Innovation, Investment, and Emerging Opportunities in Today's Textile and Apparel Value Chain

By Sumit Manchanda, Sabine Schlorke, and Maud Schmitt

Textile and apparel manufacturing is a critical creator of formalized jobs, a well-known path to industrialization, and an enabler of value chain relationships that modernize economies and make them more complex. Today, value chains that support the textile and apparel industries are rapidly evolving. They are integrating new technologies, embracing workplace innovations, adopting sustainable efficiencies, and inventing products and processes to meet the changing demands of global consumers and markets. This pattern has largely been repeating itself since the First Industrial Revolution more than 250 years ago. At the most fundamental level of the textile and apparel value chain, countries with an abundance of low-wage, minimally skilled workers enter the industry to do the heavy manual labor and, with time and learned experience, build skills that enable them to graduate to the production of complex products that help them integrate into more important value chains and steadily advance their standards of living.

Textile and apparel manufacturing is among the world's oldest industries. Because there is a relatively low barrier to entry—the principal requirement is low-cost labor—the sector has traditionally served as a strategy for developing countries to establish and leverage an industrial knowledge base to systematically modernize and grow their economies.

In recent years, investments in logistics, telecommunications, predictive technologies, and manufacturing processes—all of which were prohibitively expensive in emerging markets and developing economies until recently—have helped countries integrate into more lucrative value chains and improve the lives of millions of people. As a result, quality healthcare has become more abundant, education levels have improved, and job prospects are better.

Along with an increase in demand for apparel products to meet modern fashion trends from emerging middle classes in developing markets, there are many new opportunities for investment in the textile and apparel value chain that can accelerate its progress toward greater sustainability. Textile manufacturing has a large environmental footprint through its water demand and GHG emissions. For example, annual water usage by the fashion industry stands at ca. 93 billion cubic meters of water—equivalent to the consumption of five million people.[1] With such progress toward greater sustainability, complexity, and efficiency, the textile sector can lead to more prosperous and advanced economies.

As demand for fast fashion continues to increase with the emergence of new and increasingly affluent consumer markets around the world, a new generation of low-cost regional stitchers, sewers, and dyers (such as in today's Ethiopia, Vietnam, and Cambodia) are rushing to meet it. As countries with experience in the clothing and garment industries (for example, China and the Republic of Korea) move up the complexity ladder, they cede their less sophisticated businesses to newcomers while innovating their way to other, more complex levels of production.

Most of today's developed economies have experienced a similar industrialization journey. That trend precipitated the "Asian Tigers" of Singapore; Taiwan, China; Hong Kong SAR, China; and Korea in the 1960s. It has been the dominant evolutionary pattern of the textile and apparel value chain ever since.

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Today the trend is moving even faster due to advances in technology, telecommunications, logistics, and manufacturing processes. Value chains that serve the clothing and garment industries are far more fluid than a generation ago, automation is more common, data analytics are speeding up decision making, there is a greater diversity of products (ranging from cotton tee-shirts to personal protective equipment, or PPE, made from advanced synthetic fibers), and shoppers are more plentiful and wealthier around the world.

We have yet to understand the full impact of COVID-19 on the textile and apparel manufacturing industry, but as the pandemic exposes inefficiencies in value chains, companies and countries are hastening investments in initiatives that reduce risks and mitigate future disruptions. In Bangladesh, where economic growth has been impressive but complexity has stagnated, industry leaders have long worried about their country's reliance on ready-made garments.

Ready-made garment (RMG) manufacturing accounts for a staggering 80 percent of Bangladesh's exports and employs some 4.4 million workers. Because the sector depends on imported fabric from China and India, a disruption to that supply chain could devastate both it and the national economy. Consequently, Bangladesh has begun to seek diversification opportunities, drawing on the experiences of countries like Vietnam, Turkey, and Morocco to leverage existing manufacturing capabilities and establish global value chain relationships, with the goal of entering higher value sectors such as electronics assembly, footwear, and other light manufacturing.

Diversification, which had been an aspirational goal of many textile and apparel manufacturers for years and a mantra in many boardrooms, is being addressed with new urgency as potential and ongoing geopolitical and environmental disruptions expose vulnerabilities in value chains.

Even before the pandemic, apparel manufacturers were deepening their integration into local and regional value chains and cultivating more diverse and resilient supply chain partnerships in an effort to become more nimble, more competitive, and quicker to address fashions trending on social media. Long supply chains were becoming unwieldy and "just in time" deliveries functioned better when suppliers were geographically closer. At the same time, shifting value chains presented new opportunities for countries and companies to leverage their expertise and experience, and to diversify, in some cases shifting from natural fabrics—the entry point for most textile and apparel manufacturing—to produce apparel using man-made and synthetic fibers, which requires more sophisticated production processes, more complex technologies, and better skilled and educated workers.

On the marketing side, forward-looking brand strategists have been engaging dynamically with emerging middle-class consumer markets where shoppers are younger and have growing incomes. These markets are likely to continue to expand, perhaps even eventually overtaking in importance the aging European and U.S. markets.

The emergence of middle-class consumers in developing markets is accelerating the pace of investments in complex, higher-value technologies that efficiently, safely, and sustainably manufacture products that can command higher prices in global markets. Such a progression into more complex production processes and more sophisticated products has historically preceded leaps in social, educational, environmental, and economic development. It has led to more and better-paying jobs, greater community well-being, and increased opportunities for future generations. That evolution in industrial capabilities and know-how is the dynamic that powers countries to modernize and advance by becoming more economically complex.

What is Economic Complexity?

Textile production and apparel manufacturing have historically been gateways to industrialization, modernization, and more diverse and flexible economies. This progression toward more advanced production—or higher economic complexity— means that companies and sectors adopt more sophisticated production methods to manufacture more complex and unique products. It also helps companies integrate into more sophisticated regional and global value chains, leading to greater manufacturing opportunities, access to higher-value consumer markets, and stronger economic growth.

Economies with a high degree of economic complexity are home to a greater diversity of specialized know-how. According to Ricardo Hausmann, a Harvard professor who studies the concept, the key takeaway from those countries is to add "capabilities to your capabilities" to improve your Economic Complexity score.[2]
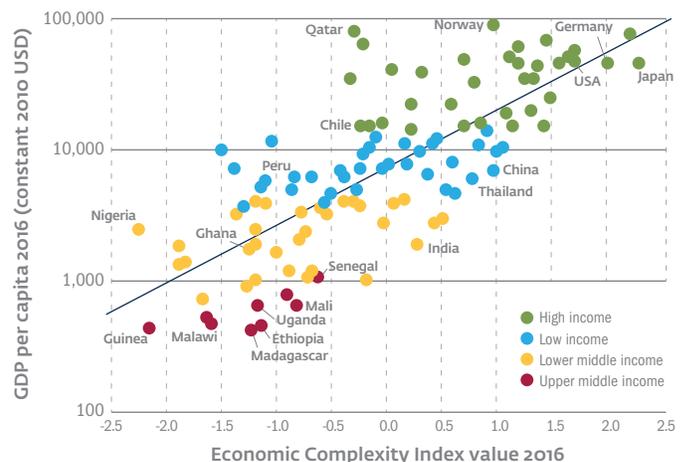

FIGURE 1 Economic Complexity Drives GDP Growth

Source: Manufacturing and Textile Deep Dive Team, IFC.

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Examples of high-complexity economies are Germany, Japan, the United States, and Norway. High economic complexity indicates an export mix with a broad diversity of products as well as products that have low ubiquity. Economic complexity also tends to be positively correlated with GDP growth (Figure 1).

On the distribution side, advanced economies possess recognizable global brands, a capacity for strong research and development, advanced design and innovation capabilities, client-oriented quality controls, and a flexible network of outsourcing partners. On the buying and selling sides, competition is based on brand and quality, with many companies operating at the forefront of the technology frontier.

Often a stepping-stone to greater economic diversification, textile and apparel manufacturing can support increased complexity in the structure of production along the dimensions of product, process, and value chain complexity. The textile and apparel value chain can enable local manufacturers to produce more complex products that are made through more intricate process technologies and are integrated in global value chains. MAS Holdings, a Sri Lankan company founded in 1984, is a garment manufacturer that evolved into more complex activities and illustrates the process. Starting as a producer of lingerie, the company leveraged its accumulated manufacturing know-how to diversify its production processes and its products, and eventually branched out into broader value chains. By 2001, it had become a diversified producer of sportswear, performance-wear, and swimwear, and as of 2019 the company was the largest textile and apparel manufacturer in South Asia, with 53 manufacturing facilities across 16 countries and over 99,000 people involved in its operations, which range from information technology to industrial parks. The company today generates $1.8 billion in annual revenue.
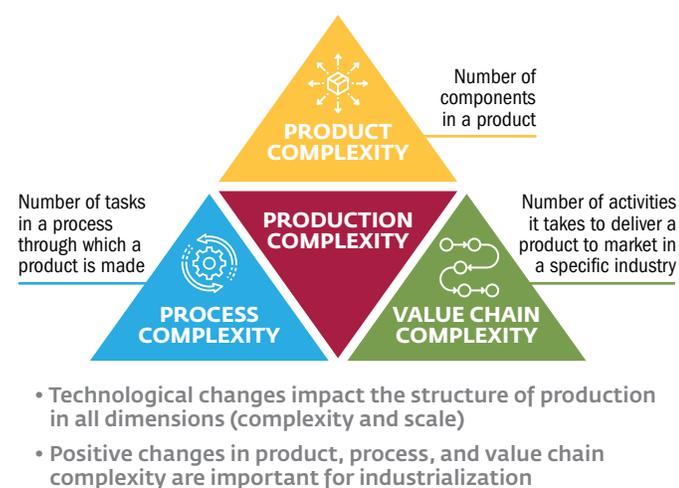

- Technological changes impact the structure of production in all dimensions (complexity and scale)
- Positive changes in product, process, and value chain complexity are important for industrialization

FIGURE 2 How Textile and Apparel Manufacturing Drives Economic Complexity

Source: Manufacturing and Textile Deep Dive Team, IFC.

By forging value chain partnerships, introducing new technologies, establishing overseas plants, benefiting from trade and investment policies, and expanding capabilities (such as starting Sri Lanka's first seamless knit operation in 1999), MAS has leveraged 35 years of manufacturing experience to become one of the world's most recognized design-to-delivery solution providers. Its customers are a who's who of global brands that include Victoria's Secret, Nike, Calvin Klein, Puma, GAP, H&M, Patagonia, and Tommy Hilfiger.

Today's Accelerating Trends

Today, textile and apparel value chains are more fluid and global than ever. As a result of global telecommunications that facilitate instantaneous messaging and data analytics powered by artificial intelligence, decision making is far faster than before. Online shopping has created direct-to-consumer purchasing options that have opened the door to value-creating "servicification" add-ons for clothing companies.

Many new middle-class markets in corners of the world that a generation ago commanded no attention from the apparel industry are now viewed as future profit centers that cannot be ignored. Markets such as Southeast Asia's six core economies—Vietnam, the Philippines, Indonesia, Malaysia, Thailand, and Singapore—are young, digitally sophisticated, and have disposable incomes that are creating demand for fashion brands, according to McKinsey's "The State of Fashion 2020."

Meanwhile, there is an increased focus on sustainability among apparel brands that understand the value of cultivating a socially responsible reputation. Through resource efficiency, waste management innovations, circularity (reducing, reusing, and recycling in an effort to reduce waste and conserve natural resources), and the implementation of transparent labor practices, sustainability strategies are critical to protecting the planet and attracting consumers who increasingly desire brands that are environmentally friendly and socially responsible.

A July 2020 McKinsey survey of more than 2,000 British and German fashion consumers found that a majority are making significant lifestyle changes to reduce their environmental impact and that "engagement in sustainability has deepened during the COVID-19 crisis."[3] E-commerce plays a role in the sustainability equation as well, not only as an important sales channel but as a facilitator of more streamlined value chains. Digitalization and data analysis—now more transparent and accessible than ever—are enabling companies to predict and manage inventories and fine-tune sales fulfillment options, driving more cost-efficient and energy-efficient logistics.

Overarching policy initiatives are also weaving their way into textile and apparel value chains. With the support of the United Nations, industry stakeholders in 2018 created the Fashion Industry Charter for Climate Action with the goal of achieving

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net-zero emissions by 2050. Today, the global apparel and footwear industries account for approximately 8 percent[4] of the world's greenhouse gas emissions and consume 79 trillion liters of water per year.[5] But as the costs of renewable energy technologies, effluent treatment, and more efficient equipment decline, brands and manufacturers are increasingly committing to more stringent sustainability standards.

At the company level, new technologies are hastening product innovations and complexity as well as accelerating sustainability efforts. Investments are being made in new fabrics and materials that, for example, are being designed with recycling and reuse in mind. Process innovations ranging from automation and laser cutting to 3-D printing are making factories cleaner, safer, and more energy efficient.

As digitalization and virtual design technologies wind their way through the global network of interconnected and symbiotic value chains and become cheaper, developing countries are finding opportunities to participate in global markets and increase their knowledge, skills, standards, complexity, and commitments to sustainability.

In low-wage countries there has been concern that automation could become a job killer and lead to near-shoring, when brands shift their apparel manufacturing plants closer to their primary consumer markets and replace workers with robots. But in most cases, robotics and automation in the textile and apparel industries are still no match for low-wage workers with years of manufacturing experience and know-how.

One near-shoring experiment that flopped began in 2015, when Adidas built two fully automated "Speedfactories" in Germany and the United States. The idea was to reduce the time it took to deliver products to European and U.S. store shelves by eliminating shipping delays. But by 2019, Adidas had reversed course, relocating those plants back to Asia where, a spokesperson at the time told the media, "the know-how and the suppliers are located." Some industry experts asserted that Adidas had simply overestimated the technical sophistication, logistical savings, and economic feasibility of deploying a robotic workforce, and that, for these reasons, its experiment was premature.

Today, the global textile and apparel manufacturing sector employs about 60 million workers[6]—80 percent of them in Asia, and mostly female[7]—and employment is not expected to shrink any time soon. At the same time, working conditions in the industry have been improving as a result of greater value chain transparency and global initiatives such as Better Work, a partnership of the International Labour Organization and IFC that strives to improve compliance with labor standards, prevent abusive practices, curb excessive overtime, and bolster profitability and community support.

Risk mitigation in the era of the COVID-19 pandemic and global warming is proving to be a powerful catalyst for changes in globalization strategies as well. Manufacturers are reducing their reliance on a single sector for export earnings and are diversifying their supply and value chains to guard against natural and man-made disruptions. Asian manufacturers are exploring nearby consumer markets such as India, China, Southeast Asia, and Africa to leverage demographic advantages and expand market breadth.

Apparel production is slowly moving away from China, which still reigns as the largest exporting nation, to seize new opportunities in India, Bangladesh, and Vietnam that are attracting attention and investment. Particularly since the outbreak of the pandemic, textile companies have ramped up production to expand their product mix to meet demand for protective equipment made of man-made fabrics, as well as leisure and athletic clothing that is favored by work-at-home employees during COVID-19 quarantines.
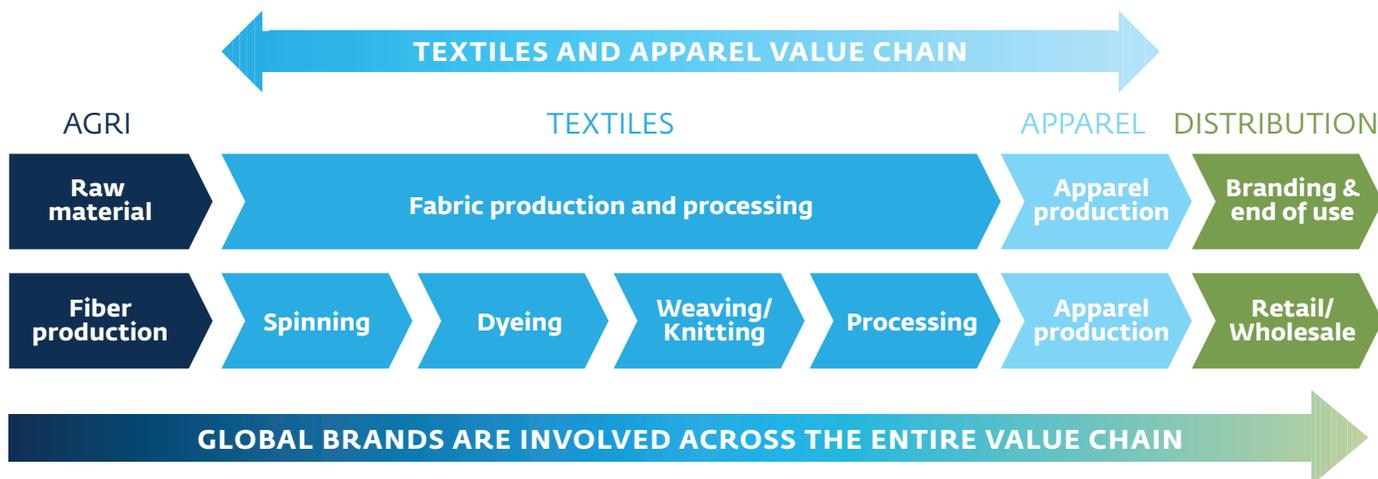

FIGURE 3 Textiles and Apparel Value Chain

Source: Manufacturing and Textile Deep Dive Team, IFC.

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Textile and apparel manufacturing continues to be a foundational industry for emerging economies. Since the First Industrial Revolution began some 250 years ago, when machines powered by steam and water began to replace hand production, textiles and clothing manufacturing have been foundational to industrial innovation, helping to expand the use of new technology and the skills needed to operate it. Textile and apparel manufacturing has played a pivotal role in the industrialization process of most developed countries because of the low start-up costs and direct linkages to advanced technologies and improved living conditions.

With each successive industrial revolution, textile manufacturers built upon their capabilities. During the Second Industrial Revolution, textile companies adopted mass production, assembly lines, chemical dyes, and the electrical grid. In the Third Industrial Revolution, they adapted electronics and information technology to their processes. Today, they are increasingly using data-driven tools, robots, instantaneous communications, and artificial intelligence to innovate. These advances are already impacting not only what products are being manufactured, but also how they are being made, where they are made, and the workers needed to make them.

With each revolution, the cost of technology has declined, and the accessibility of technology has proliferated, allowing additional countries to enter the industry.

Apparel factories, unlike highly automated car plants or semiconductor assembly lines, continue to be labor-intensive enterprises, requiring armies of low-wage workers to sew, dye, stitch, and handle hundreds of millions of pieces of fabric and apparel in every conceivable size and color, to produce a near-endless selection of clothing. As a result, big brands continuously seek low-wage assembly workers (ideally near their target consumer markets), providing opportunities for the next cheapest workforce to enter the industry.

Industry 4.0 technologies, including "sewbots" as well as 3D printing and the Internet of Things, have the potential to disrupt the industry, but are unlikely to displace labor in significant numbers anytime soon. As Figure 4 shows, China, Bangladesh, Pakistan, and Indonesia experienced surges in textile and apparel industry employment between 1980 and 2017, just as robotics and automation were booming in many industries.

Today, Cambodia, Ethiopia, Myanmar, and other countries that are geographically well positioned and that have an abundance of low-wage workers are motivated to develop an industrial foundation to nudge out the previous generation of low-wage countries and develop a foothold in the industry. The pattern has been repeated over and over. When Japan's workforce became too expensive in the late 1960s, Korean manufacturers took their place. When Korea grew too expensive, China, India, and Bangladesh filled the void.
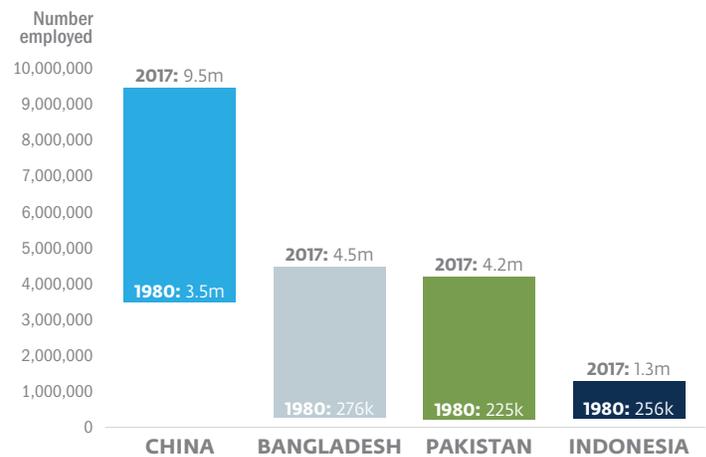

Number employed

FIGURE 4 Textiles and Apparel Employment in Four Key Exporting Markets, 1980–2017

Sources: UNIDO Industrial Database, 2019, and Better Work Country Updates, October 2018.

The human and economic ramifications are enormous, given the sector's 60 million global workers and the importance of the industry to the well-being of many countries. In Bangladesh, as previously mentioned, textile and apparel production accounts for 80 percent of the country's total exports and is a critical component for economic growth. Because the vast majority of textile and apparel industry employees around the world are women, many of whom are the sole breadwinners for their families, the sector is also crucial to advancing gender equality and social reform.

Complacency is the foe of complexity. While history shows that many countries launched their initial industrialization efforts by starting with the textile and apparel value chain, some have failed to leverage their know-how and build on their capabilities. A vision and a set of conducive policies are necessary to maintain momentum, but it is incumbent upon the private sector to implement, innovate, and invest in industrial strategies in order to grow more diverse and complex.

Korea, Japan, China, Thailand, Malaysia, and Vietnam are examples of countries that pursued industrialization strategies in textile and apparel value chains before diversifying into more complex products and sectors. Ethiopia, an emerging textile and apparel player, is already reaping benefits and spillovers from industrialization.

The experience of these and other countries shows how the textile and apparel sector—with low barriers to entry that do not require skilled labor, resources, or significant capital or technical know-how—can become the pathway to greater industrialization. That said, the benefits of entering the apparel segment can quickly dissipate if diversification is not pursued.

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In Bangladesh, for example, market inefficiencies are proving to be a challenge to growth. The textile and apparel sectors contribute more than 10 percent of GDP and more than four-fifths of export earnings, making Bangladesh the second biggest apparel exporter after China. Bangladeshi textile and apparel manufacturers employ more than 4.5 million people— mostly women—and contribute to the employment of some 10 million workers in ancillary industries. The sector has grown dramatically since the early 1980s when it employed about 276,000 workers. By 2018, the country was exporting an astonishing $32.9 billion a year and recorded an average 7 percent GDP growth rate for six consecutive years. The 2017 McKinsey Apparel Purchasing Survey predicted that Bangladesh would remain the preferred apparel sourcing destination for international brands for at least five years.

But such heavy reliance on a single sector with no active strategy for diversifying into new products, sectors, and value chains has exposed the country's economic vulnerabilities. The COVID-19 pandemic has amplified the issues that Bangladeshi apparel manufacturers face: fracturing the supply chain of raw materials and fabrics from China, diminishing overall consumer demand for clothing during the pandemic lockdown, and shifting fashion trends to leisure and exercise clothing made from synthetic instead of natural fabrics.

In China, a consistent strategy to adopt more complex production processes and produce increasingly complex products has paid off. Between 1977 and 1981, China's share of textile and apparel output steadily rose, reaching a peak of 20 percent of its total manufacturing output. As the country continued to industrialize and diversify into different manufacturing sectors, textile and apparel fell as a percentage of the country's total manufacturing output even as the sector continued to grow in real numbers.
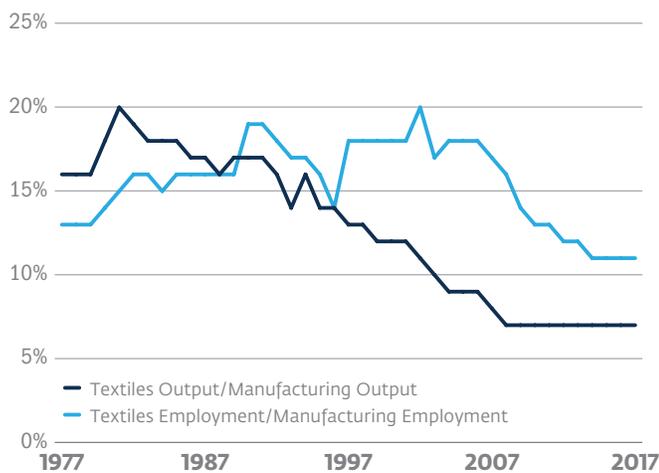

FIGURE 5 China Textiles and Apparel Output and Employment Share of Total Manufacturing

Source: Manufacturing and Textile Deep Dive Team, IFC.

Employment in the sector followed a similar pattern. In 1977, 13 percent of Chinese workers were employed in the sector. By 2001, textile and apparel manufacturing employed 20 percent of Chinese workers. But as Chinese manufacturing diversified into more complex industries such as plastics, computers, and automobiles, textile and apparel employment dropped to 11 percent. Similar examples of diversification and complexity can be seen at the corporate level.

The Singapore-based Indorama Corporation, which started in 1975 as a cotton yarn spinning company, has steadily diversified over the decades, leveraging its early capabilities and know-how to expand into higher complexity sectors. In 1991, Indorama began producing polyester fibers from petrochemical derivatives, and today it operates in multiple sectors producing an array of products that include nitrogen fertilizers, phosphate fertilizers, polyethylene, polypropylene, polyester, polyester feedstocks, textiles, cotton fiber, and medical gloves.

In 2019, Indorama was one of Asia's leading chemical holding companies, with eight affiliate companies. Today, it operates over 70 manufacturing sites in more than 30 countries and employs more than 30,000 people worldwide, having dramatically evolved to become a far more diversified and complex manufacturer.

Three Levels of Complexity and a Path Forward

The complexity concept as developed by Ricardo Haussmann and César A. Hidalgo[8] has been adapted by IFC into a framework of categorizing countries into three pillars that reflect the sophistication and diversity of their manufacturing base and their integration into regional and global value chains. Within each pillar, specific growth and complexity opportunities exist. This framework of categorizing into pillars has been developed by IFC's Manufacturing team and is applicable across manufacturing value chains including textile and apparel. The framework can help map where countries in the value chain currently lie and what pathways they can adopt to improve complexity and growth.

Pillar One: Emerging economies

Country classification: These economies generally operate on a small industrial scale; have few industrial standards; face challenging social and environmental issues; lack economic diversity; employ mostly low-skilled and unskilled workers; rely on base materials; have limited resources; and depend on imported technology and engineering practices. These countries have not achieved value chain sophistication.

Opportunities: Pillar One countries should consider backward integration, and when not possible within their own borders, they should consider backward integration within regional value chains. For example, by establishing mills to add value to raw fibers such as cotton, they can enhance both their process complexity and their value chain complexity.

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Goal: Lay the foundation for the industrial production of textiles and apparel products. Public-private partnerships are key to leveraging policies that encourage value chain diversification.

Pillar Two: Developing economies that have established an industrial base

Country classification: These economies have an established manufacturing base that continues to evolve. Pillar Two countries also are strengthening their competitiveness to enter multiple global value chains.

Opportunities: Cultivate backward and forward integration and diversification into global value chains through more robust connections with brands, technology, skill-building, and investments in base-material industries. Support production of complex materials such as synthetic fibers and encourage the upgrading of process technologies to improve sustainability.

Goal: Expand and diversify the manufacturing base through textiles and apparel-based activities.

Pillar Three: High complexity economies

Country classification: These economies have broad and sophisticated industrial bases where technology, skills, and diversification drive growth via collective know-how and resilient industry networks. Pillar Three economies are characterized by their global competitiveness in multiple value chains and their high level of industrialization.

Opportunities: Advance new technologies to harness growth, accelerate complexity, and support global sustainability goals through resource conservation and material efficiency. Pillar Three economies are well integrated into global value chains and have developed sophisticated inter-industry linkages—including "servicification," R&D leadership, and branding—that can benefit the entire manufacturing ecosystem regardless of the level of complexity. These economies can be encouraged to support South-South investments, share technology and knowledge, and support technological and product advancements for use in multiple value chains.

Goal: Support more complex manufacturing using the textiles and apparel value chain.

The past 65 years provide insights into the Pillar approach through the experiences of many economies, none more dramatic than the Asian Tigers, which rebuilt and reimagined their postwar economies by mobilizing colossal numbers of low-skilled and low-paid textile workers; putting them to work in efficient factories; developing modern ports that could deliver goods to important markets; and then weaving together regional—and later global—value chains.

Between the early 1960s and the mid-1990s, the Asian Tigers transformed their economies into textile and apparel powerhouses. They then turned their industry-building knowledge—including skills, education, and government policies, among others—to assembling what is arguably the most complex and important manufacturing region in the world, producing goods ranging from tee-shirts to satellites, and generating enormous wealth for their economies and higher living standards for their people. The Asian Miracle was a well-planned and well-executed project that numerous countries have attempted to emulate ever since.

COVID-19—An Opportunity and a Concern

As the textile and apparel sector matures and the COVID-19 pandemic exposes inefficiencies in value chains, companies and countries have responded by accelerating investments in initiatives to reduce risks, improve productivity, and leverage alternative products, processes, and markets.

The pandemic has made it clear that making fabric in China, shipping it to Bangladesh for assembly, and shipping it to consumer markets in North America and Europe is not the most efficient strategy. It has also showed that lean inventories, while adequate and efficient during normal times, are inadequate and risky during times of crisis, and that there is a cost to focusing too heavily on efficiency and not enough on resilience in business operations.

Prior to COVID-19, higher digitalization levels and e-commerce penetration enhanced competitiveness through forward and backward value chain integration. Diversification and sustainability awareness were already major trends in the sector; now they are being addressed with a greater urgency.

Not only do virtual design, sampling, remote audits, and remote inspections seem to be safer methods of operating during the pandemic, they are also proving to be cost efficient and easier to implement than once thought. The pandemic has indeed accelerated existing trends and uncovered opportunities to invest in forward-looking strategies, technologies, and opportunities.

In some emerging economies in Africa, for example, textile and apparel manufacturers have used their experience, know-how, and skilled workforces to retool their operations to make PPE. Out of necessity, the pandemic has nudged some manufacturers to transition from natural fibers into more complex synthetics that are used with PPEs. At the same time, PPE production has opened the doors to more complex regional and global value chains, as demand for protective garments and equipment is not limited to any one market or region.

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Conclusion

Today, textile and apparel value chains are more interconnected and quicker to respond to market conditions than at any time prior. Advances in technology, telecommunications, systems analysis, logistics, predictive technologies, and manufacturing processes have reduced the time, energy, and effort it takes to bring a product to market.

An abundance of data collected, sorted, and analyzed by artificial intelligence applications provides insights on processes, products, and markets that were unimaginable a decade ago. Decisions can be made and communicated almost instantaneously. Technology that was once cost-prohibitive for developing economies has become affordable and transferable and is now creating opportunities for companies and investors to integrate into increasingly important value chains and markets.

The products and machinery are different, but the evolutionary trends of the Fourth Industrial Revolution are familiar to students of past industrial revolutions. These trends are driven by technological innovations that trickle down from the most advanced economies to developing economies through dynamic value chains that span the globe. It is a pattern that has been repeated for hundreds of years but is now moving faster than ever through textile and apparel value chains and is touching corners of the world that are only now beginning to industrialize and develop.

As these trends take root, values that are important for the health of the planet and the social and physical well-being of societies are being increasingly emphasized and memorialized in approaches pursued by clothing manufacturers and international brands. Today, countries and companies must respect environmental and workplace sustainability protocols to evolve into more complex economies. They must consider both their bottom lines and the welfare of their communities and the communities they interact with through their value chains. As this latest industrial revolution proceeds at a breakneck pace, it is instilled with a consciousness about the safekeeping of the natural world.

Please see the following additional reports and EM Compass Notes about responses to COVID-19 and about reaching unserved and underserved populations in emerging markets: *AI Investments Allow Emerging Markets to Develop and Expand Sophisticated Manufacturing Capabilities* (Note 87, July 2020); *Impacts of COVID-19 on the Private Sector in Fragile and Conflict-Affected Situations* (Note 93, Nov 2020); *How Natural Capital Approaches Can Support Sustainable Investments and Markets* (Note 92, October 2020); *Leveraging Inclusive Businesses Models to Support the Base of the Pyramid during COVID-19* (Note 84, May 2020); *What COVID-19 Means for Digital Infrastructure in Emerging Markets* (Note 83, May 2020); *Artificial Intelligence in the Power Sector* (Note 81, April 2020); *Accelerating Digital Connectivity Through Infrastructure Sharing* (Note 79, February 2020); *Artificial Intelligence and 5G Mobile Technology Can Drive Investment Opportunities in Emerging Markets* (Note 76, December 2019); *The Role of Artificial Intelligence in Supporting Development in Emerging Markets* (Note 69, July 2019).

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