# IMPACT OF SELECTED FACTORS ON INTERNATIONAL TRADE OF BANGLADESH: AN EMPIRICAL ANALYSIS

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**Abstract:**

*International trade is a vital driver of economic development for nations worldwide, and Bangladesh, as a developing country in South Asia, strategically utilizes trade as a key element in its economic growth agenda. This paper examines the impact of internal factors on Bangladesh's international trade, employing Ordinary Least Squares (OLS) regression analysis to analyze data spanning from 2000 to 2022. The study focuses on factors such as GDP, inflation, real interest rates, unemployment rates, government expenditure, population growth, remittance inflows, government expenditure in education, macroeconomic management, and tariff rates. The results reveal a strong statistical significance between the predictors and Bangladesh's international trade volume. Notably, personal remittances, government expenditure in education, and macroeconomic management index exhibit significant influence on international trade. The findings provide valuable insights for policymakers and stakeholders to enhance Bangladesh's trade performance, contributing to its sustainable economic development.*

**Keywords:** International trade, Ordinary Least Squares, Economic Development, Bangladesh

## 1. Introduction

International trade plays a fundamental role in the economic development of a country, and Bangladesh is no exception. As a developing nation, Bangladesh has been striving to improve its economic status through various means, and international trade has been one of the key strategies. Bangladesh, located in South Asia, is known for its rich cultural heritage and diverse resources. Despite being a small country, it has a large population, making it one of the most densely populated countries in the world. This demographic characteristic, along with its strategic location, puts Bangladesh in specific scenario international trade. Over the years, Bangladesh has made significant strides in its trade relations with various countries. It has established itself as a major exporter of ready-made garments, jute, and leading producer of several agricultural products , among other things. The country's export sector has been a major contributor to its Gross Domestic Product (GDP), and it has been instrumental in creating suitable opportunities for millions of people. According to the Bangladesh Bureau of Statistics, it showed a GDP growth rate of 7.1% in FY22. (BBS, 2023)  Despite achieving steady economic growth over the years, Bangladesh still faces considerable socio-economic challenges, including poverty, inequality, infrastructure deficits, and inflation. Moreover, the country is susceptible to external shocks, such as pandemics and global economic fluctuations, which impeded its development trajectory, which brought the IMF prediction of GDP growth to 6% (IMF, 2023) and World Bank estimation at 5.6% (World Bank, 2023). However, like any other country, Bangladesh's international trade is influenced by various factors. These factors can be broadly categorized into internal and external factors. Internal factors include the country's economic policies, infrastructure, and human resources, while external factors include global economic trends, trade policies of partner countries, and international relations.

This research aims to analyze the impact of selected factors mostly internal ones on Bangladesh's international trade. By doing so, it hopes to provide valuable insights that could help policymakers and stakeholders make informed decisions to further enhance the country's trade performance. It aims to find factors influencing the trade scenario of the country by reviewing the existing literature. Then  it aims to test the impact of the factors by applying Ordinary

Least Squares regression model. Following through the interpretations and implications would be discussed having the results of the test in hand. It would conclude by making policy recommendations for the relevant authorities, so that the unfound loophole in the bottom of bucket of development can be wielded gradually. The study recognizes limitations of not including all the factors involved, especially the external ones. As it has been designed just for the investigation of the internal factors.

## 2. Literature Review

International trade, also known as foreign trade, involves the exchange of goods and services across national borders. This type of trade plays a crucial role in boosting the global economy. Over the years, international trade has seen significant growth, extending to services like overseas transportation, travel, tourism, banking, storage, communication, advertising, distribution, and more (Helpman, 2011). Other key developments include the rise in foreign investments and the manufacturing of foreign goods and services in other countries. These foreign investments and productions allow companies to get closer to their international customers, providing them with goods and services at a very affordable rate. All these activities are components of international business. Therefore, it can be inferred that international trade and production are two facets of international business, which are expanding daily worldwide. In most nations, foreign trade constitutes a substantial portion of the Gross Domestic Product (GDP) (Melitz, 2003). While international trade has been a part of history for a long time, its economic, social, and political significance has been escalating in recent centuries. According to Wasserman and Hultman, "International trade is made up of transactions between residents of different countries" (Wasserman and Hultman, 1962). Anatol Marad describes it as a trade between nations (Douty, 1963), and according to Edgeworth, "International trade implies trade between nations" (Edgeworth, 1925).

Corden opined on the matter of trade theory that, majority literature focuses on orthodox theory, significance of peripheral literature should be acknowledged and its potential integration into the main theory would be a significant development. He recognized that orthodox trade theory often overlooks income distribution and monopolistic market structures, could be enriched by considering the impact of government policies, such as taxation and subsidies, on economic outcomes (Corden, 1974). Vijayasri in 2013 in his paper focused on the relationship between economic development and international trade, highlighting the strategic importance of international trade in the development process of an economy. It discusses the role of trade policy, the impact of foreign trade on economic development, and the potential disadvantages of international trade, concluding that international trade can lead to economic growth if supported by appropriate policy measures and economic infrastructure (Vijayasri, 2013). Another study found positive association between international trade and economic growth, reviewing the role of GATT/WTO in promoting free trade, discussed the impact of trade on output and growth, and the influence of productivity on trade, while also considering the challenges posed by trade barriers, preferential trade agreements, and the difficulty in separating the effects of trade policies from other macroeconomic policies (Singh, 2010). Afonso in 2001 examines the impact of commercial and technological aspects of international trade on economic growth, tracing the evolution of theories from the classic period, where trade and growth were seen as inseparable, through the neoclassic period, where they became distinct, to the recent reintroduction of endogenous growth models that merge both theories, enhancing our understanding of their relationship (Afonso, 2001). The study by Adeleye et al., investigates the influence of international trade on Nigeria's economic growth, using net export and Balance of Payment as indicators, and finds that only total export has a significant positive impact, suggesting Nigeria's economy is heavily reliant on oil, with recommendations for diversification to boost non-oil exports and industrial growth (Adeleye et al., 2015). Ulasan in his paper revisits the relationship between trade openness and long-run economic growth from 1960-2000, using various openness measures and additional composite trade policy indexes, finding a positive correlation between openness variables and economic growth, although this association becomes less significant when accounting for other growth determinants (Ulasan, 2012). Another study explores the significant role of international trade in China's economic growth, analyzing the evolution of China's trade regime, its performance, and the impact of trade on productivity, using both econometric and non-parametric approaches, and finds that increased global trade participation and a shift towards high-tech exports have positively affected China's regional productivity, with policy implications drawn accordingly (Sun and Heshmati, 2010). Caleb et al., investigates the long-term relationship between trade and economic growth in Zimbabwe from 1975 to 2005, using a cointegration approach, and finds that while trade and economic growth are cointegrated, the relationship is

influenced by macroeconomic stability and openness to trade (Caleb, Mazanai and Dhoro, 2014). Lawal and Ezeuchenne investigates the impact of international trade on Nigeria's economic growth from 1985 to 2015, using imports, exports, balance of trade, and trade openness as variables, and finds a long-term relationship between trade and growth, with recommendations for the government to increase exploration of finished goods and reduce importation to boost economic growth (Lawal and Ezeuchenne, 2017).

On the matter of how GDP and international trade are correlated, most scholars opined that GDP has positive influence on international trade and vice versa. Almog et al., discusses the International Trade Network (ITN), its impact on economic processes, and the importance of modeling its structure using macroeconomic quantities, found the role of GDP in determining trade linkages using a unified model that uses GDP to reproduce the ITN's topology and link weights (Almog et al., 2017). Jeston and Tao in 2002 investigates the causal relations between the growth rates of exports, imports, and GDP in Canada and the United States using the vector error correction model and Granger causality tests, finding bidirectional causality for Canada and a weaker relationship for the United States, suggesting that Canada is more open and trade-dependent and finally its implications on GDP of both the countries. Some scholars also discussed the limitations of economic data coverage, particularly in conflict studies, and the impact on the ability to infer linkages between economic and political interactions, with a set of procedures proposed to create additional estimates for data on GDP, population, and bilateral trade flows (Gleditsch, 2002). From the review above, it is quite clear that most of the scholars agreed that international trade and GDP are positively correlated.

But while investigating inflation and international trade, both positive and negative . Kurihara explores the correlation between international trade openness and inflation in Asian and OECD countries, indicating a stronger negative relationship in recent times in Asia, despite a lack of consensus on this issue (Kurihara, 2013). Atabay in 2016 explored the impact of trade liberalization in Turkey and globally since 1980, and its correlation with inflation. It reveals a negative correlation between trade openness and inflation in Turkey from 1980-2011, with crisis and election years having statistically insignificant effects. Aziz investigates the role of exchange rates in international trade adjustment, trade prices, and domestic inflation in developing countries, with a focus on Bangladesh. It reveals a positive impact of exchange rates on trade balance, partial pass-through to consumer prices, and the significance of trade liberalization for Bangladesh's trade and inflation (Aziz, 2011). Neely and Rapach analyzed the commonalities in international inflation rates, attributing them to common shocks, central bank reactions, and international trade. They used a dynamic latent factor model to decompose inflation rates into world, regional, and idiosyncratic components, revealing that international influences account for over half of inflation variability (Neely and Rapach, 2011). Bibi et al., presents an empirical analysis of the impact of trade openness, inflation, imports, exports, real exchange rate, and foreign direct investment on Pakistan's economic growth from 1980 to 2011. It reveals a long-term positive relationship among these variables, with the negative effects of trade openness mitigated by import substitution and trade surplus (Bibi et al., 2014 ). Wayne and Kersting reviews the evidence of a robust negative relationship between a country's trade openness and its long-term inflation rate, as first documented by Romer in 1993. It challenges the standard explanation that more-open economies have steeper Phillips curves, thus reducing central banks' incentives to persuade surprise inflations (Wayne and Kersting, 2007). From the discussion above, it is quite clear that, majority scholars have agreed that inflation negatively influences international trade.

Findlay in his paper presents a trade model where an intermediate good undergoes a variable-duration production process, and a finished good is produced instantly. Countries differ in their future discount rates, influencing their trade behaviors. The less "impatient" country exports the time-intensive intermediate good and imports the finished good, leading to incomplete specialization, and equalization of interest rates and real wages. He suggests a positive relationship between real interest rates and international trade, as lower real interest rates (indicating less "impatience") are associated with a country's propensity to export time-intensive goods (Findlay, 1978). Opening economies to trade can improve welfare, especially when all generations are included in compensations. Financing through deficits can result in a rise in interest rates, and the expectation of future deficits can influence the interest rate structure. When a country's current income increases, it benefits, but it can negatively impact the long-term economic well-being of other countries. This implies that there could be a direct correlation between real interest rates and global trade. (Dornbusch, 1985). Afolabi, Danladi and Azeez in 2017 discusses a study examining the impact of international trade on Nigeria's economic growth. The study used time series secondary data and various statistical tests to analyze the relationship between economic growth (proxied by GDP) and several variables including exchange rate, government expenditure, interest rate, foreign direct investment, import, and export. The

results revealed that government expenditures, interest rate, import, and export have a positive significant impact, while exchange rate and foreign direct investment have a negatively insignificant impact on Nigeria's economic growth. This suggests a positive relationship between real interest rates and international trade, as higher interest rates are associated with increased economic growth through international trade. Tan and Tang discuss in their study by empirically analyzing the relationships among domestic investment, foreign direct investment (FDI), trade, interest rate, and economic growth in the ASEAN-5 regions from 1970-2012. The study confirms long-term causal correlation between real interest rate, domestic investment and FDI, suggesting that collaboration between domestic and foreign investors is crucial (Tan and Tang, 2016). From the discussion, it can be concluded that real interest rates positively affect international trade.

Dutt, Mitra and Ranjan suggest that, according to the model of trade and unemployment, trade openness and unemployment are generally negatively related due to Ricardian comparative advantage, which outweighs the positive effect of trade openness on unemployment in capital-abundant countries predicted by the Heckscher-Ohlin model. However, in the short run, trade liberalization can increase unemployment before reducing it in the long run as the economy reaches a new steady state (Dutt, Mitra and Ranjan, 2009). Mohler, Wyss and Weder indicate that despite the common belief that globalization and import competition due to international trade contribute to unemployment, particularly among low-skilled workers, a study based on Swiss manufacturing sector data from 1991 to 2008 found no strong evidence to support a positive relationship between import competition and the likelihood of low-skilled individuals becoming unemployed (Mohler, Weder and Wyss, 2018). The paper by Belenky and Riker suggests that while theoretical models present a complex and often ambiguous relationship between trade and aggregate unemployment rates, depending on factors like industry composition and labor market frictions, empirical studies generally find that an expansion in international trade reduces a country's aggregate unemployment rate in the long run (Belenky and Riker, 2015). Kim suggests that the impact of international trade on aggregate unemployment is influenced by the flexibility of labor market institutions. Specifically, an increase in trade can lead to higher unemployment in the presence of rigid labor market institutions, but it may reduce unemployment if the labor market is flexible. In a country with an average degree of labor market rigidity, an increase in trade does not significantly affect unemployment rates (Kim, 2011). Gozgor suggests that recent studies indicate a significant impact of trade openness and globalization on unemployment, especially in developed economies. The study, which focused on the G7 countries, found that all measures of trade openness and globalization, along with macroeconomic indicators and market size, are significantly and negatively associated with the unemployment rate. Thus, the continuation of globalization, rather than protectionism, is crucial for reducing unemployment in developed economies (Gozgor, 2012). So, it can be concluded that, in the context of a developing country like Bangladesh, unemployment do negatively affect international trade of a nation.

Study suggests that while globalization, measured by inward FDI and openness, doesn't affect the overall size of government expenditure, it does shift the composition towards social spending, supporting the compensation hypothesis over the efficiency hypothesis. This implies a positive relation between international trade (globalization) and certain types of government expenditure (social spending) (Gemmell, Kneller and Sanz, 2008). Another study indicates that there is little to no causal relationship between trade openness and both aggregate and disaggregated government expenditure, contradicting the relationship suggested by Rodrik in 1998. The only exception is a positive causal relationship between trade openness and education expenditures in low-income countries. There is no positive causal relationship between social security and trade openness. This implies that the relationship between government expenditure and international trade is not universally positive or negative, but depends on the specific type of expenditure and the income level of the country (Benarroch and Pandey, 2012). Gong suggests that empirical results show that public expenditure and exports have a positive effect on productivity, while imports do not have a significant impact. This indicates a positive relationship between government expenditure and exporting aspects of international trade. Another study suggests by examining the relationship between trade openness and government expenditure in ASEAN-4 countries from 1974-2006 show a significant positive long-term relationship between trade openness and government expenditure in all ASEAN-4 countries (Kueh, Puah and Wong, 2009). Abizadeh opines that contrary to common expectations, as small open economies liberalize their trade, the size of government expenditure decreases. This implies a negative relationship between trade liberalization and the size of government expenditure. Study by Ali et al., suggests that in the long run, the openness of trade has a substantial and inverse link with unemployment in both the overall and lower-income economies of the Organization of Islamic Cooperation

(OIC). However, it has a direct relationship with unemployment in the OIC's higher-income countries. Public spending is inversely and significantly linked with unemployment in the OIC's higher-income and overall economies. Human capital decreases unemployment in the OIC's higher-income and overall economies, but it leads to an increase in unemployment in the OIC's lower-income economies. Based on the context, this implies that the relationship between government expenditure and trade openness is positive for low income or the developing countries.

Studies show that trade liberalization initially increases population growth due to increased income, but eventually decreases it as higher investment in capital raises women's wages, shifting them from child-rearing to production. Thus, the relationship between population growth and international trade is initially positive but becomes negative in the long run (Lehmijoki and Palokangas, 2009). Study by Galor and Mountford in 2008 suggests that international trade has a differential effect on population growth in developed and less developed countries. In developed countries, gains from trade lead to investment in education and income growth, reducing fertility rates. In contrast, in less developed economies, a significant portion of trade gains is directed towards population growth, leading to increased fertility and reduced investment in education. Thus, the relationship between population growth and international trade can be both positive and negative, depending on the level of economic development. Study by DeFries et al., suggests that urban population growth and exports of agricultural products are positively correlated with forest loss, indicating a positive relationship between population growth and international trade and in terms of deforestation (DeFries et al., 2010).

Ferdaous and Qamruzzaman in 2014 investigated the long-term impact of international trade, remittances, and industrialization on Bangladesh's economic growth from 1976 to 2010, revealing a positive causal relationship among these factors. Study by Le in 2009 examines the impact of trade, remittances, and institutions on the economic development of developing countries. It finds that while institutions and trade generally promote growth, remittances tend to hinder it. The role of trade in remittance growth is more significant in the long run, but its effect is less clear over shorter periods. The study Olubiyi explores the causal relationships among GDP, exports, imports, and remittances in Nigeria from 1980 to 2012. It finds that trade and remittances significantly influence GDP in the short run, and there's a unidirectional causation from remittances to GDP (Olubiyi, 2014). The study by Khurshid et al., investigates the connection between remittances, exchange rate, and export competitiveness in 58 countries ranging from low to middle-income groups. The findings suggest that remittances lead to an appreciation of the exchange rate and adversely affect competitiveness in lower-middle and middle-income countries. (Khurshid et al., 2018).

Study by Erceg et al., suggests that certain trade policies, such as a combination of higher import tariffs and export subsidies, can positively stimulate net exports and output by causing only a partial exchange rate offset. However, a temporary increase in value-added taxes accompanied by a payroll tax reduction can have a negative impact on aggregate demand and output, especially under fixed exchange rates. Thus, the relationship between international trade and macroeconomic management can be both positive and negative, depending on the specific policies implemented (Erceg et al., 2018). Mann mentions that trade facilitation, which includes policy reforms and practices to reduce impediments to global sourcing and multinational supply chains, has a positive relationship with international trade and macroeconomic management. Improved trade-facilitation policies enhance global sourcing through international trade, although the specific policy reforms that support this vary by country, product, and supply chain (Mann, 2012). Cacciatore suggests that while trade integration can enhance welfare and productivity, it can also lead to a temporary increase in unemployment due to failure in macroeconomic management related to labor market frictions and transitional adjustments. Labor market rigidities can reduce the gains from trade but may mitigate short-term employment losses. Furthermore, stronger trade linkages can increase business cycle synchronization, with the strength of this effect depending on the labor market characteristics of the integrating partners. Therefore, the relationship between international trade and macroeconomic management is complex and can be both positive and negative, depending on specific labor market conditions and the nature of trade integration (Cacciatore, 2014).

In 2001, Baier and Bergstrand in their study suggests that the growth of world trade is influenced by income growth (67%), tariff-rate reductions (25%), and transport-cost declines (8%), with income convergence having virtually no impact. This indicates that tariff-rate reductions, which lower the costs of international trade, are positively related to the growth of world trade. Romalis suggests that the North American Free Trade Agreement (NAFTA) significantly increased trade volumes by reducing tariffs, which created a divergence in consumption patterns between NAFTA

and non-NAFTA countries. However, the impact on prices and welfare was modest. NAFTA also increased North American output and prices in many highly protected sectors by displacing imports from non-member countries. This indicates that tariff reductions, which facilitate international trade, are positively related to trade volumes (Romalis, 2007). Muradovna suggests that in the modern world economy, both tariff and non-tariff barriers act as effective regulators of international trade. While there has been a steady decline in import customs duties, non-tariff measures are being increasingly applied. Despite this, customs and tariff policies remain key factors in determining national trade regimes and market access conditions. The research assesses the impact of these factors on international trade, finding that non-tariff barriers, specifically Sanitary and Phytosanitary Standards (SPS) and Technical Barriers to Trade (TBT), have had the largest negative impact. This indicates that both tariff and non-tariff barriers are negatively related to international trade (Muradovna, 2020). The existing literature on international trade and macroeconomic variables lacks a specific focus on internal factors influencing Bangladesh's trade dynamics, leading to a notable research gap in tailoring analyses to Bangladesh's context. Moreover, while the paper aims to analyze selected internal factors, the literature review primarily explores broader macroeconomic variables, indicating a need for empirical studies to systematically investigate these identified factors and their implications for Bangladesh's trade performance. Furthermore, the literature review provides limited insights into policy implications tailored to Bangladesh's context, underscoring the importance of offering specific policy recommendations aligned with the country's trade dynamics and development goals.

## 3. Hypothesis

Based on the reviewed literature in the previous section, the development of hypotheses can be initiated. Bangladesh's economic growth is closely linked to its international trade activities, with GDP serving as a key indicator of economic health. A growing GDP indicates a thriving economy with increased production and consumption, which in turn stimulates demand for imports and facilitates export growth (Vijayasri, 2013; Afonso, 2001, Ulasan, 2012; Caleb et al., 2014; Alomog et al., 2017). Therefore, it is expected that higher GDP levels would lead to greater trade volume as Bangladesh expands its participation in global trade networks and enhances its export competitiveness across various industries.

Hypothesis (H1): GDP has a positive impact on international trade in Bangladesh, holding all other variables constant.

Inflationary pressures can significantly impact a country's trade dynamics by eroding purchasing power, increasing production costs, and introducing uncertainties into the market (Aziz, 2011; Kurihara, 2013; Atabay, 2016). In Bangladesh, where many industries rely on imported inputs and raw materials, higher inflation rates can lead to cost-push inflation, reducing firms' competitiveness in international markets. Additionally, elevated inflation may dampen consumer spending and investment, further constraining trade volume growth. Therefore, it is expected that higher inflation rates would have a negative effect on trade volume in Bangladesh, hindering the country's export performance and import demand.

Hypothesis (H2): Higher inflation rates negatively influence international trade in Bangladesh, holding all other variables constant.

Real interest rates play a crucial role in shaping investment decisions, borrowing costs, and overall economic activity, all of which can influence a country's trade volume (Dornbusch, 1985; Tan and Tang, 2016; Afolabi et al., 2017). In Bangladesh, where access to credit and financing is essential for businesses to engage in international trade, lower real interest rates can stimulate investment, promote entrepreneurship, and facilitate access to capital for trade-related activities. Additionally, lower borrowing costs can incentivize consumers to spend and invest, boosting domestic demand and import levels. Therefore, it is expected that lower real interest rates would have a positive effect on trade volume in Bangladesh, fostering trade expansion and economic growth.

Hypothesis (H3): Lower real interest rates positively impact international trade in Bangladesh, holding all other variables constant.

Unemployment rates are reflective of labor market conditions and consumer purchasing power, both of which are critical determinants of trade volume (Dutt et al., 2009; Gozgor, 2012). In Bangladesh, where a significant portion of the population relies on wage income for consumption and investment, higher unemployment rates can lead to reduced consumer spending, dampened domestic demand, and decreased production levels. Additionally, elevated unemployment may indicate underutilized labor resources and inefficiencies in the economy, which can undermine

export competitiveness and trade performance. Therefore, it is expected that higher unemployment rates would negatively impact trade volume in Bangladesh, limiting the country's ability to participate in international trade and achieve sustainable economic growth.

Hypothesis (H4): Higher unemployment rates negatively affect international trade in Bangladesh, holding all other variables constant.

Government expenditure plays a crucial role in providing public goods, infrastructure, and regulatory frameworks that support economic activities, including international trade (Gemmell et al., 2008; Kueh et al., 2009). In Bangladesh, where investment in infrastructure such as ports, transportation networks, and trade facilitation measures is essential for enhancing trade efficiency and competitiveness, increased government spending can lead to improved trade-related infrastructure and logistics capabilities. Additionally, targeted government investments in education, innovation, and export promotion programs can enhance the country's human capital and export diversification efforts, further stimulating trade volume growth. Therefore, it is expected that increased government expenditure would have a positive effect on trade volume in Bangladesh, contributing to the country's economic development and integration into global markets.

Hypothesis (H5): Increased government expenditure positively influences trade volume in Bangladesh, holding all other variables constant.

Population growth rates can significantly influence a country's labor supply, consumption patterns, resource availability, and infrastructure requirements, all of which are critical determinants of trade volume (Mountford, 2008; Lehmijoki and Palokangas, 2009). In Bangladesh, where rapid population growth can strain resources, infrastructure, and social services, higher population growth rates may lead to increased production costs, environmental pressures, and urban congestion, thereby limiting the country's trade capacity and competitiveness. Additionally, higher population growth rates may exacerbate income inequalities, social tensions, and political instabilities, further hindering trade expansion and economic development efforts. Therefore, it is expected that higher population growth rates would have a negative effect on trade volume in Bangladesh, posing challenges to the country's sustainable development and integration into global markets.

Hypothesis (H6): Higher population growth rates negatively impact international trade in Bangladesh, holding all other variables constant.

Remittance inflows play a significant role in shaping household incomes, consumption patterns, and investment opportunities, all of which can influence a country's trade volume (Le, 2009; Olubiyi, 2014). In Bangladesh, where remittances constitute a substantial portion of household income and national GDP, higher remittance inflows can lead to increased consumer spending, investment, and overall economic activity. Additionally, remittance recipients may allocate a portion of their funds towards purchasing imported goods and services, thereby contributing to higher import levels and trade volume. Therefore, it is expected that higher remittance inflows would have a positive effect on trade volume in Bangladesh, bolstering both domestic demand and import demand (Ferdaous and Qamruzzaman, 2014).

Hypothesis (H7): Higher remittance inflows positively impact international trade in Bangladesh, holding all other variables constant.

Investment in education is critical for enhancing human capital, productivity, innovation, and overall economic competitiveness, all of which can influence a country's trade volume (Fukase, 2010). In Bangladesh, where skilled labor is essential for driving technological advancements, export diversification, and value-added production, higher government expenditure in education can lead to improved workforce skills, entrepreneurship, and industry-specific training programs. Additionally, investments in education can foster research and development activities, promote knowledge-intensive industries, and attract foreign investment, thereby contributing to higher export levels and trade volume. Therefore, it is expected that higher government expenditure in education would have a positive effect on trade volume in Bangladesh, supporting the country's efforts to enhance its human capital and economic competitiveness in global markets.

Hypothesis (H8): Higher government expenditure in education positively influences international trade in Bangladesh, holding all other variables constant.

Effective macroeconomic management, including monetary policy, fiscal policy, exchange rate management, and financial regulation, plays a critical role in maintaining economic stability, investor confidence, and trade competitiveness (Mann, 2012; Erceg et al., 2018). In Bangladesh, where macroeconomic stability is essential for attracting foreign investment, promoting export-oriented industries, and managing external trade balances, better

macroeconomic management practices can lead to improved business conditions, reduced economic uncertainties, and enhanced trade performance. Additionally, sound macroeconomic policies can mitigate inflationary pressures, exchange rate volatility, and financial risks, thereby fostering a conducive environment for trade expansion and investment. Therefore, it is expected that better macroeconomic management would have a positive effect on trade volume in Bangladesh, supporting the country's efforts to integrate into global markets and achieve sustainable economic growth.

Hypothesis (H9): Better macroeconomic management positively influences international trade in Bangladesh, holding all other variables constant.

Tariff rates are a crucial determinant of trade costs, market access, and competitiveness, all of which can significantly influence a country's trade volume (Baier and Bergstrand, 2001; Romalis, 2007; Muradovna, 2020). In Bangladesh, where many industries rely on imported inputs and intermediate goods for production, lower tariff rates can reduce production costs, enhance export competitiveness, and stimulate import demand. Additionally, lower tariff barriers can encourage foreign direct investment, technology transfer, and innovation, further supporting trade expansion and economic growth. Therefore, it is expected that lower tariff rates would have a positive effect on trade volume in Bangladesh, facilitating greater participation in international trade and integration into global value chains.

Hypothesis (H10): Lower tariff rates positively impact international trade in Bangladesh, holding all other variables constant.

## 4. Methodology

This study employs Ordinary Least Squares (OLS) regression analysis to examine the impact of selected factors on international trade volume in Bangladesh. OLS is a widely used statistical technique for estimating the parameters of a linear regression model. It is particularly suitable for analyzing relationships between a dependent variable and one or more independent variables, as is the case in this study. To investigate whether international trade cause economic growth or not, Singh in 2010 employed OLS (Singh, 2010). For the same purpose, Romer and Frankel used this approach in 2017 (Romer and Frankel, 2017). To measure NAFTA and CUSFTA's impact on international trade, Romalis employed the same approach (Romalis, 2007). The log-linear regression model used in this study is specified as follows:

$$log(TradeVolume_i) = \beta_0 + \beta_1 log(GDP_i) - \beta_2 log(InflationRate_i) + \beta_3 log(RealInterestRate_i) - \beta_4 log(UnemploymentRate_i) + \beta_5 log(GovtExpenditure_i) + \beta_6 log(RemittanceReceived_i) + \beta_7 log(MacroeconomicManagementIndex_i) - \beta_8 log(TariffRate_i) + \beta_9 log(GovtExpenditureInEducation_i) - \beta_{10} log(PopulationGrowthRate_i) + \varepsilon$$

Where:

- $log(TradeVolume_i)$ represents the logarithm of the international trade volume of Bangladesh in period i.
- $log(GDP_i)$,……………………….$log(TariffRate_i)$ are the logarithms of the independent variables representing GDP, inflation rate, real interest rate, unemployment rate, government expenditure, remittance received, macroeconomic management index, tariff rate, government expenditure in education, and population growth rate respectively, in period i.
- $\beta_0$ is the intercept term.
- $\beta_1, \beta_2, ..., \beta_{10}$ are the coefficients associated with the natural logarithms of the independent variables.
- $\varepsilon_i$ is the error term, representing the difference between the actual observed log of trade volume and the value predicted by the regression model.

Data for this study has been collected from reputable sources such as the World Bank, International Labor Organization, and International Monetary Fund (IMF). The data concerning GDP, Government Expenditure ,Government Expenditure in Education and Personal Remittance has been taken in million USD. And all the variables have been logged. The data covered a suitable time period from 2000 to 2022, to capture the dynamics of international trade and the selected factors influencing trade volume in Bangladesh. The OLS regression analysis has been conducted using statistical software SPSS. The regression model will be used to estimate the coefficients of the independent variables and assess their statistical significance in explaining variations in trade volume.

## 5. Findings

The model summary shows that the model has a very high R value of 0.998, indicating a strong linear relationship between the predictors and the dependent variable. The R Square value is 0.996, suggesting that approximately 99.6% of the variance in the dependent variable can be explained by the predictors included in the model. The Adjusted R Square value is slightly lower at 0.992, which takes into account the number of predictors used relative to the number of observations.

**Table 1: Summary of Regression Model Analyzing Factors Impacting Bangladesh's International Trade**

| | | | Model Summary | |
|---|---|---|---|---|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1 | .998[a] | .996 | .992 | .028512742949 |

a. Predictors: (Constant), TariffRateapplied, UnempRateILOofWF, RealIntRates, InflationCPI, MacMmgIndx, PopGrwthannual, GovtExpofGDP, GovtExpinEdu, GDPmil$, PersRemmRecmil$

**Table 2: ANOVA Table for Regression Analysis**

| | Model | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 2.121 | 10 | .212 | 260.869 | .000[b] |
| | Residual | .009 | 11 | .001 | | |
| | Total | 2.130 | 21 | | | |

| a. Dependent Variable: TVmil$ |
|---|
| b. Predictors: (Constant), TariffRateapplied, UnempRateILOofWF, RealIntRates, InflationCPI, MacMmgIndx, PopGrwthannual, GovtExpofGDP, GovtExpinEdu, GDPmil$, PersRemmRecmil$ |

The ANOVA table presents the results of the regression analysis conducted to understand the impact of selected factors on Bangladesh's international trade. The model is statistically significant with an F-statistic value of 260.869 and a p-value of less than 0.001. This indicates that there is less than a 0.1% chance that the results from this model are due to random variation alone.

**Table 3: Regression Coefficients Table**

| | | Unstandardized Coefficients | | Standardized Coefficients | | |
|---|---|---|---|---|---|---|
| Model | | B | Std. Error | Beta | t | Sig. |
| 1 | (Constant) | 4.051 | 1.470 | | 2.755 | .019 |
| | GDPmil$ | .268 | .116 | .269 | 2.317 | .041 |
| | InflationCPI | .205 | .096 | .116 | 2.127 | .057 |
| | RealIntRates | -.227 | .105 | -.106 | -2.166 | .053 |
| | UnempRateILO%ofWF | .231 | .216 | .039 | 1.070 | .308 |
| | GovtExp%ofGDP | -.066 | .434 | -.010 | -.151 | .882 |
| | PopGrwthannual | .371 | .198 | .116 | 1.874 | .088 |
| | PersRemmRecmil$ | .467 | .151 | .499 | 3.092 | .010 |
| | GovtExpinEdu | .640 | .280 | .178 | 2.290 | .043 |
| | MacMmgIndx | -.119 | .045 | -.156 | -2.655 | .022 |
| | TariffRateapplied | -2.085 | .556 | -.573 | -3.752 | .003 |

**Coefficients[a]**

a. Dependent Variable: TVmil$

The coefficients table provides detailed information about the impact of each predictor on the dependent variable, "TvMil$". Each predictor's unstandardized and standardized coefficients, along with their t-values and significance levels, are presented. The GDP in millions of dollars (GDPmil$), Inflation CPI, Real Interest Rates, Unemployment Rate (UnempRateILO%WF), Government Expenditure of GDP (GovtExpofGDP), Population Growth Annual (PopGrwthannual), Personal Remittances Received in millions of dollars (PersRemmRecmil$), Government Expenditure in Education (GovtExpinEdu), Macroeconomic Management Index (MacMgmgIndx), and Tariff Rate Applied (TariffRateapplied) are the predictors used in the model. Notably, the predictors with the most significant impact on "TvMil$" are PersRemmRecmil$, GovtExpinEdu, and MacMgmgIndx, as indicated by their low Sig. values. This suggests that these factors have a statistically significant influence on Bangladesh's international trade.

Based on the coefficients table from the regression analysis, the following interpretations can be made for the significant predictors. As all the variables were logged, a 1% increase in GDP (GDPmil$) is associated with a 0.268 unit increase in the dependent variable "TvMil$", holding all other variables constant. Similarly, a 1% increase in real

interest rates (RealIntRates) is associated with a 0.227 unit decrease in "TvMil$", holding all other variables constant. When it comes to personal remittances received in millions of dollars (PersRemmRecmil$), a 1% increase is associated with a 0.467 unit increase in "TvMil$", holding all other variables constant. On the other hand, a 1% increase in government expenditure in education (GovtExpinEdu) is associated with a 0.640 unit decrease in "TvMil$", holding all other variables constant. Lastly, a 1% increase in the macroeconomic management index (MacMgmgIndx) is associated with a 0.119 unit decrease in "TvMil$", holding all other variables constant.

From table 4, the mean of the residuals is approximately 0 (2.13E-14), which is a good sign as it indicates that the model is not systematically overestimating or underestimating the dependent variable. The standard deviation of the residuals is 0.724, which gives the idea about the typical deviation from the mean. The histogram shows the distribution of residuals. If the residuals are normally distributed, they should roughly follow the shape of the bell curve evident in table 4. From the histogram, it appears that the residuals are reasonably normally distributed, which is a good sign as it's one of the key assumptions of linear regression.

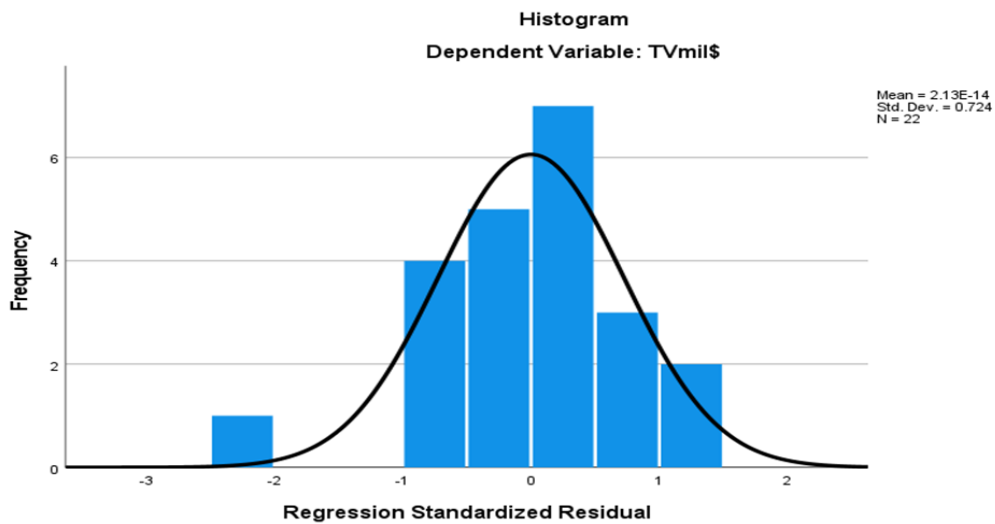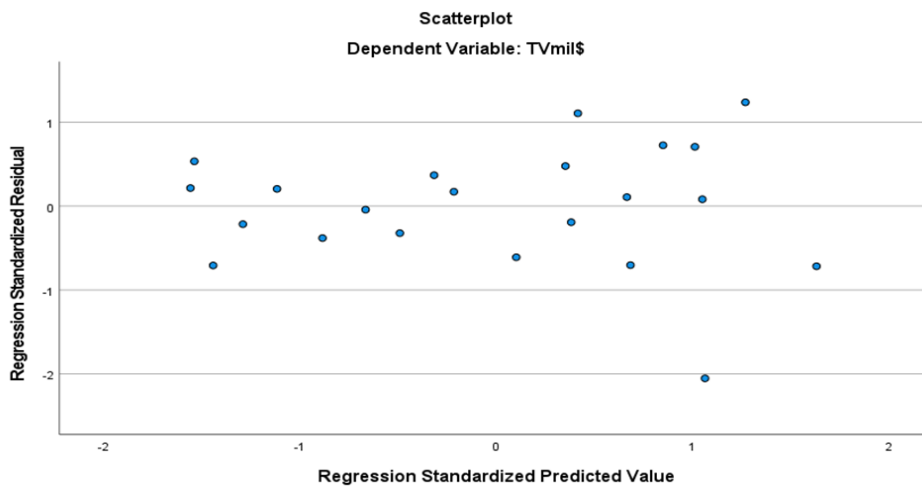**Table 4: Histogram of Regression Standardized Residuals**



**Table 5: Scatterplot of Regression Standardized Residuals vs Predicted Values**

The scatterplot in table 5 is a tool used in regression analysis to verify the assumptions of homoscedasticity and linearity. Homoscedasticity, the assumption that the variance of the errors is constant across all levels of the independent variables, is confirmed if the plot shows a random pattern of residuals around zero. Any clear pattern, such as residuals increasing or decreasing as the predicted value increases, indicates heteroscedasticity, violating this assumption. Linearity, the assumption that the relationship between the independent and dependent variables is linear, is suggested if the residuals are equally spread along the zero lines. The scatterplot appears to show that the residuals are randomly dispersed around the zero line, indicating that the assumptions of homoscedasticity and linearity are reasonably satisfied.

## 6. Recommendations

In this section, a series of policy recommendations are presented. These recommendations are derived from the significant predictors identified in the regression model that was used to analyze the impact of various factors on Bangladesh's international trade. The aim of these recommendations is to provide policymakers and stakeholders with actionable insights that can help enhance the country's trade performance. The specific recommendations are discussed in the following sections.

Leverage Personal Remittances: Given the significant positive impact of personal remittances received (PersRemmRecmil$) on international trade (TvMil$), policymakers should focus on initiatives that encourage and facilitate remittance inflows. This could involve streamlining remittance channels, reducing transaction costs, and implementing policies to attract higher remittance flows. The recent problem facing Bangladesh related to remittance through indirect channels should immediately be fixed. Remittance though official channels should be subsidized. Alongside, incidents of harassment of the remittance workers would be brought down to zero.

Strategic Allocation of Government Expenditure: The negative association between government expenditure in education (GovtExpinEdu) and international trade (TvMil$) suggests a need for careful consideration in allocating government funds. While investments in education are crucial for long-term development, policymakers should ensure that such expenditures do not disproportionately burden trade-related sectors. Balancing investments in education with measures to support trade infrastructure and development could lead to more sustainable trade growth.

Enhance Macroeconomic Management: The negative impact of the macroeconomic management index (MacMgmgIndx) on international trade (TvMil$) underscores the importance of effective economic governance. Policymakers should focus on improving macroeconomic policies, regulatory frameworks, and institutional capacities to create a conducive environment for trade. This could involve measures to enhance fiscal discipline, monetary stability, and regulatory efficiency, thereby fostering investor confidence and facilitating trade expansion.

Mitigate Effects of Real Interest Rates: The negative association between real interest rates (RealIntRates) and international trade (TvMil$) highlights the need to address factors contributing to interest rate fluctuations. Policymakers, primarily the central bank of Bangladesh should adopt measures to mitigate the adverse effects of high real interest rates on trade, such as implementing monetary policies aimed at stabilizing interest rates, promoting investment-friendly environments, and fostering financial sector development to enhance access to credit for trade-related activities.

Monitor and Adapt to GDP Fluctuations: The positive relationship between GDP (GDPmil$) and international trade (TvMil$) suggests that economic growth can stimulate trade activities. However, policymakers should closely monitor GDP fluctuations and their implications for trade dynamics. During periods of economic expansion, efforts should be made to capitalize on increased demand for goods and services through trade facilitation measures, market diversification strategies, and export promotion initiatives.

It is important to note that these recommendations should be considered in conjunction with other relevant factors and research, even though they are based on the findings of this research.

## 7. Conclusions

In conclusion, this study aimed to analyze the impact of selected internal factors on Bangladesh's international trade dynamics employing OLS. Through an empirical investigation utilizing regression analysis, key insights have been derived regarding the factors influencing the country's trade performance. The findings underscore the significance of various internal factors in shaping Bangladesh's international trade landscape. Personal remittances received,

government expenditure in education, macroeconomic management index, real interest rates, and GDP have been identified as crucial determinants affecting the volume of international trade. Notably, personal remittances received emerged as a significant driver of international trade, highlighting the importance of leveraging remittance inflows to stimulate trade activities. However, the negative association between government expenditure in education and international trade underscores the need for strategic allocation of resources to balance educational investments with trade-related initiatives. Furthermore, the study emphasizes the imperative of enhancing macroeconomic management practices to create a conducive environment for trade. Effective governance, regulatory frameworks, and monetary stability are pivotal in fostering investor confidence and facilitating trade expansion. Addressing fluctuations in real interest rates and monitoring GDP dynamics are also essential considerations for policymakers to capitalize on trade opportunities during economic growth phases. In essence, the findings of this study provide valuable insights for policymakers and stakeholders seeking to enhance Bangladesh's international trade performance. By strategically addressing the identified internal factors and aligning policies with broader development goals, Bangladesh can foster sustainable trade growth and contribute to its overall economic prosperity. However, it is crucial to recognize the dynamic nature of international trade and the need for continuous monitoring and adaptation to evolving market conditions and global trends.

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