

Highlights



The requirement for original equipment manufacturers to navigate through two distinct stages of a permit application for importing welding gases could be rationalised and consolidated into a single, more efficient process.



Small and medium enterprises should be provided greater access to finance to automate their production lines, mitigating productivity loss owing to outdated machinery.



Policies should focus on skill upgrading, education, and training are essential to cultivate a highly skilled workforce and increase the availability of skilled welders.



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Bicycle Industry in Bangladesh

An Analysis of the Value Chain

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Introduction

In Bangladesh, bicycle exports are the largest exports in the country's light engineering sector. Notably, bicycle exports account for 7.5 per cent of all light engineering exports (Kathuria & Malouche, 2016). In the global value chain (GVC) of bicycle production, Bangladesh focuses on assembling a large number of parts, with the manufacturing process being less energy-intensive. Currently, the leading producers of bicycles are in China, followed by Indonesia, India, and Japan (Velu & Surabian, 2016). In Bangladesh, the bicycle export industry has emerged only recently. However, the bicycle manufacturing industry has significant potential in the global economy. The top destinations for bicycle exports from Bangladesh include the United Kingdom (64 per cent), Germany (14 per cent), and Belgium (9 per cent) (Kathuria & Malouche, 2016).

Malaysian investors were the first proponents of establishing a prominent bicycle exporting firm in Bangladesh called Alita in Chattogram, followed by the Meghna Group and German Bangla Bicycles. Nevertheless, eventually Meghna Group became the country's largest bicycle manufacturer. Apart from these three large firms, there are several small and medium-sized enterprises (SMEs) who assemble bicycles and manufacture parts at a much smaller scale and retailers that predominantly cater to the domestic market. As such, the bicycle manufacturing industry in Bangladesh stems into two branches: i) export-based original equipment manufacturers (OEM) and ii) small-scale bicycle parts industry catering to the local market. These two branches operate separately and have limited linkages (Velu & Surabian, 2016).

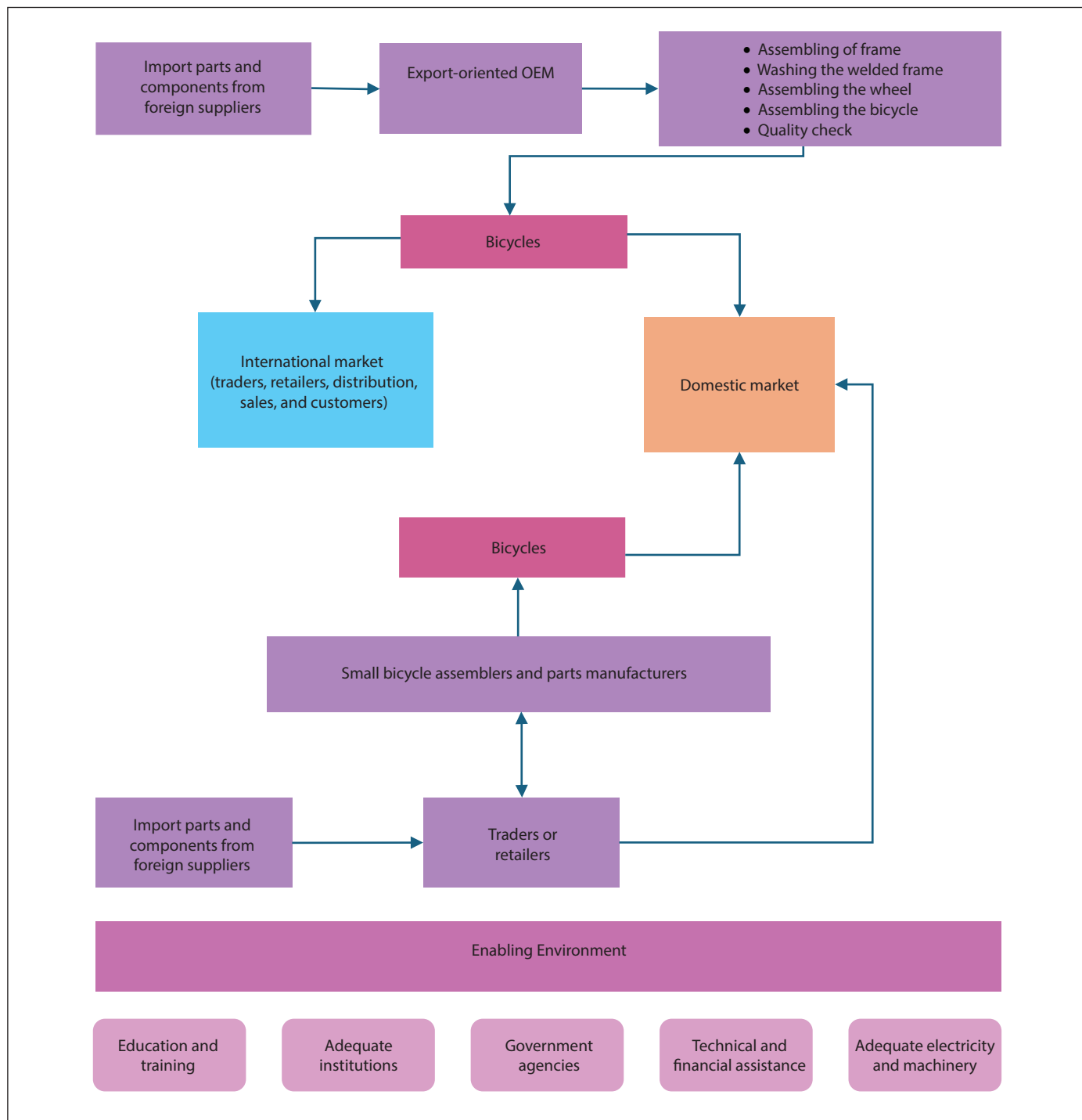
Input-output structure

The input and output structure of the value chain delineates the interconnections between the inception of a product or service and its final consumption or end use. The main branches of the input-output structure include research and development (R&D), design, production, distribution, marketing, and sales. However, these fragments may differ owing to the type of industry. Nevertheless, to comprehend the complexity of the value chain, it is first imperative to observe and underscore the fundamental operations of the industry as part of the GVC and highlight the ever-changing structure of the firms representing each fragment of the value chain (Fernandez-Stark & Gereffi, 2019).

Bicycle manufacturing firms are responsible for assembling the disaggregated parts of a bicycle and manufacturing it into a finished product. The manufacturing process includes five stages: assembling the frame, washing the welded frame, assembling the wheel, assembling the bicycle, and quality check. Each OEM begins manufacturing the bicycle by

assembling the frame, which involves slicing the tubes for the frame, fork, seat, and chain stays and then welding the tubes (Veliu & Surabian, 2016). The welded frames are then washed to remove any remaining impurities before attaching the tyre to other parts, including frame rims, spokes, and tubes. In the last stage of assembly, the frame, the wheels, and all the parts, such as the

Figure 1: Value chain mapping of the bicycle manufacturing industry in Bangladesh



Source: Authors' illustration based on a review of the literature (Veliu & Surabian, 2016; Frederick, 2019).

handlebar, stem, headset, brakes, saddle, seat post, and chain sets, are attached. Subsequently, each assembled bicycle is later tested for quality control before being delivered to the warehouse, where they are stored before exporting them to foreign buyers or trading them to the local markets (Figure 1). It is important to highlight that imported components or parts greatly dominate the bicycle value chain in Bangladesh, while the final assembly stage adds the bulk of the production cost. The OEMs in Bangladesh import bicycle components mainly from China, Singapore, Taiwan, Hong Kong, Malaysia, and Thailand (Velieu & Surabian, 2016).

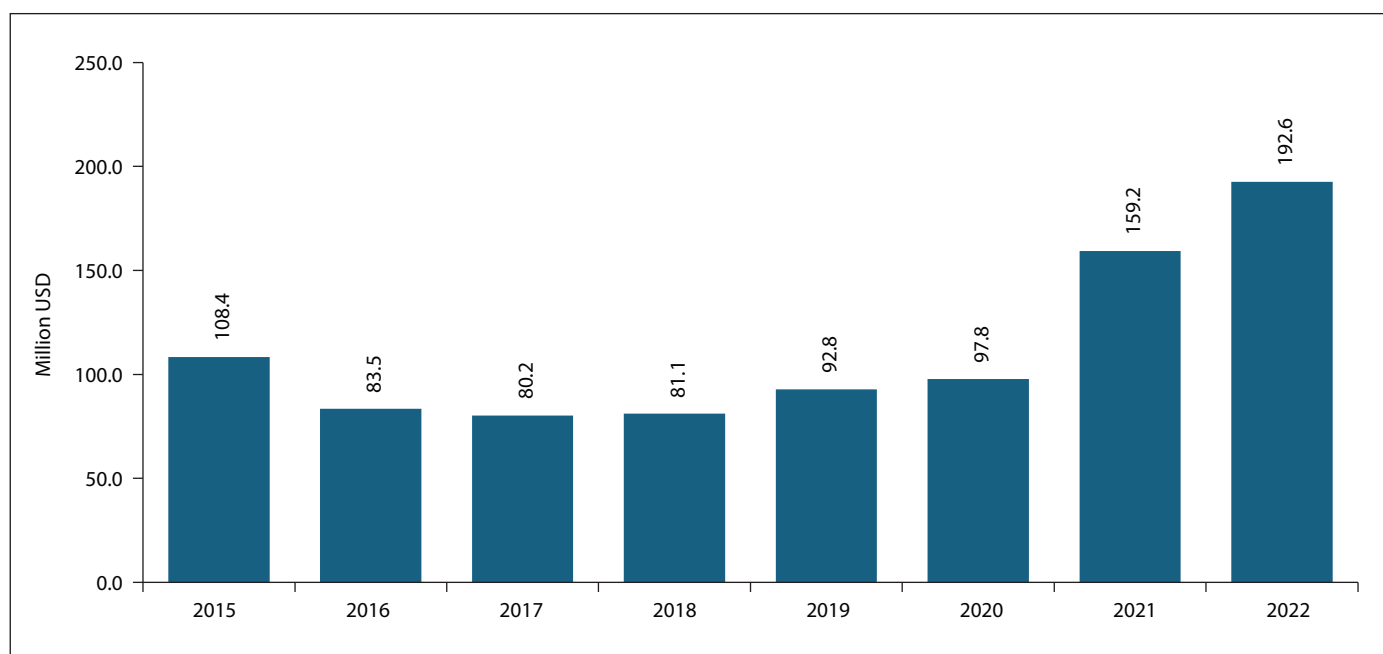
The high dependency on imported components arises as local firms lack the expertise and financial resources to produce export-quality manufacturing components and must rely on inputs imported from other nations (Kathuria & Malouche, 2016). Several crucial bicycle parts and components are not readily available in Bangladesh's local market. These include the derailleur, chain set, freewheel and hubs, brake set, bearing, saddle, rack (carrier), steering column, mudguard, pedals, handlebar, frame assembly set (tube and fork), wheel assembly set (rims and spokes), and tyres and tubes (Kathuria & Malouche, 2016). The absence of these components suggests potential challenges for bicycle manufacturers, repair shops, and enthusiasts in sourcing necessary parts domestically, potentially leading to reliance on imports or limited availability, hindering the development of the local bicycle industry. However, certain bicycle parts and components are available in the local market of Bangladesh, including grips, seat posts, and chain covers (Kathuria & Malouche, 2016). Local suppliers who manufacture

parts and components only cater to the local market, where the quality requirements are not as high. Nonetheless, Meghna Group is the only OEM in Bangladesh with the resources and adequacy to produce the parts and components of export quality partially. Yet, the firm is still very much dependent on imported materials (Velieu & Surabian, 2016).

Governance structure

The governance structure of the value chain facilitates the analysis of the power dynamics involved within a chain. In other words, governance defines the authority responsible for coordinating and controlling the entire value chain. Fundamentally, the governance structure can be disaggregated as either being 'producer-driven' or 'buyer-driven.' Producer-driven chains concern industrial enterprises with a cardinal role in overseeing the production system, including forward and backward linkages. Such characteristics are common in capital- and technology-intensive industries such as automobiles, computers, aircraft, and electronic machinery (Gereffi, 1994). Concurrently, buyer-driven chains are associated with industries where the central role is dominated by colossal retailers, globally recognised merchandisers and trading corporations who regionalise the production linkage in various export-oriented developing countries. Such industries are generally labour-intensive, producing consumer goods, including garments, footwear, toys, consumer electronics, home products, and various hand-crafted items. Additionally, industries that manufacture finished products under the OEM arrangement are also dominated by buyers as the design and specifications are

Figure 2: Bangladesh's bicycle exports to the world



Source: Authors' illustration based on data from ITC Trade Map (ITC, 2022).

provided by the dominant buyers and internationally recognised firms (Gereffi, 1994). However, the governance structure can be disaggregated further into five categories. These include market, modular, relational, captive, and hierarchy (Fernandez-Stark & Gereffi, 2019; Gereff, Humphrey, & Sturgeon, 2005). These five categories are based on three fundamental principles concerning the complexity of transactions, the ability to codify transactions, and the capabilities of the supply base (Gereff, Humphrey, & Sturgeon, 2005).

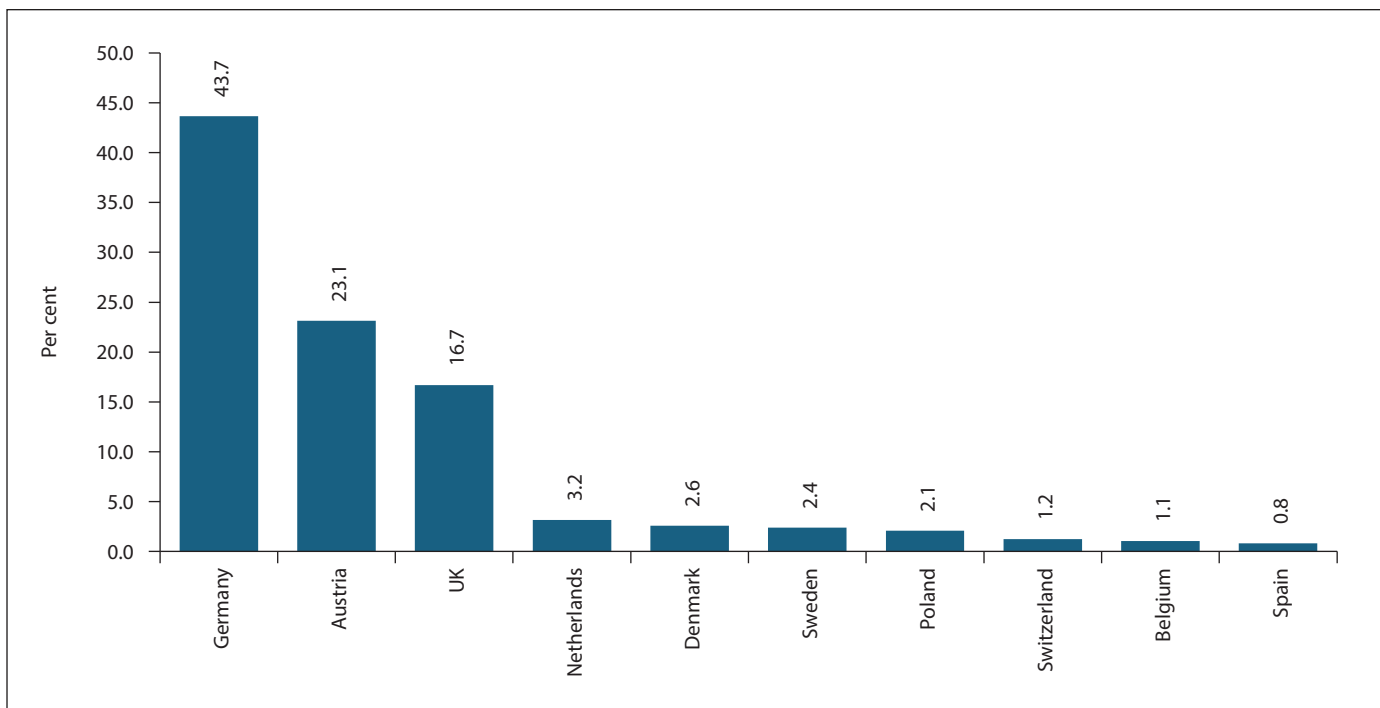
The value chain of the bicycle industry has evolved from a hierarchal governance structure to a market-based structure, especially in the twentieth century. Due to market forces, the value chain has shifted from a traditional top-down organisational framework to a network of multiple firms working together in inter-firm governance (Gereff, Humphrey, & Sturgeon, 2005). Based on the market mechanism and consumer demands, several firms across the value chain of the bicycle industry have now begun to collaborate and specialise in manufacturing different bicycle components (Gereff, Humphrey, & Sturgeon, 2005). Market governance is defined as having low intricacy of information and transactions, which can easily be monitored with simple designs and product specifications. In addition, there also exists a greater competency of suppliers with adequate ability to manufacture the specified product with less intervention from the buyers. The industry’s low transaction cost facilitated this transition by harmonising initial component

design with final product design, economies of scale, and the evolving specialised expertise among suppliers (Gereff, Humphrey, & Sturgeon, 2005).

The total export of bicycles from Bangladesh has increased from USD 45.2 million in 2004 to USD 192.6 million in 2022 (Figure 2). In these 18 years, the growth of bicycle exports from Bangladesh has been exponential. Notably, between 2021 and 2022 alone, there was an approximately 21 per cent growth in bicycle exports, highlighting the burgeoning potential of Bangladesh’s bicycle industry (ITC, 2022). Germany was the top export destination for Bangladesh’s bicycle products in fiscal year 2023, accounting for about 44 per cent of the total bicycle exports (Figure 3). This was followed by Austria, accounting for about 23 per cent, and the UK, accounting for about 17 per cent (EPB, 2024).

Opportunities for investment in the bicycle industry emerged for Bangladesh, especially in accessing the European market, after the European Union (EU) introduced anti-dumping duties on Chinese bicycle exporters. In 1993, the EU imposed the first anti-dumping duties on bicycles exported from China (Kathuria & Malouche, 2016). This opened new avenues for other countries, such as Bangladesh, to become important participants in the bicycle value chain. As of 2019, the anti-dumping duty on Chinese bicycle exports to the EU was between zero and 48.5 per cent (EU, 2019). Despite this, the bicycle sector in Bangladesh still faces considerable challenges and has a formidable journey ahead.

Figure 3: Top 10 major export destinations for bicycles from Bangladesh for FY23 (as share of total bicycles export)



Source: Authors’ illustration based on data from the Export Promotion Bureau (EPB, 2024).

Shimano, a Japanese manufacturing conglomerate for cycling components, has been a leading firm in the GVC of bicycle production. Shimano has gained traction through mergers and acquisitions and positioned itself internationally as a prominent parts supplier in the bicycle industry, particularly in the US market (Mikkola, 2002). As such, Bangladesh needs to import more from leading parts and components manufacturers, such as Shimano in Japan, to strengthen its backward linkage in the GVC. However, to diversify and enter new markets such as Japan and perhaps in the regional urban cohorts of South Asia, Bangladesh requires significant policy reforms targeted at a broader level rather than focusing on the bicycle industry alone. Trade facilitation and reforms in business practices will significantly enhance the lead time and decrease the cost of doing business while improving competitiveness (Kathuria & Malouche, 2016).

Upgrading

Economic upgrading within global value chains has become increasingly crucial for Bangladesh, particularly as it approaches graduation from the status of a Least Developed Country (LDC). After the LDC graduation, Bangladesh will no longer benefit from international support mechanisms, potentially diminishing the competitiveness of its exports in the global market. Considering the nation's heavy reliance on apparel exports, Bangladesh must undertake significant transformations to enhance its position within the global value chain. In alignment with the GVC framework, four types of economic upgradation have been identified: process upgrading, product upgrading, functional upgrading, and chain or intersectoral upgrading (Islam & Polonsky, 2020).

Process upgrading is characterised as converting inputs into outputs more efficiently by restructuring the production process or injecting advanced forms of technology (Schmitz, 2006). Reorganising the production processes enables firms to adapt to market changes and buyers' specifications and make alterations immediately. This may include automation that improves the productive capacity of a firm or quality management and efficient business organisation, thereby reducing the lead time (Humphrey & Schmitz, 2002). On the other hand, product upgrading refers to switching to more complicated and advanced product lines (Morris & Staritz, 2014). It is essentially specified as a firm's competency to improve product quality and integrate complicated production designs. In addition, functional upgrading involves learning new skills and abilities to participate in higher value-added activities, entailing the delivery of manufactured products and providing services to the end consumers. Lastly, chain upgrading is defined as firms transitioning to a new but comparable industry (Humphrey & Schmitz, 2002).

In the epoch defined by digital designs and sophisticated technology, consumers are exposed to various bicycle options in

the market tailored to their preferences. These choices encompass several features involving propulsion methods such as motorised or non-motorised, construction types denoted by basic steel frame city bikes, high-performance carbon fibre racing bikes, and other varied functionalities. As such, the predominant categories of bicycles are utility, hybrid, mountain, motocross or BMX, touring, and racing models (Velieu & Surabian, 2016). OEMs from Bangladesh have sufficient adequacy to manufacture several ranges of bicycles for the international market. Production may vary anywhere from 100 models for a single buyer to over 200 models for several clients (Velieu & Surabian, 2016). However, while manufacturers in Bangladesh have garnered the expertise to assemble basic utility, hybrid, mid-end to high-end, mountain or BMX bicycles, they still have limited resources to emerge as key proponents in manufacturing bicycle models designed for competitive racing (Velieu & Surabian, 2016). OEMs in Bangladesh still lack the proficiency to capture the intermediary part of the supply chain, which encompasses manufacturers specialising in particular parts and components. Domestic manufacturers in Bangladesh have not yet developed the ability to produce parts and components to meet international standards (Kathuria & Malouche, 2016).

Consequently, the bicycle manufacturing industry in Bangladesh must enhance its production methods and cultivate a superior product standard. Enhancing production processes will empower OEMs to adeptly fabricate specialised bicycle components and parts. This advancement will facilitate improved fulfilment of domestic market demands and elevate export volumes to align with global industry benchmarks. It is important to understand that the bicycle industry is capital-intensive. While the abundance of labour at affordable wages may be advantageous for RMG, leather or comparable sectors, it is not a decisive feature that defines the competitiveness of the bicycle as a product. As a result, the bicycle industry flourishes more in countries with a relatively higher cost of labour than Bangladesh, such as China (Kathuria & Malouche, 2016). Therefore, scaling up the nature of the production process and introducing more automation in the production line will enable bicycles manufactured in Bangladesh to become more competitive and facilitate the OEMs in Bangladesh to specialise in components and parts of bicycles that can be exported.

Manufacturers need to invest in advanced equipment like semi-automated and automated precession tools to specialise in the parts and components industry of the bicycle value chain. This will increase production and improve the quality of the parts and components produced, narrowing the gap between the standards of the domestic and the international market (Kathuria & Malouche, 2016). However, Bangladesh's competitiveness in the production of bicycles also suffers from redundant public policies and bureaucratic administration (Velieu & Surabian, 2016). For instance, to import welding gases, OEMs require permits in two stages, which involve prior permission and final permission

from the Explosive Department of the Ministry of Energy, which is assigned to monitor trade in dangerous materials. Most of the information needed to acquire the preliminary permit closely mirrors the data submitted to authorities for the final permit, resulting in an extended and bureaucratic procedure (Veliu & Surabian, 2016).

The OEMs have also found it challenging to hire skilled and qualified workers, primarily welders, in different parts of the manufacturing process. Qualified welders are among the highest-paid employees in the assembly line, earning about USD 150 each month in Dhaka (Veliu & Surabian, 2016). Yet, despite the premium wages, hiring skilled welders remains a challenge. As such, skill upgradation, education, and training are imperative to create a qualified workforce. This is because the industry's export competitiveness may be at risk once the EU phases out the anti-dumping duties on Chinese bicycles. Manufacturers in Bangladesh have acknowledged that the anti-dumping duties on Chinese bicycles have aided bicycle exports from Bangladesh in gaining traction in the international market. It is expected that after the anti-dumping duties are phased out, Chinese bicycles may become 10 to 20 per cent more affordable than bicycles exported from Bangladesh in the European market (Veliu & Surabian, 2016).

Another concern is the inadequate electricity supply, which impedes domestic manufacturers' production process, especially for SMEs that cannot afford generators. Insufficient access to finance hinders the automation of small manufacturers who suffer productivity loss from using old machinery. Improved access to finance will support such small domestic manufacturers in automating their production processes. A viable approach may entail large OEMs facilitating such investments by guaranteeing supplier bank loans with orders. This strategy could be supplemented by enhancing the financial accessibility of SMEs. Bangladesh also needs to attract adequate Foreign Direct Investment (FDI), especially from Japan, with attempts to be more integrated into the regional and global value chain (Kathuria & Malouche, 2016).

Simultaneously, transitioning to more sophisticated production lines will expand the bandwidth of OEMs to manufacture a comprehensive range of bicycles, positioning them as pivotal contributors within the GVC. An opportunity for this advancement can potentially reside in the manufacturing of electric bicycles. Given the escalating environmental degradation and concerns over climate change, sustainability has become a leading priority in international trade and the GVC. In this light, electric bicycles have gained more attention globally due to their ability to be an environmentally friendly mode of transportation. In addition, the global market for electric bicycles is projected to grow at a compound annual growth rate of 8.2 per cent, accounting for 6.8 million units in sales by 2025 (Citron &

Gartner, 2016). This denotes a growing potential for Bangladesh to diversify its production line and attempt to take advantage of the increasing market for electric bicycles. There are essentially three types of electric bicycles that Bangladesh may explore and diversify into, which include pure electric bicycles, power-assisted bicycles, and electric bicycles with two modes, pure and power-assisted (Hung & Lim, 2020). Electric bicycles have yet to make a prominent introduction into the bicycle manufacturing industry in Bangladesh. As recently as February 2024, PRAN-RFL Group took the lead in manufacturing Bangladesh's first electric bicycle, slated for export to Germany (TBS Report, 2024). Duranta Bike, a subsidiary of PRAN-RFL Group, entered the bicycle industry as a newcomer in 2015. Duranta Bike operates primarily from two main factories in the Hobiganj district of Sylhet division, with one facility producing bicycles for the domestic market while the other concentrating on products destined for international export (Sachee & Bhatta, 2020).

Developing Bangladesh's local bicycle manufacturing industry is necessary to ascertain greater participation in the GVC by being involved in high-value-added activities. Such an endeavour can be achieved through greater education and skill development of the labour force involved, adequate institutions, compliant government agencies, improved supply of electricity and advanced machinery, and technical and financial assistance, especially to the SMEs to attain adequate brand recognition and better compete with large OEMs (Veliu & Surabian, 2016).

Conclusions and recommendations

Bangladesh's bicycle manufacturing sector comprises of export-oriented OEMs and a small-scale local parts industry, operating independently with minimal linkage. The manufacturing process involves assembling the frame, wheels, and bicycle, followed by quality checks, spanning five stages. However, bicycle manufacturers in Bangladesh have hitherto been unable to specialise in export-quality parts and components. Thus, the local parts industry primarily caters to the domestic market, where quality requirements are not as high as in the international market. In light of the findings of this policy brief, the following recommendations are put forward for policymakers:

Trade policy: Greater efforts must be made to streamline administrative procedures to mitigate the burden of redundant public policies. Specifically, the requirement for OEMs to navigate through two distinct stages of a permit application for importing welding gases could be rationalised and consolidated into a single, more efficient process. By simplifying and unifying these permit requirements, bureaucratic hurdles can be reduced, enhancing the ease of doing business and fostering a more conducive environment for industrial operations.

Financial assistance: Small manufacturers in the bicycle industry require financial and technical assistance to compete with the large OEMs. Greater access to finance will enable production line automation for SMEs, mitigating productivity loss owing to outdated machinery. Furthermore, larger OEMs could play a role by guaranteeing bank loans for suppliers and facilitating such investments. Moreover, Bangladesh should focus on attracting more FDI, particularly from Japan, to bolster integration into regional and global value chains.

Capacity building: Increasing the availability of skilled workers, particularly welders, is crucial for OEMs to address challenges in the manufacturing process. Despite offering competitive wages, hiring skilled welders remains a challenge for suppliers in the bicycle industry. Therefore, policies focusing on skill upgrading, education, and training are essential to cultivate a highly skilled workforce. By investing in skill development initiatives, OEMs can ensure a steady supply of qualified workers, improving overall productivity and efficiency in the manufacturing sector.

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