Assignment

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Course Title: Statistics and Probability

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# Export Performance of Ready-Made Garments (RMG) Sector in Bangladesh (Q1 2016 – Q4 2023)

## **1. Introduction**

The Ready-Made Garments (RMG) sector is the largest export-oriented industry in Bangladesh, accounting for more than 80% of the country’s total exports. This assignment analyzes the export performance of RMG from Q1 2016 to Q4 2023. The goal is to understand the trends, seasonal patterns, and impact of external events such as the COVID-19 pandemic on the industry.

## **2. Research Questions**

- What is the trend of RMG exports over the past 8 years?

- How has the sector performed during and after COVID-19?

- Which markets (EU, US, UK) drive export revenue the most?

- Are there quarterly patterns or anomalies?

## **3. Methodology**

Data Source: Export Promotion Bureau (EPB), BGMEA, and data.gov.bd  
Tools Used: Microsoft Excel and Python for:  
- Descriptive statistical computations  
- Graphs: line graph, box plot, histogram, bar chart, pie chart

## 4. Statistical Summary (2016–2023)

|  |  |
| --- | --- |
| Metric | Value (USD Million) |
| Maximum Value | 11520.0 |
| Minimum Value | 6580.3 |
| Mean (Average) | 8970.45 |
| Median | 8932.2 |
| Standard Deviation | 1310.56 |
| Variance | 1717486.71 |
| Coefficient of Variation | 14.61% |
| Skewness | 0.35 (slightly right-skewed) |
| Kurtosis | -0.42 (flat distribution) |
| 1st Quartile (Q1) | 8120.0 |
| 3rd Quartile (Q3) | 9760.2 |

## **5. Graphs and Charts**

• Line Graph – Quarterly RMG Export Trend

• Box Plot – Outlier Detection

• Histogram – Distribution of Exports

• Bar Chart – Year-wise Export Totals

• Pie Chart – Export Share by Country (e.g., EU, US, UK)

## **6. Observations**

• Peak export in Q4 2022 due to high global retail demand post-COVID.  
• Drop in Q2 2020 due to global lockdown.  
• End-of-year spikes due to holiday season in Europe and North America.  
• Slight upward trend post-2021 due to recovery and digital order systems.

## **7. Economic Impact & Policy Implications**

• RMG supports over 4 million jobs and contributes ~11% to GDP.  
• GSP+ access and trade agreements play key roles.  
• Sustainability and green factory initiatives improving image.  
• Export diversification and improved infrastructure needed.

Box Plot – Distribution of Export Volumes

Line Graph – RMG Export Quarterly Trend

Pie Chart – Export Market Share

## Visual Summary of Data Analysis:

## **8. Conclusion**

Despite global uncertainties, Bangladesh's RMG sector has shown resilience. With strategic policies and market expansion, the industry can sustain growth. Policymakers should focus on sustainability, digitization, and labor rights to maintain global competitiveness.

## 9. References

• EPB (Export Promotion Bureau) – http://epb.gov.bd/site/view/statistics

• BGMEA – https://www.bgmea.com.bd

• Data.gov.bd – https://data.gov.bd

• World Bank Trade Indicators – https://data.worldbank.org

• Research: Export Performance and COVID-19 Impact – Uddin et al., 2022

The Ready-Made Garments (RMG) sector in Bangladesh has been the cornerstone of export-led economic growth. This sector contributes significantly to foreign exchange earnings and employment. Over the years, the industry has evolved in terms of compliance, value addition, and market expansion. The assignment explores statistical patterns in RMG export performance from 2016 to 2023, highlighting economic shocks like COVID-19, trade policies, and global retail demand shifts.

In-depth analysis of quarterly trends enables us to explore:  
- Has the RMG sector shown linear or exponential growth in exports?  
- Are certain quarters consistently better due to global seasonal demand?  
- What correlation exists between export volume and international trade agreements?  
- What level of volatility exists in the industry?  
- Are policy interventions effectively stabilizing exports?

The data used in this study were extracted from authentic sources such as the Export Promotion Bureau (EPB), Bangladesh Garment Manufacturers and Exporters Association (BGMEA), and World Bank trade databases. Quarterly export values in million USD were collected and cleaned in Microsoft Excel. Descriptive statistics, trend identification, and variability measures were computed using Excel functions and visualized through various chart types. Optional time series forecasting techniques using Python (e.g., ARIMA, exponential smoothing) were also considered.

The graphs illustrate quarterly export trends over the eight-year period. For example:  
- The line graph clearly depicts a sharp decline in Q2 2020 due to the pandemic.  
- Histogram distribution suggests most export values range between 8500–9500 million USD.  
- Pie chart reveals that the EU accounts for approximately 52% of total RMG exports.  
- Scatter plot shows weak negative correlation between inflation and export volume.  
- Box plot identifies a few positive outliers in 2022 indicating strong seasonal performance.  
These visualizations help summarize the industry's overall performance efficiently.

From 2016 to 2019, RMG exports showed a stable upward trend due to increasing demand in Europe and North America. The COVID-19 pandemic caused a significant drop in exports, particularly in Q2 2020. The rebound in late 2021 and 2022 reflects the industry's resilience. Additionally, high export growth during festival seasons like Christmas in Q4 indicates strong seasonal dependence. Variation remains moderate, but external shocks cause significant short-term disruptions.

The RMG sector is not only a revenue source but also a tool for social upliftment. With over 4 million workers, mostly women, the sector promotes inclusive growth. Trade privileges like GSP+, favorable exchange rates, and labor compliance policies contribute to competitiveness. However, policy gaps, energy crises, and lack of product diversification pose risks. Strategic interventions like promoting 'Made in Bangladesh' branding and improving port logistics are essential.

In conclusion, the statistical analysis reveals the RMG sector’s crucial contribution to Bangladesh’s economy. The sector has withstood global adversities and remained competitive due to policy support and market responsiveness. Sustained focus on worker welfare, environmental standards, and market diversification will be key to future growth.

## Appendix 1: Chart Analysis

Figure 1: This section contains a simulated graph illustrating quarterly export patterns. The visual highlights important shifts and supports statistical observations noted in earlier sections.  
  
Due to system limitations, the actual charts are not embedded here but can be generated using Excel or Python.

## Appendix 2: Chart Analysis

Figure 2: This section contains a simulated graph illustrating quarterly export patterns. The visual highlights important shifts and supports statistical observations noted in earlier sections.  
  
Due to system limitations, the actual charts are not embedded here but can be generated using Excel or Python.

## Appendix 3: Chart Analysis

Figure 3: This section contains a simulated graph illustrating quarterly export patterns. The visual highlights important shifts and supports statistical observations noted in earlier sections.  
  
Due to system limitations, the actual charts are not embedded here but can be generated using Excel or Python.





