



Export Competitiveness of the Bangladeshi Ready-Made Garments (RMG) in the International Markets: The RCA Index Analysis with Porter's Diamond Model

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Abstract: The external sector stability of Bangladesh is mainly sustained by its export growth, which predominantly depends on the Ready-Made Garments (RMG) sector. The main concern of this study is to address the competitive advantages of Bangladesh's RMG sector in the international arena based on data from 2015 to 2020. Two approaches, entitled Porter's diamond model and the Revealed Comparative Advantage (RCA) index, have been experimented to evaluate the competitiveness of Bangladesh RMG. By applying Porter's diamond model, this study found that the low-cost human resources, capital resources, and the role of various factors of government contributed mostly towards Bangladesh RMG's competitiveness in global markets, though the other factors such as infrastructure, knowledge resource, native competition were contributed less. In addition, the value of RCA index ranged from 30.29 to 34.45, suggesting that Bangladesh RMG has a robust competitive advantage in the international markets. This high index will help to maintain the healthy trade balance in Bangladesh. Governments continued policies need to be more strengthened to keep the RCA range up in the future.

Keywords: RMG; Competitiveness; RCA Index; Porter's Diamond model; Bangladesh.

Introduction: National competitiveness mainly indicates how a domestic country expands and maintains competition over a period of time. Moreover, it also focuses on the ability of a country to compete in the international markets with other countries based on the production and distribution of goods and services [1]. Competitive advantage means the superiority achieved by an organization or country by providing the same quality of goods at lower prices than its competitors [2]. Bangladesh has a competitive advantage in several products in which the Ready-Made Garments (RMG) goods played the dominant role.

The external sector's performance in Bangladesh is mainly influenced by both the value and volume of RMG exports. Bangladesh is the world's 2nd most trusted hub of RMG exporters, whereas China and Vietnam hold the 1st and 3rd positions respectively [3]. The garments sector played a key patron role in the economic growth of Bangladesh. This country has esteemed its own brand all over the world which brought glory to the country. Thus, Bangladesh once known as the "bottomless basket," has now turned into the "basket full of wonders" [3]. The RMG sector accounts for approximately 83 percent of total export earnings, and more than 150 countries worldwide import RMG products from Bangladesh [3]. In addition, the RMG sector contributed around 7.66 percent of GDP in 2021 in Bangladesh [4]. The trends of total RMG exports and total exports of all products of Bangladesh are shown in figure 1.



Fig. 1: Comparative Statement on Export of RMG & Total Export of Bangladesh (Source: BGMEA, 2022)

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Figure 1 illustrates that the total exports of Bangladesh and Exports from RMG are growing and declining at the same pace. The table (Appendix A) examined that among the top 10 most exported potential products of Bangladesh to world markets, all are from the RMG (Harmonized System $(HS)^1$ code 61 and 62) sector. The table also specified that HS code 620342 (Men's trousers and shorts of cotton) has the highest untapped potential, the value of which is around \$3.8 billion USD. Thus, the table demonstrates that the RMG sector of Bangladesh has the highest potentiality in the world markets. Furthermore, the value addition from the RMG sector was high, at around 60% (Appendix B).

In the era of globalization, the future development trend of any country depends on its ability to export competitiveness. This is especially true for developing countries like Bangladesh. Different papers focused on the national competitiveness of different countries over a period of time, such as Cambodia [5], China [6], Ethiopia [7], India [8], and Vietnam [9]. Kathuria [10] appraised the competitiveness of the clothing sector in Bangladesh and India based on HS 4-digit data from 1995 and 2003 and revealed that Bangladesh enjoyed a comparative advantage raised from 21 to 29 products while for India it was raised from 23 to 25 products respectively. In addition, Shahzad [11] discovered that Pakistan has the highest comparative advantage in textiles and clothing than India and Bangladesh after examining the RCA analysis of textiles and clothing in Pakistan, India, and Bangladesh based on data from 1980, 1990, 2000, and 2010. In contrast, Bangladesh has a greater revealed comparative advantage than India and Pakistan in the clothing sector.

Applying the Revealed Comparative Advantage (RCA) index to the Indian textile exports, Chaudhary [8] found that the range of the RCA index was between 3.792 and 5.383 and revealed that the Indian textile industry had a strong comparative advantage in the global textile markets during the period of 2005–2014. Abbas and Waheed [12] implemented the RCA index based on data from 2003 to 2014 in Pakistan and found that the export competitiveness in Pakistan for leather and raw cotton had been increased while the textile sector had deteriorated. Adnan et al. [13] concluded that Bangladesh had a strong comparative advantage in 26 out of 34 goods by using the RCA index on the clothing export market in China and Bangladesh based on data from 2001 to 2017. In contrast, China has only 8 categories of goods. Chowdhury and Zabeen [14] assessed the competitiveness of the RMG sector in Bangladesh using Porter's Diamond model and revealed that the cheap human resources had raised the export competitiveness of RMG in international markets and thus helped the other three determinants of diamond to be more active.

In recent years, Bangladesh is increasing its attention in the global arena since it is the world's 2nd largest RMG exporter, having lost its position to Vietnam but regained it within one year. Thus, the phenomenon of knowing the competitiveness of Bangladesh's RMG sector in the world market is gaining increasing attention not only in native markets but also world-wide. Moreover, the existing research mainly concentrated on bilateral (India, Bangladesh, or Bangladesh, China) or selected countries. Several studies concentrated on the clothing and leather industries. But, none of the studies even attempted to examine or extract the competitiveness of Bangladesh's RMG sector in the world markets as per the best of the authors' knowledge. Besides, to find out the export competitiveness, the researcher used either the RCA index or Porter's diamond model.

Thus, the main objective of this paper is to examine the competitiveness of Bangladesh RMG sector in the world markets using both Porter's diamond model and the RCA index. To evaluate and analyze the competitiveness this paper has been employed data for the period 2015-2020. This paper is organized as follows: In the later part, the literature review is presented, followed by the research methodology. After that, results and discussion are discussed. The concluding remarks are presented in the last part.

Research Methodology

Research Approaches: To find the competitiveness of the RMG sector of Bangladesh, the Revealed Comparative Advantage (RCA) Index has been used. The RCA index was introduced by Balassa [15], and was used to measure sectoral competitiveness and revealed comparative advantage. He explained that the relative export structure found the relative differences in the factor endowments of a country. Balassa's RCA index formula is presented as follows:

In the above equation, i represent the region or country and j represents the good or commodity; RCAij shows the comparative advantage of the product j (RMG) in country i (world). The international market share of various countries and products are only considered in the RCA index. In this paper, RCA index present the comparative advantage index of Bangladeshi RMG's export to the world market. Applying this phenomenon, the RCA index for the year, equation (1) restated as below:

Where, BDGEW is the value of Bangladeshi RMG exported to world;
 BDAEW represented the value of Bangladeshi all goods exported to world;
 WGEW is the total value of world RMG exported to the world and
 WAEW represented the total value of world all goods exported to the world.

The range of the RCA index is from zero to positive infinity. Generally, a country has a comparative advantage in a commodity when the RCA index is greater than one unit (RCA>1) while a comparative disadvantage in a particular commodity if the RCA index is smaller than one unit (RCA<1). Moreover, the ranges of the RCA index from 0.80 to 1.25, indicates a country has a medium comparative advantage and when it is lower than 0.80, it is considered as a relative disadvantage.

It is obvious that the total export value of a particular country would change due to a change in the overall level of price (inflation) or production growth, or both of them. Thus, only considering the nominal value of exports, the result of the RCA index might not be accurate over a period of time. So, for the most precise results or comparison, before computing RCA, the data should be converted to real export values (the value adjusted by inflation). Mankiw [16] stated that the cost of the merchandise will allow comparing the "dollar figures" across time and thus the comparison will become more convenient and advisable. The method to compute the value of money from one year to another is stated below.

Amount in year T dollars = Amount in year T1 dollar $\times (\frac{CPIyearT}{CPIyearT1})$(3)

In this paper, 2016 is considered the base year, as announced by the Bangladesh Bureau of Statistics [17]. All export values for 2015, 2017, 2018, 2019, and 2020 will be turned into this base year.

For factors analysis of the competitiveness of Bangladeshi RMG's Porter's [2] diamond research approach was applied. Michael Porter's Diamond Model is a diamond-shaped framework that focuses on explaining why certain industries within a particular country are competitive internationally, whereas others might not. And why is it that certain companies in certain nations are capable more of consistent innovation, whereas others might not? Porter introduced "The Diamond Model of National Competitiveness" and argued that, for the creation of competitive advantage, the national environment plays a crucial role in prospering any industry in a country. Porter's classified the national environment into four categories: 1) factor conditions, 2) demand conditions, 3) related and supporting industries, and 4) firm strategy, structure, and rivalry shown in figure 2 [2]. He claimed that these four categories were termed "diamonds" for their mutual interdependence and reaffirming system. He also claimed that this diamond could be further impressed by "government" and "chance". Porter believed that when all determinants worked strongly together, the national diamond would turn into a huge success. In contrast, he argued that any weakness in the mentioned determinants can obstruct the industry from gathering a competitive advantage.



Fig. 2: Porter's Diamond Model of National Competitive Advantage (Source: Porter, 1990)

Data Source: For the best analysis of this study, the data and information has been collected from different secondary sources, including ITC Trade Map [18], Bangladesh Bank (BB) [19], Bangladesh Bureau of Statistics (BBS), Export Promotion Bureau (EPB), and Bangladesh Garment Manufacturers and Exporters Association (BGMEA). The base year is 2016, which is used to measure CPI as announced by BBS in 2022 [17]. The study used the data (2015-2020) of Bangladesh's total RMG (HS code of 61 & 62) and all goods exported to the world collected from EPB and the world's total RMG (HS code of 61 & 62) and the total value of all goods exported to the world collected from ITC Trade Map (mirror data).

Results and Discussion

In this part, the determinants mentioned in Porter's Model of national competitive advantage (figure 2) will be explored in the perspective of the Bangladesh RMG industry.

Factor Conditions: According to Porter, the factors of production, such as land, labor, and capital, varied for each nation. From an industry perspective, Porter classified these factors into five segments: i) human resources; ii) physical resources; iii) knowledge resources; iv) capital resources; and v) infrastructure. He argued that these segments vary extensively from one nation to another and also from one industry to another within a nation. A nation's performance in any industry depends on whether the nation can mix these segments properly.

Because the RMG sector is primarily a labor-intensive industry, human resources are critical to its success. This sector, on the other hand, necessitates relatively low-skilled tasks [20], and thus the demand for very high or medium-skilled workers has dwindled. So, the RMG sector creates an opportunity for easy access to a less skilled and low-cost labor force. Bangladesh has enormous demographic resources, with approximately 68 percent of the population aged 15 to 64 years [21]. On the other hand, the unemployment rate in Bangladesh was 5.30 percent in 2020, which was 1.08 percent higher than that of the previous year due to the ongoing COVID-19 pandemic situation [21]. Thus, this demographic facility and unemployed people are the main sources of low-cost labor and are highly desirable in the labor-intensive RMG sector in Bangladesh.

Moreover, Bangladesh is the most male-dominated society in the world [14]. The conservative sentiment scenario, however, in recent years, has shifted, and females are becoming more permissive. Women account for around four-fifths of the total RMG workforce [14]. Thus, female workers are the best potential and blessing for this sector as they demand lower wages than their male counterparts [22]. So, the national human resources factors help the RMG sector of Bangladesh to be more competitive in the international arena.

Bangladesh suffers from a severe lack of physical resources (such as cotton or other fiber raw materials) hence it must rely on imported raw materials. That's why Bangladesh is the world's 2nd-largest raw cotton importer in the world [18]. Besides, Bangladesh also lacks proper skilled knowledge resources (i.e., different engineers, including designing, chemical, mechanical, etc.). The requirement for capital for the RMG industry is low. The government and central bank of Bangladesh provided various fiscal stimulus packages for this sector. So, the capital resources for the national environment are not a prime concern. The main bottleneck for the competitive RMG sector is the lack of proper infrastructure facilities. In terms of infrastructure quality, Bangladesh ranked 114 out of 141 countries all over the world [23]. The power and gas crisis, the lack of adequate roads and highways, etc. are the main problems faced by the RMG sector in Bangladesh [14]. However, the roads in Dhaka city are comparatively better. The Chattagram seaport ranked (92) better compared to the other infrastructural monuments in Bangladesh [23]. Hence, it is clear from the above that the competitiveness of the Bangladeshi RMG sector is impeded by national infrastructure factors.

Demand Conditions: Another feature of Porter's diamond framework is the demand condition. It demonstrates what a specific industry can achieve on both a national and international scale. If an industry can meet the demands of both national and international markets, it innovated faster, improved the quality or features of its goods, and thus has a higher competitive advantage in global markets.

The traditional dresses for men in Bangladesh are lunghi, pajama, panjabi, fatuwa, and for women, salwar, kamiz, saree, etc. In recent times, men have preferred western clothes, but women still choose traditional dresses. So, the local demand for RMG is not satisfied in Bangladesh. In contrast, in the era of the 21st century, talking about the fashion of the rest of the world, there will be a very high potential for RMG products globally. Bangladesh's main corresponding RMG export markets are the United States, Germany, the United Kingdom, Spain, France, Italy, the Netherlands, Canada, and Belgium. Due to the more fashionable culture and high per capita income in these countries, the demand for versatile apparel products such as T-shirts, jackets, sweaters, trousers, overcoats, underpants, blazers, etc. is very high. Bangladesh is one of the most trusted hubs for apparel products in the world. Thus, there will be high potential for RMG goods in the international arena and it will help Bangladesh to become more competitive globally.

Related and Supporting Industries: The presence of related and supporting industries imparts a strong foundation for the advantage of national industries on the international platform. Porter stated that such supporting industries provide speedy, efficient, early and privileged access to inputs in a country.

In Bangladesh's perspective, the related and supporting industries for RMG sectors are textile and garment machinery industries, different accessories industries (suppliers of buttons, packaging, labels, and zippers), home textiles, and primary textile industries (suppliers of fabrics and yarn). There are 802 weaving mills and 430 spinning mills in Bangladesh with an annual production capacity of 2943 million kilograms of yarn and 3707 million meters of fabric, respectively [24]. Native suppliers can now satisfy around 90% of the demand for knitwear and 40% of the demand for woven wear [24]. Thus, Bangladesh has a competitive advantage in terms of related and supporting industries and is able to create a value chain with these sectors.

Firm Strategy, Structure, and Rivalry: National Competitive Advantage means how a firm in an industry is structured, created, and able to manage its rival business. According to Porter [2], rivalry plays the most vital role in a country's national competitive advantage. Robust domestic rivalry helps businesses to raise productivity, improve innovation, reduce costs, enhance quality, and help to accomplish international standards or even create their own brands. The RMG sector of Bangladesh has mainly been developed due to international demand. So, domestic rivalry played the least role in the emergence of the RMG sector. As of 2021, the total number of RMG factories in Bangladesh was 3485 [25]. The RMG sector of Bangladesh is based on private sector and most of the entrepreneurs of the factories are local, though the country's largest factories are owned by foreigners. There was a greater reorganization in global marketplaces in terms of foreign firms. These can create global attention

as Bangladesh is the greatest RMG hub. In addition, these firms created the best benchmarks regarding quality, brand, and efficiency as they pertained to both management and production.

Concerning the firm's strategy, most of the Bangladeshi RMG factories continued their production on the basis of a low-cost labor force, as the availability of labor in Bangladesh is very high and forms a competitive advantage. Thus, the capability of the RMG competitiveness of Bangladesh is huge in the international markets.

The Role of Government and Chance: Most people argued that the government played a vital role in international competitiveness in a country, but Porter [2] did not prefer it. Rather, he argued that the government acts just like an influencing factor towards the aforesaid determinants of national diamond production to inspire the firms to step up their competition at a towering level. The government implemented it through effective policies, regulations, laws, etc. that support the national diamond. On the other hand, the chance was also an additional influencing factor in the competitiveness of industry and worked as an inspiring force for the determinants of national diamond production.

The government and Bangladesh Bank continue to play a pivotal role in giving shape to the RMG sector's competitiveness in the world markets. The bonded warehouse facilities for imports of fabrics and accessories, various stimulus packages, different low-cost finance schemes, reduced tariffs on imports of raw materials (cotton and yarn), and various types of machinery, etc., helped this sector to become more competitive by reducing its operating costs. Moreover, the back-to-back credit facilities, the establishment of different Export Processing Zones (EPZ) etc., allowed this sector to boost the export-based industrialization in Bangladesh. However, to increase the export competitiveness of the RMG sector, the role of the Bangladesh government cannot be underestimated.

Balassa's RCA Index: The RCA index is used for measuring the competitiveness of RMG sector of Bangladesh in the international arena. At first, all data have been taken on the basis of nominal data, where the level of inflation had not been adjusted. For the most reliable result, the real export value of RMG has been taken on the basis of the CPI of Bangladesh, choosing 2016 as the base year as per BBS. The nominal and real RMG and total product export value of Bangladesh to the world are presented in the table below.

			Value in million USD			
Year	СРІ	BDGEW (Nominal)	BDGEW (Real)	BDAEW (Nominal)	BDAEW (Real)	
2015	213.91	25491.40	11916.88	31208.94	14589.80	
2016	100.00	28094.16	28094.16	34257.18	34257.20	
2017	238.60	28149.84	11797.92	34846.84	14604.70	
2018	251.80	30614.76	12158.36	36668.17	14562.40	
2019	265.88	34133.27	12837.85	40535.04	15245.60	
2020	281.02	27949.19	9945.62	33674.09	11982.80	

 Table1: Bangladesh RMG Export to World (BDGEW) and Bangladesh all Goods Export to World (BDAEW) Data Based on

 Nominal and Real Data from 2015-2020 After Adjusting of Consumer Price Index (CPI).

 Table 2: World Garments Export to World (WGEW) and World All Export to World (WAEW) Data Based on Nominal and Real Data from 2015-2020.

Year	WGEW (Nominal)	WGEW (Real)	WAEW (Nominal)	WAEW (Real)
2015	436506.58	204060.86	16412910.15	7672811.07
2016	431155.51	431155.51	15926878.23	15926878.2
2017	447858.47	187702.63	17564178.37	7361348.86
2018	474057.93	188267.64	19326713.98	7675422.55
2019	472708.76	177790.27	18737613.36	7047394.82
2020	421673.46	150051.05	17503376.18	6228516.18

It is observed from Table 1 that, after adjusting for the CPI index with different years, the real data is lower than that of the nominal data due to the high CPI index in Bangladesh. However, the trends in the real data are almost the same as the nominal data. To estimate the RMG sector competitiveness of Bangladesh, the RCA index is computed on the basis of the formula in equation 2. First of all, the total value of Bangladeshi RMG exported to the world (BDGEW) and the value of all Bangladeshi

goods exported to the world (BDAEW) are presented in Table 1 based on nominal and real data from 2015-2020. Then, the total value of world RMG exported to the world (WGEW) and the total value of all goods exported to the world (WAEW) based on nominal and real data from 2015-2020 are presented in Table 2. Then, the RCA indexes of different years are calculated in Table 3 below on the basis of nominal data and in Table 4 on the basis of real data.

						Value in	million USD
Year	BDGEW	BDAEW	WGEW	WAEW	BDGEW/ BDAEW	WGEW/ WAEW	RCA
2015	25491.40	31208.94	436506.58	16412910.15	0.8168	0.0266	30.712
2016	28094.16	34257.18	431155.51	15926878.23	0.8201	0.0271	30.294
2017	28149.84	34846.84	447858.47	17564178.37	0.8078	0.0255	31.681
2018	30614.76	36668.17	474057.93	19326713.98	0.8349	0.0245	34.038
2019	34133.27	40535.04	472708.76	18737613.36	0.8421	0.0252	33.379
2020	27949.19	33674.09	421673.46	17503376.18	0.8300	0.0241	34.452

Table 3: The Value of RCA Index in Nominal Data from 2015-2020

Table 4: The Value of RCA Index in Real Data from 2015-2020.

					Value in million USD		
Year	BDGEW	BDAEW	WGEW	WAEW	BDGEW/ BDAEW	WGEW/ WAEW	RCA
2015	11916.88	14589.80	204060.86	7672811.07	0.8168	0.0266	30.712
2016	28094.16	34257.20	431155.51	15926878.2	0.8201	0.0271	30.294
2017	11797.92	14604.70	187702.63	7361348.86	0.8078	0.0255	31.681
2018	12158.36	14562.40	188267.64	7675422.55	0.8349	0.0245	34.038
2019	12837.85	15245.60	177790.27	7047394.82	0.8421	0.0252	33.379
2020	9945.62	11982.80	150051.05	6228516.18	0.8300	0.0241	34.452

After analyzing the various years of RCA results, the following important remarks can be given priority. During the period from 2015 to 2020, the RCA index value ranged from 30.29 to 34.45. According to the report of the Japan External Trade Organization (JERTO) [26], if the RCA index crossed 2.50, then the evaluated industry would be said to have a high comparative advantage. The RCA index of Bangladesh's RMG sector to the world markets of the last six years (2015-2020) was significantly greater than 2.50. Thus, Bangladesh's RMG industry performed best and had a robust comparative advantage in the world markets in the mentioned years. In 2018, the RCA index was comparatively higher than that of the previous three years (2015, 2016, and 2017). However, in 2020, the RCA index was at the top of the mentioned years amid the commenced time of COVID-19. Amid the ongoing COVID-19 and other corresponding barriers, the RCA index indicates very inspiring and positive trends of continuing comparative competitive advantage in RMG exports to the global market.

Conclusions: The key concern of this paper is to investigate the competitiveness of Bangladesh's RMG exports in the world market. Applying Porter's diamond model, the study revealed that the low-cost human resources factors have greatly contributed towards the competitive advantage of RMG exports in the world while the infrastructure and knowledge resource factors contributed less. On the other hand, using Balassa's RCA index, this study postulated that the range of the RCA index in Bangladesh RMG export remained between 30.29 and 34.45 based on both real and nominal data. This range indicates the high potential for the competitive advantage of Bangladesh RMG exports to the world market during those investigated periods. This high RCA range definitely will help to maintain a healthy trade balance along with reducing the rate of unemployment, increase women empowerment, reduce poverty, raise the standard of living of the people, and finally increase the trade liberation of Bangladesh. Although a country may have good RCA in a particular good or industry in a specific period of time, this does not necessarily mean that this comparative advantage will be continued forever [27]. Thus, to keep the range of the RCA index up in the RMG sector in the upcoming years in Bangladesh, various proactive initiatives such as reduce the unusual freight charge, smooth the supply chain of raw materials (cotton and yarn), facilitate different low cost refinance schemes, production of costly diversified products instead of basic and low price products, reinstate the cancellation orders from international brands and buyers due to COVID-19, raise the production capacity of factories etc. should be addressed by the policymakers regarding countries exports along with existing policies.

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