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Resilience of Ready-Made Garment Sector of Bangladesh to Global Crisis: Survival and Growth Strategies

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ABSTRACT

Purpose: Bangladesh's RMG sector underpins national economic stability but frequently confronts shocks, such as the MFA phase-out, industrial disasters like Rana Plaza, COVID-19 disruption, and geopolitical tensions. These events have fueled inflation, currency devaluation, and fluctuating export earnings. This study explores survival and growth strategies, suggesting policy actions for sustained competitiveness. It also recommends workforce development and collaboration with international partners to strengthen the sector's global standing.

Methodology: This study deliberately eschews fresh field surveys and intricate econometric models, opting instead for a visually driven, contextual analysis to illuminate the evolution of the readymadegarment sector. Drawing on government statistics and industry white papers, it chronicles the industry's expansion, its periods of turmoil, and its subsequent recoveries. De Marchi's (2023) analytical framework underpins the assessment of the sector's capacity to absorb shocks, adapt to shifting conditions, and regain momentum.

Findings: Although disruptions caused transient drops in export earnings, overall performance remained stable. Key contributors to resilience included proactive strategic adjustments, adherence to international compliance protocols, and strong governmental support.

Practical Implications: Timely risk identification and swift policy responses, particularly in labor safety and factory compliance, foster market confidence. Government interventions, such as policy incentives and subsidized loans, bolster the industry against currency volatility and inflation. Future strategies may involve diversifying export destinations, modernizing technology, and enhancing workforce skills for global competitiveness.

Originality/Value: This research offers a comprehensive view of how the RMG sector endures recurrent challenges, providing valuable guidance for policymakers, industry stakeholders, and international collaborators in fostering long-term sustainability.

Limitations: Dependence on secondary data may constrain the depth of insight. Real-time field investigations could enrich understanding of on-the-ground resilience practices and validate the sector's adaptive measures. Future research could incorporate additional quantitative metrics.

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1. Introduction

Bangladesh is a small Southeast Asian country with a limited export base. For the past few decades, it has been observed that it is the ready-made garments (RMG) or apparel sector that overwhelmingly dominates Bangladesh's export with the highest potential in value terms. This sector not only transformed Bangladesh into one of the largest apparel exporters in the world but also helped Bangladesh to sustain its economic growth and somewhat balance trade deficit. However, this export engine of Bangladesh has encountered numerous hurdles as it evolved, each putting its resilience and adaptability to test. Since the contribution of RMG sector towards our economy is undeniable, in this paper firstly in the literature section an attempt has been made to highlight the crucial role played by this industry in Bangladesh's economy and then to elucidate how it survived and expanded admits divergent challenges, ranging from the post Multi-Fiber Arrangement (post-MFA) era, The Rana-plaza disaster, Tazreen Fashion fire incident to recent crises such as the COVID-19 pandemic, the Russia-Ukraine War, The Red-Sea Conflict etc. Some of these challenges compelled this sector to look for new strategies while others to follow more stringent compliance measures. As a whole, all of these challenges have from time to time put this sector under tremendous pressure, if it is to maintain its competitive position it has no other option than to face these challenges but at the same time remain competitive by offering a competitive price which is till now this sector's main strength in the global apparel market.

The first major challenge surfaced due to the MFA phasing out (2004), the removal of thirty years of quota restrictions by industrial countries on textile and apparel import from developing countries. It is a period marked by a significant shift in the Bangladesh's RMG industry's competitive position in the global apparel market. As Bangladesh did not have adequate skilled labor nor did have product diversification so it was natural to expect that its RMG sector will not be able to maintain its competitive position in the global apparel export market after MFA phase out. Only after a decade of MFA phase out once again the RMG sector of Bangladesh was struck by a most disastrous tragic events back-to-back in two consecutive years namely the 'Tazreen Fashions Fire' (2012) and the 'Rana-Plaza Collapse' (2013). On November 24, 2012, a fire at the Tazreen Fashions factory in Bangladesh killed 112 workers and injured more than 200, making it the deadliest fire in the country's history. The circumstances surrounding the blaze were frustratingly similar to previous deadly fires in the Bangladesh garment industry: poor quality electrical wiring led to a short-circuit on the ground floor of the factory, where flammable materials caught fire. Rana Plaza collapse was a structural failure resulting in the death of more than thousand workers leaving thousands severely injured. This is considered to be one of the deadliest garment factory disasters in the history of Bangladesh. This incident underscored the urgent need for improved safety measures and the issue of labor rights; it compelled our apparel industry owners to follow more stringent compliance measures especially with regard to safety if they are to maintain their position in the global apparel market. Then within less than a decade again the entire world suffered from a global pandemic, COVID-19 (2019). The onset of the coronavirus pandemic revealed vulnerabilities in global supply chains, disrupting production and distribution network on a global scale. Following the pandemic, the global economy experienced a surge in demand and supply shortages, exchange rate became volatile, economy became inflationary, and all of these created a new set of challenges for our RMG industry, putting additional pressure on its resilience. The RMG sector of Bangladesh were expected to be critically affected by this pandemic because its major export destinations were the countries which were severely affected by this virus. Recently (2022), the aftermath of Russia-Ukraine war and Red Sea conflict again have some spillover effect as it drove up the fuel and cotton prices and also resulted in transportation delays.

This study endeavors to assess the impact of the above-mentioned challenges on the RMG sector of Bangladesh and examine the strategies it has adopted from time to time to deal with each of these challenges. Accordingly, the guiding research question for this study is: How has the Bangladeshi

RMG sector demonstrated resilience in response to major global and domestic disruptions between 2001 and 2023?

Graphical analysis is done to highlight this sectors journey during these periods. Finally, to examine these challenges systematically, this paper draws on De Marchi's (2023) Resilience Assessment Model, which offers a structured lens to assess how production sectors absorb shocks, adapt practices, and pursue long-term transformation.

This study attempts to offer valuable perspectives for policymakers, industry leaders, and stakeholders, thereby contributing to a deeper understanding of the sector's direction. By understanding the past challenges and embracing future possibilities, this sector can continue to be the driving force behind Bangladesh's economic growth and sustainable development.

2. Literature Review

The RMG industry of Bangladesh is a well-researched topic, however in our study as we have specifically focused on the major challenges that is being faced by this industry both at the national and global level for that we have only investigated some of the pertinent literatures covering the period from 2010 to 2023.

Abdul and Joarder (2010) have analyzed the post-MFA export performance of Bangladesh's RMG industry and it has been observed that despite the apprehension that exports figure will drop after the MFA termination, Bangladesh still experienced significant growth; the reasons identified are government support, low wage rates, stable exchange rates, and GSP facilities for least developed nations. Hasan (2013) employed a descriptive research design using a survey among a small sample of 15 managers through purposive sampling in different garment companies. His study has revealed that after phase-out of the MFA in 2005, the RMG industry did not suffer loss, rather it expanded due to increased external demand. Ahmed (2013), has examined the shifts and stability within Bangladesh's apparel industry following the post-MFA era, analyzing secondary data from 1998 to 2011. Contrary to previous forecasts of a decline in apparel exports, employment, and factory numbers, there has been a notable increase in each aspect. This remarkable growth and stability can be attributed to the adoption of Lean Manufacturing Techniques, the establishment of an Industrial Police Force, the establishment of new Captive Power Plants, and gaining GSP facilities post-quota elimination. Alam and Natsuda (2016) have investigated in their article, the competitive aspects of the Bangladeshi garment sector in the post-MFA era through a survey conducted with 70 firms in 2012. Despite facing numerous obstacles, three key factors have notably enhanced the industry's export competitiveness: labor costs, technological advancements, and the country's market access policies.

Alam et al. (2017) have utilized World Bank Enterprise Surveys and secondary sources to uncover the drivers of Bangladeshi exports and the factors behind the success of the garment industry in the post-MFA era. Their analysis has revealed that labor cost, productivity, firm size, availability of domestic inputs, and proximity to port cities are key determinants of Bangladesh's garment exports. Additionally, factors such as inexpensive labor, firm size, diversification of products and markets, preferential market access, and proactive government policies contributed to the industry's success post-MFA. So, it is clear from all the studies, contrary to the believe that MPA phase out will negatively affect our garments industry's performance in the global market was quite satisfactory and the reasons identified were cheap labor, proactive government policies, GSP facilities, lean manufacturing technique, proximity to port cities, product and market diversification, technological advancement etc.

The 2012 Tazreen Fashions fire was a pivotal moment in Bangladesh's ready-made garment (RMG) industry, marking one of the deadliest industrial disasters in the country's history. The fire claimed the lives of more than 100 workers and injured many more, drawing global attention to the hazardous working conditions within the RMG sector. In the years that followed, both short- and long-term impacts emerged, influencing factory safety regulations, global supply chains, and the overall resilience of the industry.

The Tazreen fire highlighted the dangerous working conditions faced by garment workers in Bangladesh. In a report by the International Labour Organization (ILO), it was noted that inadequate fire safety measures, such as locked exits and overcrowded working spaces, were major contributors to the high death toll (ILO, 2013). A related study by Clean Clothes Campaign (2013) emphasized that fire was not an isolated incident but part of a pattern of neglect in the industry.

Global supply chains, particularly in the fast fashion industry, have been criticized for prioritizing low costs over worker safety. Anner (2015) discussed the role of international brands in perpetuating unsafe working conditions through their pricing and purchasing practices, which pressure suppliers to cut costs at the expense of safety. Similarly, Donaghey and Reinecke (2018) analyzed the corporate responses to the disaster, particularly focusing on the efforts of global retailers to implement safety reforms such as the Bangladesh Accord on Fire and Building Safety. Following the Tazreen fire, two major initiatives were launched: the Bangladesh Accord on Fire and Building Safety and the Alliance for Bangladesh Worker Safety. These initiatives have been widely studied as examples of collaborative governance between corporations, governments, and labor unions. Reinecke and Donaghey (2015) found that while the Accord made substantial progress in addressing safety concerns, challenges remained in terms of long-term sustainability and full compliance by all factories.

Despite the devastating impact of the fire, Bangladesh’s garment industry has shown remarkable economic resilience. Labowitz and Baumann-Pauly (2014) noted that while there was a temporary dip in exports immediately after the fire, the sector recovered due to continued demand from global buyers. However, the socio-economic impact on workers, particularly those injured in the fire or the families of the deceased, has been more severe and long-lasting (Human Rights Watch, 2015). The fire also had a lasting effect on labor rights activism in Bangladesh. Siddiqi (2017) argued that although the international response led to reforms, the lack of strong worker representation and labor unions has hindered progress on meaningful changes in working conditions. Many scholars, such as Ahmed and Hossain (2016), argue that without empowered worker voices, the sustainability of safety reforms remains uncertain.

In a nutshell, the Tazreen Fashions fire had both immediate and long-term implications for Bangladesh's RMG sector. In the short term, it spurred regulatory reforms, increased factory inspections, and brought global attention to safety issues. However, the long-term impact of these changes has been mixed. While safety initiatives like the Accord and the Alliance contributed to some improvements, challenges remain in ensuring consistent enforcement and addressing systemic issues within industry. Despite these challenges, the RMG sector has shown remarkable resilience, maintaining its position as a leading global supplier of garments. The industry’s ability to recover and adapt, even after such a tragic incident, underscores its importance to the Bangladeshi economy, although continuous efforts are needed to sustain safety and working condition improvements.

Ansary and Barua (2015) have assessed the challenges facing Bangladesh's RMG industry regarding workplace safety post-Rana Plaza collapse. Their study has revealed that despite notable strides in workplace safety compliance, with significant achievements in structural assessments, challenges still persist with around 1000 factories. Barua and Ansary (2016) have addressed the crucial issue of workplace safety, particularly in Bangladesh's RMG industry, following the tragic Rana Plaza collapse. Their paper reviewed the progress and outcomes of various initiatives aimed at enhancing safety within the sector in the three years following the disaster. It emphasized the importance of sustaining momentum and compliance efforts in the long term, even after external support diminishes, to ensure the continued safety and sustainability of the RMG sector in Bangladesh.

Jacobs and Singhal (2017) have examined the impact of the Rana Plaza collapse on the sourcing strategies of global apparel retailers. Despite the tragedy's severity, the stock market reaction to the disaster was negative but short-lived, with no significant long-term effects observed. These findings suggest that retailers may lack strong economic incentives to shift their sourcing away from Bangladesh or other low-cost countries. Following the Rana-plaza collapse, Bossavie et al. (2019) have observed no significant decline in number of workers, but there was a decline in the number of garments factories. Siddiqui et al. (2020) have investigated how the Rana Plaza collapse in Bangladesh influenced private sector responsibility and governance in global supply chains. Through interviews and archival analysis, they found that the disaster prompted multinational corporations to adopt a responsibility framework, leading to improved working conditions in the RMG industry. From the above literatures on Rana Plaza incident, it is obvious Bangladesh RMG industry did not suffer much and even if they have suffered the impact was short lived and among many reasons the reluctance of the buyers to shift their import destination to other low-cost countries is an important one. Unfortunately, after the incident though many policy initiatives were taken at the government level to improve the workplace safely but the actual implementation of many of these policies are still not done.

Islam et al, (2020) have conducted a descriptive study to investigate the impact of the COVID-19 pandemic on the RMG industry of Bangladesh. Through the secondary data analysis, they found that from the beginning of the pandemic, the export of woven and knit items started to decline, which ultimately led the total RMG export to register loss. Moreover, marking the occurrence of factory closure, order cancellations, and job loss, they recommended the pursuit of temporary low price policy and good relations with foreign business partners to tackle the pandemic. Jebin & Hossain, (2020) have also uncovered the impact of increased gas and electricity bills during that period. They found that owners were unhappy with the rise in bills, particularly electricity bills amid the pandemic's deadly effect on them. A descriptive study has been carried out by Akter (2020) to measure the extent to which the pandemic poses a threat to unemployment in Bangladesh. Based on analyzing secondary data, it was found that the global and local recession due to the pandemic would create unemployment issues in various sectors, including the RMG. Kabir et al. (2020) have performed a study on the effect of the coronavirus pandemic on the ready-made garments workers of Bangladesh. Their research has revealed that the COVID-19 pandemic might have a long-term effect on the RMG workers in terms of substantial financial hardship, future employment conditions, and increased health issues. Shimanta et al. (2020) have studied the condition of the RMG sector during the pandemic period. Through analyzing the secondary data, they highlighted this industry's condition in the beginning days of the pandemic and warned about the possibility of an increased unemployment rate shortly due to longer durations of lockdowns.

A study has been done by Siddiquee & Faruk (2020), where they examined the impact of COVID-19 on the economy of Bangladesh using secondary data. Their qualitative analysis encompassed major financial and economic indicators of the economy, including wages, remittance, investments, price level, foreign trade, etc. In the case of the RMG sector, they found that knit and woven garments items experienced a drastic decline. Also, the export, import, and service payments fell sharply during the pandemic. A descriptive analysis has been conducted by Islam (2020), assessed the impact of COVID-19 on the ready-made garments sector of the country by utilizing both primary and secondary data. His analysis revealed that due to the pandemic export orders worth 3.18 billion USD were cancelled. Sultan et al. (2020) have examined the efforts of trade unions to mitigate the fallout of the RMG sector of Bangladesh in the face of the COVID-19 outbreak. Their qualitative study has revealed the likely impact on garment workers due to pay cuts, and job loss as well as highlighting several other issues that urged trade leaders to assist in proper policymaking. Similarly, Ahmed et al. (2021) have carried out qualitative research to assess the impact of COVID-19 on the RMG industry and suggested ways to overcome it. They have suggested that the economic stagflation created by the pandemic might lead to poverty. As this sector employs millions, their review of this sector revealed that over one million garment workers lost their jobs. A study on the economic effect of the pandemic on the Bangladeshi RMG factories has been carried out by Boudreau & Naeem (2021). Their study found that during the early stage of COVID-19, renegotiations and order cancellations were the most common. Even though revenue loss varied widely among these factories, the decline in revenue was witnessed by almost all. Hansen et al. (2021) have carried out a research to find the impact of the COVID-19 pandemic on the ready-made garments industry in India and Bangladesh using both primary and secondary data. They suggested the expansion of social protection programs (unemployment benefits and housing) targeting all garment workers, utilization of a government database specially designed for this sector, and restoring trust between workers, employers, and buyers for reducing the negative effect of pandemic. Mustajib (2021) has assessed the impact of coronavirus on the garment workers of Bangladesh. The research findings showed that curtailed earnings of the workers jeopardized their livelihood as well as deteriorating safety, security, health condition, and social relations. Likewise, using a qualitative research method to assess the impact of the COVID-19 pandemic on the RMG sector of Bangladesh Aktar et al. (2021) have found that garment workers' health and security, unemployment-related issue, and women's empowerment have been affected by the pandemic.

Hossain & Alam, (2022) have predicted the impact of the novel coronavirus outbreak on the economy of Bangladesh as well as on the RMG sector using the Holt-Winters' seasonal additive method. They revealed that according to their prediction, RMG sector revenue would drop by 6854.089 million USD and 2026.187 million USD in 2020 and 2021, respectively. This constitutes a 21.80% loss in the former year and 6.40% in the latter. Highlighting this as alarming, they urge this sector to maintain a good relationship with international purchasers and implement a price reduction policy to improve global demand. A study has done by Rahman, (2022) explored the effect of the pandemic on Bangladesh's RMG supply chain. The study employed a content analysis method. The study found that in the global supply chain, workers are more vulnerable and purchasers failed to maintain corporate social responsibility. Banik (2023), has investigated the potential short-run and long-run impact of the pandemic on the RMG export growth through empirical analysis. The analysis revealed that the COVID-19 pandemic has a significant negative impact on the RMG export in the short run but a positive effect in the long run, through two transmission channels. These channels are, as identified by the study, credit growth and degree of openness to trade. Therefore, the study concluded that increasing international trade and credit flow is essential for the recovery of this sector. It is obvious from all literature that COVID-19 pandemic took a serious toll on our RMG industry.

It can be observed from all the above studies that COVID-19 pandemic has seriously affected the financial condition of the RMG sector. It also has a severe impact on both the financial and health condition of its workers. However, the negative impact on RMG export earnings is expected to be long term but rather a short lived one. The above literature on COVID-19 has also revealed that owners of different factories of this sector maintained their position by Government continuous initiative and support along with collaboration and discussions with the international purchasers.

To summarize, the literature on Bangladesh's ready-made garment (RMG) industry highlights a complex landscape marked by significant growth alongside persistent challenges. Initial studies indicated that the sector thrived in post-MFA, driven by government support and competitive labor costs. However, the Tazreen Fashions fire in 2012 and the Rana Plaza collapse in 2013 brought global attention to the industry's hazardous working conditions, prompting safety reforms through initiatives like the Bangladesh Accord and the Alliance for Bangladesh Worker Safety. Despite progress, ongoing issues related to compliance and worker representation remain critical. The COVID-19 pandemic further complicated the industry's trajectory, causing substantial financial distress and impacting workers' livelihoods. While the long-term effects of the pandemic are yet to be fully realized, the resilience demonstrated by the RMG sector underscores its vital role in the Bangladeshi economy. To ensure sustainable growth and improved labor conditions, continuous efforts are necessary to strengthen safety regulations, enhance worker rights, and foster collaboration among stakeholders.

3. Methodology

This study adopts a qualitative, interpretive approach, focusing on a review of significant national and international events that have influenced Bangladesh's ready-made garments (RMG) sector. The sample period covered spans from 2001 to 2023, enabling the study to capture two decades of transformation shaped by multiple global and domestic disruptions.

Rather than relying on statistical or primary data analysis, the research draws on secondary sources and event-based visual interpretations to explore the sector's resilience. The analysis unfolds in two parts. First, a series of graphs illustrate key events—such as the MFA phase-out, the Rana Plaza collapse, the COVID-19 pandemic, the Russia-Ukraine war, and the ongoing Red Sea conflict—mapped against relevant performance indicators like RMG export earnings, employment trends, and factory numbers.

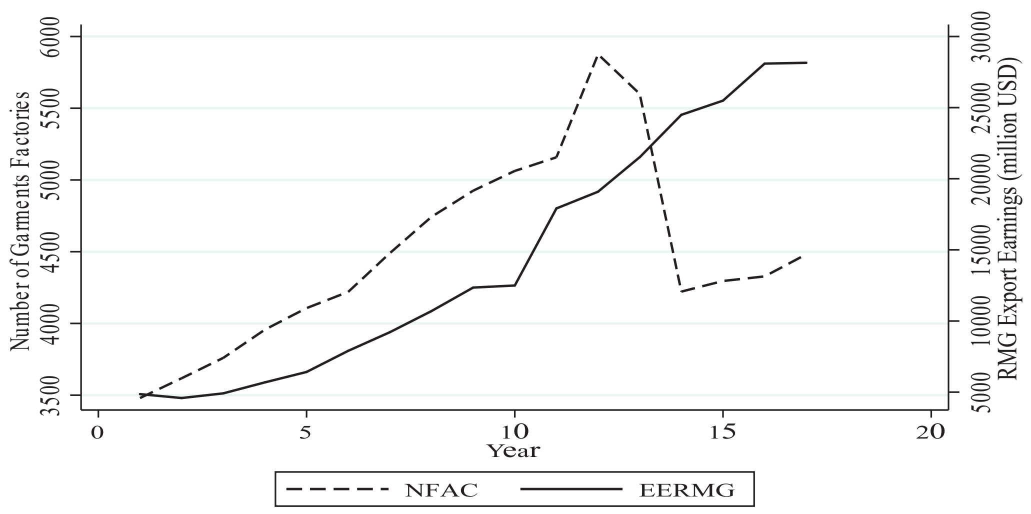
Second, the study applies De Marchi's (2023) Resilience Assessment Model as an analytical framework to assess how the RMG sector has absorbed shocks, adapted to changing conditions, and pursued long-term transformations. This framework has been contextualized for the Bangladeshi RMG landscape, relying on literature, reports, and visual insights rather than primary field data.

By combining historical review with framework-based interpretation, the paper aims to offer a grounded and nuanced understanding of resilience in Bangladesh's RMG sector over time.

4. Findings and Analysis

4.1 Tazreen Fashions and Rana Plaza Incident

The tragic fire at the Tazreen Fashions factory in November 2012 and on April 24, 2013, the collapse of Rana Plaza in Bangladesh resulted in the death of 1,134 workers and injuries to nearly 2,000 more (Hashad, 2015). These two tragedies in two subsequent years exposed severe labor law abuses and unsafe working conditions. After these incidents stricter safety measures were implemented, leading to a decline in garment factories in the 2013-14 fiscal year. This was a major challenge for Bangladesh, a country with heavily reliance on RMG exports.



Source: Authors Calculation from BGMEA and EPB data

Figure 1. *Number of garment factories vs RMG export earnings*

However, though the number of factories declined after the Tazreen Fashions and Rana Plaza incident, RMG export earnings have not declined proportionally. Instead, export earnings rose due to low products cost and stable demand for apparel from the international buyers.

It can also be observed from figure 2 below, though the number of factories declined following the occurrences, but the number of workers employed did not fall, maybe due to the inability to find a suitable alternative job. (Data from 2000-01 to 2016-17 show this resilience Figure 1 and 2).

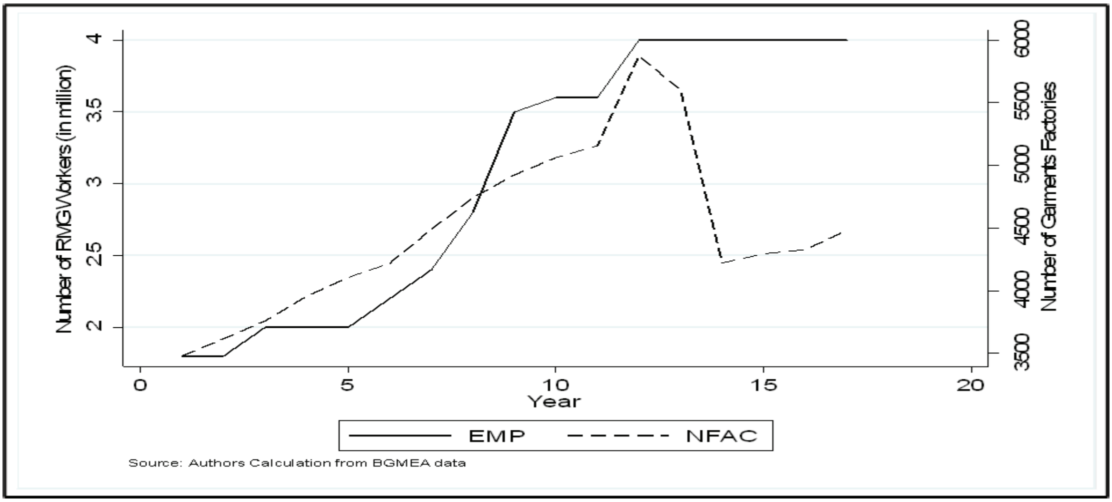


Figure 2. *Employment level vs number of garments factories*

Though more than a decade has passed since these two incidences, but the industry's current situation still indicates lapses in safety measures. In 2019 the government issued a guideline mandating safety compliance. The RMG Sustainability Council (RSC), aims to sustain safety standards but lacks binding authority, raising transparency concerns. According to a study by Action Aid (2019) in Bangladesh, a majority of Rana Plaza survivors now live in poverty, despite receiving US$30 million from the Rana Plaza Arrangement, full compensation under a national employment injury insurance system has not materialized. In June 2022, a three-year Employment Injury Scheme (EIS) was initiated, aiming to cover 150,000 workers and provide compensation for medical treatment and lost income (Biswas, 2023).

4.2 COVID-19 Pandemic

The year 2019 can be marked as a period of stability and remarkable expansion for Bangladesh's ready-made garments (RMG) industry. However, this progress has been abruptly halted due to the outbreak of the novel coronavirus in the late 2019. Originating from China's Wuhan, the virus quickly disseminated around the globe (Shereen et al., 2020) and has been given the status of a pandemic within a month (Cucinotta & Vanelli, 2020). The outbreak of coronavirus caused the global economy to collapse. Consequently, the trading situation deteriorated rapidly (Naseer et al., 2023). Given the fact that, Bangladesh has grown to be a prominent export market participant through RMG, its vulnerability to this shock was indeed greater. Moreover, this sector's vulnerability to the crisis doubled when its major export destinations, the United States of America (USA) and the European Union (EU), have been reported to be among the most affected countries by the pandemic. As a result, due to prolonged lockdowns and safety measures, along with other institutions, their retail shops, and malls remained shut, consumer spending declined and clothes supply piled up (Zamir, 2020). The reduced demand from importing regions coupled with halted production due to lockdown in the country resulted in a significant drop in the RMG export earnings.

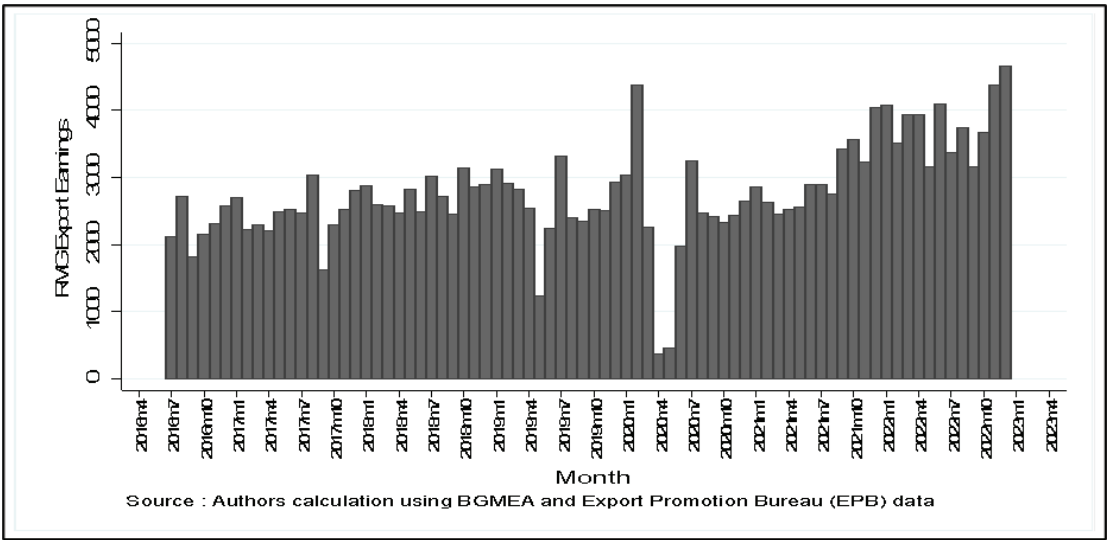


Figure 3. *RMG export earnings (Million USD)*

This decline in earnings is evident in figure 3, which illustrates monthly earnings from July 2016 to December 2022. In the pre-pandemic period, spanning from 2016-2019, fluctuation in earnings were observed, however, after coronavirus outbreak (2020-2022), a downward trend in the earnings became apparent. It was recorded to be the lowest on April 2020 with the value of 374.66 million USD only. Whereas only a few months earlier at the end of 2019, export earnings from this sector were at its peak. This drop in April, during the first wave of pandemic constituted a decline of around 85% in RMG export earnings growth in comparison to that of previous year (2018-19). In the consecutive months, the decline in RMG export growth continued.

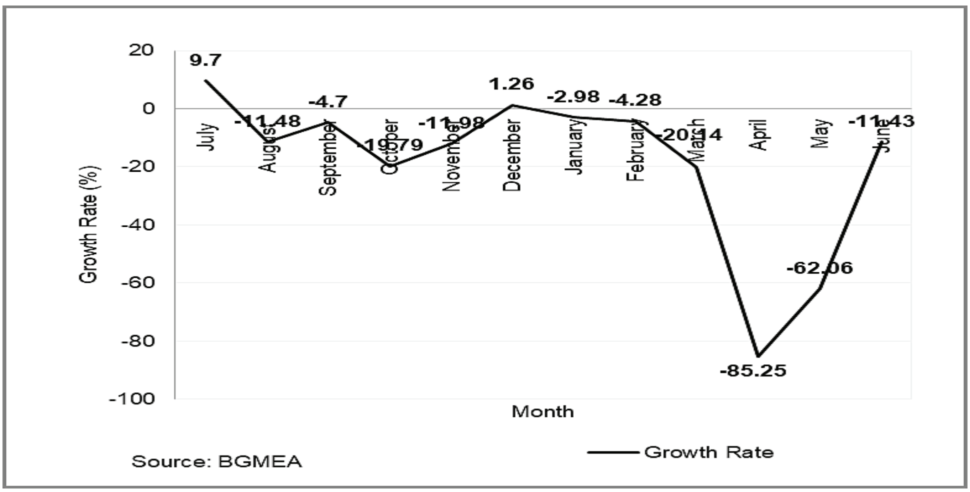
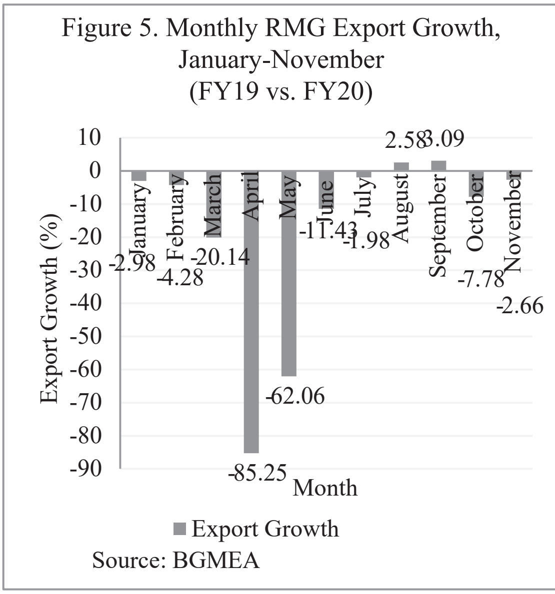


Figure 4. *RMG export earnings growth, monthly, FY2019-20 vs. FY2018-19 (Y-O-Y basis)*

As can be seen in the graphical representation in figure 4, in May and June 2020, there was 62.06% and 11.43% drops in earnings on year-on year basis. Overall, in terms of yearly analysis, in 2019-20, the growth rate of RMG export stood at -18.12%, this was the lowest in two decades. This drastic decline can be attributed to order cancellations stemming from reduced demand in exporting destinations during the crisis.

According to the BGMEA report, during March to April 2020, the export order suspension and cancellations from international retailers and buyers were worth of 3.18 billion USD (Majumder, 2021). Major export destinations USA, Europe and Canada alone cancelled and held orders worth of 2556 million USD, whereas non-traditional markets were responsible for the rest (620 million USD). Also, around 1150 factories faced order cancellations from over 1300 buyers (BGMEA). Furthermore, the halted production for 40 consecutive days from March to April 2020 resulted in difficulties in wage payment, unmet overhead costs and bank liabilities, lay off or termination of workers, and even temporary or permanent factory shutdowns. Therefore, the far-reaching consequences of the pandemic were evident.

However, in the month of August and September 2020, the RMG industry's earnings growth again displayed positive figures (figure 5). Stimulus packages and policy supports announced by the government, negotiations with global brands, media supports and reopening of garments factories might have played an important role. But this growth was again halted by the emergence of second wave. As a consequence of its early impact, the export earnings again started to plummet (see figure 5). Furthermore, the retail sales in the major exporting destinations also started to decline (figure 6).



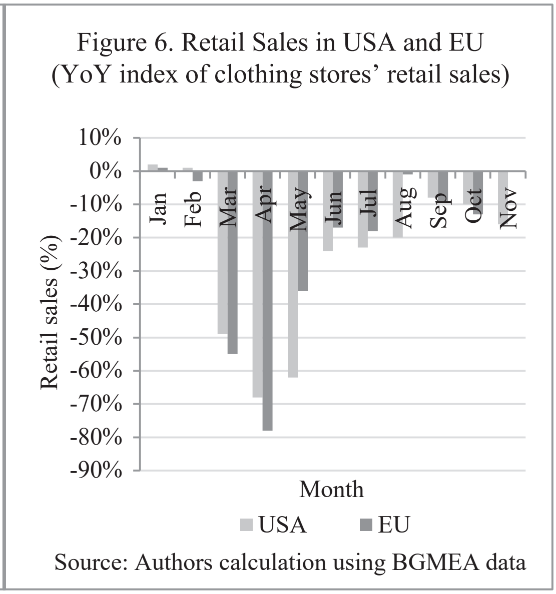


Figure 5 & 6. *Year-on-Year Changes in RMG Export and Retail Clothing Sales During FY19-FY20*

As a spillover effect of the pandemic, decline in the number of garments workers and number of factories was anticipated. But upon analyzing these data it can be seen that, both followed an upward trend over the years. Even throughout the pandemic period of 2019 to 2021, there was a gradual increase in both numbers. It is also observed that the continuous decline in the apparel price is a longstanding trend in the realm of global trade, predating the onset of COVID-19 pandemic. Amidst continuously rising production cost, following the outbreak of coronavirus, garment factory owners found themselves compelled to allocate additional funds for sustainability and safety measures, thereby adding to the already mounting expenses. According to Majumder (2021)'s report in the Apparel Story published by BGMEA, Bangladesh's export price observed a year-on-year decline of 2.17% in January-September period. Furthermore, the newsletter underscores that roughly 85% to 90% of the substantial order losses were reinstated by negotiations. Nevertheless, a significant portion of these recovered orders has been subjected to discounts ranging from 20% to 50%. As a result, manufacturers were compelled to cut prices, thereby diminishing the competitiveness of Bangladeshi RMG in the international market.

4.3 Russia-Ukraine War

Commencing on February 24, 2022, the Russian invasion of Ukraine unfolded during the time when the global economy was still in the process of recovering from the disruptions caused by the COVID-19 pandemic. The on-going conflict, marked by a lack of reconciliation between the two parties involved, holds potential for significant global implications. The Bangladesh RMG industry, due to its over exposure to the international market, is once again a matter of concern. Though the countries of the European Union (EU) and the United States (US) continue to be the largest importers of Bangladeshi apparel, over time this industry has diversified its market presence worldwide. The two countries now at war are also export destinations of Bangladeshi RMG. With an estimated worth of more than one billion USD (annually), Russia has been regarded as the emerging market for Bangladeshi apparel, while Ukrainian market is relatively small. However, the dynamics have somewhat changed due to the outbreak of war. Naturally, the export of RMG to both nations would be impacted. Again, there is a possibility that neighboring EU countries of Ukraine may get involved or affected by the war. Therefore, relatively less apparel export to Ukraine does not rule out the possibility of significant negative impact on the entire RMG sector, as more than 50% of the RMG is destined towards the EU.

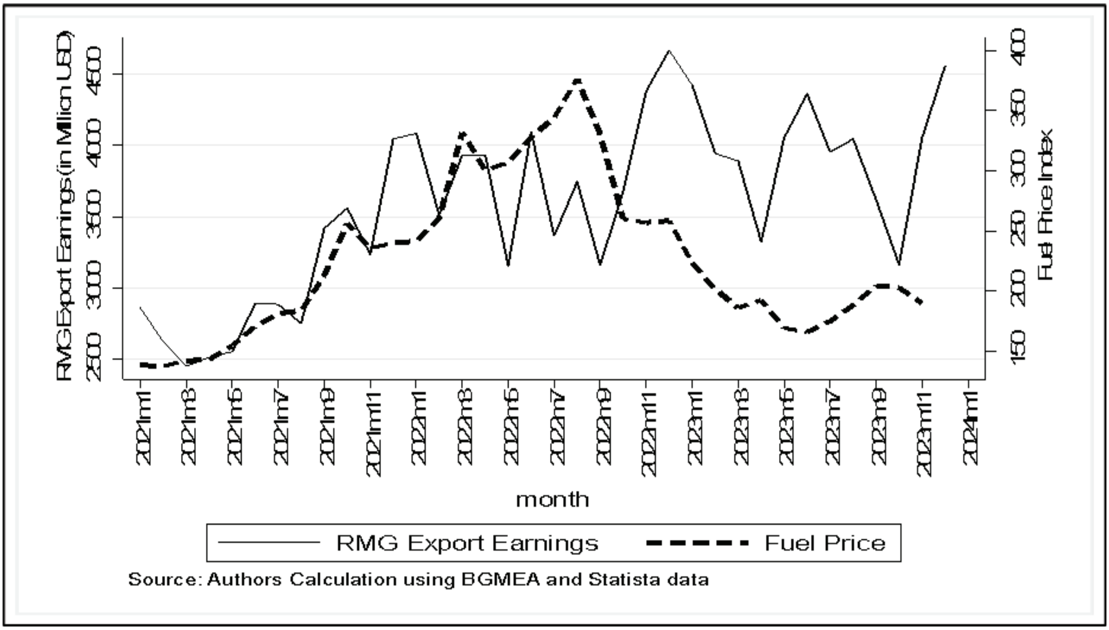
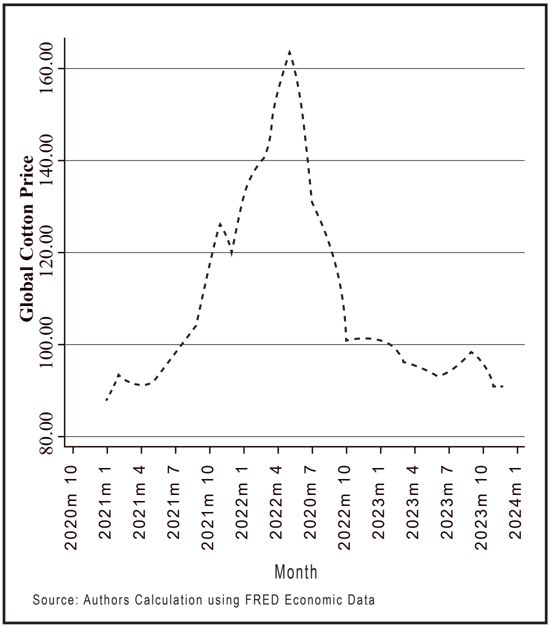


Figure 7. *RMG export earnings VS fuel price*

The direct consequences of the war are felt on the energy sector; particularly due to Russia's prominent position as one the third largest oil exporter. Consequently, fuel prices skyrocketed in the international market. Since Bangladesh is depended upon imported fuel for power generation, the country's government had to increase both power and gas prices. As a result, the surge in energy cost substantially impacted the apparel industry, where it is a crucial necessity. Many factories struggled to complete production to fulfill existing orders, let alone initiate new ones. The graphical representation in Figure 7, plotting monthly RMG export earnings and fuel price index worldwide (Index use as base 2016 = 100 and includes crude oil, natural gas, coal price and propane indices) from January 2021 to December 2023, provides insight into the situation. Before the outbreak of the war, RMG export earnings exhibited an upward trajectory. However, after the war commenced, earnings started to fluctuate and consistently remained below the levels observed at the start of the year 2022 for some months.

Simultaneously, following the war, the fuel price skyrocketed, reaching a record high of 376.41 in August 2022, followed by a steady decline. Despite the decline in fuel price, earnings fluctuation persisted.



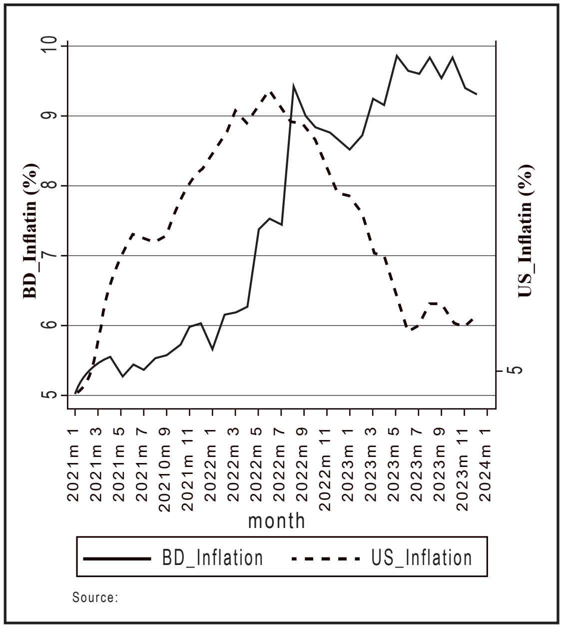


Figure 8. *Global cotton price (US cents per pound)* & **Figure 9.** *Inflation rate of US & BD*

According to the World Bank's Commodity Markets Outlook report, the war in Ukraine has emerged as a major shock to the commodity market (Husband,2022). The report projected a substantial rise of around 40% in cotton price, with an expected easing down in 2023. As Bangladesh's RMG sector heavily depends on imported cotton for its production purpose, higher price of it in the international market, therefore, posed as another threat to this industry. Following the war, the price of cotton indeed soared high. The peak was recorded in August 2022, when it exceeded 160 US cents per pound in the international market (refer to Figure 8). Even though it showed a gradual decline as 2023 approached, since the war has not ceased yet, there remains a high possibility that cotton prices may rise again. Clearly, the rapid increase in production cost due to raw material price hike and the persistent energy crisis make it difficult to picture this sector's future condition.

In the post-COVID period, as the countries around the globe started expanding their economic activities, they encountered supply shortage in the face of excessive demand. This imbalance created inflationary pressure which has been exacerbated by the ongoing war, as it caused a substantial hike in the prices of food, fuel, and certain raw materials. Furthermore, the energy crisis alone has potential of driving up prices of various commodities by increasing production cost (Husband, 2022). Major economies worldwide, including Bangladesh's largest RMG importers such as the EU and the USA (Figure 9) are battling with high inflation. This inflationary trend is not limited to developed nations; developing and underdeveloped nations is similarly impacted. Figure 9 highlights the inflationary condition in the US and Bangladesh, which notably exceeded 9% after the onset of the war. During that time period the exchange rate experienced a rapid depreciation, as illustrated in Figure 10.

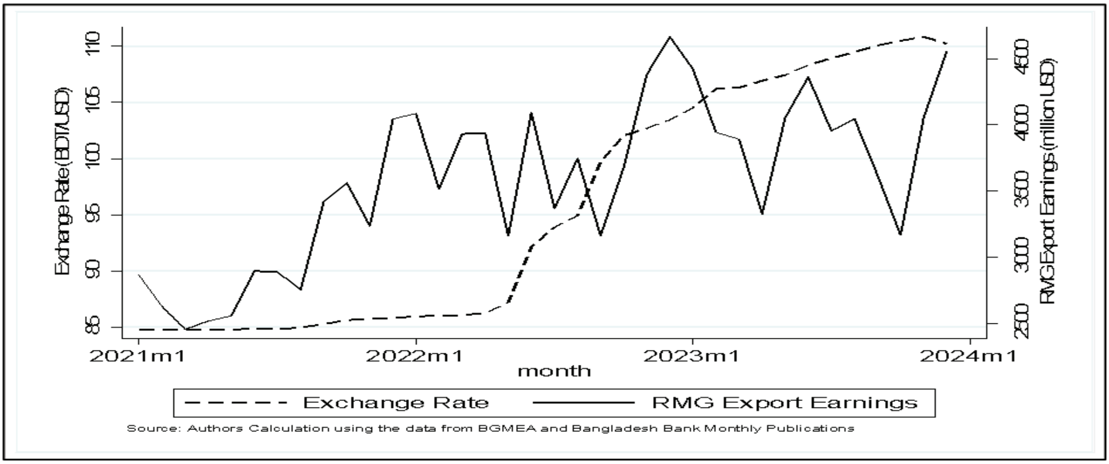


Figure 10. *Exchange rate vs. RMG export earnings*

Typically, devaluation implies an increase in earnings when export earnings are converted into domestic currency. However, contrary to this expectation, Figure 10 indicates that earnings remained relatively low when the exchange rate was high. This discrepancy can be attributed to the fact that the elevated exchange rate led to increased costs for importing raw materials, which were already experiencing a surge in prices.

Table 1. *RMG export earnings from three major importers (Value in Million USD)*

Countries	July-Dec FY 2022-23	July-Dec FY 2023-24	Growth (%)
EU	11,504.83	11,361.66	-1.24
USA	4,278.50	4,035.04	-5.69
Canada	774.16	741.94	-4.16

Source: BGMEA

Incidentally, consumers all around the world are becoming more cautious about their spending. They have reduced their budget on clothes as food and fuel are to be purchased at a significantly higher price (Rahman, 2022). Consumers of Bangladesh's RMG in the western countries are no exception. They are reducing their demand for clothes, which is resulting in fewer orders. As a consequence, export earnings from these major destinations experienced a decline as depicted in Table 1. In the first half of the fiscal year 2023-24, the RMG export earnings from the major three importers registered a noteworthy decline, thus intensifying challenges further for this industry.

4.4 Red Sea Conflict

The RMG industry of Bangladesh, already struggling to recover from the severe fallouts of COVID-19 pandemic and Russia-Ukraine war, is now confronted with a new challenge – The Red Sea Conflict. On the third week of October 2023, Houthi forces from Yemen, supported by Iran, initiated attacks on Israel-linked ships in the Red Sea. This conflict originated in response to the latter's shattering war in the Gaza Strip (Mirdha & Halder, 2024). Since then, this route has become a center of global tension. The crisis has further deepened with intensified counterattacks on the rebel groups by the UK and the US (Mirdha & Halder, 2024).

The Red Sea, responsible for approximately 30% of the global container traffic, plays a crucial role in facilitating over 40% of trade between Asia and Europe, thus, disruption in the supply chain due to this crisis is evident (Mirdha, 2024). Moreover, The Red Sea-Suez Canal serves as the fastest and most efficient route, handling over 65% of the multibillion-dollar garment exports destined for Europe and the U.S. from the South Asian nations (Mahmud, 2024). Bangladesh heavily relies on this route for export of not only RMG but also of jute, pharmaceuticals, frozen food, leather, and handicrafts (Illius & Chowdhury, 2024). Given that more than 80% of its export earnings come from the RMG sector, this crisis poses a severe threat to the country's core engine. This situation is further exacerbated by the country's shallow main port, resulting in delays in order deliveries even when there are no geopolitical disruptions (Mahmud, 2024). Consequently, to avoid the crisis, the majority of the vessels are rerouting through the African or Cape of Good Hope route. However, this alternative is both costly and time consuming (Tuhin, 2024). This is primarily because ships have to cover an additional distance of around 3500 kilometers more (Mirdha, 2024) which increases shipping time by at least 10days and shipping cost by nearly 40% (Mirdha, 2024). Moreover, Bangladesh suffers from lead time deficiency, with its shipping time being 15-20 days longer than that of the major exporting nations such as Indonesia, and Vietnam. As a result, businesses are turning to competitors offering shorter lead time, thus, rendering the Bangladeshi RMG less competitive in the international market.

Table 2. *Freight Charges*

	40-Foot Container Freight Charges		
Destination From Chattogram to	In normal time (USD)	Surcharges due to conflict (USD)	Current charg (USD)
Europe	1800-2000	1200-1500	3000-3700+
USA	2500-2800	1200-1600	3700-4400+

Source: TBC Insight by IPCD Finance (The Business Standard)

The cost of rerouting commercial vessels has seen a substantial increase, surging from 1500 USD to 4000 USD per container (Textile Today, 2024). This increase can be primarily attributed to heightened fuel consumption by spending an extra 10 days at sea (Textile Today, 2024). A notable issue exacerbating the situation is the scarcity of 40-foot containers. According to the Bangladesh Inland Container Depots Association (BICDA), 75% of the RMG exporters rely on these containers to ship their products (Mahmud, 2024). However, there is severe shortage of the same in the Chittagong port. This has occurred by opting for the Cape of Good Hope route over the Red Sea, as ships carrying containers now have to spend at least 22 days more at sea (Illius & Chowdhury, 2024). As highlighted by Illius et al. (2024) shipping companies have raised container transport freight charges from Bangladesh to USA and Europe by a minimum of 40% (surcharge) due to rerouting (see Table 2). Moreover, there is indication of another 20%-25% raise due to the continued impact of the Red Sea attack. Consequently, trading costs are increasing rapidly.

To maintain the strict lead time, many international retailers have already opted for air shipment instead of seaways. As in this competitive market, without delivering on time, there is little chance of getting future orders from the buyers. However, in the case of air shipment profit is nearly zero, since airfreight costs 15 to 20 times more than seaways (Illius & Chowdhury, 2024). Currently the shipping costs are borne by the buyers, as Bangladeshi garment exporters utilize the freight on board (FoB) method. However, there is a potential scenario where buyers may demand discounts in future to offset the higher shipping costs.

The Red Sea trade route accounts for a trade value of about 4 Billion USD for Bangladesh. Around 61% of its exports make their way to America and Europe through this route, and 8% imports also follow the same path (Illius & Chowdhury, 2024). Bangladesh's imports encompass a range of essential goods, including petroleum, food, edible oil, LNG, wheat, rice, sugar, pharmaceutical ingredients, industrial and chemicals. The country's RMG is highly dependent on imported raw materials for production. Consequently, timely shipment of the same is vital. But due to the crisis this might be hampered. Also, owing to soaring fright costs, the prices of imported raw materials and necessary commodities may increase in the domestic market, this, in turn, may contribute to elevating the inflationary level further.

Back-to-back severe global crises have already put Bangladesh's export under stress. If these difficulties persist, the foreign currency reserves, which have reached a record low, will not receive the necessary boost from the external sector. Consequently, taka will remain under pressure, resulting in higher import costs and elevated level of inflation (Mirdha, 2024). The turmoil in the Red Sea Canal, however, is already posing additional challenges by causing another supply chain disruption like war. If this unrest persists, its RMG sector will be especially impacted along with other export-oriented sectors. There is also a concern about potential job losses.

5. Challenges Ahead

In light of Bangladesh's impending transition from Least Developed Country (LDC) to a developing nation by 2026, the country's central bank has recently declared the discontinuation of cash incentives for 43 sectors including the vital RMG industry. The RMG sector contributing nearly 84% of the country's total exports has been the primary beneficiary of cash incentives. Recent government data reveals that a significant portion, approximately 65% of these cash incentives, totaling nearly 5,000 Crore BDT, is directed towards the garments and textiles industry. However, the government has opted to discontinue this incentive for five specific HS code RMG products (refer to table 3). According to the data from the BGMEA, these products played a substantial role, contributing 25.95 billion USD in exports, making up 55.22% of the total RMG exports and 46.71% of the overall export in the last fiscal year. Notably, four out of these five HS code products four belong to the knit sector, resulting in 70- 80 % of the knit apparels, considered high value items, losing access to cash assistance. Additionally, cash incentives for exports to three major new markets—India, Australia, and Japan—initially set at 4% have undergone a shift. The recent circular has reclassified these three markets into the Traditional Market category, leading to the removal of the cash incentive for export to these destinations.

Table 3. *Incentive Rates and Exclusions for Garment Industry Sectors in Bangladesh*

At present different sectors of the garment industry receive incentives at the following rates	The Apparels items and markets Not allowed to Enjoy Cash Incentives
1. 3% as support for new products or market expansion 2. 3% in instead of tariff bonds and duty draw-backs, 3. an additional 4% for all small and medium industries in the knit, woolen and sweater sectors 4. an additional 1% for exporters in the textile sector in the euro area 5. special cash assistance at the rate of 0.50% to readymade garments sector	• Harmonized system (HS) codes of 6105, 6107, 6109, 6110, and 6203 that is, men's or boys' knitted or crocheted briefs and similar articles, men's or boys' knitted or crocheted shirt knitted or crocheted t-shirts, singlets and other vests, jerseys, pullovers, cardigans and similar articles, and men's or boys' suits, jackets, blazers, trousers, ensembles, etc. • Major new markets—Australia, India and JapanSource: The Dhaka Tribune ((Hossain (2024)'s report)

Following the aftermath of the COVID-19 pandemic, the Russia-Ukraine and Israel-Hamas conflicts, global economic strains have become more pronounced. Bangladesh, too, is facing an escalating cost of business, driven by factors such as the dollar and gas crises. The government's decision to reduce cash incentives for exports has garnered resistance from the ready-made garments (RMG) sector, as it comes at a crucial time when the industry is already under pressure. Exporters within this industry have voiced their concerns, objecting to the time of the government's move. The decision comes at a time when the sector is already facing difficulties due to prevailing economic conditions. Despite the resistance, economist are backing the government's initiative, recognizing the necessity to shift from incentive-driven approaches to those based on efficiency and productivity. They argue that sustained incentives are not feasible and advocate broader measures, including reducing business costs, addressing extortion, and streamlining bureaucratic process. While industry authorities like BGMEA and BKMEA express their worries about sector's competitiveness globally, economists believe that phased implementation of the initiative over an extended period will help soften the immediate impact. Professor Mustafizur Rahman, from the Centre for Policy Dialogue (CPD) underscores that cash incentives, while significant, should not be the sole focus, urging a comprehensive strategy for business growth (Uddin & Prince, 2024).

The withdrawal of cash incentives, however, raises worries about the sector's competitiveness in the international market, particularly amid consecutive global crises and disruptions in supply chain due to on-going wars. The challenges include a decline in RMG exports due to global economic setback, a dollar crisis, exchange rate fluctuations, reduced remittance, and persistent gas shortages. Compounding the issue is Bangladesh's reliance on imported raw materials (cotton and petrochemicals) for RMG production, while other garment-exporting countries like Pakistan and India produce their own raw materials.

Critics argue that the timing of withdrawing incentives from a major foreign earnings sector, given the current economic climate, is inappropriate. The Finance Ministry, responding to protests from exporters and recognizing the potential risks, has requested the central bank to reinstate cash incentives on export of the items under the five HS codes as well as on Australia,

India and Japan by reenlisting them as new markets again. Considering current challenging economic climate and exporters protests that withdrawal of cash assistance at this point will jeopardize not only the RMG industry but also the overall economy, the fresh Finance Ministry asked central bank to reinstate cash incentives for five HS codes and markets like Australia, India and Japan. This reinstatement aims to preserve the RMG industry's competitiveness, stimulate exports, and bolster foreign earnings during this challenging economic peril.

5.1 Man-made Fiber (MMF)

Bangladesh's export of ready-made garments (RMG) is predominantly centered on cotton- based apparel, constituting 70% of earnings in FY2023. However, there is a growing global demand for synthetic fiber clothing with higher price points, and some progress has been made in this direction. Entrepreneurs have entered this segment, particularly in woven-RMG exports, where the share of non-cotton items has risen from 26.9% to 39.4% between FY2015 and FY2023 (Rahman, 2024). While woven items see positive changes, the scenario for knitwear remains relatively stagnant, with the share of non-cotton items holding steady at around 24% (Rahman, 2024). Despite Bangladesh's strong position in the global apparel market, the actual investment in synthetic and manmade fiber-based items falls below its potential. Production in this segment tends to be more capital-intensive and technology-driven, revealing the country's inadequate technological advancement. Leveraging its successful track record in overcoming challenges, Bangladesh's RMG sector can address this issue through sound policies and initiatives and in turn achieve diversification within the industry. Certainly, this would present an opportunity to strengthen the sector further by capitalizing on untapped potential.

6. Prospects

6.1 Virtual Marketplace

Bangladesh, despite ranking as the world's second-largest apparel exporter and making significant strides in digitization and automation within the readymade garment (RMG) sector, faces a paradox as it has yet to develop a virtual marketplace to showcase its products. The nation has yet to establish a virtual marketplace for showcasing its products, forcing manufacturers to rely on traditional brick-and-mortar systems. This situation stands in contrast to Bangladesh's overarching goal of achieving a "digital Bangladesh." The global surge in online sales, especially during the COVID-19 pandemic, highlights the crucial role of virtual marketplaces. Given Bangladesh's substantial potential in the fashion industry, embracing e- commerce becomes imperative, considering its heightened popularity post-pandemic.

A virtual marketplace could emerge as a conduit for Small and Medium-sized Enterprises (SMEs) to enter the global stage, meeting the demand for custom-made products. This presents an opportunity for Bangladesh to shift from being merely a manufacturing hub to a global force in design and innovation. The decision to join established platforms like Amazon, Walmart, and eBay or to develop a unique marketplace necessitates careful consideration. Critical for success are adjustments in existing policies, intensified branding efforts, and the resolution of trust issues in online shopping. The fashion industry, a cornerstone of the economy, can significantly contribute to Bangladesh's development goals by embracing technological advancements and capitalizing on the escalating trend of virtual marketplaces.

In response to these challenges, the Bangladesh Garment Manufacturers and Exporters Association (BGMEA) launched a feasibility study, executed by Light Castle Partners, to explore the potential of a tailor-made virtual platform for the country's textile and apparel sector. The study, unveiled at the BGMEA headquarters (on January 25, 2024) evaluates market potential, gauges sector readiness, and proposes sustainable business models while addressing policy gaps for effective implementation. The principal objective of the virtual marketplace is to seamlessly integrate the local textile industry into global value chains, leveraging the increasing inclination towards online purchases. Key strategic approaches underscored in the report involve expanding Business-to-Business (B2B) activities into emerging markets such as Asia and the Middle East and creating additional value through establishing direct connections (B2C) between Bangladeshi manufacturers and end customers. The envisioned virtual platforms would operate as independent private entities, offering comprehensive support in logistics, design consultations, secure payment systems, and matching spare capacity.

Nevertheless, challenges persist, stemming from the lack of a well-defined international e-commerce policy. Issues include the absence of global payment gateways, difficulties in securing working capital financing, complex export processing for small orders, and impractical return policies. Despite these hurdles, the report underscores the potential of the virtual marketplace to become a central hub for stock lots, fostering connections among local producers, traders, and international buyers in emerging markets.

The accelerated pace of digital transformation, particularly due to the COVID-19 pandemic, accentuates the urgency for Bangladesh to overcome obstacles hindering entry into the virtual marketplace. Additionally, the sector faces challenges from geopolitical tensions, a dollar crisis, exchange rate fluctuations, and heightened competition from low-cost nations. Establishing a virtual marketplace could provide a significant competitive advantage, serving as a catalyst for economic growth, global market expansion, and a transformative shift towards innovation in the country's garment sector.

6.2 Regained Global Rank and Green Factory Milestones

As indicated by the recently published "WTO Trade Statistical Review 2021," Bangladesh has successfully reclaimed its position as the world's second-largest apparel exporter after being temporarily displaced to the third position by Vietnam in 2020. The readymade garment (RMG) exports to major markets such as the USA, EU, and non-traditional markets have displayed notable growth. Additionally, Bangladesh has emerged as the primary supplier of denim for both USA and EU. This highlights a substantial demand for Bangladesh's RMG, reflecting positively on its market standing. In another significant accomplishment in 2022, a record-breaking 30 factories in the country achieved green certification. This achievement establishes Bangladesh as the global leader with the highest number of green garment factories, totaling 183 USGBC LEED-certified facilities. Such successes inject a positive impetus into strategies geared towards ensuring the sector's prosperity through sustainable practices and ongoing growth.

6.3 Cash Incentive Reinstatement

The government's decision to withdraw cash incentives from the RMG sector, amidst ongoing global crises and supply chain disruptions due to ongoing wars, presented an additional challenge for the industry. However, in response to continued protests from exporters and recognizing that discontinuing incentives during such crises would undermine the sector's competitiveness in the global market, the government reinstated the incentives. This move is expected to preserve the RMG industry's competitiveness, boost exports, and result in increased foreign earnings.

The RMG sector showed a positive performance following a challenging October-December quarter in 2023, with the export growth curve taking a favorable turn (see figure 11). According to data from the Export Promotion Bureau (EPB) compiled by the BGMEA, the country exported garments worth 4971.84 million USD in January, reflecting a significant 12.45% year-on-year growth—marking a historic high in single-month export turnover. Additionally, both knit and woven exports recorded year-on-year growth of 17.32% and 7.16%, respectively. As the pressure on major economies due to high inflation and interest rates diminishes and the economy rebounds alongside a revival in exports, it is anticipated that 2024 will witness a comeback in terms of trade and growth.

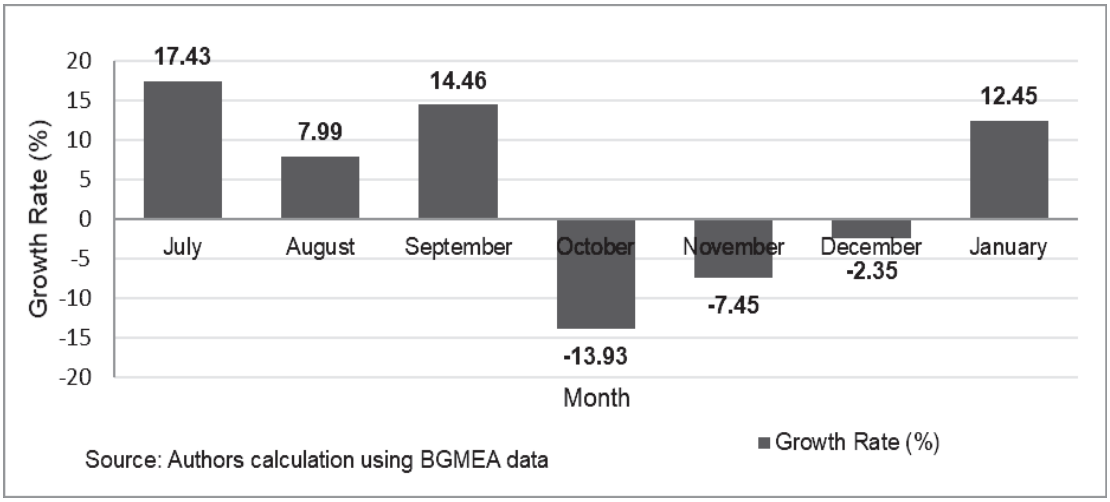
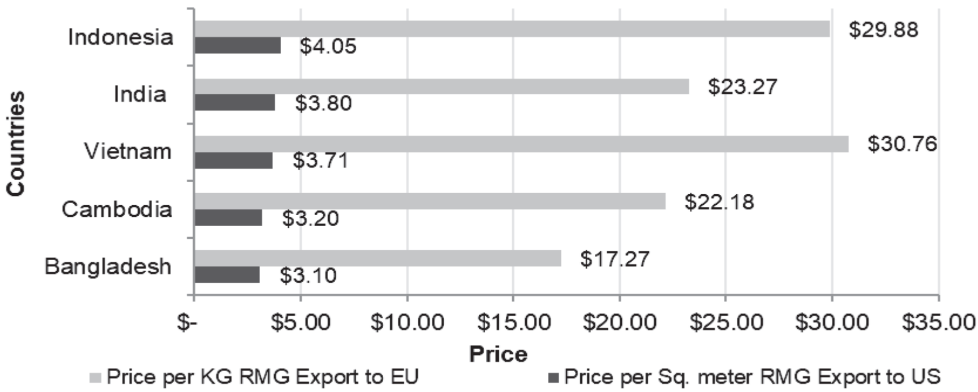


Figure 11: *RMG export growth in 2023-24 from 2022-23 (%)*

BGMEA President Faruque Hassan attributes this positive trend to the sector's efforts in diversifying products, expanding the market base, continued expansion, and progressing in value addition.

6.4 Embarking on Value Addition

Despite Bangladesh securing the world's second-largest position in RMG exports, the majority of its exported items are relatively low-priced, resulting in prices lower than those of its competitors. This discrepancy persists even though Bangladesh exports more than its counterparts. A visual representation (figure 12) using data from the Office of Textiles and Apparels (OTEXA) under the US Department of Commerce reveals that Bangladesh receives the lowest prices for exports to both the US and EU (Zaman, 2023). In response to this pricing challenge, the industry has strategically diversified by introducing value-added items, including waterproof garments, men's and women's blazers, suits, leather jackets, printed, embroidered suits and jackets, and slow-moving high-end fashion products (Rahman, 2024). This strategic shift towards exporting these value-added items aims to command higher prices, ultimately strengthening the industry's overall position and competitiveness in the global market.

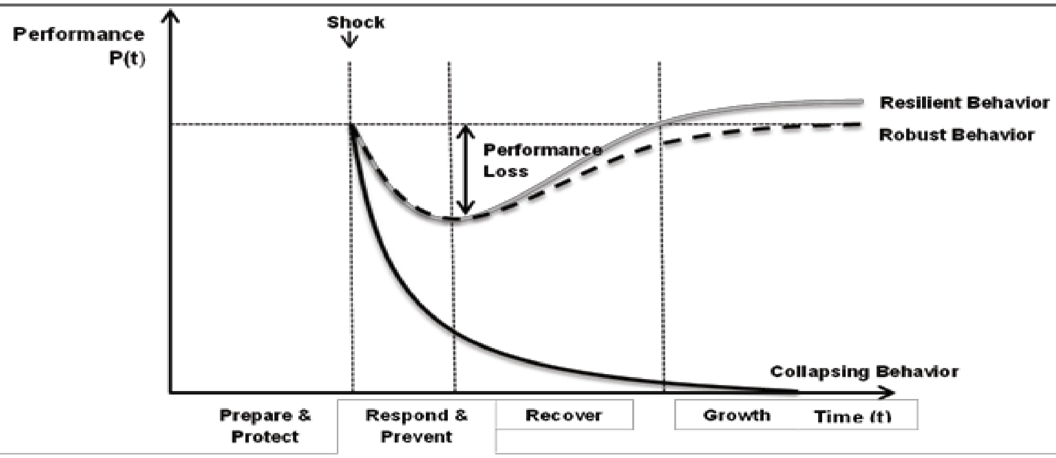


Source: Authors calculation using OTEXA data collected by the Textile Today

Figure 12. *Price received from exporting RMG to US and EU*

7. Resilience Assessment

To assess the resilience of Bangladesh's RMG industry amidst national and international crisis, this study draws on the framework proposed by De Marchi er al. (2023). Specifically, we employ the Resilience Assessment Model for Manufacturing Enterprises (Performance Curve), along with a Four-step Circular Resilience Assessment Tool (CRAT). Together these tools offer a systematic and clear way to understand how this sector reacts to disruptions, manages their impact, and recovers, thus, providing a structured approach to measure resilience over time.



Source: Authors' construction using information from De Marchi et al. (2023)'s article

Figure 13. *Resilience Assessment Model for Manufacturing Enterprises, Performance Curve*

The above Figure (Figure 13) illustrates the performance curve by De Marchi er al. (2023) which outlines the four critical stages of resilience: Prepare and protect, respond and prevent, recover and growth.

1. **Prepare and protect:** Bangladesh's RMG sector's initial efforts focused on strengthening its resilience to the global market changes, notably after MFA phaseout in 2004. Although many feared a decline in export due to the removal of quota protections, the industry continued to grow. Researches (Abdul and Joarder, 2010; Ahmed, 2013; Alam et al., 2017) show that proactive government initiatives, the adoption of lean manufacturing, low labor costs, preferential trade agreements (GSP facilities), market and product diversification, technological advances etc. contributed to sustaining competitive positioning. This preparedness allowed the sector to protect its market position, reflected in its consistently increasing export earnings, despite facing external shocks.

2. **Respond and prevent:** The RMG sector responded to major crises like Tazreen Fashions fire (2012) and Rana Plaza collapse (2013) by improving safety standards and factory compliance. While the number of factories dropped from around 5000 to 4500, export earnings remained relatively steady, reflecting the sector's strategic focus on retaining international buyers through compliance improvements. Similarly, during the COVID-19 pandemic, the sector faced a sharp 85% drop in export earnings in April 2020 (USD 374.66 million). However, it quickly recovered over 4000 million USD in subsequent months, supported by government stimulus packages, renegotiated orders, and strict health protocols (Figures 3 and 4). Literature highlights that consistent production alongside enhanced worker safety played a key role in minimizing long term disruptions (Majumder, 2021).

3. **Recover:** The recovery phase is characterized by a strategic rebound in export earnings and production volume. Government's stimulus and strategic engagement with international buyers played a significant role in this. For instance, export growth recovered from a drastic fall of 85% in April 2020 to a positive trend in mid-2021, driven by reinstating cancelled orders. In January 2024, export earnings reached a record high of USD 4971.84 million, representing a 12.45% year-over-year gain. Diversifying export markets beyond typical destinations helped the sector rebuild order volumes despite supply chain delays brought on by the conflict between Russia and Ukraine. A factor in the recovery trajectory was the introduction of higher value items and the growing use of clothing made of synthetic fibers.

4. **Growth:** This sector's growth phase is marked by a shift towards high value products, diversification into non-traditional markets such as Australia, Japan, and India, and the adoption of digital platforms (virtual market places). This strategic adaptation ensured continued export growth despite external pressures like the Russia-Ukraine war and the Red Sea conflict. Notably, between FY2015 to FY2023, the percentage of woven exports that were made of synthetic fibers increased from 26.9% to 39.4%, reflecting a shift in production strategies to meet changing global demand (Rahman, 2024). Furthermore, investing in eco-friendly garment factories helped the sector remain competitive worldwide. Despite inflationary pressures and exchange rate fluctuations, the RMG industry achieved a notable increase in export revenues, highlighting the growing value of its products (Figure 9 and 10).

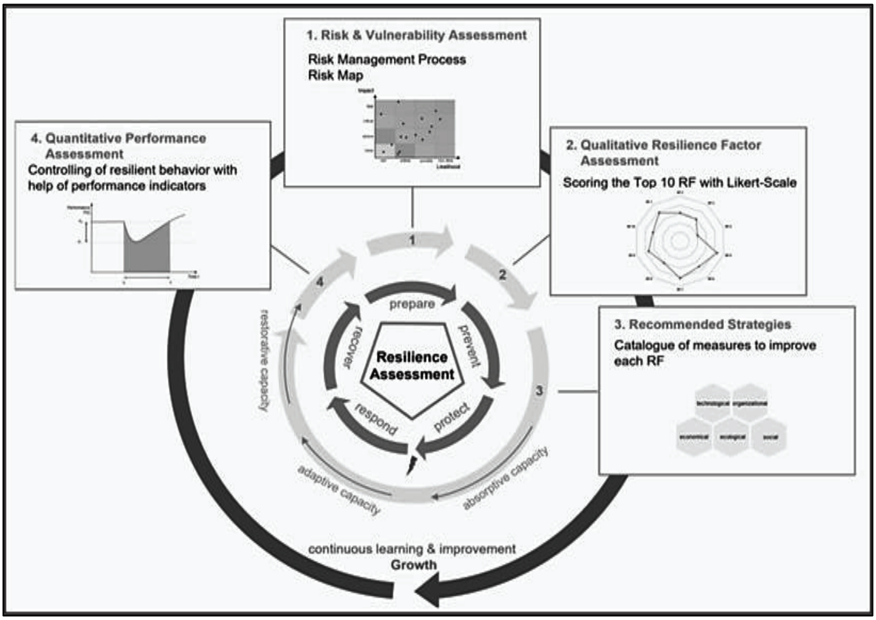


Figure 14. *A Four-step Circular Resilience Assessment Tool (CRAT)*

Source: De Marchi et al. (2023)'s article

This study also assessed resilience of this sector using the four-step Circular Resilience Assessment Tool (CRAT), focusing on each of the following key stages.

1. **Risk and vulnerability assessment:** This sector's primary risks and vulnerabilities include dependency on key export markets (US, EU), reliance on imported raw materials (cotton and fuel), and exposure to geopolitical crises. The Russia-Ukraine War and Red Sea conflict intensified challenges, including soaring transportation costs and logistic delays, significantly affecting export lead times (Mirdha, 2024). High inflation and exchange rate fluctuations which have affected both production costs and export pricing, are further threats to the industry (Figures 9 and 10)

2. **Quantitative performance assessment:** Analysis reveals that RMG export revenues have generally maintained an upward trend, despite back-to-back crises (Figures 1 and 3). For example, between FY 2022-23 and FY 2023-24, export earnings from USA decreased by just 5.69%, whereas EU revenues plummeted by only 1.24% (BGMEA,2024). Data shows that, amidst factory closures during crises, employment stayed reasonably stable, with no significant drop in the workforce (Figure 2)

3. **Quantitative resilience factor assessment:** The adoption of safety compliance protocols post-Rana-plaza, adaptive pricing strategies during COVID-19 pandemic, technological upgrades, and diversification into synthetic fibers are important resilience factors. Moreover, proactive strategies like virtual market place development have been identified as critical for future growth. Government cash incentives also played pivotal role in maintaining output, but their recent cuts pose future risks.

4. **Recommended strategies:** To enhance long term resilience, the sector should invest in locally produced raw materials to lessen import dependency. Strengthening digital infrastructure, particularly through virtual marketplaces, can reduce traditional supply chain disruptions. Additionally, ongoing worker skill development would ensure productivity even amidst global economic downturns.

8. Conclusion

The Ready-Made Garments (RMG) sector has undeniably been a cornerstone of Bangladesh's economic landscape, playing a pivotal role in driving economic growth, fostering industrialization, and alleviating poverty. This study has underscored the sector's resilience in the face of numerous challenges, ranging from the phasing out of the Multi-Fiber Arrangement (MFA) in 2004, the catastrophic Tazreen Fashions and Rana Plaza disaster in 2012 & 2013, and the global upheavals caused by the COVID-19 pandemic, to recent geopolitical tensions such as the Russia-Ukraine War and conflicts in the Red Sea region. Even in the face of these challenges RMG industry has continued to exhibit exceptional resilience and adaptability.

Despite the dire predictions after the MFA phase-out, Bangladesh's RMG sector not only survived but excelled, demonstrating an ability to compete on the global stage against major players like China and India. This industry demonstrated similar resilience again after the Tazreen Fashions and Rana Plaza disasters by swiftly implementing stringent safety and compliance measures to restore its global reputation and market position. The COVID-19 pandemic posed an unprecedented challenge, yet the sector's response in navigating supply chain disruptions and adapting to volatile market demands further cemented its crucial role in the economy.

Key findings from the analysis emphasize that government support through favorable policies, the benefit of low labor costs, and preferential market access have been crucial in maintaining the industry's competitive edge. Additionally, the industry's proactive response to crises—by enhancing compliance with safety standards, diversifying markets and products, and adopting innovative strategies—has been essential in sustaining growth.

Looking ahead, the sector must continue to innovate and embrace new opportunities such as virtual marketplaces and digital transformation to stay competitive. Policy support, strategic planning, and continued investment in compliance and worker safety are essential to sustain this growth trajectory. The government and industry leaders must work collaboratively to address the emerging challenges and leverage the sector’s strengths to ensure it remains a vital engine of economic growth.

In conclusion, the RMG sector has navigated numerous crises, revealing vulnerabilities alongside remarkable resilience and adaptability. By learning from past challenges and strategically preparing for future opportunities, the RMG industry can continue to propel Bangladesh’s economic growth and sustainable development, cementing its role as a global leader in apparel exports.

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