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Investigating the determinants of competitiveness of the footwear industry of Bangladesh: An ARDL approach

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ABSTRACT

This empirical study aims to investigate the factors determining the competitiveness and comparative advantage of the footwear industry in Bangladesh. A two-stage methodology was employed, including a novel dataset from the year 2001 to 2022. In the first stage, this study employs Revealed Comparative Advantage (RCA), Revealed Symmetrical Comparative Advantage (RSCA), Relative Trade Advantage Index (RTAI), Revealed Import Advantage Index (RIAI), Net Export Index (NEI), and Export Market Share (EMS) to identify the comparative and competitive advantages of the footwear sector in Bangladesh. In the second stage, this study applies the Autoregressive Distributed Lag (ARDL) model to evaluate the determinants of competitiveness spanning from 2001 to 2022. The findings reveal a sustained comparative advantage of the footwear sector in Bangladesh. The ARDL examination discloses that economic growth and trade openness have a significant positive association with footwear competitiveness, both in the long and short term. Human capital, trade freedom, and institutional quality also have a significant association with footwear competitiveness. These findings reveal that the footwear sector in Bangladesh has the potential to significantly contribute to the overall export growth of the country. Policymakers, industry stakeholders, investors, and trade organizations should take sustainable measures to utilize this competitiveness and focus on taking facilitative measures to diversify the current export basket of Bangladesh.

Contribution/ Originality: This empirical study has two major contributions: first, it has employed multiple measures of competitiveness, improving the robustness of the research findings; second, it provides new perspectives on the country-specific determinants of competitiveness in Bangladesh's footwear sector, which have practical implications for policymakers.

1. BACKGROUND OF THE STUDY

This research aims to assess the competitiveness and comparative advantage of Bangladesh's footwear industry. Existing studies have pointed out that the footwear industry has enormous potential to grow into a major source of export earnings for Bangladesh. The aim of this study is twofold: first, to determine the export competitiveness of the footwear sector, and second, to identify the factors that contribute to the sustainable competitiveness of the footwear sector in Bangladesh.

Since the 1980s onward Bangladesh has observed a significant relationship between international trade and economic growth (Helpman, 2011; Khan, Hossain, Islam, Rahman, & Dey, 2023; Sarker, 2018). Bangladesh, a small

economy with a high population density and limited resources, provides a noteworthy illustration of how trade can open up markets, stimulate economic growth, generate job prospects, and reduce poverty (Hossain, Ahmed, & Sharif, 2018). A turning point in Bangladesh's international trade engagement took place in the 1990s (Hossain et al., 2018). Between 2000 and 2022, the contribution of the Ready-Made-Garments (hereafter, RMG) sector to the Gross Domestic Product (GDP) increased significantly, almost doubling from 11% to 22% (Ahmed, Islam, & Al-Amin, 2013; OECD, 2023). Remarkably, RMG exports comprised 84.5 percent of Bangladesh's overall export earnings in FY2022–2023, amounting to approximately $47 billion supporting 3.5–4 million jobs (Bangladesh Bank, 2024; Hossian, Kabir, & Latifee, 2019; Raihan, 2020). However, the RMG industry faces difficulties like labor disputes, technological breakthroughs that result in job losses, fierce worldwide rivalry, and pressure from foreign purchasers for increased compliance. These difficulties are further intensified by Bangladesh's graduation from a Least Developed Country (LDC) to a middle-income country. This poses a risk of losing preferential treatment in major European markets (OECD, 2023; Raihan, 2020).

Experts have emphasized that Bangladesh, as a developing country, must prioritize export diversification in order to sustain its economic growth. This strategy entails transitioning the economy from manufacturing low-value goods to creating high-value ones, which fosters the growth of transferable expertise, competencies, and inter-industry linkages (Ahmed et al., 2013; Dunusinghe, 2009; Hausmann, Hwang, & Rodrik, 2007; Raihan, 2020; Sarker, 2018).

Bangladesh aims to become a developed country by 2041, and export diversification is a key component of this goal (Islam, 2023). Smart Bangladesh, an initiative that prioritizes export diversification, aims to accelerate industrialization, create over 1 crore jobs, and achieve an additional $40 billion in exports by 2030. Strategic investments through Foreign Direct Investment (FDI) are directed towards targeted sectors within the envisioned 100 economic zones (EPB, 2021). To increase exports, the export policy for 2021–2024 has placed a strong emphasis on diversifying products, identifying priority products, growing export industries, and facilitating trade and investment (EPB, 2021). Fourteen sectors were identified by the government as top priorities in the Export Policy 2024. One of the major sectors cited is the footwear (leather and non-leather) sector (EPB, 2021).

Prior research conducted in Bangladesh has largely concentrated on the comparative advantage of RMG (Hasan & Rasel, 2021; Hossain, Dechun, Zhang, & Van, 2017; Sarker, 2018). Only a handful of studies has concentrated on non-RMG sectors, such as fish and seafood (Sarker, 2018) tea (Islam, Ema, Chakrobortty, Jahan, & Hossain, 2021; Sarker, 2018); leather (Islam, 2019) and footwear (Islam, 2019); service (Islam, 2019); Jute (Sharna & Kamruzzaman, 2020) and agriculture (Sarker, 2018). Islam (2019) has studied the competitive advantage of footwear industries but to the best of our knowledge, country-specific determinants of sustainable competitive advantage have largely been ignored. This research aims to fill the gap and explore the factors that significantly influence the footwear sector's competitive advantages.

2. FOOTWEAR INDUSTRY OF BANGLADESH

Bangladesh's footwear industry has grown dramatically during the last decade, becoming a major force in the international market. Non-leather footwear exports reached USD 449 million in Fiscal Year (FY) 2021-22, a significant 30% rise over the previous fiscal year, according to export records that show this increasing tendency (EPB, 2021). During the 2017–18 fiscal year, this product's export value was $244 million. This expansion has been attributed to Bangladesh's attractiveness as a manufacturing hub due to its low labor costs and plentiful supply of raw materials, such as leather and synthetic materials (Ali, Moktadir, Shaikh, Deb, & Rashed-Ul-Islam, 2018).

The availability of animal hides and skins is greatly enhanced by the sacrificial rituals performed during Eid al-Adha, which accounts for 70% of the annual collection of animal skins. This steady supply of raw materials is beneficial to Bangladesh's leather industry. Furthermore, because the sector is cyclical, the Eid season brings a spike in footwear purchases, which supports exports and manufacturing even more. In 2022, 1 crore animals were killed on Eid al-Adha

day, and this number continues to rise year (Rashed & Musanna, 2021). The export value of footwear from 2001 to 2022 is displayed in thousands in Figure 1.

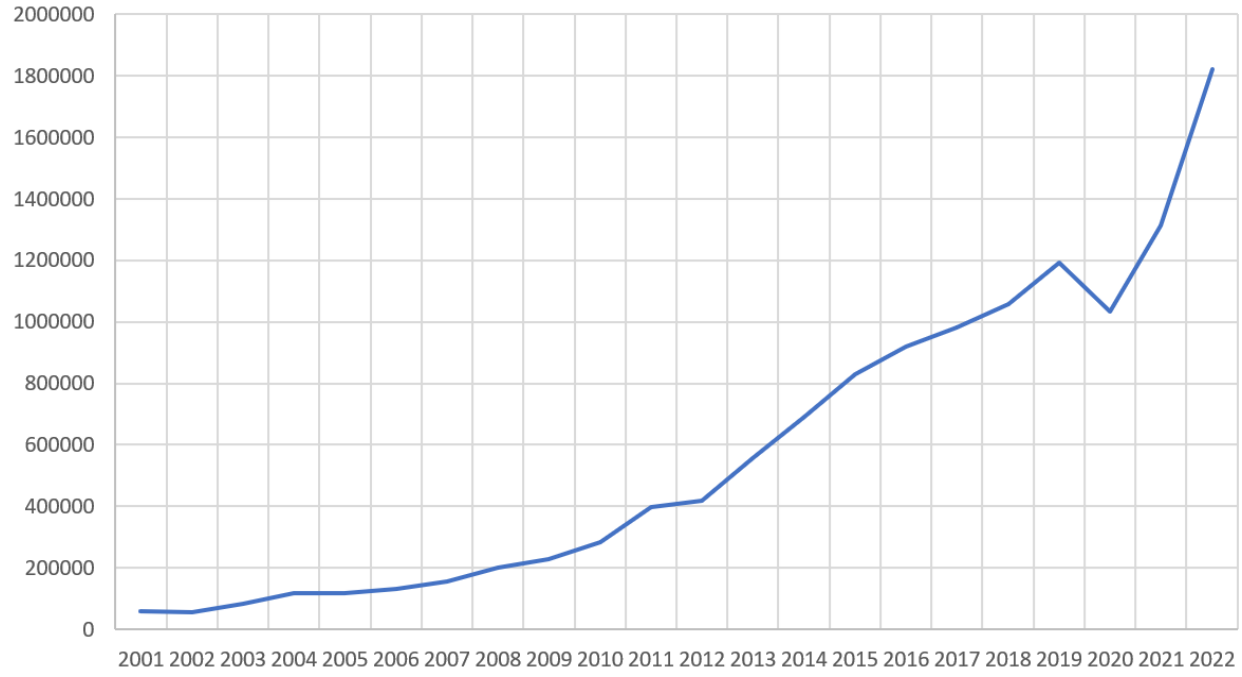

Figure 1. Export value of footwear in thousands from 2001 to 2022.

Notwithstanding these achievements, the footwear sector faces several obstacles. Export prospects might be hampered by the COVID-19 pandemic's aftermath and worldwide inflationary pressures brought on by incidents like the war between Russia and Ukraine (Rashed & Musanna, 2021)). Furthermore, obstacles including difficult-to-get bank loans, drawn-out setup processes, and poor infrastructure impede the expansion of the sector (Nurkomariyah & Sutjiatmo, 2023). Significant obstacles include the need to comply with regulations, the lack of competent workers, and environmental issues related to waste management (Rashed & Musanna, 2021).

Bangladesh, which is ranked 18th in the global footwear market, is still one of the top 10 shoe makers in the world, indicating its potential for future growth (Arvi, 2022). Although there have been swings in the country's exports, which are mostly destined for the United States (US and) European markets, they have grown rapidly. Major companies like Nike, Adidas, and Puma intend to shift their sourcing from China to South Asian nations like Bangladesh, India, and Pakistan to save prices. Due to US purchasers shifting their sourcing from China and Vietnam, Bangladesh's footwear exports to the US climbed by 64.40 percent to $451.40 million in 2022 from $274.58 million in 2021 (Haque, 2023). There are now initiatives in place to diversify export markets and lessen dependency on Chinese imports. Bangladesh is promoting itself as a desirable substitute for big-name companies looking for affordable sourcing solutions (Hossain, 2023).

The goal of initiatives like monetary incentives for footwear exports is to maintain the sector's current development trajectory. According to Hossain (2023) a 15% financial incentive is being offered by the government for the exporting of leather footwear, while a 19% incentive is being offered for the export of synthetic, textile, and other footwear. Stakeholders, however, push for more assistance to improve competitiveness and promote market access, such as simplified government services and more incentives. According to businesspeople, easy access to government institutions' services, particularly bond facilities, is necessary to boost exports (Arvi, 2022).

In summary, Bangladesh's footwear sector is significant in the worldwide market despite facing hurdles due to its extraordinary development and export potential. 80% of the sales of leather and footwear are concentrated in at most 10 nations in 2022–2023. The primary export destinations for non-leather footwear from Bangladesh are South

Korea, India, Germany, Italy, Spain, France, and the Netherlands. Although large companies like Nike and Adidas do not send orders to Bangladesh, it does get orders from names like H&M, Fila, and Kappa. Additionally, they exhorted companies in Bangladesh to implement plans aimed at enhancing market accessibility and boosting export capacity. The abundance of labor and raw resources is Bangladesh's greatest asset. Bangladesh may thus utilize this to broaden its export portfolio and discover new markets. Bangladesh is well-positioned to further establish itself as a major player in the footwear sector with sustained backing from industry and governmental stakeholders.

With the government offering strategic incentives and international brands showing a growing interest in Bangladesh, the country is well-positioned to further leverage its dominant position in the footwear sector. In the same vein, Bangladesh's export revenues have been significantly boosted by the fisheries sector, whose expertise and competitive advantage are demonstrated by its extensive global market reach. Even though the sector has been influenced by geopolitical upheavals and economic downturns, programs like the Blue Economy point to a bright future for the sustainability and expansion of the sector. Finally, Bangladesh's pharmaceutical sector is a shining example of success, having made the shift from import dependency to self-sufficiency and international competitiveness. Initiatives to improve research & development, regulatory compliance, and international alliances have strengthened the sector's resilience and potential for continued growth despite obstacles presented by market dynamics and regulatory changes.

These discussions indicate that Bangladesh's commitment to expanding its market and diversifying its exports is promising for its future economic development and stability. Supported by key players in the industry and government, Bangladesh is strategically positioned to use its strengths and overcome upcoming obstacles, establishing itself as a prominent player in the global trade landscape. The study that follows is based on a substantial body of previously published papers, as well as information from newspapers and websites. This research aims to analyze various evaluation methodologies and procedures in order to evaluate Bangladesh's comparative advantage in the global market.

3. BANGLADESH'S TRADE COMPETITIVENESS

More recently, academic research has delved deeply into Bangladesh's trade competitiveness, illuminating the complex dynamics that exist there in several different sectors. For example, Hossain et al. (2017) conducted a detailed study between 2000 and 2015 of Bangladesh's and China's competitiveness in the RMG industries. Their findings indicated that China had a larger competitive advantage in eight items whereas Bangladesh had a better comparative advantage in seven products, according to the Spearman Rank Correlation coefficient and RCA methods.

In a similar vein, Sarker (2018) investigated the export competitiveness of Bangladesh in a number of sectors between 1980 and 2013, including leather, tea, fish and seafood, ready-to-wear, jute and allied goods, and fish. The study found a competitive advantage exclusive to the ready-to-wear sector.

Continuing the investigation, Islam (2019) conducted an analysis of Bangladesh's comparative advantage in the leather and footwear industries between 2008 and 2017 employing the RCA index. The results indicate that Bangladesh has a comparative advantage within both sectors. Furthermore, Hasan and Rasel (2021) conducted a comprehensive analysis between 2007 and 2018 of China's and Bangladesh's trade competitiveness in a number of areas. Using indicators like market share, trade competitiveness index (hereafter TCI), and RCA, the research found that while there was a noticeable difference in the garment trade between the two nations, there was also convergence in the industrial trade structure between them.

Using the RCA index, Islam (2021) took a different approach while evaluating Bangladesh's trade in services competitiveness between 2010 and 2019. Their research revealed comparative advantages that were limited to the manufacturing and building services industries. Finally, Khan et al. (2023) used RSCA and ARDL approaches to

analyses the competitiveness of prawn exports from 1990 to 2019 for Bangladesh, China, India, Indonesia, Thailand, and Vietnam. Their analysis found that the competitiveness of prawn exports varied among all nation.

4. RESEARCH DESIGN

4.1. Measures of Competitiveness

The primary goal of this research is to assess the export competitiveness of Bangladesh's footwear, fish and fish products, and pharmaceutical businesses. To accomplish this goal, the study utilizes many diagnostic instruments, such as RCA, RSCA, RTAI, NEI, and EMS. The purpose of using these five metrics is to analyze different facets and dimensions to fully characterize sector competitiveness. Scholars have pointed out that using a single comprehensive measure as an indicator of competitiveness is not sufficient (Ferto & Hubbard, 2002). This is because there are difficulties in defining the concept, deciding what to compare it to, and identifying the relevant aspects of competitiveness (Esterhuizen & Liebenberg, 2001). As a result, researchers have recommended the use of several diagnostic instruments in prior studies to address these intricacies and offer a more sophisticated comprehension of sector competitiveness (Benalywa, 2023; Hasan & Rasel, 2021; Hoang, 2020; Maqbool, Mahmood, Hussain, & Ashraf, 2020; Mohamad et al., 2024; Nabi & Kaur, 2019; Saki, Moore, Kandilov, Rothenberg, & Godfrey, 2019; Tarihoran, Hubeis, Jahroh, & Zulbainarni, 2023).

4.1.1. Revealed Comparative Advantage (RCA)

Liesner established the RCA index in 1958, and Balassa first utilized it in 1965 as a technique of measuring competitiveness (Balassa, 1965). RCA of exports refers to the proportion of a country's total merchandise exports that are comprised of a certain product category in comparison to the nation's overall share of all merchandise exports (Balassa & Noland, 1989).

$$RCA = \frac{\frac{Xij}{Xwj}}{\frac{Xi}{Xw}}$$

Where,

$Xij =$ jth industry export by i[th] nation.

$Xwj =$ Exports from the j[th] industry worldwide.

$Xi =$ Total exports from the i[th] nation.

$Xw =$ World export total.

The RCA index encompasses a range of numbers that go from zero to positive infinity. These values may be more than one or less than one, depending on the context. The sign RCA > 1 implies that the country in question has a comparative advantage in the chosen sector. Conversely, if the value is less than one, as shown by the symbol RCA < 1, it means that the nation is at a comparative disadvantage. For the purpose of evaluating competitiveness, the RCA approach is widely used. However, it has been criticized for its failure to address symmetry difficulties, with a significant focus on export data and a disdain for imports, as scholars have pointed out. This has led to criticism (Hoang, 2020; Islam, 2019; Maqbool et al., 2020).

4.1.2. Revealed Symmetrical Comparative Advantage (RSCA)

The current study utilizes Laursen (2015) method to address the problem of upwardly skewed values that are inherent in the RCA index. This method adjusts the RCA values to attain symmetry. This modification guarantees that the values of the RCA index are confined to the range of +1 to -1. Laursen (2015) developed the RSCA as a modified index. It is represented using the following mathematical phrase:

$$RSCA = \frac{RCA - 1}{RCA + 1}$$

Regarding the RSCA, a value greater than zero denotes a competitive advantage, whilst a number less than zero denotes a competitive disadvantage. To be more precise, a value nearer +1 denotes a greater advantage, whilst a value nearer -1 denotes a more noticeable negative.

4.1.3. Revealed Import Advantage Index (RIAI)

The RIAI is a metric that is akin to the RCA, but it specifically examines a country's imports instead of its exports. It denotes whether a nation has a competitive edge or disadvantage in the importation of particular commodities in comparison to the worldwide market (Akhter & Maruf-Ul-Alam, 2019; Maqbool et al., 2020). It is measured in the following way;

$$RMA = \frac{\frac{Yij}{Ywj}}{\frac{Yi}{Yw}}$$

Where,

$Yij =$ jth industry import by ith nation.

$Ywj =$ Import from the jth industry worldwide.

$Yi =$ Total import from the ith nation.

$Yw =$ World total import.

RIAI values below 1 imply a competitive import advantage, meaning the economy imports specific items more efficiently or specialized than the global market. A value above 1 shows a competitive import disadvantage, showing that the economy struggles to import specific items. This measure compares a country's import strengths and weaknesses to the global market.

4.1.4. Relative Trade Advantage Index (RTAI)

This study incorporates the RTAI to address the shortcomings of depending solely on RCA and RIAI, which concentrate either on exports or imports. The RTAI takes import and export competitiveness into account to give a thorough evaluation of a nation's trade dynamics. The RTAI provides a detailed picture of a sector's total trade advantage or disadvantage by deducting the RCA from the RIAI. By capturing the interaction between a nation's export and import performance, this comprehensive technique improves the analysis and offers insightful information to both scholars and policymakers. RTAI is measured following the way.

$$RTAI = RCA - RIAI$$

$$RTAI = \frac{\frac{Xij}{Xwj}}{\frac{Xi}{Xw}} - \frac{\frac{Yij}{Ywj}}{\frac{Yi}{Yw}}$$

A positive value or over 0 implies a net trade advantage, indicating stronger exports than imports. A negative number or less than 0 indicates a net trade disadvantage, meaning the country's imports surpass its exports in competitiveness.

4.1.5. The Net Export Index (NEI)

The NEI was first established Balassa (1965) and is an analytical tool of the competitiveness of export goods. Balassa and Noland (1989) explain how this study used the same methodology. As indicated by Erkan and Sar\içoban (2014) the NEI evaluates whether a nation specializes in importing or exporting particular product groupings, determining if it is a net-importer or sells them. This index calculates the balance between imports and exports for a

certain product or industry by subtracting imports from exports and dividing the result by the total imports and exports. It is expressed in following way.

$$NEI = \frac{Xij - Yij}{Xij + Yij}$$

In a scale where values vary from -1 (representing dependence on imports) to 1 (emphasizing the importance of exports), a value of 0 signifies an equilibrium between imports and exports. This approach provides information about a nation's trade dynamics by indicating whether it tends to be a net importer or exporter.

4.1.6. The Export Market Share (EMS)

The EMS measures a nation's export proportion about exports from a set of nations as a percentage of all exports around the globe for a particular industry. This index has a range of 0 to 100, where 0 represents no exports from the nation in that industry and 100 represents the nation's exclusive exporter status on the international market. It is expressed in the following way;

$$EMS = \frac{Xij}{Xwj} \times 100$$

When comparing a nation's relative strength or weakness to other exporting countries, EMS sheds light on how competitively positioned it is in the global market for a given industry.

4.2. Data Source and Variable Description

This research primarily utilizes secondary data sources to evaluate the competitiveness of certain sectors and the variables that impact them. This study centers on footwear products (leather and non-leather), denoted by harmonized system (HS) code 64. The dataset comprises observations from 2001 to 2022, employing a mirror data collection methodology in light of the scarcity of industry-specific data on Bangladesh, specifically given its status as a least developed nation. Table 1 presents the list of variables and its sources.

Table 1. List of variables and sources.

Variables	Description	Unit of measurement	Source
X(a)	Total global product exports	USD in thousand	International Trade Center (2024)
X(b)	Total global product import	USD in thousand	International Trade Center (2024)
X(c)	Total Bangladesh product export	USD in thousand	International Trade Center (2024)
X(d)	Total Bangladesh product import	USD in thousand	International Trade Center (2024)
X(f1)	Total footwear export across the world	USD in thousand	International Trade Center (2024)
X(f2)	Footwear export from Bangladesh	USD in thousand	International Trade Center (2024))
X(f3)	Total global footwear imports of across the world	USD in thousand	International Trade Center (2024))
X(f4)	Footwear imports by Bangladesh	USD in thousand	International Trade Center (2024)
RCA	Trade competitiveness	Index value	Calculation based on trade map data
GDP	GDP per capita	USD at constant 2015 price	World Bank WDI (2024)
KOF	Economic globalization	Index value	KOF globalization index (Gygli, Haelg, Potrafke, & Sturm, 2019)

Variables	Description	Unit of measurement	Source
IQ	Institutional quality	Index value	World Bank, World Governance Index (WGI) (2024)
EXR	Exchange rate	USD	International Monetary Fund (IMF) (2024)
TF	Trade freedom	Index value	World Bank WDI (2024)
FDI	Foreign direct investment inflows	USD (Current)	World Bank WDI (2024)
HC	Human capital	Government expenditure on tertiary education	World Bank WDI (2024)

GDP per capita data was obtained from the World Development Index (WDI) to serve as a proxy for economic growth. Government investment in territory-level education is utilized as a proxy for human capital, as previously approved in research Nouira and Saafi (2022). As suggested by Khan et al. (2023) this analysis also included non-price characteristics such as trade openness, trade flexibility, institutional quality, and economic globalization. According to Dreher (2006); Dreher, Gaston, and Martens (2008) and Gygli et al. (2019). The Economic Globalization Index measures capital outflows and trade barriers, FDI, and portfolio investment statistics are included, along with criteria including average tariff rates, hidden import barriers, international trade taxes as a percentage of current income, and a capital controls index. This information is taken from the KOF Globalization Index originally developed by Dreher (2006).

Moreover, institutional quality (IQ) was calculated by Kaufmann, Kraay, and Mastruzzi (2010) and Khan et al. (2023) using government effectiveness data from the World Governance Index (hereafter, WGI) website so is this study. The WGI index takes into account political stability, the lack of violence or terrorism, voice and accountability, government efficacy, regulatory excellence, rule of law, and corruption control. Typically, these indicators are expressed as scores out of 100, with higher values indicating better performance, or as standard normal units ranging from -2.5 to 2.5. Improved institutional quality has been shown to promote competitiveness, export quality, production management, and product quality (Khan et al., 2023).

This research examined trade freedom and openness to highlight the policy implications of many trade-related elements. Trade openness measures a country's involvement in international trade, which might impact its export competitiveness. It is computed as the sum of a country's imports and exports divided by GDP. Trade freedom measures the effect of tariff and non-tariff barriers on goods and service imports and exports.

4.2.1. Model Specification

To ascertain the elements that impact Bangladesh's footwear industry's competitiveness, this study additionally utilized the ARDL. OLS and GLS are unsuitable for time series analysis due to assumptions such as autocorrelation, heteroscedasticity, non-stationarity, and serial correlation being violated (Ayinde, 2007; Beenstock & Felsenstein, 2019; Bhatta, Adhikari, & Byanjankar, 2020). This can result in biased and inefficient parameter estimates, necessitating the employment of specialist approaches. The ARDL model is highly suitable for analysis due to its ability to account for interdependencies and potential temporal lags that may be present in time series data. It effectively captures both short-term and long-term correlation among variables (Asumadu-Sarkodie & Owusu, 2016; Bhattacharya, 2019; Khan et al., 2023). The following equation is adapted from Khan et al. (2023) by adding FDI and human capital to measure the long and short-term effects of these variables on competitiveness.

$$lnRCAfootwear = \alpha 0 + \alpha 1 RCAfootweart - 1 + \alpha 2 lnGDPt - 1 + \alpha 3 lnFDIt - 1 + \alpha 4 lnKOFt - 1 +$$

$$\alpha 5 lnIQt - 1 + \alpha 6 lnTOt - 1 + \alpha 7 lnTFt + \alpha 8 lnHC - 1 + \sum \frac{p}{i=1} \beta 1 \Delta lnRCAfootwear\ t - 1 +$$

$$\sum \frac{p}{i=1} \beta 2 \Delta llnGDPt - 1 + \sum \frac{p}{i=1} \beta 3 \Delta lnFDIt - 1 + \sum \frac{p}{i=1} \beta 4 \Delta lnKOFt - 1 + \sum \frac{p}{i=1} \beta 5 \Delta lnIQt - 1 +$$

$$\sum \frac{p}{i=1} \beta 6 \Delta lnTQt - 1 + \sum \frac{p}{i=1} \beta 7 \Delta lnTFt - 1 + \alpha 8 lnHC \ + \mu t - l \quad (1)$$

Here, lnRCAfootwear represents the RCA index value of footwear that measures competitiveness. GDP is the proxy for economic development. KOF is the measure for Globalization of the economy, IQ represents 'institutional quality', TO represents 'trade openness, and trade freedom is represented by TF. The natural logarithm is used for every variable to transform variables to handle skewed distributions and to interpret changes in variables as proportional rather than absolute, making it suitable for modeling relationships with multiplicative effects. The lag length is denoted by p, the error term is denoted by ut, and T-i signifies the optimal lag selected via the Akaike information criterion (AIC). α's and β's, likewise, represent estimates for the long and short term, respectively.

However, foreign direct investment (FDI) and globalization of economy (KOF) variables are found to be non-stationary in unit root tests. Therefore, the model is redefined as follows;

$$lnRCAfootwear = \ \alpha 0 + \alpha 1 RCAfootweart - 1 + \alpha 2 lnGDPt - 1 + \alpha 3 lnIQt - 1 + \alpha 4 lnTOt - 1 + \alpha 5 lnTFt \ +$$

$$\alpha 6 lnHC - 1 + \sum \frac{p}{i=1} \beta 1 \Delta lnRCAfootwear\ t - 1 + \sum \frac{p}{i=1} \beta 2 \Delta llnGDPt - 1 + \sum \frac{p}{i=1} \beta 3 \Delta lnIQt - 1 +$$

$$\sum \frac{p}{i=1} \beta 4 \Delta lnTQt - 1 + \sum \frac{p}{i=1} \beta 5 \Delta lnTFt - 1 + \alpha 6 lnHC \ + \mu t - l \quad (2)$$

In order to determine whether or not the variables exhibit a long-term relationship, it is jointly examining the significance of the coefficients of the lagged levels using an F-test. The ARDL F-bounds test's null hypothesis states that there is no cointegration among the variables. Comparing the computed F-statistic to the critical values supplied by Pesaran, Shin, and Smith (2001) for different significance levels. The null hypothesis of no cointegration is rejected when the computed F-statistic surpasses the upper critical bound, which suggests the existence of a long-run relationship. When the F-statistic is less than the lower critical bound, however, the null hypothesis cannot be rejected. After establishing a long-run relationship in the first stage, use the equation to derive the corresponding short-run dynamic Error Correction Models (ECMs) and the long-run relationship itself in the second stage. Following the discovery that lnFDI and lnKOF are stationary, the ECM has been adjusted as follows;

$$lnRCAfootwear = \ \theta 0 + \theta RCAfootweart - 1 + \ \theta 2 lnGDPt - 1 + \ \ \theta 3 lnIQt - 1 + \ \theta 4 lnTOt - 1 + \ \theta 5 lnTFt -$$
$$1 + \ \theta 6 lnHC - 1 + \beta 1 \Delta RCAfootwear\ t - 1 + \beta 2 \Delta lnGDPt - 1 + + \beta 3 \Delta lnIQt - 1 + \beta 4 \Delta lnTQt - 1 +$$
$$\beta 5 \Delta lnTFt - 1 + \ \theta 6 \Delta lnHCt - 1 + \beta 6 \Delta lnHCt - 1 + EECT - 1 + \mu tl \quad (3)$$

4.2.2. Competitiveness Analysis of the Footwear Sector

This study uses RCA, RSCA, RIAI, RTAI, NEI, and EMS, to determine the trade competitiveness of the footwear industry of Bangladesh. Table 2 displays Bangladesh's footwear industry's (both leather and non-leather) trade competitiveness scores using different tools.

Table 2. Competitiveness of the footwear sector of Bangladesh.

Year	RCA	RSCA	RIAI	RTAI	NEI	EMS (%)
2001	1.12	0.06	0.16	0.96	0.71	0.12
2002	1.10	0.05	0.16	0.94	0.73	0.12
2003	1.37	0.16	0.18	1.19	0.75	0.15
2004	1.72	0.26	0.24	1.48	0.75	0.20
2005	1.76	0.28	0.19	1.57	0.77	0.18
2006	1.60	0.23	0.22	1.38	0.75	0.18
2007	1.81	0.29	0.37	1.44	0.65	0.19
2008	1.99	0.33	0.41	1.59	0.62	0.22
2009	1.95	0.32	0.30	1.66	0.71	0.28

Year	RCA	RSCA	RIAI	RTAI	NEI	EMS (%)
2010	2.12	0.36	0.32	1.79	0.66	0.29
2011	2.31	0.39	0.33	1.97	0.70	0.34
2012	2.31	0.39	0.30	2.01	0.74	0.35
2013	2.59	0.44	0.39	2.19	0.71	0.43
2014	2.67	0.45	0.58	2.09	0.61	0.48
2015	2.81	0.47	0.67	2.13	0.58	0.62
2016	2.91	0.48	0.57	2.33	0.65	0.70
2017	3.03	0.50	0.59	2.42	0.62	0.70
2018	3.08	0.50	0.51	2.56	0.65	0.72
2019	3.15	0.51	0.52	2.62	0.67	0.80
2020	3.31	0.53	0.63	2.67	0.64	0.81
2021	3.46	0.55	0.70	2.75	0.57	0.85
2022	3.79	0.58	0.69	3.09	0.62	1.04

Note: RCA = Revealed comparative advantage; RSCA= Revealed systematic comparative advantage; RIAI= Revealed import advantage index; RTAI= Revealed trade advantage index; NEI= The net export index; EMS= Export market share.

The examination of Table 2 demonstrates that Bangladesh's footwear sector continually maintains an RCA > 1 from 2001 to 2022 showing a growing competitive advantage (Balassa, 1965). This prolonged advantage, with RCA values ranging between 1.12 and 3.79, shows a consistent growth trajectory in the footwear business. The findings align with the definitions provided in previous research Hinloopen and van Marrewijk (2006) and Maqbool et al. (2020) where A country has a weak comparative advantage if its RCA value is greater than 1 but less than or equal to 2, greater than 2 but less than or equal to 4, and greater than 4 implies a higher comparative advantage, suggesting Bangladesh has demonstrated a moderate to high level of competitiveness in footwear exports over the analyzed period. Additionally, the higher trend in RCA values since 2018 implies a tendency towards stronger competition in the footwear sector. This figure is consistent with the previous conclusion drawn by Islam (2019). Using the study as a base, this study extended the time frame from 2011 to 2022 to investigate if, given the sector's substantial economic contribution, the industry's competitiveness has increased yearly. The results of this study significantly add to the body of existing material, showing that as of 2018, Bangladesh is getting close to being a highly competitive country in the footwear market.

Further building on earlier research Islam (2019) this study employs five additional analytical frameworks to validate the competitiveness and details, following the recommendations of earlier researchers Ferto and Hubbard (2002) who suggested using multiple analytical tools to better capture the competitiveness comprehensively. To answer the complaint that RCA fails to address the symmetrical issue, this study additionally integrated RSCA. Comparative disadvantage is expressed by a negative RSCA number, and comparative advantage is indicated by a positive value. The implementation of RSCA complements the RCA findings, validating Bangladesh's comparative advantage in footwear. Notably, the increased trend in RSCA values shows a burgeoning footwear market. This study also sheds light on the import position of Bangladesh's footwear sector utilizing the RIAI methodology, hoping to obtain deeper insights into its competitive status in the worldwide market. An RIAI value greater than 1 suggests a comparative disadvantage. The results demonstrate that Bangladesh has constantly maintained a competitive position throughout the years and has not fallen into a comparatively unfavorable situation in terms of import of footwear.

Acknowledging the critique of depending exclusively on export or import values to judge competitive situations, this study adds the RTAI analysis, which assesses net competitiveness by considering both export and import values of the footwear sector. A positive RTAI number implies a net competitiveness of the product. Upon reviewing the RTAI numbers in the table, it becomes evident that Bangladesh has maintained net competitiveness in footwear since 2001 and more intern, with its export competitiveness beating imports. Interestingly, the country's RTAI is on an upward trend, showing a gradual rise of footwear products in the worldwide market since value range from 0.96 to 3.09 over the 22 years. The NEI values, ranging from 0.71 to 0.62, reflect the balance of export of footwear product. These numbers imply that Bangladesh has constantly had a positive position, with exports generally outweighing

imports over the years. NEI values approaching 1 reflect the sector's concentration on exports, underscoring Bangladesh's competitiveness in the global footwear market. Similarly, the EMS figures, gradually increasing ranging from 0.12% to 1.04%, underline Bangladesh's export proportion relative to other exporting countries. Although the export market share is currently low only 1.04%, values increasing gradually suggest a higher export market share, reflecting Bangladesh's solid gradual competitive position in the worldwide footwear market.

Thorough examination of Bangladesh's footwear sector demonstrates a continuous comparative advantage, with RCA values constantly surpassing 1 and increasing towards higher competitiveness over the years. Moreover, the use of numerous analytical frameworks, including RSCA, RIAI, RTAI, NEI, and EMS, underlines Bangladesh's competitive strength in the global footwear market, displaying its potential to maintain a favorable position in exports and underscore its robust competitiveness.

Several critical factors have also come together to contribute to the rapidly growing growth of Bangladesh's footwear sector. First and foremost, the country is attractive to shoe producers because of its low labor costs, which make shoe production more affordable than in other countries (Hossain, Azam, & Chowdhury, 2021). In addition, Bangladesh is home to a sizable pool of highly competent and semi-skilled workers, most of whom come from the apparel and textile industries, providing the footwear production industry with important knowledge (Razzaque, Eusuf, Uddin, & Rahman, 2020). Proactive government policies and incentives, including tax breaks and subsidies, are added to this workforce synergy and are purposefully designed to support the expansion of sectors like the footwear manufacturing industry (Ali et al., 2018; Sarkar, Anjum, & Khan, 2017). Unrestricted access to essential raw materials like leather and textiles also helps the sector operate more efficiently by lowering production costs and guaranteeing smooth supply chain dynamics. Notably, the yearly Eid al-Adha holiday is crucial to satisfying the growing demand for raw hides, since the cyclical footwear sector experiences a noticeable spike in sales during this joyous Ahmed, 2024; Ali et al., 2018). Bangladesh's footwear industry has prospered thanks to preferential trade agreements, growing demand for reasonably priced footwear worldwide, and the ability to leverage export prospects in profitable regions such as Europe and North America (Ahmed, 2024; Razzaque et al., 2020). The competitiveness of Bangladeshi footwear manufacturers in the international arena has been strengthened by strategic investments in cutting-edge technology and strong infrastructure, which have resulted in notable advancements in production processes and superior-quality products (Razzaque et al., 2020).

5. DETERMINANTS OF COMPETITIVENESS

Given that the footwear industry has demonstrated the highest level of resilience in the context of global competitiveness, this research is to investigate the determinants that have impacted this competitiveness. This study used the ARDL model because it is more appropriate for time series analysis than techniques like Ordinary Least Square (OLS) and Generalized Least Squares (GLS), and ARDL allows for investigation of the factors impacting Bangladesh's footwear competitiveness.

Table 3 presents a summary of all the descriptive statistics for the variables that were further examined. It can be observed from the table that every variable's mean is either nearer or equal to the mean. Positive skewness is provided by every variable. The values are platykurtic, as indicated by all of the kurtosis values. The statistic does not show any obvious outliers.

Table 3. Descriptive statistics.

Statistic	LNIQ	LNHC	LNGDP	LNTF	LNTO
Mean	3.61	3.50	7.48	3.87	3.26
Median	3.56	3.52	7.48	3.87	3.26
Maximum	4.02	4.41	8.64	4.41	3.87
Minimum	2.75	1.33	6.95	1.10	0.35
Std. dev.	1.27	6.96	20.69	3.87	3.26

Statistic	LNIQ	LNHC	LNGDP	LNTF	LNTO
Skewness	0.80	0.19	0.10	0.52	0.48
Kurtosis	2.75	-0.48	2.32	3.26	0.01
Jarque-Bera	6.95	-3.96	17.85	0.22	6.28
Probability	21.07	0.11	1.20	0.48	17.66
Sum	153.15	78.38	455.27	28.09	37.07
Sum sq. dev.	455.27	455.27	455.27	455.27	455.27
Observations	22	22	22	22	22

Note: LNIQ = Lag institutional quality, LNHC = Lag human capital, LNGDP = Lag gross domestic product, LNTF = Lag trade freedom, and LNTO = Lag trade openness.

Table 4. Correlation matrix.

Variables	LNRCA	LNGDP	LNIQ	LNHC	LNTF	LNTO
LNRCAFOOT	1.00					
LNGDP	0.97	1.00				
LNIQ	0.49	0.38	1.00			
LNHC	0.62	0.63	0.12	1.00		
LNTF	0.26	0.33	0.06	0.35	1.00	
LNTO	0.04	0.07	0.22	0.003	0.24	1.00

Note: LNIQ represents lag institutional quality, LNHC is lag human capital, LNGDP is lag gross domestic product, LNTF is lag trade freedom, and LNTO is lag trade openness.

Table 4 The correlation matrix indicates that there is some association between the RCA of footwear and GDP, institutional quality, trade openness, trade freedom, and human capital; nevertheless, since each of these variables has a value of less than 0.80, it can be inferred that our model is not autocorrelation-prone.

Table 5 presents the results of lag length selection techniques that are frequently used in modern research, including the AIC, Schwarz Information Criterion (SIC), and Hannan-Quinn Criterion (HQ). The AIC, which is the main guide for choosing a lag, shows that a lag of two is the best option for our model. This conclusion is based on lag two having the lowest AIC value among the options examined, which is consistent with new approaches for determining lag length.

Table 5. Optimal lag selection.

Lag	Intercept					
	LL	LR	FPE	AIC	SIC	HQ
0	1.37	-7.130	1.50	1.31	1.61	1.37
1	96.93	135.28*	1.99	-5.49	-3.40	-5.08
2	158.73	43.26*	5.65*	-8.07*	-8.07*	-4.19*

Note: * Significant at 0.05 level.

After confirming the stationarity and determining appropriate lag lengths, this study investigates the presence of long-term relationships among the variables using the ARDL F-bound test shown in Table 6. The results indicate that the calculated F-statistic exceeds the critical values for both I (0) and I (1) bound at a 1% significance level, suggesting that GDP, human capital, institutional quality, trade freedom, trade openness, are cointegrated with Footwear export competitiveness. This analysis reveals a sustained connection between these independent variables and Bangladesh's footwear export competitiveness, allowing for both long-term and short-term estimations through ARDL.

Table 6. F-bound test.

F statistics	Significance	I (0)	I (1)	Comment
9.58	10%	2.08	3	Long term relationship is present
	5%	2.39	3.08	
	2.5%	2.7	3.78	
	1%	3.06	4.25	

Table 7 represents the findings of the diagnostic test. All the findings are significant at the 5% significance level. Findings indicate that there is no problem of heteroskedasticity and serial correlation. Moreover, the model is correctly specified. Therefore, it can be concluded that the model is robust and conclusive.

Table 7. Results of residual diagnostic test.

Test names	p- values	Results
Breusch-Pegan-Godfrey (Chi-square)	0.701	No issues of heteroscedasticity
Breusch-Godfrey-serial correlation LM (Chi-square)	0.367	There are no issues of serial correlation
Ramsey RESET test (F-statistics)	0.105	Model specification is correct

The ARDL model is used in this study to investigate the factors that influence competitiveness in Bangladesh's footwear export sector. Table 8 shows the determinants of footwear sector s competitiveness. The results show that GDP growth has considerable long-term consequences, with a coefficient of 0.965 and a t-statistic of 22.735, showing strong significance at the 1% level. Short-term GDP growth (ΔLNGDP) is significant at the 5% level, with a coefficient of 1.799 and a t-statistic of 3.615. H20 is, therefore, accepted. Human capital (LNHC) does not show significance in the long term, but it is significant in the short term, with a coefficient of -0.008329 and a t-statistic of -2.002976. In the short run, institutional quality (ΔLNIQ) is significant at the 5% level (coefficient = -0.049939, t-statistic = -3.621174). In the short run, trade freedom (LNTF) has a coefficient of -0.013706 and a t-statistic of -2.883, indicating significance at the 10% level. In terms of trade openness, LNTO has a long-term coefficient of 0.156654 with a t-statistic of 1.121648 at a 5% level of significance, whereas ΔLNTO has a short-term coefficient of 0.027194 with a t-statistic of 0.567955 at the 1% level. The R-squared value of 0.945810 shows that the independent variables in the model account for about 94.58% of the variation in the dependent variable.

Table 8. Determinants of footwear sector competitiveness.

Dependent Variable: C	Coefficient	St. error	T-ratio
C	-6.468***	0.323	2.411
LNGDP	0.965***	0.042	22.735
ΔLNGDP	1.798**	0.498	3.615
LNHC	0.003	0.008	0.383
ΔLNHC	-0.008*	0.004	-2.003
LNIQ	-0.012	0.102	-0.118
ΔLNIQ	-0.049**	0.014	-3.621
LNTF	0.007	0.006	0.909
ΔLNTF	-0.014*	0.005	-2.883
LNTO	0.157**	0.065	1.122
ΔLNTO	0.027***	0.048	0.568
Intercept	-1.216***	0.109	-11.161
R-squared	0.946		
Adjusted R-squared	0.921		

Note: ***, **, and ** denotes significance at 1%, 5%, and 10% levels, respectively.
C= Competitiveness; LNGDP= Log gross domestic product; LNHC= Log human capital; LNIQ= Log institutional quality; LNTF= Log trade freedom; LNTO= Log trade openness

The coefficient for LNHC (0.003195) indicates a positive relationship between human capital and the long-term export competitiveness of Bangladesh's footwear sector, although it is not statistically significant. However, the coefficient for ΔLNHC (-0.008329) reveals a statistically negative relationship at the 10% significant level, suggesting that short-term changes in human capital negatively affect the sector's competitiveness in the immediate term but the effect is minor. Findings indicate that a 1% increase in human capital, that is, government investment in territory education, leads to a decrease in footwear export competitiveness by .008%, holding all other things constant. The findings match earlier studies on human capital complexity and export sophistication and complexity. Azam (2017) stresses cognitive skills for economic complexity, but more research shows that human capital benefits structural change, economic growth, and export. Previous studies Ciccone and Papaioannou (2009) and Ding and Knight (2011) also show how human capital accelerates structural transformation and economic growth. The endogenous growth theory, supported by Hanushek and Woessmann (2008) and Romer (1990) states that education spurs innovation and economic development. These perspectives highlight how complex and dynamic human capital impacts economic complexity and export growth, even when structural change exists. Another possibility is that government investment in territorial education may not help footwear competitiveness in the short run because it takes time for skilled workers to enter the workforce and educational changes to boost footwear sector productivity. Long-term labor skill, innovation, and productivity investments are designed to make footwear more competitive as the economy benefits from a more educated and talented workforce (Chowdhury, Uddin, Uddin, & Uddin, 2018).

The coefficient for LNIQ (-0.012045) shows that the level of institutional quality has a negative but no statistically significant effect on the long-term export competitiveness of Bangladesh's footwear products. On the other hand, a statistically significant negative association with a t-statistic of -3.621174 is revealed by the coefficient for ΔLNIQ (-0.049939), suggesting that institutional quality changes have a statistically significant short-term impact on the sector's export competitiveness. This indicates that 1% increase in institutional quality leads to a decrease in export competitiveness by 0.04% in the short term, ceteris paribus. One plausible explanation is that firms with better institutional quality may face higher compliance costs or stricter regulations, reducing their competitiveness compared to weaker institutional oversight environments, where they could exploit loopholes or operate less transparently (Paunov, 2016). However, it is also true that poor institutional quality of the footwear sector can be the reason for footwear export competitiveness due to inefficiency, corruption, and regulatory barriers, affecting corporate operations and investor trust (Alam, Mian, & Smith, 2006; Paunov, 2016). This highlights the significance of short-term policy interventions and adaptability in Bangladesh's footwear sector.

Though it is not statistically significant, the coefficient for trade freedom (LNTF = 0.007061) shows a favorable correlation between trade freedom and the long-term competitiveness of Bangladesh's footwear industry. This finding aligns with previous research by Khan et al. (2023). On the other hand, the ΔLNTF coefficient (-0.013706) indicates a statistically significant negative connection at the 10% level, indicating that short-term adjustments to trade freedom negatively impact the sector's competitiveness. In the long term, increased trade freedom likely fosters competition, stimulates innovation, and enhances efficiency within Bangladesh's footwear sector, ultimately contributing to greater competitiveness based on previous studies Khan et al. (2023) and Dereli (2015). However, according to previous studies, in the short term, sudden changes in trade freedom may disrupt existing market dynamics, leading to adjustment costs, uncertainty, and temporary setbacks in the sector's competitiveness (Rahman et al., 2023). Despite the lack of statistical evidence, in the long-term association with trade freedom, this research highlights the necessity of monitoring and correcting short-term swings in trade policies to maintain continuous competitiveness in Bangladesh's footwear sector.

The coefficient for LNTO (0.156654) shows that, at the 5% level, there is a favorable and statistically significant connection between trade openness generally and the competitiveness of Bangladesh's footwear products over the long run. This suggests consistent efforts to increase trade openness can raise the industry's competitiveness.

Furthermore, at the 1% level, the coefficient for ΔLNTO (0.027194) shows a statistically significant link, emphasizing the significance of short-term variations in trade openness in affecting the sector's competitiveness immediately. These findings align with previous national and international research. The authors concluded that increased trade freedom and openness can boost domestic firms' ability to innovate, adapt, and become more globally competitive Khan et al. (2023) and Dereli (2015). This highlights the need for policymakers to maintain and enhance the competitiveness of Bangladesh's footwear sector by prioritizing both long-term and short-term strategies that promote trade openness in trade policies. Lastly, the model equilibrium connection is confirmed by the statistically significant but negative error correction term with the coefficient of - 1.216475, which also shows the long-term equilibrium resilient adjustment. It also shows that the model rebounds to long-term equilibrium at a 121% adjustment rate after resolving the short-term disequilibrium.

GDP was taken as a substitute for economic growth. This implies that competitiveness typically increases in response to increases in economic growth. The long-term and short-term economic growth strongly boosts footwear export competitiveness, underscoring its importance in the model. The findings suggest that 1% increase in GDP or economic growth will increase 0.96% at the long run and 1.80% at the short run-in footwear competitiveness, ceteris paribus. These findings contradict what Khan et al. (2023) have done on shrimp competitiveness in Bangladesh but support previous research Bierut and Kuziemska-Pawlak (2017) and Ruzekova, Kittova, and Steinhauser (2020). Another study done on Eastern European Countries (EEC) by Pilinkiene (2016) also validated that economic growth positively and substantially impacts trade competitiveness. Therefore, Bangladesh's economic growth may boost footwear export competitiveness by increasing consumer spending, infrastructural expenditures, technological advances, export diversification, and trade liberalization (Razzaque et al., 2020).

6. CONCLUSION

Global trade has significantly influenced Bangladesh's economic development. To accomplish long-term development goals, export diversification has been given priority by policymakers, determining whether a given sector is competitive in the global market is essential to improving long-term developments. This study addresses the dearth of research on trade competitiveness in Bangladesh by focusing on determinants of the footwear, sector of Bangladesh.

The study uses a quantitative approach to evaluate the trade competitiveness of Bangladesh's footwear sector (leather and noon-leather). Using extensive datasets spanning from 2001 to 2022 the research investigates export performance, comparative advantage, and competitiveness determinants of the footwear sector of Bangladesh.

The thorough examination of Bangladesh's footwear industry demonstrates a persistent comparative advantage, bolstered by RCA values that continuously surpass 1 and increase over time. Footwear products export from Bangladesh gradually blooming and becoming resilient as indicated by the values of RSCA, RIAI, RTAI, NEI, and EMS. The application of multiple analytical frameworks additionally validates Bangladesh's competitiveness in the global footwear market. Bangladesh's footwear industry is becoming more competitive due to factors like low labor costs, proactive government policies, investments in infrastructure and technology, and a skilled workforce.

The ARDL model analysis clarifies the variables influencing Bangladesh's export competitiveness in the footwear industry, showing a strong positive correlation between trade openness and economic growth on competitiveness in the short- and long term. Furthermore, even if human capital shows negative short-term consequences but favorable long-term effects, education, and skill development investments are still essential for maintaining competitiveness. The competitiveness of Bangladesh's footwear sector is negatively impacted by short-term changes to trade freedom because of shifts in market dynamics. Conversely, long-term increases in trade freedom promote better competitiveness by boosting efficiency and innovation. Poor institutional quality, characterized by inefficiency and corruption, hinders short- and long-term competitiveness, underscoring the need for short-term policy interventions

to enhance adaptability in the footwear sector. Bangladesh's export competitiveness in the footwear sector is significantly impacted by short-term variations in institutional quality.

The findings contribute to the extant literature by analyzing the determinants of the footwear sector's sustainable competitiveness in Bangladesh. This study advances the knowledge of export dynamics and provides important guidance for boosting Bangladesh's competitiveness and economic growth. In addition, this study closes the gap by identifying the competitiveness drivers and evaluating the competitiveness of pharmaceutical products, fish and fish products, and footwear using six dynamic tools of competitiveness.

Methodologically, Saiful Islam (2019) used the RCA technique to assess the footwear items' competitiveness, this study uses six different diagnostic approaches and extends the analysis period from 2001 to 2022. By employing six comprehensive diagnostic instruments, this study contributes to the existing corpus of knowledge by providing empirical insights into the export performance and comparative advantage of significant industries in Bangladesh. By providing empirical information on the export performance and comparative advantage of the footwear sector the findings of this study give valuable recommendations for policymakers in Bangladesh. The findings can be utilized by policymakers to build strategic plans for the diversification of exports, choose priority sectors for investment, and design policies that will boost competitiveness in the global market. Additionally, stakeholders such as investors, industry associations, and trade organizations can benefit from these insights to make informed decisions regarding the allocation of resources, strategies for entering the market, and business development initiatives that are aimed at maximizing opportunities for export and fostering sustainable economic growth.

Future studies could look at previously unstudied sectors including agricultural exports and headgear items, which have just been included in Bangladesh's top 10 export lists. In addition, other analytical techniques like NRCA, TCI, and TSC could be used to confirm the competitiveness of the sectors this paper and others have evaluated. Future research may also look into adding variables like the interest rate, inflation rate, and unemployment rate to better understand the factors affecting competitiveness.

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