

Diversifying the Export Basket of Bangladesh: Exploring the Readiness of the Bicycle Industry

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ABSTRACT

Purpose: This study explores the readiness of the Bangladeshi Bicycle as a potential export item of the country's export diversifying strategy.

Methodology: This study uses mixed methods. It first analyzes comparative advantage using a quantitative approach and then identifies challenges and areas for improvement using a qualitative approach. The quantitative data spans from 2012 to 2023, while qualitative data comes from semi-structured interviews with participants from three major bicycle-exporting firms in the country.

Findings: Bangladesh has a comparative advantage in bicycle exports from 2012 to 2023, with steady growth and a spike in 2021. Key challenges for exporting bicycles include limited capital, lack of expertise, minimal government support, and political instability. Advanced technology, improved quality, and enhanced training and connectivity are needed to overcome these challenges.

Practical Implications: This study will help build the country's export diversification strategies through bicycles and contribute to its trade policy reforms. The findings will also help policymakers, bicycle producers, and exporters initiate strategies that further develop the country's export readiness.

Originality/Value: Exploring the Bangladeshi bicycle industry's export readiness and competitiveness, comparative advantage, challenges, and way out in exporting bicycles from Bangladesh presents the originality and value addition of this study.

Limitations: The analysis uses only the RCA index to assess the comparative advantage in bicycle readiness. While it shows whether a country has an advantage or disadvantage in certain products, it does not reveal the underlying reasons for these conditions.

1. Introduction

Export diversification is the changes in the structure and composition of the exports of a country initiated by altering patterns of an existing basket of goods or by escalating innovation and technology on them (Dennis & Shepherd, 2011). A diversified basket of goods is considered an essential tool for enhancing economic progress in developing countries (Sarin et al., 2022). Export diversification benefits most developing countries with lower per capita income (Lee & Zhang, 2022), and it offers long-term economic growth in small economies by mitigating fluctuations in export earnings (McIntyre et al., 2018)

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This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited (2018). Therefore, export diversification is crucial for developing and small economies as it ensures more export stability, accelerates further economic growth, and offers the ability to produce high-value manufactured goods (Holiuk et al., 2021).

Exports play a prominent role in Bangladesh's constant economic expansion. According to Trade Map data, Bangladesh earned 57.84 billion dollars from exports in 2023, which is 13.16% of GDP and almost double the amount exported in 2013. The RMG and apparel industry have been a blessing for the economy, contributing more than 85% of the country's export earnings. However, dependency on one sector is alarming. It can put the entire economy at stake and raise questions regarding the economy's welfare, as Bangladesh will lose many of its trade benefits once it graduates from Least Developed Countries (LDC) status. Dependence on a single sector makes the country more vulnerable to international macroeconomic drivers (Shimu & Islam, 2018). Therefore, Bangladesh needs to diversify its export basket at the earliest possible period to sustain the development it has achieved over the years.

According to the Bangladesh Investment Development Authority (BIDA), light engineering, leather and footwear, jute and jute products, plastics, automobile parts, etc., have immense potential for exporting by Bangladesh because of its growth over the years. Despite being negatively affected by COVID-19, in FY 20-21, the export earnings of light engineering were USD 489 million, one-fourth of which was from bicycle exports (*BIDA - Light Engineering*, n.d.). Bangladesh now produces about 1.5 million bicycles annually, nearly one million of which are exported to global markets (Sachee & Bhatta, 2022). According to Eurostat, Bangladesh is the third-largest non-European exporter of bicycles to the EU and the world's eighth-largest exporter after Taiwan and Cambodia.

Since 2011, the bicycle industry has experienced significant growth. By 2016, the market had grown from USD 40.2 billion to USD 45.6 billion (Sachee & Bhatta, 2022). Furthermore, the industry is expected to be worth USD 70.10 billion by 2027, with a compound annual growth rate (CAGR) of 6.13%. According to a USAID comprehensive private-sector assessment report, the global bicycle market is expected to grow by 37.5 percent between 2016 and 2024, with a market value of \$62 billion by 2024 (Rahaman, 2020). For the present and future potential growth of the bicycle industry, investing and focusing on the bicycle industry is expected to help Bangladesh diversify its export basket and reduce the dependency on a single industry for exporting.

Considering the potential of the bicycle industry in Bangladesh's export diversification need, this study aims to determine Bangladesh's comparative advantage in bicycle export, identify the current challenges in the export of Bangladeshi bicycle products and find possible areas of improvement to enhance Bangladesh's readiness for the global market.

2. Literature Review

Export diversification illustrates a structural change in the composition of a country's existing export basket, focused on products, technology, or destinations (Dennis & Shepherd, 2011). Export diversification is also essential for nations to overcome external economic shocks, price inelasticity, vulnerability, and instability arising from a narrow export basket (Hesse, 2009; Mania & Rieber, 2019; Sarin et al., 2022). Developing LDCs and small economies often diversify their export baskets to counter these adverse economic effects and further sustain their economic progression (Lee & Zhang, 2022; McIntyre et al., 2018). A country should have export competitiveness in particular products to be successful in export diversification (Hesse, 2009). The study of export diversification cannot offer specific policy recommendations until it evaluates the country's competitiveness in exporting a particular product (Agosin, 2007). However, countries can identify export competitiveness through comparative advantage analysis by measuring trade competitiveness and market share percentages and using revealed comparative advantage metrics across various product categories, thus revealing their strengths in specific sectors based on historical trade data and comparing their export performance in particular sectors against competing nations over a defined period. (Das et al., 2024; Malik et al., 2023; Sariçoban, 2022)

Comparative advantage is rooted in the idea of opportunity cost, where countries allocate resources to produce goods with the lowest relative cost, thus maximizing efficiency and economic growth (Rahman, 2023; Zhang, 2000). The Ricardian model of comparative advantage demonstrates

how countries can gain from trade by specializing in goods where they have a relative advantage, even if they are not the most efficient producers globally (Rahman, 2023). Revealed Comparative Advantage (RCA) indexes have usually been used to measure whether a country has a comparative advantage in particular products (Danna-Buitrago & Stellian, 2022). This mathematical technique gives credence to the Ricardian Comparative Advantage theory (Adigwe, 2022). Balassa (1965) introduced the RCA index, a method to calculate a country's comparative advantage by capturing the relative costs and non-price aspects associated with exporting goods in a particular industry (Islam & Huda, 2020).

The RCA index is sometimes criticized for its limitations, i.e., it frequently fails to explain the performance, instead merely revealing the relative position of export performance of chosen industries. This index is frequently critiqued for its theoretical underpinnings and empirical distribution (Vanitha et al., 2014). Despite this criticism, in previous studies, the RCA index is considered one of the most prominent tools for measuring the comparative advantage of countries in different products (Utkulu & Seymen, 2004; Islam, 2021). Table A (in the appendix) presents several sample studies that explored the comparative advantage of countries in different products. Table A shows that previous studies considered individual industries and products, as well as all products of a sector in a country. These studies also cover countries in all categories- developed, developing, and LDCs, implying the broad view of the RCA index to be used in any particular country to explore the comparative advantage of any products.

Some studies also explored the comparative advantage of different products in Bangladesh using the RCA index. These previous studies considered the comparative advantage position of Bangladesh in the RMG industry, raw leather, leather goods, footwear items, plastic items, ceramic goods, shipbuilding, light engineering, etc. (see Table B in the appendix). However, these studies are limited by ignoring the inclusion of all the potential manufacturing goods in the analysis, instead urging for future similar research on other potential export items that seem to have potential for the country's export diversification effort (Islam & Huda, 2020). Therefore, a research gap is still evident and can be filled by exploring the comparative advantage of the Bangladeshi bicycle using the RCA index, as previously mentioned, the scope and potential of bicycle products in the nation's export diversification effort.

To the best of researchers' knowledge, no previous studies have been evident that exclusively studied the bicycle industry of a specific country in any of the following areas: export potential, export competitiveness, comparative advantage, and export readiness. Only a few available studies considered all manufactured products of a trading nation in the analysis of national comparative advantage, where the bicycle is included without any specific concentration. Besides, despite the burgeoning literature on the comparative advantage in the developing LDCs, no previous studies have been found that included bicycles in their research. Interestingly, most of the studies on the bicycle industry focused on the benefits and usage of bicycles and policy measures to promote more use of bicycles in the local territory, even with imports, when adequate local production is unavailable. The following paragraphs enumerate some of the main findings illustrated in those studies.

In urban planning, politics, academia, and the media, bicycles have received increased attention. The expansion of the bicycle industry is primarily attributed to three factors: accumulated knowledge, a supportive environment, and globalization of production (Brookfield et al., 2008). Regarding accumulated knowledge and a supportive environment, bicycles are widely recognized as a realistic solution to combat health-related problems arising from the sedentary lifestyle and mitigate adverse climatic problems in short-distance travel (Chen et al., 2022). As a result, younger generations in the city areas, especially those in advanced economies, now prefer stylish and personalized bicycles to go to work or school (Hoor, 2022). Regarding globalization of production, studies suggest bicycle producers guarantee the availability of top-notch local raw materials in the production of bicycles for the local markets and also meet standards set by foreign buyers to satisfy them in the case of exports (Habib,

2020). In this regard, lean production and smart manufacturing may be combined to increase the industry's added value (Li, 2019).

Additionally, several SDGs, especially those about trade and investment, small and medium-sized enterprises (SMEs), and economic growth, depend on transportation to be successful (Rahman & Farzaneh, 2022). In this regard, using bicycles is an innovative, cost-effective, and environment-friendly solution, which is also gaining momentum in developing LDCs (Xames et al., 2022). The e-commerce boom in Bangladesh is a crucial factor fueling the rising market demand for bicycles in Bangladesh, where bicycles are predominantly used for individual transportation requirements (Xames et al., 2023). Moreover, cycling has been highlighted as an eco-friendly mode of transportation that can reduce carbon dioxide (CO₂) emissions in a nation with a high population density like Bangladesh (Roy et al., 2019). Adopting the North American strategy for the bicycle industry as an LDC, Bangladesh can benefit significantly in economic and social development. As a result, the government of Bangladesh has recently taken the necessary steps to support cycle manufacturers by providing them with subsidies and creating separate cycle lanes for the general public to encourage them to use cycles in their daily lives (Pitz & Ashraf, 2018).

Furthermore, some studies on bicycles suggested integration in the circular economy and Industry 4.0 for optimal production, the differences in environmental effects in bicycle production between developed and least developed countries, carbon emission, and ecological impacts of bike-sharing services, bicycle logistic ecosystem, and environmental and social sustainability in bicycle production. While exploring these issues, these studies used different methodologies, including qualitative research, a life cycle and environmental impact assessment approach, sensitivity analysis, hypothesis testing, literature review, and model formulation approach (Table C in the appendix).

3. Research Gap

The literature mentioned above summarizes that exploring the export readiness of a given industry through assessing comparative advantage is one of the early steps in the government's effort toward export diversification. The LDCs and small economies are interested in export diversification to secure their foreign earnings and sustain economic growth (Lee & Zhang, 2022). Therefore, these economies must evaluate the export readiness of different new and non-traditional items that can be included in the diversified basket of the country's exports. However, no previous studies have been evident that explored the export readiness of the Bangladeshi bicycle industry or even explored the export competitiveness, comparative advantage, challenges, and way-out in exporting bicycles from Bangladesh. Therefore, new research is worthwhile to address this gap in the literature and provide some policy recommendations to support the country's need for export diversification.

4. Research Methodology

4.1 Research Approach

This study follows a sequential mixed-method approach. Sequential mixed methods procedures are research approaches where the investigator aims to enhance or deepen the insights gained from one method by integrating another method (Creswell & Creswell, 2017). The intent of this two-phase, sequential mixed methods study is to identify Bangladesh's comparative advantage in bicycle exports with quantitative analysis, the industry's current challenges in the export sector, and possible areas of improvement to enhance Bangladeshi bicycles' readiness in the global market with qualitative analysis.

Moreover, this study is descriptive and explores the status of the Bangladeshi bicycle industry as a potential item in the country's diversified export basket. Descriptive studies unveil the critical aspects of social issues using different charts, graphs, and tables in a logical sequence, which further justifies the use of descriptive research in this project (Huda & Islam, 2020).

4.2 Data Collection Methods

This research collected the required export data of Bangladesh and other relevant countries from 2012 to 2023 from the Trade Map developed by the International Trade Centre to analyze the study's first objective, identifying Bangladesh's comparative advantage in bicycle exports. Trade Map is presented as a valuable tool for analyzing trade flows and measuring trade potential between countries (Bothma & Cant, 2010). However, before selecting Trade Map, the researcher also explored the export data available from the national sources, i.e., the Export Promotion Bureau (EPB) and the Ministry of Trade. However, those sources are constrained by the comparability of the data with other trading nations. While Bangladeshi agencies and authorities record and publish trade data based on the fiscal year, most other trading nations publish it on the calendar year. Therefore, to ensure the reliability and validity of the data, the researcher required a data source that presents export data of different commodities of different trading partners on the same time scale.

On the contrary, interviews with the industry participants are used to collect data on major challenges and possible solutions to the export of bicycle products from Bangladesh, which are the other two objectives of the study. Face-to-face interviews help when researchers cannot observe participants directly, and they allow participants to share experiences (Creswell & Creswell, 2017). The interviews were designed with some open-ended questions and first sent to the potential companies to give them an idea about the interview and request an appointment with the potential participants. While the formal request was sent to eight major bicycle-exporting companies in Bangladesh through emails and follow-up phone calls, only three companies agreed to conduct interviews on their premises. However, none of these companies provided their consent to disclose their identity. Two participants from each company were selected based on their positions and authorities in export activities and interviewed separately.

Table 1. *Respondents' details*

Respondent Id	Position
1	Director (Production) of Company 1
2	Export manager of Company 1
3	General Manager (GM) of Company 2
4	Supply Chain Executive of Company 2
5	Export-Import Executive of Company 3
6	Factory Manager of Company 3

Source: Author's creation

The interviews lasted, on average, 40-45 minutes each. With the interviewees' consent, each interview was recorded on digital devices and transcribed later.

4.3 Data Analysis Techniques

Several techniques have been adopted to analyze the different objectives of this research project. This study used the Revealed Comparative Advantage (RCA) index proposed by Balassa (1965) to determine the comparative advantage of the Bangladeshi bicycle industry in the study period of 2012-2023. The RCA index is used to quantify the export performance by dividing the share of a specific country in the total exports of a product by the share of that country in the total exports of the world in all products (Islam & Huda, 2020). Besides, calculating the RCA index over time is significant in finding changes in the competitive position of a product (Abbas & Waheed, 2017). The RCA index adapted for this research project is presented as follows,

$$RCA = \frac{\frac{X_{ij}}{X_{wj}}}{\frac{X_i}{X_w}} \quad (1)$$

Where,

X_{ij} = Export of j th industry by i th country

X_{wj} = World export of the j th industry

X_i = Total export of the i th country

X_w = Total export of the world

According to Balassa (1965), an RCA value of more than 1 indicates a country's comparative advantage on the selected products, and an RCA value of less than 1 indicates the country's comparative disadvantage on that product.

Then, this research project used a thematic technique suggested by Braun and Clarke (2006) to develop themes, intersect, and report data collected through the study's interviews. This process considers a systematic thematic analysis to identify the major challenges and some areas of improvement of bicycle exports from Bangladesh. In this analysis part, the outcome or theme generated through the interviews is also cross-matched with the findings of the previous studies. Some of this thematic analysis's major phases involve data familiarization, first level coding, primary and sub-theme development, and finally, preparing outcomes. This process also includes a detailed transcription of each interview, initially recorded on digital devices. Such transcriptions result in a text of more than 15 pages, which are then reduced to a marginal level to fit with the scope of the research. Besides, the four criteria of dependability, credibility, transferability, and conformability suggested by Miles et al. (2014) are considered during the thematic analysis to confirm the trustworthiness and rigor of the qualitative approach.

5. Analysis and Discussions

5.1 Revealed Comparative Advantage of Bangladeshi Bicycle Industry

This study adopts the RCA index proposed by Balassa (1965) to measure the comparative advantage of Bangladeshi bicycle exports. As the model suggests, it is calculated by dividing a country's export share of a certain good by its overall export share. If the RCA index is more than 1, a country has a comparative advantage in that product. In contrast, the RCA index, with a value of less than 1, indicates a comparative disadvantage of the country in the specified product or industry. Besides, this study calculates the RCA index for Bangladeshi bicycles for 2012-2023, twelve years, to find the changes in the competitive position of the Bicycle industry. Table 4.1 and Figure 4.1 show Bangladeshi bicycle exports' RCA value from 2012 to 2023. Bangladesh had a comparative advantage in its bicycle exports throughout the study period, though the position fluctuated during the study period. The RCA index shows that the comparative advantage peaked (at 5.69) in 2022, and the second highest peak was in 2014 (5.45), followed by a sharp decline and a gradual increase until 2023, when it reached 4.59.

Table 2. *RCA index of Export of Bicycle by Bangladesh from 2012 to 2023*

Years	RCA Index	Years	RCA Index
2012	4.71	2018	3.74
2013	5.12	2019	4.15
2014	5.45	2020	4.02
2015	4.41	2021	5.08
2016	3.85	2022	5.69
2017	3.85	2023	4.59

Source: Authors' calculation based on Trade Map Data, 2024

The figure and table also reveal that the comparative advantage position of Bangladeshi bicycles was not negatively affected during COVID-19. While international exports were halted for a while, and there was a decline in the exports of different products in the international market, the comparative advantage

of Bangladeshi bicycles was stable. While the RCA index reached the bottom in 2018 (at 3.74), it gradually increased over the years, even during the global pandemic. Such a stable performance in the comparative advantage measures qualifies the bicycle industry to be included in the diversified export basket of Bangladesh with full attention and care.

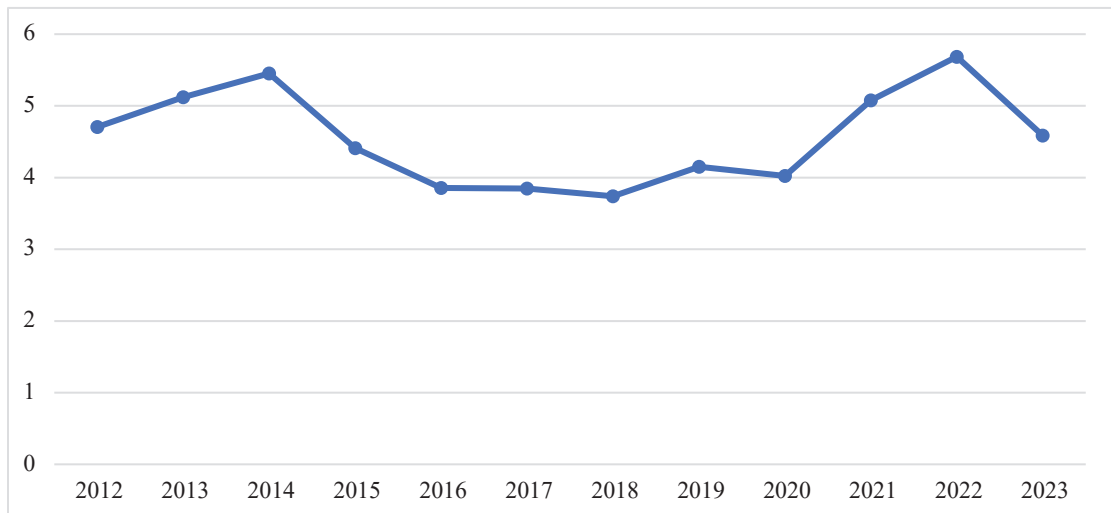


Figure 1. RCA index of Bangladeshi bicycle exports from 2012 to 2023

Source: Authors' calculation based on Trade Map Data, 2024

The traditional dominance of the RMG industry causes a marginal portion of bicycle exports in the country's total export earnings. However, previous studies also support that the export earnings of Bangladeshi bicycles have been increasing over the years, making bicycles one of Bangladesh's top ten export items. Besides, Bangladesh is currently the eighth-largest exporter of bicycles worldwide and the third-largest supplier of bicycles to the European Union, the largest bicycle market in the world (Roy et al., 2019; Xames et al., 2023). Throughout the study, bicycle exports increased gradually from 2012 to 2023 and reached almost 2.5 times the initial period. Even Bicycle exports did not decrease during the COVID-19 crisis; in 2020, they rose by 5.57% from the previous year. Table 2 and Figure 2 show the value of Bangladeshi bicycle exports and their contribution to the country's total exports and the world's bicycle exports from 2012 to 2023.

Table 3. Export of Bicycles by Bangladesh from 2012 to 2023 (Value in US Dollars thousand)

Years	Bangladesh's Bicycle Export	Bangladesh's Total Export	World Bicycle Export	Contribution to Total Export	Contribution to World Bicycle Export
2012	65,963	28,257,739	9,126,129	0.23%	0.72%
2013	79,846	31,714,387	9,270,711	0.25%	0.86%
2014	95,331	34,470,831	9,547,655	0.28%	1.00%
2015	93,720	36,410,042	9,579,905	0.26%	0.98%
2016	83,487	38,617,563	8,932,613	0.22%	0.93%
2017	80,247	40,939,216	8,946,574	0.20%	0.90%
2018	81,145	45,594,199	9,199,922	0.18%	0.88%
2019	92,829	47,704,825	8,795,229	0.19%	1.06%
2020	97,829	42,920,109	9,910,421	0.23%	0.99%
2021	159,235	54,907,762	12,647,971	0.29%	1.26%
2022	193,274	68,317,557	12,300,363	0.28%	1.57%
2023	108,043	57,848,282	9,632,853	0.19%	1.12%

Source: Trade Map Data, 2024

The figure shows that while bicycle exports make a minimal contribution to the country's total exports, they make a greater contribution to the world's bicycle exports. It depicts that the industry has the potential to contribute more to the country's export basket.



Figure 2. *Contribution of Bangladesh's Bicycle Export to the Country's Total Export and World Bicycle Export from 2012 to 2023*

Source: Author's creation based on Trade Map Data, 2024

Moreover, while Bangladesh stands at the end in comparing global bicycle exports, it stands second after Cambodia, with the highest export growth percentage over the period. Therefore, with the significantly highest growth percentage after Cambodia and residing in Asia, the country possesses a high potential to be a leader in global bicycle exports, even though currently Bangladesh accounts for a very nominal share in global bicycle exports.

5.2 Current Challenges in the Export of Bangladeshi Bicycle Products

This study further explores the significant challenges Bangladeshi bicycle exporters are currently facing. The Braun and Clarke (2006) thematic analysis is used to develop the theme for the challenges of Bangladeshi bicycle exports. Figure 4.4 shows the four main themes of the bicycle export challenges around which the inductive coding is organized. These four themes are firm-specific incompetence, institutional constraints, environmental constraints, and legal and political constraints.

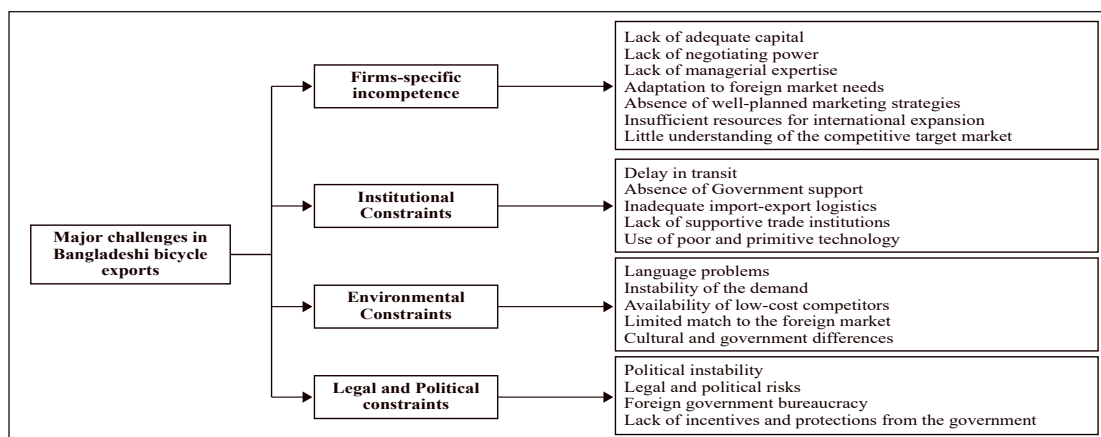


Figure 3. *Major challenges of bicycle exports from Bangladesh*

Source: Author's creation based on interviews

5.2.1 Firm-Specific Incompetence

The firm-specific incompetence divulges the current shortcomings of the firms in exporting its products to the international markets. Several coding and details are also identified through the respondents' comments to highlight different firm-specific incompetence, like inadequate capital, other resources, negotiation power, and managerial expertise for international expansion. In this regard, Respondent 3 stated that

"We have limitations not only in good bargaining but also other capabilities like adequate physical resources, informational resources, and financial resources that often obstruct us from succeeding in the international market."

Other firm-specific incompetence includes inappropriate marketing strategies, inability to adapt to foreign market needs, and little understanding of the competitive target market. To support these challenges, Respondent 2 argued that

"The needs of Bangladeshi customers and those of international ones, especially the European customers, are not the same. We often have limited orientation to adapt to those needs, which makes our journey difficult in the international market". Another participant, Respondent 5, echoed that *"Selling products to international customers requires tailoring products and its features accustomed to the need of the international markets. It requires a different marketing strategy than the traditional one in the local market. It often struggles to make this necessary shift".*

5.2.2 Institutional Constraints

Institutional constraints include elements of the surrounding institutional framework of the business, dramatically affecting the operations, efficiency, and effectiveness of the concerned businesses. In the bicycle exports of Bangladesh, local firms are currently challenged with institutional constraints, namely, delays in transit, absence of government support, inadequate import-export logistics, lack of supportive trade institutions, and use of poor and primitive technology. Respondents frequently mentioned these challenges during interviews, and the following extracts are concluded. Respondent 1 focused on the usual delay in transit by stating,

"Delay in shipments, due to cross-border trade formalities, required documentation and arrangement of necessary transportation often put us in a competitive disadvantage compared to other exporting countries in the European market".

Also, the lack of government support and supportive trade institutions are two major institutional constraints on Bangladeshi bicycle exports. Respondent 4 mentioned,

"Policy focus and related support to the expansion of bicycle export from Bangladesh is so far overlooked because of government priority to other industries, whereas bicycle exports are one of the potential exports of this country, which have global demand and required initial government support."

Besides, a separate wing for research and development is required, where customers' tastes and preferences worldwide will be identified, and we can customize our products according to those preferences.

5.2.3 Environmental Constraints

Environmental constraints include the issues that arise from the business environment, usually the greater macro environment of both home and host countries. Several such environmental constraints have been highlighted in the extracts of the interview participants, i.e., language problems, cultural and governmental differences, instability of the demand, availability of low-cost competitors, and limited match to the foreign market. One of the fundamental problems that participants echoed in their comments is the cultural differences, including language, consumer taste and preferences, and government philosophies. Respondent 3 articulated,

“The cultural differences, especially language, are a barrier when negotiating or promoting our products through marketing messages. We are overcoming this issue by appointing translators or experts in the negotiation and campaign”.

All participants mentioned that competition with low-cost producers worldwide is the most significant problem of exporting bicycles to foreign markets. In this regard, Respondent 5 highlighted that

“the most significant problem we face is the competition with other low-cost producers worldwide. Vietnam, Cambodia, China, and India are the most frequent exporting countries of bicycles from Asia and have almost similar technologies and labor force.”

5.2.4 Legal and Political Constraints

The legal and political constraints are the issues relating to the law and regulatory framework of the country and, to some extent, to those of the host countries. The major legal and political constraints identified in the interviews are political instability, legal and political risks, foreign government bureaucracy, and lack of incentives and protections from the government. All the participants mentioned their concern over the political instability of Bangladesh, especially in the year of the national election and the years before and after the election year. Respondent 1 stated,

“During the year of election and after that, we see lots of political clashes and instabilities, which creates the business risks and risks of sending products overseas on time.” Respondent 5 also said, *“Sometimes political instability and incidents make severe losses, or we lose customers because international buyers doubt our commitment, though it is not in our hands.”*

Respondents also expressed disappointment with existing government incentives and required protections, which they expect should be more trade-facilitating. Respondent 3 stated,

“Our existing export policies are friendlier to other manufacturing products than bicycles. We have limited support from the government and protection of our business secrets from government institutions.”

The above extraction is the major theme and relevant sub-theme of bicycle exporters' problems and challenges in their exports. Participants frequently utter these themes, organized in these four groups, in their comments. Some of the challenges can overlap in two themes but significantly affect the current export of Bangladeshi exports.

5.3 Areas of Improvement to Enhance the Readiness of Bangladeshi Bicycles Export

This study also tried to determine some areas of improvement to increase the exports of Bangladeshi bicycles. In this context, this research considers the experience of the exporters. The Braun and Clarke (2006) thematic analysis is also considered to find the theme for the areas of improvement for more exports of Bangladeshi bicycles. Figure 4 depicts two central themes of improvement areas: the immediate requirement for increasing bicycle exports from Bangladesh. It is expected that if necessary, initiatives can be taken in the identified areas, Bangladesh will receive more export earnings through bicycles in its export diversification attempt. The two central themes identified as areas of improvement for Bangladeshi bicycle exports are firm- and country-level improvements.

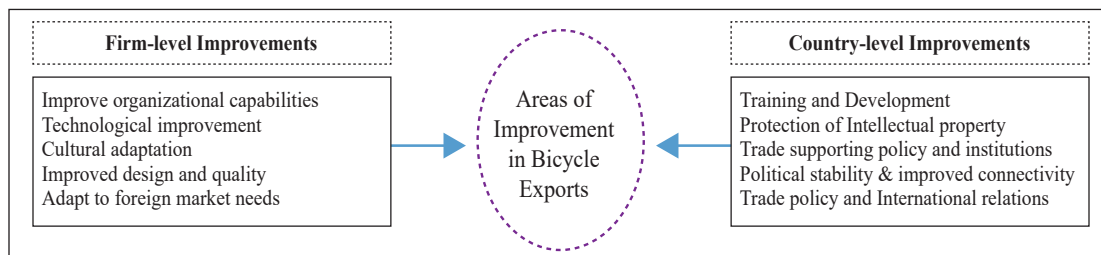


Figure 4. Areas of improvement for more bicycle exports from Bangladesh

Source: Author's creation based on interviews

5.3.1 Firm-level Improvements

The firm-level improvements are the areas of improvement at the firm level that the bicycle exporting companies should initiate. It includes but is not limited to improving organizational capabilities, technological improvement, cultural adaptation, improved design and quality, and adapting to foreign market needs. Participants in the interviews echoed that they have a major role in improving their capabilities, strategies, philosophies, products, and processes to serve customers in foreign markets and succeed in global competition. In this regard, Respondent 5 states that

“Bicycle exporters need to change their orientation from a local market focus to the international market, especially the strategies we fix and how we customize our products to the needs of international buyers.”

Participants also mentioned cultural adaptation, improving design and quality, and adapting to foreign market needs in their recommendations. Respondent 1 contended, *“The standard of European markets is comparatively higher than ours. We need improved built quality, and exporters should focus on improving those to ensure long-term success in international markets.”* Participants in the interviews further recommended increasing firm-level efforts toward adapting to foreign market needs. Respondent 4 argued that

“Bicycle exporters often misunderstand the market competition in foreign locations and lose their position to other potential suppliers around Asia. Therefore, exporters should immediately work on their efforts and adapt themselves to the needs of foreign markets.”

5.3.2 Country-level Improvements

The country-level improvements are the areas of development initiated at the country level by either the home country or the host country. The significant country-level improvements identified in the interviews are training and development, intellectual property protection, trade-supporting policy and institutions, political stability and improved connectivity, and trade policy and international relations. Respondent 4 stated,

“Government can help exporters by activating trade supporting policies and institutions which will work for export promotion of Bangladeshi bicycles.” In this regard, Respondent 5 further supported that, the *“Government also can play a vital role through its trade policies and international relations in creating newer markets and promoting Bangladeshi bicycles in other potential destinations.”*

Participants also emphasized protecting intellectual property, ensuring political stability, and improving connectivity. Respondent 1 said,

“Bangladesh offers limited protection to business secrets, product design, and innovation. Sometimes, foreign technology cannot be licensed to local companies, or the innovations of local producers are not protected in the existing legal framework, which ultimately hinders the expansion of this industry.”

The protection of intellectual property with appropriate measures can solve this situation. Therefore, the above abstraction is the central theme and relevant sub-theme of areas of improvement that bicycle exporters immediately require to expand their exports more in their exports. Participants emphasized firm- and country-level initiatives to improve bicycle exports from Bangladesh. Therefore, two central themes have been developed in the study: firm- and country-level improvement.

6. Conclusion and Implications

Bangladesh exports more than \$40 billion every year (Bangladesh Exports 1960-2023, n.d.). The export basket includes clothes, hosiery, jute, home textiles, footwear, etc. Exporting bicycles can be a way of diversifying the export basket of Bangladesh, as we stand 13th in exporting bicycles. Also, Bangladesh

can manufacture this product cost-effectively if the sector is emphasized more. The research background reveals the Comparative Advantage analysis regarding the readiness of bicycles, which has not been studied yet in Bangladesh. The research found the exporting challenges regarding bicycles and implications for future areas. The paper has a mixed methodology of quantitative and qualitative data analysis. The RCA index has shown an upward rise in achieving the comparative advantage. Throughout the study period, the RCA index was above 3 and increased to 5, which reveals a potential comparative advantage in exporting this product. This product has demand in USA, Canada, Europe, and other countries. Bangladesh is taking part in exporting to those countries. A qualitative research approach has been used to find the major challenges regarding this product. The major implications can be ensured through R&D. The challenges regarding exporting bicycles are many, but the potential of the readiness of this product is higher because of the rising demand. So, this sector can flourish if it can get under care and necessary attention.

This study creates several theoretical and practical implications. First, in terms of theory, the understanding developed through this study will help build the country's export diversification strategies through bicycles. Second, this study will help find a framework to explore the export potentiality of other industries such as pharmaceuticals and API, medical equipment, leather and footwear, light engineering, plastics, automobiles, motorcycles, parts, etc. Besides, other developing LDCs and small economies can further explore the export readiness of their different export items. In terms of practical contributions, this study points out a holistic overview of the export readiness of the Bangladeshi bicycle industry, which contributes to the trade policy reforms of the country. As the country needs to diversify its export basket, the findings of this study will help policymakers in articulating an export diversification strategy centered on the bicycle industry. Fourth, this study explores the current challenges and possible areas of improvement in bicycle exports from Bangladesh. These findings will help policymakers as well as producers and exporters of bicycles to initiate strategies that further develop the export readiness of the country. Finally, this study offers important managerial implications. As the study explores the comparative advantage of Bangladeshi bicycle exports and identifies the strengths, challenges, and possible areas of improvement, existing and potential procurers will get significant insights from the findings of this study.

There are a few limitations to the scope of this study. The research is only about the bicycle and its comparative advantage analysis regarding the diversification of the export basket of Bangladesh. The other global factor, foreign currency volatility, has not been studied here. The only RCA index has been used to find the comparative advantage of the readiness of bicycles, where the index can only tell whether a country has a comparative advantage or disadvantage in selected products rather than explaining the reasons behind that. Therefore, future research may find the comparative advantage of other products that can diversify the export basket of Bangladesh. Future research can also be conducted to define how the export market of bicycles is expanding in comparison with other countries.

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Appendices

Table A

Sl No	Study	Years Covered	Country in Focus	Scope/ Industry	Focus and Contribution
1	Made, Hamzah, Adhawati, Cangara, Wardani and Mas'ud. (2025)	2017-2021	Indonesia	Lobster	The study highlights the necessity of well-balanced regulations that support the lobster export industry's economic expansion and environmental sustainability.
2	Lozano, Andrade, Sanipatin and Mera. (2024)	2018-2022	Ecuador	Chocolate	This study analyzes how the Ecuador-EU trade deal has affected Ecuadorian chocolate exports. It identifies opportunities and problems in the European market and recommends public policy to improve competitiveness.
3	Özdemir. (2024)	2013-2021	Turkey	12 industries.	The study offers insightful information about the competitive advantages of Turkey's service industry, which serves as a basis for well-informed policy choices and strategic planning in global commerce.
4	Adigwe. (2022)	2009-2018	27 EU countries	Consumer goods, industrialized or mechanized goods, capital goods, service delivery, and agricultural products.	The findings show that the European Union's trade performance is strong, especially in industrialized and mechanized goods, which greatly exceed its exports of agricultural items.
5	Mishra. (2022)	1995-2018	Afghanistan, India, Bhutan, Bangladesh, Nepal, Pakistan, Maldives, Sri Lanka.	Merchandise commodities are classified using the Harmonized System (HS) Code.	The study examines how trade patterns have changed in South Asian nations, pointing out notable transitions from exporting primary goods to manufactured goods after liberalization. The study offers a framework that may be used for different commodities or geographical areas. The results pinpoint particular goods where each nation has demonstrated a comparative advantage.
6	Jain. (2020)	2000-2018	India	13 Products	The paper discusses the long-term effects of India's decision not to join RCEP, arguing that India would lose out on expanding its market access and joining global value chains.
7	Balogh and Ménesi. (2019)	2000-2015	Gulf Cooperation Council member states	Oil trade	The study reveals that only four of the six Gulf Cooperation Council (GCC) member states—Kuwait, Saudi Arabia, the United Arab Emirates, and Qatar—remained competitive in at least one oil product during the study period. This contradicts the belief that all GCC countries are equally competitive in oil trade.
8	Abbas. (2017)	2012-2015	Pakistan	11 major manufacturing industries.	The research presents evidence that Pakistan has a comparative advantage only in leather products, toys, and sports goods. Other sectors, like pharmaceuticals and plastics, face competitive disadvantages, and overall international competitiveness is declining.
9	Affendy, Lau, and Thien. (2013)	1991, 1995, 2000-2010	Malaysia and Indonesia	Palm oil	According to the analysis of 20 palm oil products, Malaysia generally demonstrates greater competitiveness than Indonesia in most downstream palm oil-related industries. The findings suggest that both countries should focus on developing higher-value downstream industrial products.
10	Wadud. (2009)	1981-2005	15 developed economies, 4 Asian NIEs, and 8 developing economies	Textile and clothing	The paper highlights the trend toward developing economies by offering a thorough empirical analysis of how various nations have performed over time in these areas. It identifies and examines particular national attributes that affect comparative advantage, such as industry sizes, wage rates, and capital/labor ratios.

Tabel B

SI No	Study	Years Covered	Country in Focus	Scope/Industry	Focus and Contribution
1	Hasan and Das. (2024)	2011-2020	Bangladesh	RMG	The study highlights certain product categories within the Ready-Made Garment (RMG) industry that give Bangladesh a comparative advantage. The insights from this research can help policymakers and industry leaders develop strategies to improve the export performance of the RMG sector.
2	Shams, Tamanna and Talukdar. (2024)	2001-2022	Bangladesh	11 non-RMG sector	The study examines the competitiveness of non-RMG sectors such as leather, fish, shrimp, footwear, and pharmaceuticals. The result shows that jute products remain competitive, while only footwear and bicycles show growth. It also identifies ceramics, shipbuilding, and pharmaceuticals as weaker sectors.
3	Islam. (2021)	2010-2019	Bangladesh	Service industry	This study examines Bangladesh's trade performance, contributions, and comparative advantages across various service sectors. The findings indicate that Bangladesh heavily relies on manufacturing rather than services, and it has notable comparative advantages only in construction and manufacturing services among the eleven services analyzed.
4	Islam and Huda. (2020)	2009-2018	Bangladesh	Plastic, leather, footwear, ceramic, and ship-built	This study addresses the existing gap in the literature concerning the comparative advantages of selected Bangladeshi export items, offering valuable insights for the country's trade policymakers. Additionally, the research highlights that Bangladesh has a comparative advantage in leather goods and footwear among the five evaluated products.
5	Adnan, Khan, and Islam. (2019)	2001-2017	Bangladesh and China	Clothing and apparel items	This study aims to analyze the competitive dynamics between Bangladesh and China to help develop export promotion policies that can enhance the competitiveness of the Ready-Made Garments (RMG) sector. The findings will provide valuable insights for policymakers and researchers.
6	Ali, Kabir, and Uddin. (2017)	2012-2015	Bangladesh's comparison with India, Sri Lanka, Vietnam, Pakistan, China, Cambodia, and Turkey	Top ten RMG exporting products	The paper conducts a comprehensive analysis of the Revealed Comparative Advantage (RCA) for Bangladesh's ready-made garment (RMG) exports, comparing it with major competitors. This analysis sheds light on Bangladesh's competitiveness in the global RMG market both before and after the suspension of the US Generalized System of Preferences (GSP).
7	Hossain, Dechun, Zhang and Van. (2017)	2000-2015	Bangladesh and China	14 main products of the textile and apparel industry	This paper analyzes the strengths and competitiveness of the Textile and Apparel (T&A) industry in Bangladesh and China. It highlights the important role this industry plays in creating jobs and boosting the economy in both countries. The paper also discusses how the T&A sector helps reduce poverty and empower women, showing its significant social and economic impact.
8	Islam and Siddique. (2014)	2004-2013	Bangladesh, Pakistan, China, India	Leather	This paper highlights the potential of the Bangladeshi leather industry in the global market. It recommends that entrepreneurs and policymakers focus on increasing the production and export of raw hides and skins to boost export revenues.
9	Hossain, Huang, and Tran. (2013)	2000-2009	Bangladesh and China	Textile and apparel industry	The paper analyzes the competitiveness of the textile and apparel (T&A) industry in Bangladesh versus China using the Balassa Revealed Comparative Advantage (RCA) Index. It recommends improving competitiveness in Bangladesh by reducing lead times, developing brands, and adhering to international labor standards.

10	Kathuria. (2013)	1995-2003	India and Bangladesh	Textile and clothing sector	The study shows that India and Bangladesh both have comparative advantages in the textile and apparel sector. During the study period, the number of products for which both India and Bangladesh enjoyed the comparative advantage increased. For India, it increased from 23 to 25 products, and for Bangladesh, it increased from 21 to 29 products.
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Table C

Sl No	Study	Country in Focus	Scope/ Industry	Methodology	Focus and Contribution
1	Chen, Zeng, Deveci and Coffman. (2024)	Washington D.C.	Bike sharing service	Life Cycle Analysis (LCA)	This research compares pile-based and pile-less bike-sharing systems, assessing their carbon emissions throughout their life cycle. It recommends that urban planners focus on proactive maintenance and fleet management to improve environmental benefits.
2	Shen,Huang, Weng, Lai and Huang. (2023)	Taiwan	Bike	Model formulation and sensitivity analysis	The paper discusses the integration of Industry 4.0 (I4.0) technologies with Circular Economy (CE) principles to improve sustainability in the bike industry. It presents a mathematical model that helps bike manufacturers determine optimal production rates, design times, and sales promotion periods.
3	Fratocchi and Mayer. (2023)	Asutralia	Bicycle	Qualitative research approach, case study	The paper stresses the importance of environmental and social sustainability in reshoring decisions. While these factors may not always be the primary motivations, they significantly influence decisions and support the company's sustainability strategy. The research also outlines the key drivers and barriers related to sustainability that affect near-shoring choices.
4	Xames, Shefa, and Sarwar. (2023)	Bangladesh	Bicycle	SWOT Analysis	This paper examines the Bangladeshi bicycle industry as a driver of post-pandemic green recovery. It identifies strengths to seize opportunities, while effective government planning can address weaknesses and improve tax policies to mitigate threats. Overall, investment in this industry can positively impact Bangladesh's economy and environment.
5	Fontes and Andrade. (2022)	Brazil & Germany	Bicycle logistics service	Qualitative research approach	This paper compares Berlin and São Paulo to show how urban environments influence cycle logistics effectiveness. It also presents a cycle logistics ecosystem framework that outlines stakeholder interactions and key factors for successful implementation.
6	Akhyar, Nasution, Mulyagusdin	ASEAN	Cast-Bike	Literature review	This paper analyzes the economic impact of cast bicycle production at local, regional, and national levels. It calculates the Break-Even Point (BEP), examines labor productivity trends in the ASEAN region, and highlights the environmental benefits of using recycled aluminum.
7	Gong, You, Wang and Cheng. (2020)	China	Manufacturing industry	Systematic analysis and hypothesis testing.	This paper presents key ideas about environmental regulation, trade advantages, and how the manufacturing industry is becoming greener. It offers clear policy suggestions for the Chinese government, including strict environmental regulations within reasonable limits, improving trade structures, and encouraging better collaboration between environmental rules and trade practices.
8	Roy, Miah, and Zafar. (2019)	Bangladesh	Bicycle	Life Cycle Assessment (LCA) and Environmental Impact Assessment.	The paper presents a thorough evaluation of the environmental impacts associated with bicycle production in Bangladesh and conducts a comparative analysis with those in Europe. The findings indicate that the environmental impact of bicycle production in Bangladesh is lower in several key categories, such as climate change and human toxicity.
9	Luo, Kou, Zhao and Cai. (2019)	U.S.	Bike sharing service	Life Cycle Assessment (LCA)	The paper compares the environmental impacts of station-based and dockless bike-sharing systems (BSS) in the U.S. It examines their effects across the manufacturing, operation, and end-of-life phases, providing insights for city planners and operators to enhance sustainability.

