yields and oil recovery. The development of short cycle varieties allowed farmers to fit mint cultivation between the *rabi* and *kharif* crops in the rice-wheat or rice-potato/pulse crop cycles. The Fragrance and Flavor Development Centre (FFDC) at Kannauj took over the distribution of planting material and organization of extension and training. This public-private collaboration has resulted in an industry that today supports at least half a million families. At current prices (INR930/kg), raw mint oil adds over US$700

[222] World Bank (2014) An analytical toolkit for support to contract farming. Internal Paper.

million a year to the rural economy in Uttar Pradesh. India has an estimated 80-90 percent share of global exports of menthol products.[223]

4.13.5. **Nurture inclusivity**

The anticipated rise in demand for agribusiness has the potential to generate enormous income opportunities in rural areas and along the value chains. However, without support, some groups risk being left behind. This is problematic in any country, as the core of the food supply is produced domestically and by family farmers. Not including small-scale producers would be especially problematic in South Asia, where the majority of producers hold less than one hectare of land, and women now constitute over half of the agricultural workforce in Bangladesh and a third in Afghanistan, India, Pakistan, and Sri Lanka. Most linkages between farmers and processors will be established directly by the private sector. However, the public sector can help reduce the transaction costs facing processors, logistics providers and retail firms in working with a myriad of small scale producers, for example by providing production information and facilitating access to seeds for emerging value chains. Similarly, publically-financed services can be provided to small-scale farmers and agribusinesses to reduce prohibitively high market access costs, for example implementation and certification of market standards.

Few companies work directly with small-scale producers, and successful small-holder inclusion in value chains has often been through aggregators or producers groups. At the global level, the cocoa sector may provide the most successful example of small holder inclusion in global value chains, as much of the industry relies on producers with less than a hectare of land. Increasing global demand and supply constraints due to climate change have led companies like Mars and Cadbury to work with hundreds of thousands of smallholders to improve practices and to certify their production. This has required that producers are organized in cooperatives or producer organizations. This private sector-led approach has been successful in the high-value cocoa industry because the costs can be recovered rapidly. Public support may be more important in other sub-sectors, for example in the form of technical support through the extension services in organizational skills, and access to finance to help establish cooperatives.

An important target group for this support is women. Together with West Africa, South Asia still has the world's largest gender gaps. Increasing access to education can boost agricultural productivity, so the region's low school enrolment ratios for girls will impair agricultural growth. Other measures, such as ensuring that women have equal access to assets and inputs (including land and credit) have proven to close productivity gaps in the agricultural sector as well as among entrepreneurs.[224]

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[223] The success story of menthol production in India can be found in full in Annex 4.

[224] Globally, FAO estimates that ensuring equal access to productive resources for women would raise agricultural output in developing countries by between 2.5 and 4 percent (World Bank, 2014; WDR, 2012). Barriers to full female participation also have implications for the competitiveness of larger industries. Internationally, companies that exclude women in management positions have proven to have lower skilled management on average, which over time leads to lower innovation and competitiveness (WDR, 2012).

The poorest smallholders are at greatest risk of being left behind, but other groups such as landless agricultural workers and women also are at risk. Modern agribusiness requires skills and technological know-how, which may prevent certain groups from participating further down the value chain. Collaboration with the private sector is essential to understand deficits in skills and to ensure that smaller participants can access different points along the value chain. Finally, public investment in training and infrastructure to support the poorest segments of the sector can also be achieved through social protection schemes, such as well-targeted cash for work or cash for training programs.

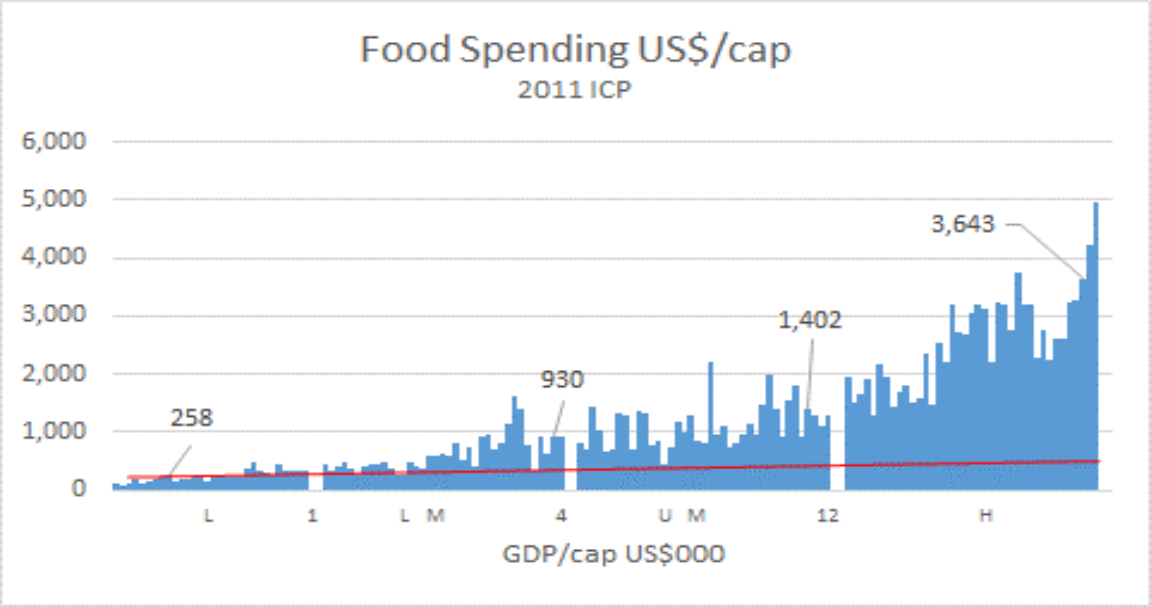
7. Annexes

7.1 Annex 1A

Estimating the Size of South Asia's Food Market by 2030

With growing incomes and population, and with rapid urbanization, South Asia's food market is projected to more than double over the next 15 years, reaching US$ 1.5 trillion by 2030. Household expenditure data on food shows that South Asia's food market is currently worth about US$ 500 billion (2011 year household food and beverage expenditure data). Because the majority of South Asians still reside in rural areas, rural food consumption account for 65 percent of South Asia's food market. This holds even though the majority of poor live in rural areas and their food spending is significantly below the average, (although they spend proportionally more of their income).

By 2030, the UN estimates that South Asia's population will increase from 1.7 to 2 billion people. To estimate the value of the total food market, it is assumed that household incomes will double from $1,500 to $3,000 over the next 15 years in line with the past 20 years' increase in per capita GDP (5% annual growth on average) and that the share of household incomes that goes to food consumption will drop slightly from around 30 to 25% based on the observation that the share of food consumption decreases as income grows as per the figure below.



Source: Source: Analysis of World Bank 2011 ICP report

7.2 Annex 1B List of Companies interviewed

	Pakistan	India	Sri Lanka
Financial	• Habib Bank, • Allied Bank, • State Bank of Pakistan		
Inputs	• Fauji Fertilizer Company, • Four Brothers Group, • Pioneer, • Bühler	• Pioneer Seeds , • Bühler India	
Rice	• Engro Foundation, • Long Grain Rice Mills, • Guard Agricultural Research & Services, • Mazco, • Matco	• KRBL, LT Foods, • Kohinoor, • LalQilla Basmati	
Dairy	• Nestlé, • Engro Foods	• ABT Foods	
Meat/ Poultry	• K&N, Menu/SeasonsFoods	• Suguna Poultry	
Maize	• Rafhan	• Anil Starch Private Ltd	
F & V	• Fauji Fresh and Freeze, • Mitchell's Fruit Farms, • Green Springs, • Roshan, Imtiaz, • Noon,	• Desai F&V Pvt Ltd	

	• National Foods		
Retail	• Metro		
Multi-sector		• Godrej Agrovet	
Tea			• Dilmah

7.3 Annex 2 Examples of market linkages

Sub-sector	Company	Engagement	Comments
Cereals	**Engro**	2,000 farmers under contract; prices set daily, selling to Engro is voluntary but payment is swifter, transparent and often higher than mandi.	Established brand in UAE marketing basmati; provide input and advisory support to farmers including machinery
	Rafhan	30% of their maize supplies bought from contracted maize farmers. Provide written contract, hybrid seed, technical advice, bags and freight to mill.	Rafhan produce a range of starches and other derived maize products such as dextrins, sugars and syrups.
	Matco	10-15% of needs for paddy for milling come directly from about 250 farmers.	Export to 60 countries using brand Falak. Own agency in Dubai for trading.
	KRBL	Tried contract farming but reverted to using commission agents to buy through the mandis but retain a contact farming model where services (quality seed, technical advice) are provided to 94,000	Operate one of the largest rice milling operations in the World. Exports to all major markets. Leading position of the India Gate brand

		families.	
	LT Foods		
Horticulture	**Desai**	Contract farming. Managed logistics for highly perishable product and marketing	Premium domestic market and export 50-60% to Middle East
	National	No contracting now but provides technical assistance and some equipment eg geotex sheets for drying chillies	Engaging in PAC in creating a marketing platform for chillies for quality product
	Fauji F&F		All the farmers have existing markets for their produce.
	Pepsico	Guarantee purchases for potatoes	
Miscellaneous	**Godrej Agrovet**	Buy from 54,000 ha of small-scale owned production of oil palm across 8 states giving access to consumer markets through quality crushing operations. Potential to buy from 200,000 ha. Also engaged with small-scale producers in dairy, poultry and aquaculture.	Reducing Indian dependency on the major food import
	Hindustan Lever	Contract farming operations in chicory,	

		tomato and tea	
Poultry	**K&N**	Limited contract farming; most chicks sold to farmers and bought back at market.	Processing and value added products; own stores and direct deliveries to retailers
	Suguna	Supply to and buy from 25,000 farmers. Buy back.	Provide consumer with a guarantee of quality that secures demand from small-scale producer. Large range of value added products. Own stores. Export to the Middle East and Japan
Dairy	**ABT**	Buying from16,000 farmers, through 1,3000 collection points procuring 250,000 litres/day	Selling quality milk and dairy products to urban markets including door step delivery. Export ghee.
	Nestle	Work with 190,000 farmers	Access formal market for dairy products
	Engro	Operate through 1635 milk collection centres plus 330 mobile milk collecting vans plus 1300 medium to large farms with own chillers plus own production.	Have 56% of formal milk sector – provide milk, tea whiteners, ice cream etc

7.4 Annex 3 Examples of linkages giving access to inputs

Sub-sector	Company	Engagement	Comments
Seeds & Agro-	**Pioneer**	Operate through a	

chemicals		network of dealers who in turn finance and support the farmers	
	Fauji	Support to dealers through their farm advisory services which have reached 1.5 mn farmers since inception.	Crop demonstrations, field days, meetings and crop seminars, farm visits. Soil and water testing
Rice/Grain	**Engro**	Reach 1.5mn farmers with PKR77bn of chemical inputs. Has developed new variety of rice Basmati 515 based on foundation seed from the research station; kits to upgrade combines; training;	Gross margin /ha improved by at least 25%.
	Rafhan	Access to seed, pesticide, and fertilizer for contracted farmers.	
	Matco	Supply seed to contracted farmers	
	Guard	Advisory services through a toll free number, field days, yield competitions etc to support their seed and input sales. Contract farmers are supplied with seed and chemical inputs.	
	KRBL	Provide technical assistance and inputs;	

		close relationship with Pusa research institute	
	Kohinoor	Only technical advice	
Horticulture	**Desai**	Supply plantlets from own labs and fertilizer; manage farms from fruit set	Yields doubled
	PAC/National		
	Fauji F&F	Use contract farming to achieve international standards in broccoli, potatoes, okra, taro, bitter gourds and apple gourds inter alia. Seed is imported from Holland. Korea.etc	
	Pepsico	Seed on credit; demonstrations	
Poultry	**Suguna**	Provide inputs, advice, manage associations.	
	K&N	Breeding units; 4 hatcheries; feed production; laboratories and diagnostic research.	
Dairy	**ABT**	provides extension, training and insurance	Average daily yields increased by 22% so far
	Engro	Provide literacy, computer training, inputs and improved stock. Partnering with Telenor to develop	

mobile payment
system.

7.5

7.6 *Annex 4. The Success Story of Mentha Arvensis in India*

Menthol is an important component for the flavouring and fragrance industry. It conveys a mint taste or scent to a variety of products from pharmaceuticals and toiletries to foods and confectionery and tobacco. Mint oil is extracted by distillation from a species of mint, namely Mentha arvensis, and the oil is chilled to yield crystals of menthol leaving dementholised mint oil behind.

The first introduction M. arvensis in India was in 1954 at the Regional Research Laboratory at Jammu where it was introduced from its native Japan. There was limited commercial interest in the crop until the company Richardson Hindustan Ltd (RHL) began to explore the possibilities of cultivation on a larger scale. RHL was established in 1964 as the Indian division of USA based pharmaceutical company Richardson Merrell, to manufacture its Vicks brand of medications[225]. The Indian market presented an opportunity for the company, and an alternative to imported menthol was sought for RHL's production.

An assessment by RHL staff indicated that the northern part of Uttar Pradesh offered appropriate soil and climatic conditions for the cultivation of M.arvensis. The company established its own research base, processing unit and laboratory at Bilaspur, on the edge of the Terai region, and company personnel began working with local farmers to introduce the crop by providing planting material and technical advice to contracted growers.

The introduction proved successful and cultivation expanded. In the mid 1980's the Central Institute of Medicinal and Aromatic Plants (CIMAP) in collaboration with RHL developed a new variety of M.arvensis that outperformed the existing clone that had been the only planting material since its introduction decades earlier. Indian menthol output grew from a few tonnes from around 20ha in in 1965 to over 5,000 tonnes on 40,000 ha in 1992/93.

Production then stalled. RHL had been assimilated into Procter & Gamble in 1985 and a corporate decision to withdraw from agricultural research and production followed shortly afterwards. The upstream Indian menthol operation was restricted to buying on the open market. The farmers were left without support and without contracts. In the face of low prices and without alternative institutional support nor selected disease-free planting material, crop yields and oil output in India fell.

On the market side, production had far outpaced domestic demand and the mentha farmers were now directly impacted by global demand. The Indian menthol was considered a lower quality than the product from China and the dementholised oil, a by–product of menthol production, was not acceptable on global markets. China was the leading exporter and export sales controlled by government agencies where profit was not the driving motive. Furthermore the collapse of the USSR, which had been the main market for Indian menthol, saw international demand fall away.

The situation appeared to be dire: it was not only the crop that was well established in the farming cycle, but the know-how had spread across a wide region engaging a large number of farmers together

[225] Cough medicines, lozenges, rubs and other inhaled breathing treatments

with an industry of metal-workers able to produce the boilers and distillation equipment and an infrastructure of buyers and traders together with processors of value added products and exporters.

In 1993 CIMAP initiated its 'Improved Technology for Menthol Mint (Mentha arvensis) Essential Oil in India' project. Within a few years the introduction of new varieties together with agronomic research brought higher yields and oil recovery than previously attained. The development of short cycle varieties was key in allowing the farmers to fit mint cultivation between the *rabi* and *kharif* crops in the rice-wheat or rice-potato/pulse crop cycles. The Fragrance and Flavour Development Centre (FFDC) at Kannauj took over the distribution of planting material and organisation of extension and training.

By 2000 the output of mint oil in India had grown to about 10,000 tonnes but with remunerative prices and declining output in other origins (notably China), production of mint oil increased rapidly. Indian mint oil production peaked in 2013/14 with about 55,000 tonnes but has since fallen back below 50,000 tonnes per year. India currently produces about 20,000 tonnes of menthol with about 9,000 tonnes of dementholated oil and some 3,000 tonnes of derivatives. Some 30,000 tonnes of menthol crystals and powder and mint oils exported annually. Uttar Pradesh accounts for 90 percent of the production of mint in India. The balance is found across the semi-temperate regions of Punjab, Haryana, Himachal Pradesh and Bihar.

Today, the industry supports at least half a million families and, at current prices (INR930/kg) raw mint oil adds over USD700 million every year to the rural economy in Uttar Pradesh. In mint cultivation, popular in northern Uttar Pradesh, India now leads global exports of menthol with an estimated 80-90 percent global market share. The establishment of mint cultivation as a smallholder crop was only made possible by the initial investment of a private company in a speculative venture. Once the industry became established, the further development of varieties and agronomy were carried out by public institutions. After years of stagnation, CIMAP initiated its 'Improved Technology for Menthol Mint (Mentha arvensis) Essential Oil in India' project in 1993 and within a few years the introduction of new varieties together with agronomic research brought higher yields and oil recovery than previously attained. The development of short cycle varieties was key in allowing the farmers to fit mint cultivation between the *rabi* and *kharif* crops in the rice-wheat or rice-potato/pulse crop cycles. The Fragrance and Flavour Development Centre (FFDC) at Kannauj took over the distribution of planting material and organization of extension and training.

Despite the success story, the future of the sector is somewhat uncertain. Prices of mint oil on the MCX Futures Commodity Exchange peaked in 2012 on a wave of speculative activity that compounded short supply, but prices softened quite rapidly and the harvest that year turned out to be good. The volatility of the oil prices has encouraged the development of synthetic alternatives to menthol that offer stable prices comparable to the natural product. Overhanging stocks of mint oil and synthetic alternatives are adding downward pressure on prices in the near term and a ban in many Indian states on the consumption of *gutka*[226] has also impacted negatively on mint oil prices.

[226] Masticant of areca nut and tobacco often flavoured with mint oil. It is a stimulant and known carcinogen.

7.7 Annex 5. Cross-cutting constraints to productivity (WB Enterprise Surveys)

In the World Bank Enterprise Surveys, firms are asked to rate the importance of domestic cross-cutting investment climate issues. Firms classify them into no obstacle (value zero), minor (one), moderate (two), major (3) and very severe (4). Table 1 shows the averages for each obstacle for all countries in South Asia except for the Maldives as well as for Vietnam and China. Although, firms in South Asia report higher averages compared to China and Vietnam, they only rank electricity (Afghanistan and Pakistan) and the political climate (Afghanistan and Nepal) as having a significant impact. This result is confirmed by the lack of correlations between these factors and productivity performance (see Table 2). The real issues are related to agribusiness specific policies as discussed in Section 5.

Table 1: Firms' Obstacles by Country (Averages)

Country	Finance	Political	Crime	Taxes	Corruption	Informality	Labor Reg.	Labor Educ.	Electricity
Afghanistan	2.39	3.16	2.49	2.02	2.56	1.92	0.95	2.10	3.15
Bangladesh	1.46	2.77	0.69	1.07	1.95	1.24	0.87	1.16	2.48
Bhutan	0.88	0.38	0.38	1.17	0.63	0.75	1.13	0.63	1.00
India	1.14	1.09	0.54	1.43	2.18	0.91	1.16	1.13	1.92
Nepal	2.22	3.66	0.98	1.17	2.29	1.58	1.56	0.93	2.88
Pakistan	1.23	1.79	1.70	1.60	2.15	1.22	1.17	1.11	3.18
Sri Lanka	1.52	1.04	0.67	1.39	0.84	1.48	1.21	1.25	1.60
Average	1.55	1.98	1.06	1.41	1.80	1.30	1.15	1.19	2.32
China	0.83	0.24	0.37	0.66	0.26	1.00	0.53	0.99	0.69
Vietnam	0.96	0.09	0.25	0.43	0.39	1.19	0.46	0.75	1.15

Source: World Bank Enterprise Survey
Note: Afghanistan (2014); Bangladesh (2013); Bhutan (2015); India (2014); Nepal (2013); Pakistan (2013); Sri Lanka (2011); China (2012); Vietnam (2009).

One possible investigation is assessing whether there is any correlation between these obstacles and firm's productivity. Following Ayyagari et al (2008) and Lage de Sousa (2016) methodology, we investigate which obstacle is hampering firms to achieve higher levels of productivity in the agribusiness sector.

Table 2 shows the results for South Asian firms in these 7 countries in terms of labor productivity, total factor productivity (TFP) and labor productivity growth in the last three years.

Although firms have ranked these obstacles higher than in comparable countries, they do not seem to be correlated with firm's productivity. According to the outcomes, political aspects are negatively correlated with labor productivity, suggesting that firms facing higher political instability tend to have lower levels of productivity.

Yet this result is not backed up with TFP or productivity growth, which weakens its initial outcome. Corruption shows a positive correlation with TFP, but as for political aspects, results are not corroborated with other measures of productivity.

Table 2: Obstacles to Productivity – Agribusiness

VARIABLES	(1) Labor Prod	(2) TFP	(3) Prod Growth
Log(Size)	0.0112	-0.0445	0.0049
	(0.097)	(0.070)	(0.014)
Log(Age)	-0.0265	-0.1224	0.0119
	(0.053)	(0.067)	(0.010)
Foreign	0.6205	-0.7141	0.0069
	(0.340)	(0.409)	(0.128)
Exporter	0.3604	0.2940	-0.0081
	(0.387)	(0.277)	(0.029)
Finance	-0.0172	-0.0465	-0.0123
	(0.046)	(0.068)	(0.014)
Political	-0.1470*	-0.0737	0.0008
	(0.065)	(0.039)	(0.018)
Crime	0.0174	0.0003	0.0042
	(0.086)	(0.062)	(0.028)
Taxes	0.0351	-0.0481	-0.0081
	(0.063)	(0.042)	(0.046)
Corruption	0.0843	0.0720**	0.0015
	(0.046)	(0.020)	(0.010)
Informal Sector	0.0057	0.0006	0.0174
	(0.065)	(0.039)	(0.014)
Labor Regulations	-0.0078	0.0588**	0.0020
	(0.040)	(0.022)	(0.026)
Workforce Education	-0.0676	-0.0946	0.0002
	(0.065)	(0.065)	(0.012)
Electricity	-0.0352	-0.0388	0.0019
	(0.036)	(0.021)	(0.009)
Constant	9.6758***	1.5080***	-0.4796***
	(0.276)	(0.162)	(0.128)
Observations	993	692	828
R-squared	0.1013	0.0692	0.0370

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

7.8

7.9 Annex 6: Tasks of High Level Agribusiness Transformation Team

The agribusiness transformation team has a key role to play in generating and leveraging knowledge. One cannot underestimate the value of knowledge in motivating and informing the right kind of actions on behalf of the government and the private sector. The knowledge that the agribusiness transformation team should generate and leverage falls under four categories:

1. Identification of the main agribusiness opportunities. This effort should entail: (a) identification of potential production areas by product, based on agro-climatic suitability; (b) a demand analysis to identify the most promising markets (both domestic and international); and (c) for specific agro-climatic zones and markets, a detailed productivity/cost benchmarking (starting with the leading players) to evaluate the competitiveness distance with the main competitors.
2. Identification of the main constraints standing in the way of realizing the main opportunities.
3. The detailed cost benchmarking done in the previous step will help identify the steps in the value chains where productivity/cost need to improve the most, differentiating by type of player. The root causes (namely market and government failures along the lines discussed in this report) for the lower quality and/or higher costs should then be established in these areas through in-depth interviews of leading players with international exposure and comparative analysis.
4. Identification of practical solutions to remove the main constraints. Active dialogue with policy makers to remove key constraints is a core responsibility of the agribusiness team. The team can also collect information on how other countries have dealt with these constraints from a technical, financial, and political point of view.
5. Monitoring and evaluation of progress so as to take corrective actions. Last but not least, the agribusiness transformation team will need to put in place monitoring and evaluation systems to carefully assess implementation progress. These assessments will enable countries to terminate or correct failing initiatives while scaling up and replicating successful ones. The team can then identify successes for scaling up and also publicize opportunities.

Source: Byerlee et. al., 2013

8. *Annex 7: Most Cited NTMs specific to Countries in South Asia*

Afghanistan				
Port Access: Afghan shipments accessing Karachi port and goods from other countries to Afghanistan passing through this port are subject to long and thorough inspection by Pakistan officials	***Licensing and registration requirements*** for both imports and export. Provision for a post-transaction levy or royalty at pro-rata basis on the invoice price. The range is wide, from 0.01% to up to 15% of the invoice price.	150 categories of ***SPS and TBT measures*** related to packaging, labelling, certifications, and conformity assessments, or other restrictions pertaining mostly to food, petroleum	Range of ***para-tariffs*** in the form of export levy, licensing fees, royalty, etc Afghanistan is the second country other than Sri Lanka, to impose a variety of tariffs on exports	***Additional payments*** such as bank guarantees, collateral money for shipments/ trucks passing through Pakistan ***Other Issues:*** Large volume of informal trade creating disincentives for Afghan manufacturing and revenue loss to the Afghan government
Bangladesh				
Para-Tariffs in the form of Supplementary Duty and Regulatory Duty imposed on imports in 270 categories. government's revenue collection from supplementary and regulatory duties exceeded revenue collection from customs duty in the 2012-2013 fiscal year	***Port Restrictions:*** Export restrictions from India and import restrictions. For eg: imports under Bonded Warehouse system to enter Bangladesh through Chittagong Sea Port only	***Sanitary and Phyto-Sanitary measures*** pertaining to Human, Animal and Plant health and related food safety issues are applied to over 300 product categories for Bangladesh	***TBT Restrictions:*** **P**ackaging, labelling, certifications, &conformity assessments, or other restrictions are found for 218 product categories.	***Fluctuating Standards and Procedural Steps****:* poor coordination and dissemination between government officials and business community leads as well as fluctuation standards & procedures often hamper prospects for Bangladesh Food Processors

India				
Port Restrictions: Currently 137 Indian imports are allowed to enter Pakistan only through Attari-Wagah border between India and Pakistan. India itself imposes specific port entry restriction measure (***C3***) for many categories of products applicable for all or different countries, depending on the nature of the product. Indian traders, particularly exporters, also face such port entry restriction measures in Bangladesh.	***SPS Restrictions:*** Sanitary and Phyto-Sanitary measures applied to 250 product categories. There are complex procedural steps. For example, each consignment is subject to testing instead of the standard practice of risk based inspection.	***TBT Restrictions:*** found for about 228 product categories for India. products belong to machinery, equipment, and chemicals for industrial use, processed food	***Fluctuating Standards & Procedural Steps:*** arbitrary interpretation of regulations. Frequent changes to the standards and conformity assessment procedures.	***Import prohibition:*** Import of beef in any form and import of products containing beef in any form is prohibited for religious reasons. Import of Genetically Modified Food, feed, Genetically Modified Organism (GMOs) and Living Modified Organisms (LMOs) or any product containing any of these is subject to several kinds of certification, and other TBT measures
Bhutan				
Quantitative Restrictions: For imports from countries other than India, an importer can import only 4 containers a year.	***License Requirements:*** Each import consignment requires separate import license for the already registered importer.	***Para-Tariffs:*** Bhutan faces a variety of discriminatory para-tariffs from India and Bangladesh.	A total of 14 categories of items are ***restricted for import*** from all countries and are subject to licensing requirement with special permission ***Import of raw materials*** for industrial use must have a value addition of minimum 40%.	
Maldives				
The quota regime has been 'operationally' eliminated, and now	Time consuming import and export licensing		***Quality Standards:*** Maldives' exports often face restrictions on quality and SPS issues in importing countries due	

both public and private parties are allowed to import staple foods,	requirements	to the absence of proper testing and inspection facilities.

Nepal		
Quantitative restrictions are in place for exports of rice, wheat, sugar & grains for food security reasons.	***Special permission*** is required for exports of some timber products and forest resources related to biodiversity and environment conservation.	Six categories of products, including beef, plastic materials with less than 20 micron thickness, and some other products prohibited under other laws are ***banned for import*** on religious, public health, and environmental grounds.

Pakistan				
Political Restrictions: The NTM inventory for Pakistan found E329 (Prohibition for non-economic reason n.e.s. or 'not elsewhere specified') applicable to 585 categories of products under different levels of HS chapters and codes for imports from India.	***SPS Restrictions:*** Sanitary and Phyto-Sanitary measures (Category A under UNCTAD classification) pertaining to Human, Animal and Plant health and related food safety issues are applied to about 79 product categories.	***Technical Barriers to Trade*** (TBT) in Category B of the UNCTAD classification have been found for about 186 product categories.	***Port Restrictions:*** Currently 137 Indian imports are allowed to enter Pakistan only through Wagah border. Imports from Afghanistan are also subject to port specific restrictions due to security considerations.	162 categories of products/items, are subjected to bans/ restricted ***bans for imports and exports*** broadly. Imports of a number of products are subject to quality standards. Import of a number of products is subject to regulatory duty.

Srilanka			
Para-Tariffs in the form of export levy (referred to as 'cess' from a 10% to 35% range), and a 5% infrastructure development levy on imports, both specific and ad valorem exist	***Licensing Requirements:*** 335 categories of products with different levels of HS chapters and codes for imports are regulated under E129	***SPS Restrictions:*** Sanitary and Phyto-Sanitary measures (Category A under UNCTAD classification) pertaining to Human, Animal	***TBT Restrictions:*** applicable to about 90 product categories.

in Sri Lanka. A differential treatment in VAT calculation for imported products is also a form of para-tariff faced by importers.	(Licensing for non-economic reason n.e.s.) in Sri Lanka.	and Plant health and food safety issues are applied to over 101 product categories for Sri Lanka.

Annex 8: Weaknesses in the food safety/SPS regulation according to Lead Firms

Interviews with lead firms around South Asia reviled various weaknesses in the food safety/SPS regulation:

- National standards do not comply with international norms (e.g. WTO Agreement on Technical Barriers to Trade and WTO Agreement on Sanitary and Phyto-sanitary Measures) and therefore prevent market access for. The international recognition of the apex authorities and of monitoring laboratories is patchy.
- Weak ability of farmers to achieve the standards required by the industry or exporters.
- Weak implementation of regulations and technical capacity among institutions and their inspection agencies need to be upgraded.
- The large number of regulatory authorities leads to confusion over areas of responsibility. There may be regional discrepancies within countries where responsibility has been devolved to state or provincial level leaving uncertainty over responsibilities and unique technical regulation regimes
- Voluntary standards and mandatory technical regulations are not always clearly separated. Insufficient representation of the private sector in the governance structures
- There is no high level oversight of the national quality infrastructure or the technical regulation framework and so no co-ordination and collaboration across ministries to ensure WTO compatibility. In Pakistan a National Quality Policy[227] was formulated in June 2014. Its current status is not known.

[227] See also Policy paper on sanitary and phytosanitary management and controls in Pakistan. Ministry of National Food Security and Research, Government of Pakistan (2014)

Annex 9: The Kyrgyz Agribusiness and Marketing Project

As consumer preferences change, accessing even the domestic market can be a challenge for processor as Kyrgyz food companies are well-aware of. In the years that followed independence after the collapse of the Soviet Union, a new market started emerging especially in urban areas in the Kyrgyz Republic. Companies that had existed for decades and supplied Kyrgyz consumers with processed products such as juices, milk products, and cheeses, all of a sudden had trouble keeping up with new demands and saw their products being pushed aside on the super market shelves by products from Kazakhstan with better quality and more appealing packaging. At the same time, much of the processing equipment dated back to the time of the Soviet Union, and many managers were uncertain how to approach the challenges in this changing environment.

The World Bank-financed Kyrgyz Agribusiness and Marketing Project provided a three-pillar approach to upgrading agro-food processors. 42 companies, selected on the basis on interest and viability, were supported with subsidized consultancy services by food-technicians, marketing, and financial management specialists – all helping the processors to upgrade processing equipment, marketing strategies (including market identification, packaging, and labelling), and IT-based financial management systems for up-to-date business-oriented approaches. In addition to the subsidized consultancy services, the project also financed a revolving credit line through five commercial banks to ensure financing (at market rates) for some of these investments and to the agro-processing industry in general.

Overall, the 42 participating companies showed an average increase in sales and profit with 114 and 107 percent respectively at the end of the project, reaching the shelves in Bishkek and beyond with their upgraded products.

Source: ABMP ICR/Authors

Annex 10: The Uruguay Case Study

Uruguay—soybean, rice and plantation forestry: This small country (3.5 million people) has increased its world market share in 8 of its 10 top agricultural exports over the past 20 years. During this period, it has maintained a stable macro-economic environment and an open policy toward foreign direct investment. It had the highest score for governance indicators among the countries reviewed—although it scored relatively poorly in the Doing Business Indicators. It has also developed two significant new export industries. The new soybean industry garnered US$ 327 million in foreign exchange earnings in 2008; the new pulp and paper industry, based on plantation forests, provided US$ 902 million. Uruguay also increased rice exports nearly four times to 1 million tons, worth US$ 461 million in 2009, with significant exports to Africa in recent years.

The state has played different roles in the development of these industries. The soybean industry received no specific government incentives and was not jump-started through a special program. Large Argentinean agribusiness companies, which are highly taxed on soy exports in their own country, were able to import seed to Uruguay (thanks to flexible regulations) and openly acquire land through rental or purchase (thanks to Uruguay's well-defined property rights and well-functioning land markets). For rice, Uruguay forged a unique public-private partnership to finance rice research and technology transfer, with co-financing shared equally by producers and the government. This highly effective rice innovation system has achieved one of the highest national average rice yields in the world (around 8 tons per hectare) and a benefit-cost ratio of 7.9 on the investment in research and development.

In contrast, the government played a very activist role in developing a new forest policy and passing a forestry law that provided special incentives to the sector and to some firms. Incentives included a 50 percent subsidy and land tax exemption for plantations on land designated as low-quality pastures and tax-free status for five export pulp mills. The rationale for special forestry incentives appears to relate to (1) the long gestation period of about 10 years from forest establishment to harvest, which ties up capital; (2) the very large scale of processing investments (more than US$ 1 billion per mill); (3) the need to coordinate the investment in the feed supply to pulp mills with the investment in the mills; and (4) the fact that neighboring countries were offering equivalent or higher subsidies for plantation forestry.

A study by Morales (2007) estimated an internal rate of return on investments in the forestry industry of 32 percent, including subsidy investment provided by the government. The program attracted about US$ 4 billion in private investments, including the largest single foreign investment in Uruguay's history. Risks appear to be minimal. Plantation forestry and downstream processing were estimated to have provided four times the jobs per hectare relative to the low-productivity cattle ranching that it replaced. Environmental impacts have likely been neutral or positive. The plantation subsidy was removed in 2005.

The downside was that soy, rice, and forestry industries greatly increased wear and tear on rural roads as they moved millions of tons of new product to mills and ports. In 2011, Uruguay was debating a special tax on large land owners to finance road maintenance.

Source: Byerlee, et. al., 2013

Annex 11: Contract Farming in the Coffee Sector (Nedcoffee in Vietnam)

The coffee roasters in the consuming markets of the World are increasingly demanding that their suppliers can provide assurance that the coffee is produced under sustainable conditions. Nedcoffee Vietnam is Vietnam's third largest coffee exporter with annual exports around 90,000 tonnes per year. It was established in 2008 with a factory in Buon Ma Thuot with a fully integrated, state-of-the art processing line and designed capacity of 60,000 tonnes per year. Nedcoffee buys through four buying stations and coffee beans are brought by truck to Buon Ma Thuot. The buying stations are staffed by employees but Government regulations do not allow the exporter to buy direct from the farmer so the procurement is achieved through independent collectors in the surrounding areas, including the 22 partner collectors of Nedcoffee.

Nedcoffee Vietnam is ahead of the national average in supplying sustainable coffee, with 15 percent of its coffee produced (2013) under certified sustainable conditions, and a target of 25 percent in the next years. Coffee verified or certified as produced under sustainable conditions attracts a premium of USD40-60/tonne for the exporter. Of this premium half will stay with the exporter to cover the costs of handling the coffee separately and for maintaining the traceability of the supply. The remainder is split equally between the collector and the farmer. There is therefore an incentive for each player in the supply chain to maintain the integrity of the certified or verified coffee.

A typical partner collector for Nedcoffee will buy 500t/year of coffee and all is sent to Nedcoffee. The collector may also trade pepper and rice and supply agrochemicals and a small operation can easily turnover USD1mn per year. From May each year the collector starts to pre-finance the crop with advances of fertiliser providing the linkage between Nedcoffee and the farmers that permits the development of traceable certified sustainable coffee. In the Nedcoffee factory the coffee is prepared, cleaned, graded with colour sorters and sieves, maybe polished, and bagged. A range of grades is produced according to customer specifications. Certified coffee is handled and stored separately.

Source: Authors

Annex 12: Productivity drivers regression results

Table 2: Firm characteristics and productivity – Agribusiness

VARIABLES	(1) Labor Prod	(2) TFP	(3) Prod Growth
Log(Size)	0.0112	-0.0445	0.0049
	(0.097)	(0.070)	(0.014)
Log(Age)	-0.0265	-0.1224	0.0119
	(0.053)	(0.067)	(0.010)
Foreign	0.6205	-0.7141	0.0069
	(0.340)	(0.409)	(0.128)
Exporter	0.3604	0.2940	-0.0081
	(0.387)	(0.277)	(0.029)

Table 4: CDM Model for Agribusiness

Stage Dependent Variable	(1) 1st Stage Log(Innov. Exp./Sales)	(2) 2nd Stage Log(New Products/Sales)	(3) 3rd Stage Log(Labor Productivity)
Predicted Log(Expenditure/Sales)		-2.6759	
		(6.310)	
Predicted Log(New Products/Sales)			1.9169
			(2.251)
Log(Size)	0.0051	0.0427	0.2693*
	(0.005)	(0.040)	(0.150)
Log(Age)	-0.0007	-0.0513	
	(0.009)	(0.047)	
Export	-0.0213	-0.0056	
	(0.017)	(0.155)	
Foreign Status	0.0094	0.2218	
	(0.055)	(0.335)	
Internal Funds	-0.0278*	-0.0113	
	(0.015)	(0.193)	
Duopoly / Monopoly	-0.0182		
	(0.022)		
Capital Labor Ratio			0.0000***
			(0.000)
Process Innovation			0.3216
			(0.260)

Organization Innovation			0.0195
			(0.270)
Observations	477	489	181
R-squared			0.1629

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5: Agglomeration Economies - District Level (Agribusiness)

	1	2	3	4
Dependent Variable: TFP	Two-Digit		Three-Digit	
Localization	-0.0820***	-0.1164***	-0.0575***	-0.0329**
	(0.020)	(0.024)	(0.012)	(0.015)
Urbanization	0.0591***	0.0512**	0.0428***	0.0367**
	(0.020)	(0.020)	(0.015)	(0.018)
Observations	6,135	6,135	6,135	6,135
R-squared	0.0036	0.0052	0.0041	0.0057

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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[i] The EU-15 includes Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom

[ii] Industry associations in Bangladesh were very effective in supporting market diversification in the context of reduced demand from the United States and EU-15 during the global economic crisis (National Stakeholders, 2014)).

[iii] Lead time represented the time between the arrival of fabric (ready to cut) to garments packed and ready to ship.

[iv] www.ibtimes.com/despite-low-pay-poor-work-conditions-garment-factories-empowering-millions-bangladeshi-women-1563419

[v] Note that the magnitude of labor-output elasticities in Bangladesh is much lower when one differentiates between foreign and domestic sales, as opposed to looking at total output, perhaps because some firms answer the questions on total output, but not the questions on foreign and domestic sales.