

Macroeconomic Drivers and Barriers of Stock Market Development: Evidence from Bangladesh

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ABSTRACT

Purpose: This study aims to identify the key drivers and impediments to stock market development in Bangladesh by empirically examining the dynamic relationships between macroeconomic variables and stock market development.

Methodology: The analysis utilizes the Autoregressive Distributed Lag (ARDL) bounds testing approach, applied to annual time series data spanning a 31-year period. Prior to estimation, unit root tests are conducted to establish the integration properties of the variables, ensuring the appropriateness of the ARDL framework. Model specification is validated through standard diagnostic tests. Furthermore, Granger causality tests are employed to assess the directionality of causal relationships between stock market development and macroeconomic indicators.

Findings: The results provide robust evidence of a long-run cointegrating relationship between stock market development and its macroeconomic determinants. In the long term, the exchange rate and foreign direct investment (FDI) are found to exert significant negative effects on stock market development, whereas domestic credit to the private sector exhibits a strong positive influence. In the short run, trade openness and economic growth are also identified as influential factors, though their effects are primarily transitory. The Granger causality analysis reveals predominantly unidirectional causal links from macroeconomic variables to stock market development, with limited instances of bidirectional causality involving economic growth and FDI.

Practical Implications: The findings underscore the need for policymakers to prioritize exchange rate stability, domestic banking sector development, and adopt strategic approaches to FDI management. A coherent and coordinated macroeconomic policy framework is essential to foster sustainable stock market growth.

Value/Originality: The research advances the relatively sparse empirical literature on the determinants of stock market development in Bangladesh. By elucidating the complex interactions between macroeconomic variables and market performance, the study offers critical insights for policymakers, regulators, and investors seeking to promote financial market development in similar economic contexts.

Limitations: This study is confined to the Bangladeshi context and a specific timeframe, which may limit generalizability to other emerging economies.

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1. Introduction

Development and sustainability of capital market is crucial not only for the protection of savers and investors but also for the industrialization of country. Capital market plays the important role in mobilizing capital flows, improving corporate governance and stability of overall financial system, and thereby economic growth of a country (Adjasi & Biekpe, 2006; Pan & Mishra, 2018; Wahab & Faruq, 2012; Claessens et al., 2002). Even the development of capital market is considered one of the important indicators of economic development of a country (Levine & Zervos, 1998). Capital markets are sensitive to internal and external shocks leading to bubble-burst events. Frequent occurrence of bubble-burst result in the loss of confidence of the investors. Therefore, pragmatic regulatory policies and reforms is crucial for maintaining stability of capital markets.

This paper investigates the macroeconomic variables influencing stock market development in Bangladesh. Bangladesh, as one of the fastest-growing economies in South Asia, presents a compelling case for examining stock market development dynamics. Despite achieving remarkable economic growth averaging over 6% annually in recent decades, Bangladesh's capital market remains underdeveloped relative to its economic potential. Stock markets of Bangladesh don't have informational efficiency. It is possible for the big traders to artificially manipulate the prices of assets in capital market because of the weak infrastructure of regulatory institution (Joarder et al., 2014). Capital market in Bangladesh is progressing in spite of low institutional investment and large proportion of financially uneducated investors. Although investor demand is growing, the availability of fundamentally strong securities remains limited. Moreover, Bangladesh lacks an operational secondary bond market, and the number of multinational companies listed on its stock exchange is notably low. Due to weak infrastructure, investigation and enforcement capacity of regulators, and mismatch between demand and supply, price earnings ratio as well as price volatility is higher in Bangladeshi capital market (Wahab & Faruq, 2012). Considering the critical need for stock market development, a substantial number studies in the literature tries to investigate what macroeconomic and institutional factors contributes to or bar the development of stock market (Ho, 2019; Kyereboah-Coleman & Agyire-Tettey, 2008; Hasan & Nasir, 2008; Omar et al., 2022; Chang et al., 2021; Verma & Bansal, 2021).

This study addresses a critical research gap by empirically exploring the complex interplay between macroeconomic variables and stock market development in Bangladesh, an emerging economy often overlooked in financial literature. First, although there is extensive research on stock market development, most existing studies focus on developed or large emerging markets, leaving smaller emerging economies underexplored. Second, the conflicting findings regarding the impact of key macroeconomic variables such as exchange rates, interest rates, and foreign direct investment suggest that the relationships may be context-specific and require country-level analysis. Third, the unique characteristics of Bangladesh's economy including its export-oriented manufacturing sector, remittance-dependent foreign exchange earnings, and bank-dominated financial system necessitate a tailored empirical investigation.

This study investigates the effect of exchange rate, bank lending rate, FDI, Domestic credit to private sector, trade openness and GDP growth on stock market development in Bangladesh. The findings regarding exchange rates, domestic credit delivery, and foreign direct investment offer novel insights that contribute to the growing body of literature on capital market development in emerging economies, with particular relevance for policy formulation in Bangladesh's unique economic context.

The remaining study is structured as follows: Section 2 offers a discussion of the data and variables used in the analysis; Section 3 outlines the methodology employed. Section 4 provides an examination of the empirical results, with a critical discussion of these results in Section 5. Lastly, Section 6 offers conclusions and policy suggestions.

2. Literature Review

The interplay of macroeconomic factors and stock market development has been extensively studied across both developed and emerging economies. Understanding these determinants is crucial for policymakers, financial analysts, and investors seeking to comprehend financial market dynamics and improve market efficiency. The review of literature is break-down into following subsections.

2.1 Macroeconomic Determinants and Stock Market Performance

Stock market development is widely acknowledged to be influenced by a range of macroeconomic variables, including economic growth, banking sector development, exchange rate dynamics, inflation, and trade openness (Ho & Odhiambo, 2020). Among these, exchange rate fluctuations have been shown to significantly impact stock market performance. As Jorion (1991) argues, volatility in exchange rates can directly affect stock market movements. A depreciation in the domestic currency may exert downward pressure on stock prices, primarily due to its adverse effects on a country's trade balance and international competitiveness (Dornbusch & Fischer, 1980). The resulting decline in firms' real production capacity and expected profitability leads to a reduction in anticipated cash flows, thereby negatively influencing stock valuations. However, the extent and direction of exchange rate effects on stock market development are contingent upon country-specific economic structures and characteristics (Ross, 2013; Adler & Dumas, 1983). For instance, export-oriented economies may benefit from currency depreciation, while import-dependent economies may suffer.

The relationship between interest rates and stock market development remains inconclusive in the empirical literature. Some studies report a negative impact, suggesting that rising interest rates increase the cost of capital, reduce corporate profits, and discourage investment, thereby depressing stock prices (Asprem, 1989; Kandir, 2008; Humpe & Macmillan, 2009). Mok (1993) and Spiro (1990) further argue that higher lending rates constrain business expansion and consumer spending, contributing to reduced stock market activity. Conversely, other studies find either a positive or statistically insignificant relationship (Wongbangpo & Sharma, 2002; Lee & Brahmasrene, 2018; Lael Joseph & Vezos, 2006), highlighting the context-dependent nature of this association.

Foreign direct investment (FDI) is widely regarded as a catalyst for stock market development, particularly in emerging economies. Numerous studies have documented the positive spillover effects of FDI on capital markets through technological transfer, enhanced corporate governance, and increased investor confidence (Karthik & Kannan, 2011; Acheampong & Wiafe, 2013; Raja, 2018; Sayim & Rahman, 2015). However, Omar et al. (2022) challenge this assumption, arguing that in developing economies with underdeveloped capital market infrastructure, FDI may substitute rather than complement capital markets, potentially leading to a negative relationship between FDI inflows and stock market development.

Gross domestic credit to the private sector is commonly used as a proxy for banking sector development. The empirical literature presents mixed findings regarding the relationship between banking sector and stock market development. While these two components are often seen as complementary pillars of a well-functioning financial system, their interaction may vary across different institutional contexts. According to Levine (2005), a well-developed stock market can reduce overreliance on bank financing and mitigate the negative effects of banking sector dominance. Stiglitz (1985) and Grossman & Hart (1980) emphasize that stock markets promote improved corporate governance, facilitate efficient information dissemination, and enhance competition for corporate control. In this view, banking sector development and stock market expansion can co-evolve in a mutually reinforcing manner (Ho, 2019).

Trade openness is another important determinant of stock market development. Liberalized trade regimes enhance capital market activity by increasing both the supply and demand for financial

products and services (Niroomand, Hajilee & Al Nasser, 2014; Rajan & Zingales, 2003; Newbery & Stiglitz, 1984). Openness to international trade fosters market entry, intensifies competition, and exposes the domestic economy to external shocks, thereby increasing the need for diversified financial instruments to manage risk and raise capital (Svaleryd & Vlachos, 2002). Furthermore, trade liberalization may reduce the influence of domestic financial intermediaries in resisting capital market development (Rajan & Zingales, 2003).

Economic growth is consistently identified as a primary driver of stock market development. Empirical studies have established a positive and statistically significant relationship between economic growth and stock market performance (Levine & Zervos, 1996; Atje & Jovanovic, 1993; Hossin & Islam, 2019; Ahmed & Chowdhury, 2024). Economic expansion increases the demand for capital and financial services, enhances corporate profitability, and boosts investor confidence, thereby facilitating capital market deepening.

The direction of causality between economic growth and stock market development remains a subject of scholarly debate. The supply-leading hypothesis posits that financial market development precedes and stimulates economic growth by mobilizing savings, improving capital allocation, and providing risk diversification mechanisms (McKinnon, 1973; Shaw, 1973). In contrast, the demand-following hypothesis suggests that financial development is a consequence of increased economic activity and demand for financial services (Lucas, 1988). Pan & Mishra (2016) illustrate the complexity of this relationship in the context of China, where speculative behavior and policy interventions in the Shanghai A-share market contributed to a long-run negative correlation with industrial production.

In summary, existing research underscores the multifaceted and context-dependent nature of macroeconomic determinants of stock market development. While economic growth and banking sector development generally exert a positive influence, factors such as exchange rate volatility and inflation tend to have adverse effects. These relationships often vary across countries and over time, underscoring the importance of institutional quality, policy frameworks, and structural economic characteristics in shaping the linkages between macroeconomic variables and stock market development.

2.2 Monetary and Fiscal Policy Influences

Monetary policy instruments significantly impact stock market performance. Ali et al. (2015) identified positive associations between money supply, gross domestic savings (GDS), and stock market growth in both short and long-term horizons using the ARDL co-integration model. Similarly, research on Ghana's stock exchange demonstrates that interest rates and inflation negatively affect market performance, while fiscal policy decisions, such as government borrowing patterns, substantially influence market dynamics (Asravor & Fonu, 2020).

The implications of interest rates on stock markets operate through multiple channels. Higher interest rates increase investment costs, subsequently reducing stock market performance (Demir, 2019). Fama (1981) demonstrated that interest rates and inflation typically have adverse effects on stock returns by increasing uncertainty and eroding purchasing power. Sirucek (2012) corroborated these findings in his analysis of the U.S. stock market, where inflation notably hampered stock market growth.

2.3 International Economic Factors

International economic factors, including FDI, portfolio investments, trade balance, and crude oil prices, significantly influence stock market development. Hashmi & Chang (2021) found that FDI, trade balance, and industrial output positively affect emerging stock markets in Brazil, Russia, and India, particularly in medium and long-term horizons. Capital inflows, including portfolio investment and FDI, have been shown to stimulate stock market growth by enhancing market liquidity and providing essential capital (Hamao & Mei, 2001; Demir, 2019). Trade openness exhibits a complex relationship

with stock market development, potentially yielding positive long-term effects while causing short-term disruptions (Ho & Odhiambo, 2018). The real effective exchange rate (REER) has been observed to positively impact stock market indices, particularly in countries with significant international trade exposure (Demir, 2019). Energy markets also influence stock performance, with crude oil prices affecting stock markets differently depending on whether countries are energy importers or exporters. Sirucek (2012) noted that oil prices positively influenced U.S. stock market performance, especially the Dow Jones Industrial Average, highlighting the sector-specific nature of these relationships.

2.4 Institutional and Market Structure Factors

Institutional factors play as crucial factor in determining stock market development, particularly in emerging economies. Yartey (2010) emphasized that political risk, law and order, and bureaucratic competence significantly affect external funding availability and investor confidence. Gani & Ngassam (2008) demonstrated that rule of law and government effectiveness substantially impact stock market development by enhancing market efficiency and boosting investor trust.

Market structure and efficiency also serve as important determinants. Aman et al. (2020) found that scale efficiency in larger economies with greater GDP enhances stock market growth. However, developing nations often face impediments to stock market development due to weaker institutional frameworks and less efficient capital markets (Eichengreen & Luengnaruemitchai, 2004). Stock market liquidity is particularly important for attracting investments as it facilitates capital flow and mitigates risks (Phan & Vo, 2013; Yartey, 2008). Matadeen (2019) identified income levels, banking sector development, stock market liquidity, inflation, and investment rates as critical macroeconomic variables affecting stock market growth.

2.5 Context-Specific Variations in Emerging Markets

Emerging economies exhibit unique characteristics in their stock market development trajectories. In developing nations, domestic credit availability, economic growth, stock market liquidity, and inflation significantly influence stock market capitalization (Garcia & Liu, 1999; Yartey, 2010). Broad money supply and inflation often negatively impact stock market development in these contexts by contributing to economic instability (Raza et al., 2015).

The association of international remittances and stock market development presents an interesting case. Ali et al. (2015) found that international remittances have limited impact on stock market growth, as they are typically directed toward consumption rather than investment in many developing economies.

3. Data and Variables

The study applies annual time series data spanning a period from 1993 to 2023. The timeframe of dataset is chosen mainly based on availability. The dataset is collected from World Bank Indicators (WDI) 2024 compiled by World Bank (wdi.worldbank.org). Table 1 clarify the variables, acronym used, definition, and references.

Table 1. Data and Variables

Variable	Acronym	Definition	References
Stock Market Development	SMD	Total market capitalization of listed local companies, as a percentage of GDP.	(Omar et al., 2022; Salameh and Ahmad, 2022; Ho, 2019; Ben Naceur, Ghazouani & Omran, 2007)
Exchange Rate	ER	Officially declared exchange rate Bangladesh Taka per USD.	(Wickremasinghe, 2011; Gavin, 1989; Adler & Dumas, 1983; Kumar, 2013; Ho & Odhiambo, 2020)
Lending Rate	LR	The cost of borrowing from banks in Bangladesh.	(Erol & Aytekin, 2019; Ajaz et al., 2017; Wang & Li, 2020; Spiro, 1990; Mok, 1993)
Foreign Direct Investment	FDI	Net inflows of foreign investment, expressed as a percentage of GDP.	(Acheampong & Wiafe, 2013; Issahaku et al., 2013; Stiglitz, 1985; Levine, 2005; Ho & Odhiambo, 2020)
Local credit to Private Sector	PCD	This study employs domestic credit to the private sector as a proxy for banking sector development, expressed as a percentage of GDP.	(Newbery & Stiglitz, 1984; Rajan & Zingales, 2003; Pilinkus, 2010; Nikmanesh & Nor, 2016; Ho, 2019; Ho & Odhiambo, 2020)
Trade Openness	TO	Total exports and imports of goods and services, expressed as a percentage of GDP, indicating the degree of integration of Bangladesh into the global economy.	(Ho, 2019; Islam et al., 2019; Agrawalla & Tuteja, 2008; Cherif & Gazdar, 2010; Ho & Odhiambo, 2020)
Economic Growth	EG	Annual percentage growth rate of GDP at market prices based on constant local currency, representing the overall economic performance of Bangladesh.	(Garcia & Liu, 1999; Yartey, 2010; Cherif & Gazdar, 2010; Ho, 2019; Omar et al., 2022; Verma & Bansal, 2021)

Source: Authors Created.

Figure 1 shows the trends of stock market capitalization, expressed as a percentage of GDP in Bangladesh. The figure depicts Bangladesh's stock market capitalization to GDP ratio (1993–2023), showing several bubble and burst periods indicating capital market instability.

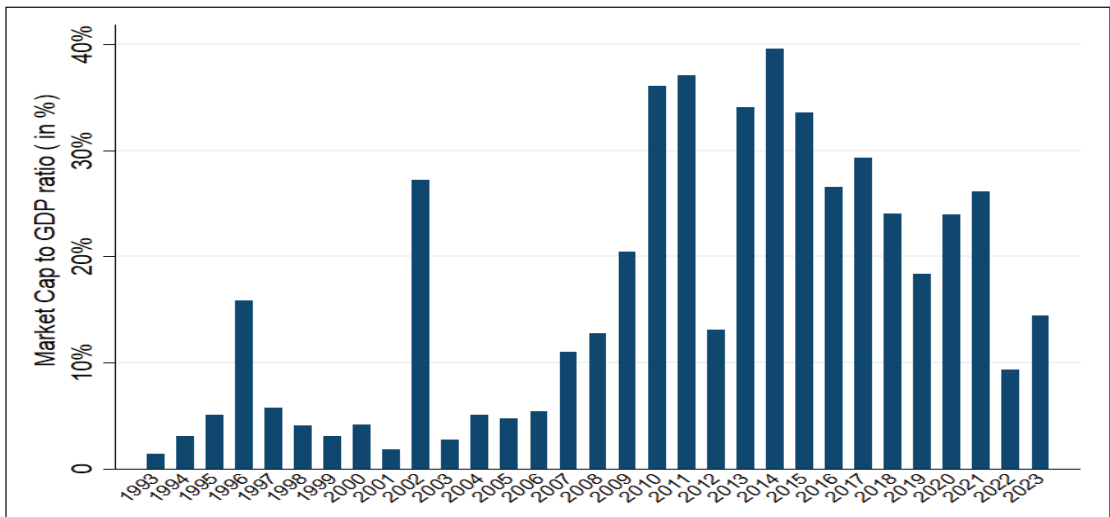


Figure 1. The Plot of Market Capitalization as a Percentage of GDP (1993-2023)

4. Methodology

This study investigates the macroeconomic determinants of stock market development in Bangladesh by analyzing both long-run and short-run dynamics. The functional relationship between stock market development (SMD) and macroeconomic determinants can be formally represented as follows:

$$SMD = f(ER, LR, FDI, PCD, TO, EG) \quad (1)$$

The Ordinary Least Squares (OLS) regression technique may yield spurious results when applied to non-stationary time series data. Following the studies conducted by Yusof & Majid (2007), Omar et al. (2022), Ho & Odhiambo (2020), Hashmi & Chang (2023), and Kyereboah-Coleman and Agyire-Tettey (2008), we chose to apply the Autoregressive Distributed Lag (ARDL) bounds testing approach developed by Pesaran et al. (2001). This approach differs from conventional cointegration techniques like VECM and VAR. The reason why ARDL bounds testing technique is particularly suitable for this study is that it can perform well even with small samples. Secondly, it can accommodate regressors of different order of integration i.e. order I (0) or I (1) or mixture of both but not I (2) (Chang et al., 2019; Anjum et al., 2017). Thirdly, it addresses potential endogeneity issues through appropriate lag selection and simultaneous estimation of long-run and short-run coefficients (Jalil, Mahmood and Idrees, 2013). After confirming the variables are integrated at I (0), I (1) or mixed, we proceed to estimate following ARDL model:

$$\begin{aligned} \Delta \ln SMD_t = & \alpha_0 + \sum_{i=1}^q b_i \Delta \ln SMD_{t-i} + \sum_{i=0}^{n1} c_i \Delta \ln ER_{t-i} + \sum_{i=0}^{n2} d_i \Delta \ln LR_{t-i} + \\ & \sum_{i=0}^{n3} e_i \Delta \ln FDI_{t-i} + \sum_{i=0}^{n4} f_i \Delta \ln PCD_{t-i} + \sum_{i=0}^{n5} g_i \Delta \ln TO_{t-i} + \sum_{i=0}^{n6} h_i \Delta \ln EG_{t-i} + \\ & \phi_1 \Delta \ln SMD_{t-1} + \phi_2 \Delta \ln ER_{t-1} + \phi_3 \Delta \ln LR_{t-1} + \phi_4 \Delta \ln FDI_{t-1} + \phi_5 \Delta \ln PCD_{t-1} \\ & + \phi_6 \Delta \ln TO_{t-1} + \phi_7 \Delta \ln EG_{t-1} + \varepsilon_t \end{aligned} \quad (2)$$

Where Δ indicates the first difference operator, q and n to represent the appropriate lag lengths, and ε_t is the white noise error term. The appropriate lag structure is determined based on Akaike Information Criterion (AIC) criteria.

The existence of a long-run relationship is examined using the bounds testing procedure. The null Hypothesis of no cointegration among variables is expressed as follows:

$$H_0 = \phi_{SMD} + \phi_{ER} + \phi_{LR} + \phi_{FDI} + \phi_{PCD} + \phi_{TO} + \phi_{EG} = 0 \quad (3)$$

Long-term cointegration among variables is established if null hypothesis gets rejection. Following the confirmation of cointegration, the short-run dynamics and the speed of adjustment toward long-run equilibrium are estimated through an error correction model, specified as follows:

$$\Delta \text{LnSMD}_t = \alpha_0 + \sum_{i=1}^q b_i \Delta \text{LnSMD}_{t-i} + \sum_{i=0}^{n1} c_i \Delta \text{LnER}_{t-i} + \sum_{i=0}^{n2} d_i \Delta \text{LnLR}_{t-i} + \sum_{i=0}^{n3} e_i \Delta \text{LnFDI}_{t-i} + \sum_{i=0}^{n4} f_i \Delta \text{LnPCD}_{t-i} + \sum_{i=0}^{n5} g_i \Delta \text{LnTO}_{t-i} + \sum_{i=1}^{n6} h_i \Delta \text{LnEG}_{t-i} + \varphi \text{ECT}_{t-1} + \varepsilon_t \tag{4}$$

Where the error correction is term, and represents the speed of adjustment towards long-term equilibrium. If the coefficient is with negative sign and statistically significant, then variables are moving toward long-run equilibrium followed by short-run disturbances.

5. Empirical Results

5.1 Descriptive Statistics

Table 2 presents the summary statistics for the variables used to examine stock market development determinants in Bangladesh over a 31-year period. Stock market development (SMD) exhibits considerable variation with a mean of 16.11% and a standard deviation (SD) of 12.38%. The exchange rate (ER) shows substantial fluctuation with an average of 67.07 and SD of 17.31, reflecting the volatility in Bangladesh's currency market. Lending rate (LR) maintains a relatively stable pattern showing a mean value of 11.66% and SD of 2.04%. Foreign direct investment (FDI) displays modest values with an average of 0.65% and SD of 0.48%, suggesting limited but variable foreign capital inflows. Private credit to domestic sector (PCD) averages 31.94% with SD of 9.31%, while trade openness (TO) averages 33.33% with SD of 7.35%. Economic growth (EG) shows a mean of 5.72% with relatively low variability (SD of 1.14%).

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
SMD	31	16.105	12.382	1.399	39.597
ER	31	67.071	17.311	39.567	106.309
LR	31	11.656	2.037	7.121	13.944
FDI	31	.651	.48	.005	1.735
PCD	31	31.944	9.308	15.294	44.407
TO	31	33.334	7.346	22.866	48.111
EG	31	5.724	1.139	3.448	7.882

Source: Authors Calculation

The study conducts Augmented Dickey-Fuller (ADF) test (Fuller, 1976; Dickey and Fuller, 1979) with testing for unit root in the time series data used in the study. As the ARDL bounds test approach cannot deal with time series integrated of order two, it is essential to test stationarity before going for ARDL model. Table 3 presents the stationary characteristics of the variables using the ADF test. The findings indicate that while most variables are non-stationary in their level form, they attain stationarity upon first differencing. Specifically, SMD, ER, LR, FDI, PCD, and TO are integrated of order one, I (1), as they become stationary after first differencing at conventional significance levels. Economic growth (EG) is the only variable stationary at level, categorized.

Table 3. Unit Root Tests Results

	Augmented Dickey Fuller (ADF)		Remarks
	Level Prob.	1st Diff. Prob.	
SMD	0.4990	0.0020***	I (1)
ER	0.9141	0.0113**	I (1)
LR	0.9666	0.0111**	I (1)
FDI	0.2385	0.0000***	I (1)
PCD	0.0949	0.0000***	I (1)
TO	0.2933	0.0000***	I (1)
EG	0.0031***		I (0)

Source: Authors Calculation

5.2 The results of ARDL Bounds Test Method

Tables 4, 5, and 6 present the empirical findings from the ARDL model examining the determinants of stock market development in Bangladesh. These results offer valuable insights into both the long-run equilibrium associations and short-run dynamics among the variables.

Table 4 presents the Autoregressive Distributed Lag (ARDL) bounds test results for cointegration analysis, with stock market development (SMD) specified as the dependent variable. The computed F-statistic of 10.99 substantially exceeds the upper critical bound value of 3.99 at the 1% significance level (as illustrated in Table 5), providing robust statistical evidence for the existence of a long-run cointegrating relationship between stock market development and its determinants - exchange rate, lending rate, foreign direct investment, private credit to domestic sector, trade openness, and economic growth. This finding establishes a statistically significant foundation for the subsequent examination of both long-run and short-run equilibrium relationships among the variables under investigation.

Table 4. ARDL Bound Test Results

Explained Variable	Function	F-Statistics	Cointegration Status
LDSEX	F(SMD ER,LR,FDI,PCD,TO,EG)	10.99***	Cointegrated

Source: Authors Calculation

Table 5. Critical Values for ARDL Bounds Test

Significance level	Lower Bound, I (0)	Upper Bound, I (1)
10%	1.99	2.94
5%	2.27	3.28
2.5%	2.55	3.61
1%	2.88	3.99

Source: Authors Calculation

The estimated long-run coefficients, presented in the upper panel of Table 6, reveal several significant relationships. The exchange rate (ER) exhibits a statistically significant negative effect on stock market development, with a coefficient of -5.9431 (p-value = 0.0040). This negative relationship suggests that currency depreciation adversely affects stock market performance in Bangladesh, potentially through mechanisms such as deterrence of foreign portfolio investment and heightened market uncertainty. Similarly, foreign direct investment (FDI) demonstrates a negative association with stock market development (coefficient = -0.2252, p-value = 0.0243), a finding that contradicts theoretical expectations. This counterintuitive result may be attributed to the structural characteristics of FDI inflows to Bangladesh, which may be predominantly directed toward sectors with minimal integration with capital markets. Private credit to the domestic sector (PCD) exhibits a strong positive relationship with stock market development (coefficient = 6.4228, p-value = 0.0001), underscoring the complementarity between banking sector development and capital market expansion in Bangladesh. This finding corroborates the financial intermediation theoretical framework, which posits that a well-developed banking system contributes to stock market growth through the provision of liquidity and facilitation of investment activities. The lending rate (LR), trade openness (TO), and economic growth (EG) do not demonstrate statistically significant long-run relationships with stock market development, although their estimated coefficients suggest potential directional effects that merit further empirical investigation with alternative specifications or extended time series.

The lower panel of Table 6 delineates the short-run dynamics and error correction model results. The exchange rate maintains its negative influence in the short run (coefficient = -4.4521, p-value = 0.0080), while private credit to the domestic sector continues to exert a positive effect (coefficient = 4.4410, p-value = 0.0028). In contrast to its long-run impact, foreign direct investment does not exhibit a statistically significant short-run effect on stock market development. Notably, trade openness demonstrates a significant negative effect with a one-period lag (coefficient = -2.5292, p-value = 0.0166), suggesting that enhanced trade openness may initially precipitate capital outflows before the materialization of potential long-term benefits. Similarly, economic growth exhibits a significant negative effect with a one-period lag (coefficient = -1.1100, p-value = 0.0110), indicating a complex short-run dynamic between economic expansion and stock market performance that differs from theoretical predictions.

The error correction term (ECT) coefficient of -1.5529 (p-value = 0.0000) is highly significant and negative, confirming the model's stability and indicating a rapid adjustment toward long-run equilibrium. The magnitude exceeding unity suggests an overshooting adjustment mechanism, wherein deviations from equilibrium are corrected within less than one period, followed by convergence to the long-run equilibrium path. This rapid adjustment coefficient provides strong evidence for the validity of the estimated long-run relationships and the stability of the economic system under investigation.

Table 6. *The Long Run and Short-Run Results of the Selected Model (1, 1, 1, 1, 1, 2, 2).*

	Coefficient	Standard Error	t-statistics	p-value
Long-run results (Explained variable is SMD)				
ER	-5.9431***	1.7035	-3.4888	0.0040
LR	-2.2324	1.3552	-1.6472	0.1235
FDI	-0.2252**	0.0883	-2.5482	0.0243
PCD	6.4228***	1.1351	5.6583	0.0001
TO	1.1558	1.2371	0.9343	0.3672
EG	0.5570	0.7850	0.7097	0.4905

Short-run results (Explained variable is Δ SMD)				
Δ ER	-4.4521***	1.4221	-3.1307	0.0080
Δ LR	1.3931	1.4599	0.9543	0.3574
Δ FDI	-0.0849	0.0806	-1.0489	0.3133
Δ PCD	4.4410***	1.2095	3.6717	0.0028
Δ TO	-1.1915	1.0460	-1.1391	0.2752
Δ TO (-1)	-2.5292**	0.9205	-2.7476	0.0166
Δ EG	-0.4657	0.3921	-1.1878	0.2561
Δ EG (-1)	-1.1100**	0.3747	-2.9623	0.0110
ECT (-1)	-1.5529***	0.1335	-11.6333	0.0000

Notes: R-squared = 0.5440, Adj. R-squared = 0.5254, ***, **, * indicates significance level at the 10%, 5% and 1% respectively. Δ indicates first difference operator. The model is selected based on AIC criteria.

Source: Authors Calculation

5.3 Diagnostic Tests

The model diagnostic tests results in Table 7 indicate robust specification. The Breusch-Godfrey LM test ($p=0.3541$) shows no significant serial correlation, while White's test ($p=0.4125$) confirms homoskedasticity. The Ramsey RESET test ($p=0.5002$) validates appropriate functional form. The Jarque-Bera test results depicted in Figure 2 suggest normality of residuals. Stability diagnostics presented in Figures 3 and 4 through CUSUM and CUSUM of squares tests demonstrate that the parameters remain stable throughout the sample period, as the test statistics remain within the critical bounds at the 5% significance level, confirming structural stability of the model.

Table 7. Diagnostic Tests Results

	Test applied	Statistic	P-value
Serial Correlation	Breusch-Godfrey LM Test:CHSQ(1)	0.859	0.3541
Heteroskedasticity	White:CHSQ	29.00	0.4125
Functional form test	Ramsey RESET : F(3, 10)	0.84	0.5002

Source: Authors Calculation

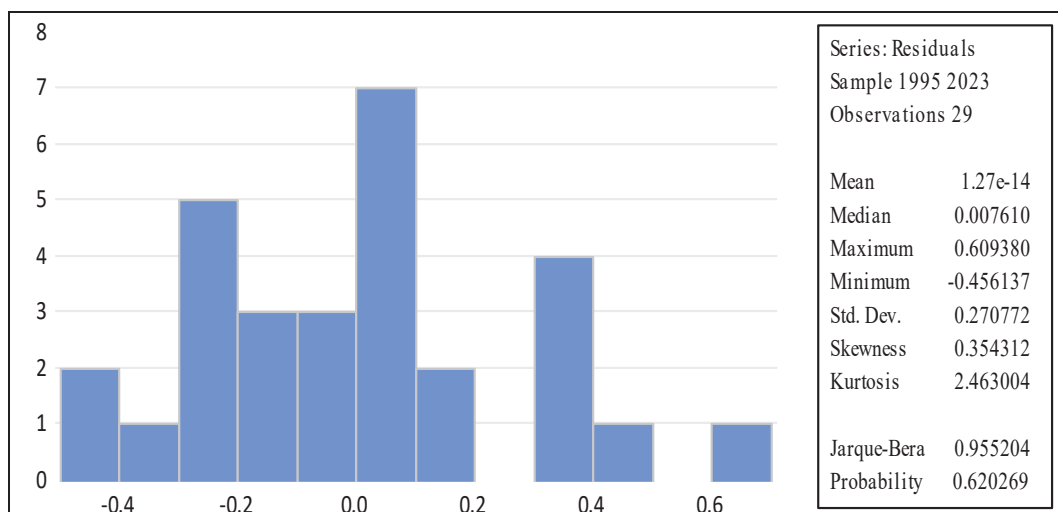


Figure 2. Jarque-Bera normality test

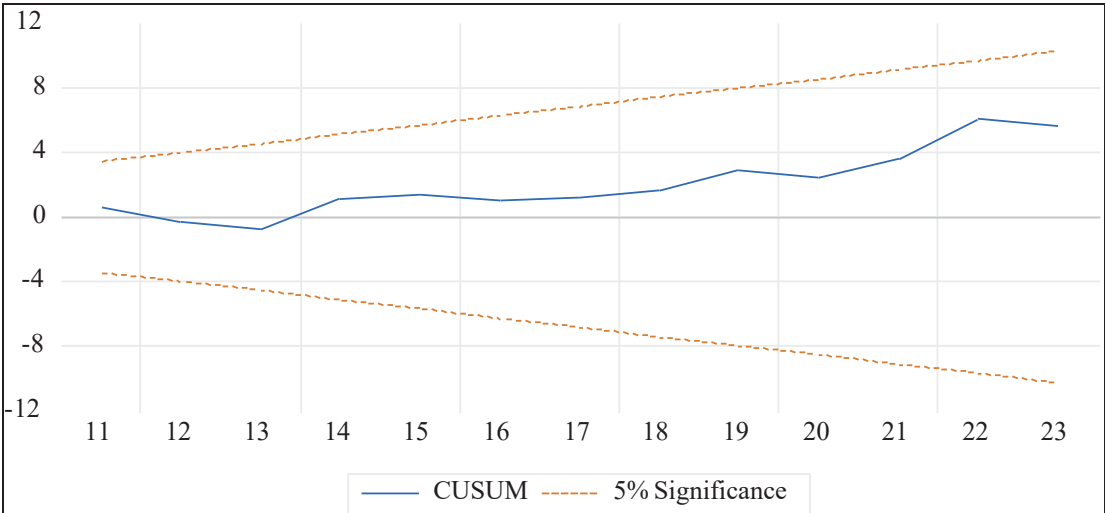


Figure 3. The Cumulative Sum of Recursive Residuals (CUSUM)

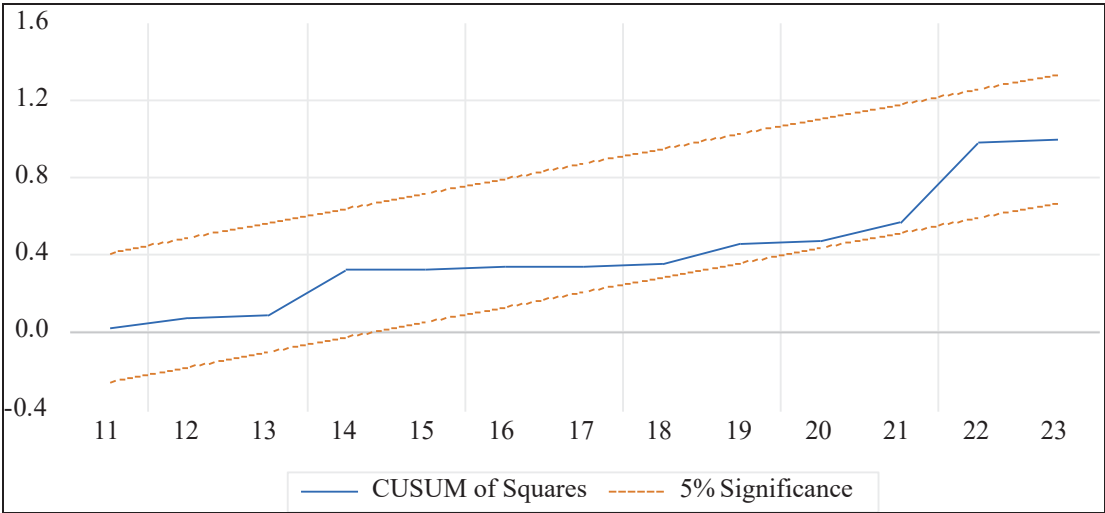


Figure 4. The Squared of Cumulative Sum of Recursive Residuals (CUSUMSQ)

5.4 Granger Causality Test

Table 8 presents bidirectional Granger causality analysis between stock market development (SMD) and various macroeconomic variables. Unidirectional causality runs from exchange rate (ER) to SMD ($p=0.047$), foreign direct investment (FDI) to SMD ($p=0.000$), private credit development (PCD) to SMD ($p=0.000$), trade openness (TO) to SMD ($p=0.018$), and economic growth (EG) to SMD ($p=0.022$). Notably, there is weak bidirectional causality between SMD and economic growth, as SMD Granger causes EG at the 10% significance level ($p=0.06$). SMD also weakly Granger causes FDI ($p=0.073$). No causal relationship is detected from lending rate (LR) to SMD, or from SMD to ER, PCD, or TO. These findings suggest that macroeconomic variables predominantly influence stock market development, with limited feedback effects from the stock market to the broader economy except in the case of economic growth and FDI.

Table 8. *Granger Causality Test*

Null hypothesis	Lag length	chi2- statistic	P-value
ER does not Granger cause SMD	2	6.097**	0.047
SMD does not Granger cause ER	2	0.338	0.844
LR does not Granger cause SMD	2	0.601	0.740
SMD does not Granger cause LR	2	4.234	0.120
FDI does not Granger cause SMD	2	17.515***	0.000
SMD does not Granger cause FDI	2	5.232*	0.073
PCD does not Granger cause SMD	1	16.441***	0.000
SMD does not Granger cause PCD	1	0.166	0.683
TO does not Granger cause SMD	2	8.030**	0.018
SMD does not Granger cause TO	2	1.889	0.389
EG does not Granger cause SMD	2	7.627**	0.022
SMD does not Granger cause EG	2	5.541**	0.06*

Note: AIC, HQIC, and SBIC criteria are used to choose optimal lag length. *, ** and *** implies significance at 1%, 5% and 10% levels, respectively.

Source: Authors Calculation

6. Discussions

The empirical results from ARDL model reveal significant relationship between key macroeconomic variables and stock market development in Bangladesh. The robust error correction term confirms the existence of a strong equilibrium relationship with rapid adjustment to disequilibria, aligning with methodological approaches used in similar studies (Yartey, 2010; BenNaceur et al., 2007).

The significant negative relationship between exchange rate and stock market development corroborates the theoretical framework proposed by Dornbusch and Fisher (1980), who posited that currency depreciation can adversely affect market capitalization in emerging economies. This finding also aligns with Ma and Kao (1990) who documented that in import-dominant economies like Bangladesh, currency depreciation negatively impacts equity markets through increased import costs and inflationary pressures. Gavin (1989) opined that the disturbances in exchange rate due to unanticipated expansionary fiscal policy has adverse impact on stock market development.

The negative coefficient for FDI contradicts conventional wisdom but can be explained through "bypass effect" theory, which suggests that in underdeveloped, riskier and poorly institutionalized financial systems, foreign investors may circumvent local capital markets through direct financing channels and act as a substitute for local capital markets (Hausmann and Fernández-Arias, 2000b, a). This finding aligned with Omar et al. (2022), who found negative FDI effects in neighbouring Pakistan, highlighting potential structural similarity between these South Asian economies.

Private credit to domestic sector (PCD) demonstrates the strongest positive relationship, supporting Garcia and Liu's (1999) "financial intermediary-growth view" which posits complementarity between banking sector development and equity market expansion. This finding is further reinforced by Yartey (2007), who established that well-developed banking systems provide critical infrastructure for stock market function in developing economies.

The short-run dynamics, particularly the negative lagged effects of trade openness and economic growth, suggest alignment with Svaleryd and Vlachos (2002), who argued that increased economic openness may initially create adjustment costs before yielding long-term capital market benefits. The persistence of PCD's positive influence in both timeframes underscores the robust banking-stock market complementarity documented by Cheng (2012) in emerging Asian economies.

This analysis demonstrates the critical importance of exchange rate stability, strategic FDI management, and continued banking sector development for fostering stock market growth in Bangladesh.

7. Conclusion

This study has examined the macroeconomic determinants of stock market development in Bangladesh using an ARDL bounds testing approach. The findings reveal complex relationships between macroeconomic variables and stock market performance that have significant implications for policy formulation and investment decisions.

The confirmed cointegration between stock market development and macroeconomic variables establishes that exchange rates, foreign direct investment, and local credit to the private sector are significant long-run determinants of stock market performance in Bangladesh. The negative relationship between exchange rate and stock market development suggests that currency depreciation adversely affects market performance, potentially by discouraging foreign portfolio investment and increasing uncertainty. Contrary to conventional expectations, FDI demonstrates a negative association with stock market development, possibly reflecting sector-specific characteristics of foreign investment in Bangladesh that may have limited linkages to capital markets. The strong positive relationship between private credit to the domestic sector and stock market development underscores the complementary relationship between banking sector development and capital market growth. This finding aligns with financial intermediation literature suggesting that a developed banking system contributes significantly to stock market expansion by providing necessary liquidity and facilitating investment activities.

The short-run dynamics reveal additional temporal effects from trade openness and economic growth, indicating that these variables may have different impacts across time horizons. The rapid error correction mechanism confirms the model's stability and indicates swift adjustment toward long-run equilibrium following shocks.

Granger causality results further enrich our understanding by demonstrating that macroeconomic variables predominantly influence stock market development rather than the reverse. This unidirectional causality from exchange rate, FDI, private credit development, trade openness, and economic growth to stock market development suggests that macroeconomic conditions are primary drivers of market performance. The limited bidirectional relationships observed with economic growth and FDI indicate potential feedback effects that warrant further investigation.

For policymakers in Bangladesh, these findings highlight the importance of maintaining macroeconomic stability, particularly through exchange rate management, while simultaneously promoting banking sector development to foster robust stock market growth. Policies aimed at attracting productive FDI with stronger linkages to capital markets could potentially transform the observed negative relationship into a positive one.

This study has the limitation of focusing only on a single-country. Therefore, findings may not be generalizable to other emerging countries with different economic characteristics. Future research should focus on examining these relationships across different economic cycles (i.e. policy reforms, financial crises) and exploring additional institutional factors that may moderate the impact of macroeconomic variables on stock market development in Bangladesh and comparable emerging economies.

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