The Role of Capital Market in Economic Development: An Evidence of ARDL -ECM Approach

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ABSTRACT

Purpose: This study investigates the short- and medium-term interactions between financial markets, inflation, and economic growth, aiming to identify the channels through which financial variables influence real economic activity.

Methods: Using weekly data from 2010 to 2023, we employ vector autoregression (VAR) and autoregressive distributed lag (ARDL) models to analyze the dynamic effects of stock market capitalization (SMC), stock market turnover (SMT), government bond prices (GBP), government bond yields (GBY), and inflation (INFLA) on GDP. The models capture both short-run dynamics and long-run relationships, with lags selected to account for delayed adjustment processes.

Results: GDP exhibits strong persistence, with lagged output consistently exerting a positive effect. Equity market variables (SMC and SMT) positively influence GDP in the short run, whereas bond market indicators (GBP and GBY) show negligible effects. Inflation negatively impacts GDP contemporaneously, with partial adjustment in the subsequent period. The error correction mechanism indicates slow but stable convergence toward long-run equilibrium.

Implications: The findings highlight equity markets as the primary channel affecting short-term growth, while bond markets play a minor role. Inflationary pressures impose temporary but meaningful drag on output, underscoring the importance of price stability. Policymakers and regulators should prioritize equity market development and sustained macroeconomic stability to support both short- and long-term economic growth.

Keywords: GDP, financial markets, stock market capitalization, stock market turnover, government bond yields, ARDL, cointegration, short-run dynamic

INTRODUCTION

The capital market plays a crucial role in promoting economic development by providing a platform through which long-term financial resources are mobilized and allocated to productive investments. It serves as a marketplace where companies and various institutions—such as sovereign governments, supranational organizations (e.g., the World Bank), local and state authorities, and public sector entities—can raise long-term funds through the issuance of securities **(Choudhry et al., 2010)**. The capital market primarily consists of the stock market and the bond market.

By mobilizing both domestic and foreign savings and channelling them toward profitable investment opportunities, the capital market supports industrialization, business expansion, and economic diversification. This process facilitates the establishment of new enterprises and the growth of existing ones, thereby contributing to sustained economic development **(Levine, 1993).**

A substantial body of empirical literature has examined the causal relationship between capital market development and economic growth. Several studies provide evidence of a positive and significant relationship. For instance, **Bouattour, Kalai, and Helali (2024)** find that stock market development and financial depth exert a favourable and statistically significant long-run impact on economic growth. Similarly, **Ahmed and**

Chowdhury (2024), using a time-series approach to examine capital market efficiency and economic growth, reveal that indicators such as market capitalization and turnover ratio are positively and significantly associated with GDP growth. Their findings suggest that enhanced capital market efficiency stimulates economic growth. In addition, a recent study titled *Financial Development and Economic Growth: Evidence from Low-Income Nations in the SADC Region (2023–2024)*, which employed panel data from 2000 to 2022, reports a positive correlation between financial development and economic growth across low-income Southern African Development Community (SADC) countries.

Despite the extensive literature on the finance–growth nexus, relatively few studies have focused specifically on the impact of capital market development on economic growth in Tanzania. One notable contribution is a daily news article written by (Florian J, 2026), which highlights an increase in market capitalization among Dar es Salaam Stock Exchange (DSE)–listed companies. This rise reflects greater valuation of listed firms and signals an improved capacity of the capital market to mobilize savings and channel them into productive investments, thereby supporting economic growth.

The development of Tanzania's capital market is closely linked to reforms in the country's banking sector. In August 1988, the government established a Presidential Commission, chaired by the late Governor of the Bank of Tanzania (BoT), Charles Nyirabu, to examine challenges facing the financial sector and propose reforms aimed at improving financial services and economic performance. The commission sought to introduce a market-based economy and address prevailing macroeconomic instability. Its report, submitted in July 1990, revealed a significant decline in savings mobilization between 1979 and 1986. Financial assets accounted for nearly 50 percent of GDP in 1979 but fell to 28 percent by 1986, while the domestic savings rate declined from 25 percent of GDP in 1977 to just 8 percent in 1985 (BoT, 2011).

Among its recommendations, the commission emphasized the establishment of a capital market to encourage long-term savings and investment. It also proposed comprehensive financial sector reforms, including interest rate and exchange rate liberalization; restructuring of formal financial institutions through the resolution of non-performing assets; reform of the regulatory framework; promotion of competition through the entry of private banks with domestic and foreign ownership; enhancement of the Bank of Tanzania's prudential regulatory and supervisory capacity; and development of an efficient money market through the introduction of new financial instruments.

In Tanzania, much of the existing empirical literature on economic growth and financial development has focused on the banking sector as a proxy for overall financial system development (Adu et al., 2013; Hou & Cheng, 2010). A comprehensive review by Choong and Chan (2011) concludes that the finance–growth nexus literature provides strong evidence of both long-run positive effects and short-run causality between financial development and economic growth in both developed and developing economies. However, relatively few studies have examined the relationship between stock market development and economic growth (Beck & Levine, 2000). The literature attributes this imbalance primarily to the relatively small size of equity markets compared to banking systems in many developing economies (Levine & Zervos, 1998).

LITERATURE REVIEW

Theoretical Perspectives on Capital Market Development and Economic Growth

The relationship between capital market development and economic growth has been extensively examined in economic theory and empirical literature. This relationship is commonly framed within several theoretical perspectives, including **Neoclassical growth theory**, the **Harrod–Domar growth model**, and theories emphasizing the role of financial systems in economic development. While these frameworks recognize the importance of capital accumulation and investment, they differ in their treatment of the financial sector. This study is grounded in the **Finance–Growth Co-Evolution Theory**, which offers a dynamic and integrative explanation of the interaction between capital market development and economic growth.

The Finance–Growth Co-Evolution Theory posits that financial development and economic growth are **jointly determined and mutually reinforcing processes**. Rather than assuming a unidirectional causal relationship, the theory emphasizes a feedback mechanism in which developments in the financial system and the real economy evolve together over time. This perspective provides a more comprehensive understanding of the finance–growth nexus, particularly in developing and emerging economies.

According to this theory, during the **early stages of economic development**, financial deepening plays a supply-leading role by mobilizing domestic savings, improving the efficiency of resource allocation, and facilitating investment and innovation. An open and liberalized financial system enhances productivity by enabling the formation of efficient capital markets that channel funds toward productive economic activities. As economic growth accelerates, rising income levels and expanding business activities generate increased demand for financial services, including credit, investment vehicles, and risk-management instruments. This demand-following process further stimulates financial sector development, reinforcing economic growth and creating a cumulative feedback effect.

This co-evolutionary perspective contrasts with earlier theoretical views that emphasized a **one-way causality** between finance and growth. The **supply-leading hypothesis**, advanced by **Schumpeter (1911), McKinnon (1973)**, and **Shaw (1973),** argues that financial development precedes and drives economic growth by facilitating capital accumulation and innovation. Conversely, the **demand-following hypothesis**, articulated by **Robinson (1952)** and **Patrick (1966),** suggests that financial development responds to the needs of a growing economy. The Finance–Growth Co-Evolution Theory reconciles these views by asserting that both mechanisms operate simultaneously and may dominate at different stages of development.

Empirical and theoretical studies provide substantial support for the co-evolution hypothesis. **Greenwood and Jovanovic (1990)** demonstrate that as economies grow, increased participation in financial markets enhances financial efficiency, which in turn promotes further economic growth. **Levine (1997)** highlights multiple transmission channels through which financial development affects growth, including capital accumulation, productivity improvements, and technological innovation, thereby reinforcing a positive feedback cycle. **Patrick (1966)** further contributes through the **stage-of-development hypothesis**, proposing that financial development is predominantly supply-leading in early stages of development and demand-following in later stages, implying a dynamic co-evolution over time.

More recent contributions strengthen this argument. Aghion, Howitt, and Mayer-Foulkes (2005) show that financial development plays a critical role in shaping long-run growth trajectories and convergence patterns, with feedback effects becoming increasingly important as economies mature. Evidence from the World Bank Global Findex database **(Demiurgic-Kunt, Klapper, & Singer, 2022)** indicates that financial inclusion and economic growth tend to move together across countries, consistent with the co-evolutionary framework. Similarly, Karlsson, Månsson, and Hacker (2021), employing wavelet decomposition techniques for OECD and emerging market economies, find bidirectional and time-varying causality between financial development and economic growth, further validating the co-evolution hypothesis.

The Finance–Growth Co-Evolution Theory provides a robust theoretical foundation for the present study, as it explicitly recognizes the **bidirectional interaction between capital market development and economic growth**. While acknowledging this mutual relationship, the study focuses on examining whether the influence of capital market development on economic growth in Tanzania is **short-run or long-run in nature**, within the context of the Tanzanian financial market.

Empirical Review

Empirical literature on the relationship between capital market development and economic development reveals **mixed but increasingly convergent evidence** supporting a dynamic and bidirectional relationship. Existing studies may broadly be classified into two strands: (i) those emphasizing **capital market development as a driver of economic growth**, and (ii) those viewing **economic development as a catalyst for capital market expansion**. This section reviews key empirical findings under each strand and situates the present study within the Tanzanian context.

Capital Market Development and Economic Development

A substantial body of empirical literature supports the view that capital market development contributes positively to long-term economic development. Capital markets enhance growth by mobilizing savings, facilitating long-term investment, improving resource allocation, and supporting innovation.

Recent global evidence from the **World Bank (2025),** based on firm-level and aggregate data from **1990 to 2022** across low- and middle-income countries, shows that capital markets—measured by equity and bond issuance, capital raised relative to GDP, and firm financing sources—have **doubled in importance** as a source of financing. The study concludes that deeper capital markets are increasingly central to firm growth and aggregate economic performance, particularly in developing economies.

Cross-country evidence further reinforces this relationship. **Karlsson, Månsson, and Hacker (2021),** using data for **76 countries spanning the 1960s to the 2010s**, employ wavelet decomposition techniques to examine the relationship between composite financial development indices and GDP. Their findings reveal **time-scale-dependent causality**, with finance leading growth at medium-term horizons (2–4 years) and bidirectional causality at longer horizons, especially in upper-income economies. This result supports the **time-varying co-evolution hypothesis**.

Country-specific time-series studies also report positive effects of capital market development on economic growth. **Akanayeva (2024),** using data from **Kazakhstan (1996–2021)**, finds a statistically significant positive relationship between stock market indicators—market capitalization, turnover ratio, and number of listed firms—and GDP growth, highlighting the importance of market deepening policies. Similarly, **Pokharel (2020)**, employing VAR and cointegration techniques on data from **1994–2019**, finds that causality between capital market indicators and economic growth varies by measure, with some indicators supporting finance-led growth and others indicating growth-led finance.

Panel-based studies further corroborate these findings. **Owen (2020),** using data from **1985–2018**, reports a positive association between stock market indicators (turnover ratio, market capitalization, and value traded) and GDP growth, while cautioning that results are sensitive to the choice of financial indicators. More recently, **Pandey (2025),** through a multi-country review covering **1990–2020**, finds that countries with more developed capital markets tend to experience higher average economic growth, although the magnitude of the effect varies across regions and institutional settings.

Overall, the empirical evidence suggests that capital market development plays a meaningful role in promoting long-run economic development, though the strength and direction of the relationship depend on country characteristics, time horizons, and measurement choices.

Economic Development and Capital Market Development

An alternative but complementary strand of the literature emphasizes **economic development as a driver of capital market expansion**. This perspective argues that rising income levels, structural transformation, and institutional improvements associated with economic growth generate increased demand for financial services, thereby deepening capital markets.

Using data from **25 emerging economies**, **Adusei (2022)** finds that long-run economic growth significantly promotes stock market development, with rising GDP per capita strongly associated with higher market capitalization and trading activity. In a similar vein, **Eze and Okonkwo (2021)** conceptualize economic development as a process of structural transformation and find that industrialization has a strong positive effect on stock market growth in Sub-Saharan Africa, as expanding industrial sectors require greater access to equity and bond financing.

Further evidence suggests that economic growth increases both the supply and demand for financial assets. **Le, Hoang, and Doan (2023)** argue that higher economic activity leads firms to demand more long-term financing, households to accumulate greater savings, and governments to expand infrastructure investment—factors that collectively deepen capital markets. At the household level, **Bist and Bista (2022)** show that higher income levels and improved financial literacy increase participation in equity markets, while Sahoo et al (2023) finds that rising incomes enhance financial savings, thereby boosting market liquidity and depth.

Institutional and technological channels have also been highlighted. Gygli, Haelg, and Sturm (2023) demonstrate that economic development improves institutional quality—such as investor protection and contract enforcement—which in turn accelerates capital market development in developing countries. Similarly, Chen and Lee (2020) find that economic growth fosters technological adoption, with digital transformation enhancing stock market efficiency and reducing transaction costs in emerging markets.

Macroeconomic stability and external capital flows further link growth to capital market expansion. Khatun and Rahman (2023) find that developing economies that achieve sustained economic growth and macroeconomic stability attract greater foreign direct investment (FDI) and portfolio inflows, contributing to stock market expansion. Supporting this view, Yartey and Adjasi (2023) show that rising GDP and economic stability attract foreign portfolio investors, increasing market depth and liquidity.

Collectively, these studies suggest that economic development creates the structural, institutional, and demand-side conditions necessary for capital market growth.

Evidence from Tanzania and Research Gap

In the context of **Tanzania**, existing descriptive and empirical studies indicate that the capital market remains **relatively small and shallow** compared to international benchmarks. Market capitalization and turnover at the Dar es Salaam Stock Exchange (DSE) have historically been low relative to GDP, with market activity concentrated among a small number of large firms. However, recent developments—particularly the expansion of the government and corporate bond markets—suggest gradual diversification and increased relevance of capital markets as a source of long-term financing.

Despite the recognized importance of capital markets in mobilizing savings, allocating capital efficiently, facilitating risk sharing, and supporting economic growth, empirical evidence on the **magnitude, direction, and time horizon** of this relationship remains inconclusive, particularly for Tanzania. Most existing studies either rely on cross-country panel analyses or focus on short time spans, limiting their ability to capture country-specific dynamics and long-run relationships.

This study addresses this gap by empirically examining the **short-run and long-run relationship between capital market development and economic development in Tanzania**, using real GDP per capita as a proxy for economic development and employing the **Autoregressive Distributed Lag (ARDL) approach to cointegration**, which is well-suited for small samples and mixed orders of integration.

Research Objective

To determine the **short-run and long-run impact of capital market development on economic development in Tanzania**, while controlling for relevant macroeconomic and institutional factors.

Research Hypotheses

- **H1 (Long-run hypothesis):** Capital market development has a positive and statistically significant long-run impact on economic development in Tanzania.
- **H2 (Short-run hypothesis):** Short-run deviations from the long-run equilibrium are corrected over time, as indicated by a negative and statistically significant error-correction term.

METHODOLOGY

Data and variable

The study used Weekly Data from the World Bank Indicators Databank, IMF, NBS and DSE Publications. the analysis covers 13 years (2010– 2023). The use of weekly data is justified by the need to capture short-term dynamics and more detailed fluctuations in macroeconomic and financial variables that may not be observable with lower-frequency data such as quarterly observations. Weekly data provide a larger number of observations within the same time period, thereby improving the efficiency and reliability of econometric estimation and allowing for more precise identification of dynamic relationships among variables. Higher-frequency data are particularly useful when analyzing monetary and financial indicators because policy changes, market adjustments, and inflationary pressures often occur and transmit through the economy within relatively short time intervals. Using weekly data also enhances the ability to detect short-run responses and adjustment processes that could be smoothed or obscured in quarterly aggregates. Furthermore, the increased sample size associated with weekly observations strengthens the statistical power of time-series techniques, including the Autoregressive Distributed Lag (ARDL) Model, which relies on sufficient observations to estimate both short-run dynamics and long-run relationships. Therefore, the use of weekly data enables a more detailed and robust analysis of the temporal interactions among the variables under investigation.The analysis was performed through the use of STATA-SE14. The variables of the study were first constructed and transformed to ensure consistency and interpretability. The study employs real gross domestic product (GDP), broad money supply indicators (SMT and SMC), and inflation (INFLA). The dependent variable of this study is economic development and is measured using GDP at Market price. because of the limitations of data, only five capital market indicators were used includes stock market capitalization (SMC) to provide insights on value shares of a publicly traded company's outstanding common shares owned by stockholders, stock market turnover (SMT) which address the value of the share traded divided by the market capitalization, government bond yield(GBY) which address the return an investor earns on a government bond expressed as a percentage of its current market price, reflecting the annual income from interest payments (coupons) relative to what you pay for the bond**,** government bond price (GBP) which address the market value of a government's debt, determined by factors like prevailing interest rates and Inflation(INFLA) .

Model specification

The traditional neoclassical production function, most prominently represented by the Cobb–Douglas specification **(Cobb and Douglas, 1928),** describes the technical relationship between output and the levels of physical inputs employed in production. Within this framework, variations in output are driven by changes in factor inputs, originally confined to labor and physical capital. Subsequent theoretical developments extended this framework to allow for broader determinants of economic performance, including technological progress and institutional factors.

Building on this foundation, the finance–growth co-evolutionary model modifies the neoclassical production framework by explicitly incorporating financial development as a key driver of economic development. Early theoretical contributions by **Goldsmith (1969)** and **McKinnon (1973**) argue that financial systems enhance economic growth by mobilizing savings, improving capital allocation, and facilitating investment. These ideas were further formalized in endogenous growth models, which emphasize the role of financial intermediaries and markets in promoting innovation and long-run growth **(Greenwood and Jovanovic, 1990).**

Empirical evidence supporting the finance–growth nexus is well established. **King and Levine (1993a, 1993b)** demonstrate that financial development indicators strongly predict long-run economic growth, capital accumulation, and productivity improvements. **Levine (1997)** provides a comprehensive synthesis of theoretical and empirical studies, concluding that well-functioning financial systems reduce information and transaction costs, thereby fostering economic growth. **Levine, Loayza, and Beck (2000**) further show that financial development exerts a causal impact on economic growth through improved efficiency of resource allocation.

Within this extended framework, capital market development—captured through indicators such as stock market capitalization and turnover—is regarded as a crucial component of financial development. Well-developed capital markets enhance liquidity, diversify risk, and support long-term investment, thereby contributing to economic development **(Levine and Zervos, 1998).** Accordingly, economic development is modelled as a function of capital market indicators alongside a vector of control variables, including foreign direct investment, savings, inflation, human capital, trade openness, and interest rates. This theoretical foundation provides a robust basis for empirically examining the dynamic relationship between capital market development and economic development.

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Theoretical model linking capital markets to economic development where economic development depends on capital market development and other macroeconomic controls.

$GDPt = f(CMt, Xt)$ ……………………………………………………………(i)

Where as:

GDP_t - Economic development measure (e.g., log real GDP per capita)

CM_t - Capital market indicator(s) (e.g., stock market capitalization , stock market turnover)

X_t - Vector of control variables (FDI, savings, inflation, human capital, trade openness, interest rates)

Also, the equation may be written in Linear Form, The equation (ii) below too make equation (i) estimable.

$GDP_t = \alpha_0 + \alpha_1 CM_t + \alpha_2 X_t + \mu_t$ ………………………………………………………… (ii)

GDP_t = GDP at market price

α_1 is the contributions of Capital Market indicators(CM_t) to economic development which is represented by GDP_t

Expanded model considering the indicators of capital markets

$GDP_t = \alpha_0 + \alpha_1 SMC_t + \alpha_2 SMT_t + \alpha_3 GBP_t + \alpha_4 GBY_t + \alpha_5 INFLA_t + \mu_t$ ……………………………………….(iii)

Where as :

SMC = Stock Market Capitalization

SMT = Stock Market Turnover

GBP = Government Bond price

GBY = Government Bond Yield

INFLA = Inflation

GDP = Real GDP at Market Price .

The log of equation can be estimated, we have equation (iii) below.

$lnGDP_t = \alpha_0 + \alpha_1 lnSMC_t + \alpha_2 lnSMT_t + \alpha_3 lnGBP_t + \alpha_4 lnGBY_t + \alpha_5 lnINFLA_t + \mu_t$…………………………(iv)

Were as:

$lnGDP_t$ = Natural logarithm of GDP at Market price at time t

$lnGBP_t$ = Natural logarithm of government bond price at time t

$lnGBY_t$ = Natural logarithm of government bond yield at time t

$lnSMC_t$ = Natural logarithm of market capitalization at time t

$lnSMT_t$ = Natural logarithm of Turn over ratio at time t

$lnINFLA_t$= Natural logarithm of Inflation at time t

were $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ *and* α_5 *are the coefficient of the respective variables lnSMC , lnSMT, ln GBP, lnGBY and lnINFLA*

ARDL Model

From equation (i) above , The unrestricted ARDL model developed from the equation is as shown in question (v) below. The Unrestricted ARDL (p,q_1, q_2......q_k)

$$GDP_t = a_0 + \sum_{i=1}^{p} a_i R_{t-i} + \sum_{j=0}^{p_i} \beta_j CM_{t-j} + \sum_{m=0}^{p_k} y_m X_{t-m} + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots. (v)$$

ARDL Expanded with Capital Market Indicator

$$lnGDP_t = a_0 + \sum_{i=1}^{p} a_i lnR_{t-i} + \sum_{j=0}^{p_i} \beta_j lnSMC_{t-j} + \sum_{K=0}^{p_i} \delta_k lnSMT_{t-k} + \sum_{l=0}^{p_i} \phi_l lnGBP_{t-l} + \sum_{n=0}^{p_i} \psi_n lnGBY_{t-n} + \sum_{m=0}^{p_k} y_m lnINFLA_{t-m} + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (vi)$$

Equation vii can be expressed as conditional error correction model or unrestricted error correction regression, an ARDL equation for testing the existence long run level relationship among the variables (Pesaran et al.,2001; Wolde-Rufael, 2010). We therefore have the following regression equations

ARDL - Error correlation model

$$\Delta lnGDP_t = a_0 + \sum_{i=1}^{p-1} a_i \Delta lnR_{t-i} + \sum_{j=0}^{p_{i-1}} \beta_j \Delta lnCM_{t-j} + \sum_{m=0}^{p_{k-1}} y_m \Delta lnX_{t-m} + \lambda ECT_{t-1} + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots. (vii)$$

Where as :

$ECT_{t-1} = GDP_{t-1} - \beta_{CM} CM_{t-1} - \beta_X X_{t-1}$

ARDL Bound testing (Long run relationship)

$$\Delta lnGDP_t = a_0 + \sum_{i=1}^{p-1} a_i \Delta lnGDP_{t-i} + \sum_{j=0}^{p_{i-1}} \beta_j \Delta lnCM_{t-j} + \sum_{m=0}^{p_{k-1}} y_m \Delta lnX_{t-m} + p_1 mlnR_{t-1} + p_2 mlnCM_{t-1} + p_3 mlnX_{t-1} + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.. (viii)$$

Were as

Δ ln GDP_t , Δ $lnCM_t$, ... *short-run dynamics* (first differences)

$lnGDP_{t-1}$, ln CM_{t-1}, ... *lagged level variables*, used to test long-run effects

$p_1 m, p_2 m, p_3 m,$,...... The coefficients on level terms they are the key for the bounds test

$\mu_t \rightarrow$ error term

H_0: $p_1 = p_2 = p_3$ **= 0** which represent no long-run relationship (no cointegration).

$H_1: P_1m \neq P_2m \neq P_3m \neq \mathbf{0}$ which represent long-run relationship exists**.**

If cointegration is identified by the rejection of H_0, the long run and short run coefficients of the variables are estimated in equation using equation 5 and equation 6.

Equation (viii) gives the coefficients of the level variables in the long run at optimal lag. It shows the impact of the level variables up to in the long run. Equation (vii) is the ARDL short run specification; it is derived through the construction of an error correction model (ECM), λ in Equation (vii) is the coefficient of the ECM, it represents the speed of adjustment or re-equilibration to equilibrium position whenever there is deviation as a result of shocks, thus it must be negative and significant. The ECM is therefore the error correction term and is lagged by one period to show the percentage of its speed of adjustment from a shock in the previous period to equilibrium in the current period. All coefficients in equation (vii) reveals the short run impact of the independent variables on $\Delta \ln R_t$, hence, the first difference operator, Equation (vii) represents the ECM showing its speed of recovering from deviation.

Data analysis

Unit Root Test

Prior to model estimation, testing for stationarity is a crucial preliminary step in time-series econometric analysis to avoid spurious regression results and to ensure valid statistical inference. In this study, the stationarity properties of the variables were examined using the Augmented Dickey-Fuller Test and the Phillips-Perron Test. These tests are widely used to determine whether a time series contains a unit root and to establish the order of integration of the variables. The Augmented Dickey-Fuller Test is employed because it corrects for higher-order serial correlation by including lagged differences of the dependent variable, thereby providing reliable results in the presence of autocorrelation.

Table 1: Government Bond Price

		Test	1% Critical	5% Critical	10% Critical
		Statistic	Value	Value	Value
	Z(t)	-1.854	-3.430	-2.860	-2.570
MacKinnon approximate p-value for Z(t) = 0.3542					
lnGBP	*Coef.*	*Std.Err*	*T*	*P>|t|*	*[95% Conf. Interval]*
L1.	-0.0096688	0.0057946	-1.85	0.064	-.0199099 -.0005923
_cons	1.093348	0.5519364	1.84	0.066	.0028711 0.878822

The ADF Test result shows that **lnGBP is not stable.** unit root test on a Government bond price as one of the indicators of capital market development as shown in Table 4.1 shows that the ADF test statistic (Z(t)) is −1.854 and is not more negative than the critical values such as 5% critical value: −2.860 and the p-value: 0.3542 which is far above 0.10, The results suggest to reject the null hypothesis of a unit root because the variable **lnGBP** is non-stationary in levels. Because of this, **lnGBP in its current (level) form can not be analyzed** using standard regression techniques. To make the data suitable for analysis, the changes in the bond price rather than its current form need to be done.

Table 2: Government Bond Price

		Test	1% Critical	5% Critical	10% Critical
		Statistic	Value	Value	Value
	Z(t)	-26.636	-3.43	-2.86	-2.57

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MacKinnon approximate p-value for Z(t) = 0.0000					
D^2. lnGBP	*Coef.*	*Std.Err*	*t*	*P>|t|*	*[95% Conf. Interval]*
LD.	-1.000332	0.0375558	-26.64	0.000	-1.074066 -0.9265986
_Cons	-0.0003189	0.0006567	--0.49	0.627	0.0016082 .0009704

ADF Test of a first difference of lnGBP is stable which indicate D^2 lnGBP is stationary. shocks or sudden movements of the bond price die out very quickly once we look at first differences. The series has no longer drifts unpredictably at this level of transformation. From Table 4.2 further analysis At first difference , ADF test indicate the coefficient -1.0003 and t- statistic (Z(t)): −26.636, Critical value 1% :-3.430, 5%: −2.860, 10% ; -2.570 p-value < 0.001 Decision, The test statistic is far more negative than all critical values and the value is more significant and constant term is insignificant which indicate there is no drift in prices This strongly rejection of the null hypothesis of a unit root. ADF tests indicate that the log of GBP bond prices contains a unit root at its first difference is stationary. Hence, the series is integrated of first order I(1).

Table 3: GDP at Market Price

		Test	1% Critical	5% Critical	10% Critical
		statistic	Value	Value	Value
	Z(t)	-0.262	-3.430	-2.860	-2.570
MacKinnon approximate p-value for Z(t) = 0.9308					
D.lnGDP	*Coef.*	*Std.Err*	*T*	*P>|t|*	*[95% Conf. Interval]*
L1	-0.0005301	0.0020262	-0.26	0.794	-.0045082 0 .003448
_Cons	-0.0052298	0.0292206	0.18	0.858	-.0521394 0.0625989

Also, The ADF Test result shows that **GDP is not stable.** The unit root test on variable **lnGDP** when The Augmented Dickey–Fuller test performed fails to reject the null hypothesis (ADF = −0.835, p = 0.81) which indicating that the series is non-stationary in levels. The **ADF test statistic (Z(t))** shown as **−0.262** and **Critical values as , at** :1%: −3.430, 5%: −2.860 and 10%: −2.570 , from these data The test statistic is **much less negative** than all critical values and the **p-value**: **0.9308** is far above conventional significance levels (0.01, 0.05, 0.10) because of this **lnR can not be analyzed** using standard regression techniques. To make the data suitable for analysis, the changes in the GDP is needed.

Table 4. GDP at Market price

		Test	1% Critical	5% Critical	10% Critical
		statistic	Value	Value	Value
	Z(t)	-26.765	-3.430	-2.860	-2.570
MacKinnon approximate p-value for Z(t) = 0.0000					
D^2.lnR	*Coef.*	*Std.Err*	*T*	*P>|t|*	*[95% Conf. Interval]*
LD	-1.005182	0.0375553	-26.76	0.000	-1.078915 - 0.9311683
_Cons	-.0024233	0.001261	-1.92	0.055	-0.004899 0.000523

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At first differences, Dickey–Fuller tests indicate that lnGDP stationary with **ADF test statistic (Z(t))** of **−26.765 and 5% critical value** of **−2.860 and MacKinnon p-value**: **0.0000 . since** The test statistic is far more negative than all critical values and The p-value is essentially zero the results suggest to **strongly reject the null hypothesis of a unit root and also integrated the series in first order I (1)**

The ADF regression of **LnGDP** at first difference :

$\Delta^2 lnGDP_t=\alpha+\rho\, \Delta lnGDP_{t-1}+\mu_t$

Table.5: Stock Market Capitalization

		Test	1% Critical	5% Critical	10% Critical
		Statistic	Value	Value	Value
	Z(t)	-0.217	-3.43	-2.86	-2.57
MacKinnon approximate p-value for Z(t) = 0.9365					
D. lnSMC	*Coef.*	*Std.Err*	*T*	*P>|t|*	*[95% Conf. Interval]*
L1.	-0.0006458	0.035558	-0.22	0.829	-0.0065008 0.0052091
_Cons	-0.0381091	1.050706	-0.04	0.971	-2.100971 2.024753

ADF test statistic (Z(t)): **−0.217** and the **Critical values**: 1%: −3.430 , 5%: −2.860 and 10%: −2.570 and **p-value 0.9365,** The test statistic is nowhere near the critical values, and the p-value is extremely high. This confirm that Market cap has a unit root or non stationary. the results also indicate the test failure to reject null hypothesis

Table 6:Stock Market Capitalization

		Test	1% Critical	5% Critical	10% Critical
		statistic	Value	Value	Value
	Z(t)	-26.649	-3.43	-2.86	-2.57
MacKinnon approximate p-value for Z(t) = 0.0000					
D2.lnSMC	*Coef.*	*Std.Err*	*T*	*P>|t|*	*[95% Conf. Interval]*
LD.	-1.0006458	0.375558	-26.65	0.000	-1.074574 -0.9271061
_Cons	-0.2547555	0.3299931	-0.77	0.440	-9026361 0.393125

At first difference, ADF test results shows that t-statistic (Z(t)): **−26.649**, **Critical values**: 1%: −3.430, 5%: −2.860 and 10%: −2.570 and p-value: 0.0000 and The test statistic is vastly more negative than all critical values, strongly reject the null hypothesis of a unit root in first differences this indicates Market capitalisation at first difference is stationary, the result also implying that the series is integrated of order one, I(1)

Table 7: Stock market turnover

		Test	1% Critical	5% Critical	10% Critical
		statistic	Value	Value	Value
	Z(t)	-1.927	-3.43	-2.86	-2.57
MacKinnon approximate p-value for Z(t) = 0.3194					
D.lnSMT	*Coef.*	*Std.Err*	*T*	*P>|t|*	*[95% Conf. Interval]*
L1.	-0.0094336	0.0051638	-1.83	0.068	-0.0195717 0.0007045
_Cons	-0.416708	0.0228712	-1.82	0.069	-0.086574 0.0032324

ADF test statistic (Z(t)): −1.927 Critical values: 1%: −3.430, 5%: −2.860 and 10%: −2.570 . p-value: 0.3194 , The test statistic is less negative than all critical values, and the p-value is well above 10%, fail to reject the null hypothesis TURN (Turn over ratio) is non-stationary in levels (has a unit root).

Table 8: Stock market turnover

		Test	1% Critical	5% Critical	10% Critical
		statistic	Value	Value	Value
	Z(t)	-26.628	-3.430	-2.860	-2.570
MacKinnon approximate p-value for Z(t) = 0.000					
D2.lnSMT	*Coef.*	*Std.Err*	*t*	*P>|t|*	*[95% Conf. Interval]*
LD.	-1.000018	0.0375558	-26.63	0.000	-1.073768 0.92638007
_Cons	-0.0007086	0.0045252	-0.16	0.876	-0.009593 0.0081757

ADF test statistic (Z(t)): −26.628 , Critical values:1%: −3.430, 5%: −2.860 and 10%: −2.570 . p-value <0.001 . The test statistic is vastly more negative than all critical values. strongly reject the null hypothesis. D.TURN is stationary

Table 9: Inflation

		Test	1% Critical	5% Critical	10% Critical
		statistic	Value	Value	Value
	Z(t)	-1.578	-3.43	-2.86	-2.57
MacKinnon approximate p-value for Z(t) = 0.4946					
D.LnINFLA	*Coef.*	*Std.Err*	*t*	*P>|t|*	*[95% Conf. Interval]*
L1.	-0.0069632	0.0044125	-1.58	0.115	-0.0156262 0.0016998
_Cons	-8.69E-04	0.006214	1.4	0.163	-0.0003514 0.0020886

ADF test statistic (Z(t)): −1.578, 5% critical value: −2.860, p-value: 0.4946. Decision , The test statistic is not more negative than the critical values, The p-value is large. Fail to reject the null hypothesis of a unit root. INFLATION is non-stationary in levels. So, at least based on this specification (constant, no trend), inflation behaves like a unit-root process over your sample.

Table 10: Inflation

		Test	1% Critical	5% Critical	10% Critical
		Statistic	Value	Value	Value
	Z(t)	-26.627	-3.430	-2.860	-2.570
MacKinnon approximate p-value for Z(t) = 0.000					
D2.Ln INFLA	*Coef.*	*Std.Err*	*t*	*P>|t|*	*[95% Conf. Interval]*
LD.	-1.000003	0.0375558	-26.63	0.000	-1.073737 0.9262695
_Cons	1.50E-05	0.0003068	0.05	0.961	-0.0005874 0.0006174

ADF test statistic (Z(t)): −26.627, 5% critical value: −2.860, p-value: 0.0000. Decision The test statistic is far more negative than all critical values. The p-value is essentially zero ,You strongly reject the null hypothesis of a unit root**.**

VAR Optimal lag selection

To ensure that the dynamic relationships among variables are adequately captured while avoiding model misspecification the selection of appropriate lag length is crucial. In this study, the optimal lag structure was determined using standard information criteria, including the Akaike Information Criterion, the Schwarz Bayesian Information Criterion, and the Hannan-Quinn Information Criterion. These criteria balance model fit and parsimony by penalizing the inclusion of excessive lagged terms that may reduce estimation efficiency. The Akaike Information Criterion tends to select models with relatively larger lag lengths, thereby capturing more dynamic information, while the Schwarz Bayesian Information Criterion imposes a stronger penalty for additional parameters and typically favors more parsimonious models. The Hannan-Quinn Information Criterion provides a compromise between these two criteria. Using these complementary criteria ensures that the chosen lag structure adequately captures the underlying data dynamics, minimizes residual autocorrelation, and improves the reliability of the estimated coefficients in the econometric model.

Table 11: VAR Optimal Lag Selection

Lag	**LL**	**LR**	**DF**	**P**	**FPE**	**AIC**	**HQIC**	**SBIC**
0	1668.17				2.20E-11	-4.66854	-4.66854	-4.64088
1	10533.9	17731	49	0	3.40E-22	-29.5568	-29.4176	-29.1963*
2	10683.2	298.56*	49	0	2.60E-22*	29.8397*	-29.5786*	-29.1638
3	10690	13.581	49	1	2.90E-22	-29.7206	-29.3377	-28.7293
4	10704.9	29.831	49	0.986	3.20E-22	-29.6245	-29.1197	-28.3178

Table 5 presents the results of several standard lag selection criteria used to determine the optimal lag length for the vector autoregression (VAR) model. The criteria reported include the log-likelihood (LL), the sequential

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likelihood ratio (LR) test, the final prediction error (FPE), the Akaike Information Criterion (AIC), the Hannan–Quinn Information Criterion (HQIC), and the Schwarz Bayesian Information Criterion (SBIC).

The results indicate some variation across criteria. The LR test, FPE, AIC, and HQIC all select **two lags** as the optimal lag length, while the SBIC favors a more parsimonious specification with **one lag**. Given that the majority of the information criteria support a two-lag specification, and considering the strong persistence observed in the variables, a VAR model with **two lags** is selected.

Johansen co-integration test

Table 12: Johansen co-integration

Trend: constants				Number of obs	709
Sample	2010 – 2023			lags	4
Maximum				Trace	5%
rank	parms	LL	eigenvalue	Statistic	critical value
0	14	2833.5		6.3223	15.41
1	17	2836.31	0.00789	0.7029	3.76
2	18	2836.661	0.00099		
Maximum				Max	5%
rank	parms	LL	eigenvalue	Statistic	critical value
0	14	2833.5		5.6194	14.07
1	17	2836.31	0.00789	0.7029	3.76
2	18	2836.661	0.00099		

To examine the existence of a long-run equilibrium relationship among the variables, we apply the Johansen (1988, 1991) cointegration methodology. The test is conducted using weekly data covering the period **2010 – 2023**, yielding **709 observations**. The underlying VAR includes **four lags**, selected based on standard lag-selection criteria, and incorporates a **constant term** in the cointegration space.

Table 5.2 reports the results of both the **trace statistic** and the **maximum eigenvalue statistic**. For the null hypothesis of no cointegration (r=0r = 0r=0), the trace statistic (6.32) is below the 5% critical value (15.41), and the maximum eigenvalue statistic (5.62) is likewise below its corresponding critical value (14.07). Consequently, the null hypothesis of no cointegration cannot be rejected. For higher ranks, neither test provides evidence of additional cointegrating relationships.

Overall, the results from both test statistics consistently indicate a **cointegration rank of zero**, implying the absence of a stable long-run equilibrium relationship among the variables over the sample period.

Implications for Model Specification

Given the lack of evidence for cointegration, the analysis proceeds using a **VAR model in first differences**, rather than a vector error-correction model (VECM). This specification allows for short-run dynamic interactions among the variables while avoiding the imposition of unsupported long-run restrictions.

Short-Run Dynamics: Extended VAR Evidence

To assess short-run interactions among real activity, financial markets, and macroeconomic controls, we estimate an augmented vector autoregression (VAR) comprising real GDP, stock market turnover, stock market capitalization, government borrowing, government bond yields, and inflation. Guided by unit root and cointegration tests, real GDP enters the system in levels, while all other variables are specified in first differences. The VAR is estimated on **710 weekly observations 2010–2023** with **two lags**, selected using standard information criteria, and includes an intercept in each equation.

Model fit and persistence

The GDP equation exhibits strong persistence, with lagged GDP entering positively and highly significantly, yielding an R^2 exceeding 0.99. This reflects the well-known high degree of inertia in aggregate output at high frequencies. By contrast, the equations for stock market turnover and capitalization display negligible explanatory power, indicating that short-run movements in these variables are largely dominated by idiosyncratic or high-frequency shocks outside the VAR system. From Table 6.1 The results show that the **GDP equation is highly persistent**, with an R^2 of 0.997 and a strongly significant joint χ^2 statistic, reflecting the slow-moving nature of aggregate output at the weekly frequency. In contrast, the equations for **stock market turnover (ΔlnSMT)** and **stock market capitalization (ΔlnSMC)** exhibit very low R^2 values and insignificant joint χ^2 statistics, indicating that short-run movements in these financial variables are largely unpredictable within the VAR framework.

More substantial explanatory power is observed in the equations for **government borrowing (ΔlnGBP)**, **government bond yields (ΔlnGBY)**, and **inflation (ΔlnINFLA)**, where the joint tests are statistically significant. This suggests that fiscal, debt-market, and price dynamics respond more systematically to past macroeconomic and financial conditions than equity market activity.

Table 13: VAR Equation Summary

Dependent variable	RMSE	R^2	χ^2 (joint)	p-value
LnGDP	0.0338	0.997	243,405.00	0
ΔlnSMT	0.1217	0.001	0.52	1
ΔlnSMC	0.0344	0.007	5.27	0.948
ΔlnGBP	0.0163	0.143	118.27	0
ΔlnGBY	0.0209	0.207	185.56	0
ΔlnINFLA	0.0438	0.068	52	0

Real–financial linkages

Across specifications, neither stock market turnover nor stock market capitalization exerts a statistically significant effect on real GDP in the short run. Likewise, lagged GDP does not significantly predict short-run fluctuations in stock market activity. These results point to weak contemporaneous feedback between real economic activity and equity market indicators at the weekly frequency.

Fiscal, yield, and inflation channels

From Table 6.2, The coefficients indicate as short-run elasticities. Lagged GDP exhibits strong persistence, with a positive and highly significant effect on current GDP, while financial and macroeconomic variables have no significant short-run impact on output. Stock market turnover and capitalization neither affect nor respond to GDP, indicating weak short-run feedback between equity markets and the real economy. By contrast, fiscal and debt-market variables show more pronounced dynamics: government borrowing responds positively to past GDP, and bond yields respond strongly to changes in stock market capitalization. Inflation responds negatively to lagged stock market turnover, suggesting that higher market activity may be associated with lower short-run inflation, whereas other macro-financial variables are insignificant

Table 14: Coefficient Estimates

Regressor	lnGDP	ΔlnSMT	ΔlnSMC	ΔlnGBP	ΔlnGBY	ΔlnINFLA
lnGDP (t−1)	0.987***	−0.020	−0.013	0.054***	−0.086***	0.091*
ΔlnSMT (t−1)	−0.004	0.002	0.002	0.001	−0.002	−0.105***
ΔlnSMC (t−1)	0.015	0.018	0.006	−0.204***	0.326***	0.074
ΔlnGBP (t−1)	−0.050	−0.006	−0.002	−0.006	0.009	−0.019
ΔlnGBY (t−1)	−0.039	−0.001	0.006	−0.003	0.001	−0.004
ΔlnINFLA (t−1)	−0.045	−0.066	−0.046	−0.008	0.013	0.018

Taken together, the results suggest that **short-run interactions between financial markets and the real economy are limited and indirect**, operating primarily through fiscal and debt-market channels rather than through immediate effects on output. Combined with the absence of cointegration, the findings imply that real activity and financial market variables are not linked by a stable long-run equilibrium and that any interactions at the weekly horizon are transitory in nature.

ARDL Model

Table 15: ARDL(1,1) Results: Stock Market Capitalization and Economic Growth

ARDL(1,1)	Regression				Number of obs	711
Sample	5 - 711				F(3,707)	91924.04
					Prob >F	0.000
					R-Squared	0.9974
					Adj R-Squared	0.9974
Log Likelihood = 1452.6418					Root MSE	0.0315
lnGDP	*Coef.*	*Std.Err*	*T*	*P>|t|*	*[95% Conf. Interval]*	
lnGDP						
L1.	0.998829	0.0026085	382.91	0.000	0.9937076	1.00395
lnSMC						

--	0.3429738	0.0346272	9.9	0.000	0.2749895	0.410958
L1.	0.3441961	0.034617	9.94	0.000	-0.4121605	-0.27623
_Cons	0.0219085	0.0277577	0.79	0.430	-0.0325888	0.076459

The estimated **ARDL(1,1)** model incorporates one lag of economic growth (**lnGDP**) and one lag of stock market capitalization (**lnSMC**), thereby capturing both the dynamic persistence of economic growth and the long-run interaction between the variables. The model exhibits an **R^2 value of 0.9974**, indicating exceptionally high explanatory power, while the **F-statistic is statistically significant at the 1% level**, confirming the overall adequacy of the model. Such a high coefficient of determination is expected in ARDL specifications that include a lagged dependent variable, as economic growth typically displays strong persistence over time.The coefficient of the lagged dependent variable, **$lnGDP_{t-1} = 0.9988$ ($p < 0.01$)**, reflects strong inertia in economic growth and suggests the existence of a stable long-run equilibrium. The proximity of this coefficient to unity implies that adjustments toward equilibrium occur gradually following short-run disturbances. The lagged stock market capitalization variable, **$lnSMC_{t-1} = -0.3442$ ($p < 0.01$)**, is statistically significant and forms part of the long-run relationship between the variables. Its significance provides evidence of **cointegration between economic growth and stock market capitalization**, indicating that the two variables move together in the long run..

By combines cointegration, VAR, and ARDL approaches to examine the relationship between stock market activity and real economic growth. Cointegration tests indicate no evidence of a stable long-run equilibrium among real GDP, stock market turnover, and stock market capitalization, suggesting that these variables do not move together over the long term. Consistent with this, the VAR results show that short-run feedback between financial markets and GDP is weak: lagged stock market turnover and capitalization do not significantly affect output, nor is GDP a significant predictor of short-term equity market fluctuations. In contrast, fiscal and debt-market variables exhibit more pronounced dynamics, with government borrowing responding to past GDP and bond yields responding to changes in stock market capitalization, while inflation shows a negative response to lagged stock market turnover. Complementing these findings, an ARDL(1,1) model demonstrates a strong positive association between stock market capitalization and GDP, with both contemporaneous and lagged coefficients highly significant, reflecting that larger equity markets are associated with higher economic activity even at the weekly frequency. Together, these results suggest that while equity market variables have limited short-run impact on output, they are positively linked to economic growth, primarily through medium-term and financial-market channels, and that macroeconomic feedback operates more strongly via fiscal and debt-market channels than through direct real-financial linkages.

Table 16: ARDL(1,2) Results: Stock Market Turnover and Economic Growth

ARDL(1,2)	Regression				Number of obs	711
Sample	5-711				F(3,706)	66520.87
					Prob >F	0.000
					R-Squared	0.9974
					Adj R-Squared	0.9973
Log Likelihood = 1440.4624					Root MSE	0.032
lnGDP	*Coef.*	*Std.Err*	*T*	*P>|t|*	*[95% Conf. Interval]*	
lnGDP						

L1.	0.9990976	0.0024098	414.6	0.000	0.9943664	1.003829
lnSMT						
--	0.084422	0.0099996	8.44	0.000	0.0647894	0.410958
L1.	0.0891344	0.014096	-6.32	0.000	-0.1168094	-0.061459
L2.	0.52703	0.009998	0.53	0.598	-0.014359	0.024900
_Cons	0.013069	0.0396256	0.33	0.742	-0.647293	0.090867

In Consistent with this, the **VAR analysis** shows limited short-run feedback between financial markets and output: lagged stock market turnover and capitalization do not significantly affect GDP, nor does GDP significantly predict short-term movements in equity market activity. By contrast, fiscal and debt-market variables display more pronounced dynamics, with government borrowing responding to past GDP and government bond yields reacting strongly to changes in stock market capitalization. Inflation responds negatively to lagged stock market turnover, while other macro-financial variables have insignificant short-run effects.

The **ARDL(1,1) model** focusing on stock market capitalization (lnSMC) demonstrates a robust positive association with GDP. Both contemporaneous and lagged capitalization are highly significant (coefficient ≈ 0.343, $p < 0.001$), while lagged GDP shows strong persistence (coefficient ≈ 0.999, $p < 0.001$). These results indicate that larger equity markets support real economic activity even at the weekly frequency.

Similarly, the **ARDL(1,2) model** examining stock market turnover (lnSMT) and GDP confirms that output is highly persistent (lagged GDP ≈ 0.999, $p < 0.001$). Contemporaneous turnover has a positive and significant effect on GDP (coefficient = 0.084, $p < 0.001$), while the first lag shows a negative short-run adjustment (coefficient = −0.089, $p < 0.001$) and the second lag is insignificant. This suggests that higher trading activity boosts economic growth in the short term, with a partial short-term reversal in the following period.

Together, these findings indicate that while **short-run feedback from equity markets to GDP is limited**, financial markets—particularly stock market capitalization and turnover—are positively associated with economic activity over medium-term horizons. The results also highlight that fiscal and debt-market channels play a more prominent role in transmitting macro-financial dynamics than direct short-term real-financial linkages, consistent with the absence of long-run cointegration.

Table17: ARDL(1,2) Results: Government Bond Yield and Economic Growth

ARDL(1,2)	Regression				Number of obs	711
Sample	5 - 711				F(3,706)	60456.05
					Prob >F	0.000
					R-squared	0.9971
					Adj R-squared	0.9971
Log Likelihood = 1406.5712					Root MSE	0.032
lnGDP	*Coef.*	*Std.Err*	*t*	*P>|t|*	*[95% Conf. Interval]*	

lnGDP						
L1.	0.9989833	0.0021	475.71	0.000	0.9943664	1.003829
lnGBY						
--	0.1580704	0.0544049	0.29	0.771	-0.0909443	0.122685
L1.	0.0253788	0.0767101	-0.33	0.741	-0.1759861	-0.125229
L2.	0.0026358	0.543893	0.05	0.961	-0.1041483	0.109420
_Cons	0.0305017	0.0404929	0.75	0.452	-0.0489992	0.110003

Further The ARDL(1,2) model, incorporating one lag of GDP (lnGDP) and two lags of government bond yields (lnGBY), is estimated using 711 observations and is jointly significant ($F = 60{,}456.05$, $p < 0.01$), with a high explanatory power ($R^2 = 0.9971$) and low residual variance (RMSE = 0.032). The lagged dependent variable ($lnGDP_{t-1} \approx 0.999$, $p < 0.01$) indicates strong persistence in economic growth, while all contemporaneous and lagged coefficients of ΔlnGBY are statistically insignificant, showing that short-term fluctuations in bond yields do not meaningfully affect GDP. Consequently, the computed long-run elasticity of GDP with respect to bond yields is not economically meaningful, and no evidence of a reliable long-run relationship or cointegration is found. The implied error correction term (ECT ≈ −0.001) is negative, as expected, but extremely small, indicating that deviations from equilibrium are corrected at a very slow pace. Overall, these results suggest that economic growth is primarily driven by its own past values rather than by bond market dynamics, and that the transmission of government bond yield shocks to the real economy is weak and delayed.

Table 18: ARDL(1,0) Results: Government Bond Price and Economic Growth

ARDL(1,0)	Regression				Number of obs	709
Sample	5- 713				F(3,706)	120429.00
					Prob >F	0.000
					R-squared	0.9971
					Adj R-squared	0.9971
Log Likelihood = 1401.5183					Root MSE	0.0336
lnGDP	*Coef.*	*Std.Err*	*T*	*P>|t|*	*[95% Conf. Interval]*	
lnGDP						
L1.	0.999026	0.002095	476.9	0.000	0.994914	1.003139
lnGBP	0.008886	0.010343	0.86	0.391	-0.01142	0.029193
_Cons	0.02774	0.048603	0.57	0.568	-0.12316	0.067684

Also, further The ARDL(1,0) model, which includes one lag of GDP (lnGDP) and the contemporaneous value of government bond price (lnGBP), is estimated using 709 observations and is jointly significant ($F = 120{,}429.00$, $p < 0.01$) with high explanatory power ($R^2 = 0.9971$) and low residual variance (RMSE = 0.0336). Lagged GDP ($lnGDP_{t-1} \approx 0.999$, $p < 0.01$) demonstrates strong persistence, reflecting gradual adjustment of output following short-run shocks. The contemporaneous coefficient of lnGBP is small and statistically insignificant (0.0089, $p = 0.391$), indicating that short-term fluctuations in GBP do not meaningfully affect economic growth. Consequently, the implied long-run effect is not economically meaningful, and no evidence of cointegration between GBP and GDP is found. The error correction term is negative but extremely small (≈ −0.001), suggesting that deviations from equilibrium are corrected very slowly. Overall, these results indicate that economic growth is primarily driven by its own past values, with GBP movements playing a negligible role in short- or medium-term growth dynamics.

Table 19: ARDL(1,1) Results: Inflation and Economic Growth

ARDL(1,1)	Regression				Number of obs	709
Sample	5- 713				F(3,706)	81177.05
					Prob >F	0.000
					R-squared	0.9971
					Adj R-squared	0.9971
Log Likelihood = 1405.9207					Root MSE	0.0334
lnGDP	*Coef.*	*Std.Err*	*T*	*P>|t|*	*[95% Conf. Interval]*	
lnGDP						
L1.	0.996853	0.003511	283.91	0	0.98996	1.003747
lnINFLA						
--	-0.0843	0.027968	-3.01	0.003	-0.13921	-0.02939
L1.	0.079989	0.028003	2.86	0.004	0.02501	0.134968
_Cons	0.033351	0.042482	0.79	0.433	-0.05006	0.116758

The ARDL(1,1) model, incorporating one lag of GDP (lnGDP) and one lag of inflation (lnINFLA), is estimated using 709 observations and is jointly significant (F = 81,177.05, $p < 0.01$), with high explanatory power (R^2 = 0.9971) and low residual variance (RMSE = 0.0334). The lagged dependent variable ($lnGDP_{t-1}$ ≈ 0.997, $p < 0.01$) indicates strong persistence, reflecting gradual adjustment of GDP toward long-run equilibrium. In the short run, contemporaneous inflation negatively affects GDP (−0.0843, p = 0.003), while lagged inflation exerts a positive partial rebound effect (0.0800, p = 0.004), suggesting that inflationary shocks reduce growth initially but are partially corrected in the following period. The implied long-run coefficient of inflation is negative, consistent with theoretical expectations that sustained inflation undermines economic performance, and the negative error correction term (ECT ≈ −0.0032) confirms a stable long-run relationship, though adjustment is slow, with only ~0.3% of disequilibrium corrected per period. Overall, the results highlight that inflation exerts a significant and economically meaningful drag on growth in both the short and long run, underscoring the importance of monetary and price stability for sustaining economic performance.

Table 20: Summary of VAR and ARDL : Capital Markets and Economic development

Depen/Variable	Lag/Regressor	VAR Coefficient	ARDL Coefficient	Significance	Interpretation
LnGDP	L1.lnGDP	0.987***	0.999*** (SMC)	*** p<0.01	Strong persistence of GDP
	ΔlnSMT	-	0.084*** (SMT)	***	Short-term positive effect of turnover

	L1.ΔlnSMT	-	-0.089***	***	Short-term adjustment/reversal
	ΔlnSMC	-	0.343***	***	Positive contribution of market capitalization
	L1.ΔlnSMC	-	0.343***	***	Medium-term persistence
	lnGBY	-	0.158	n.s.	No significant short/medium-term effect
	L1.lnGBY	-	0.025	n.s.	-
	L2.lnGBY	-	0.003	n.s.	-
	lnGBP	-	0.009	n.s.	No significant effect of bond price
	lnINFLA	-	-0.084	**	Contemporaneous negative effect of inflation
	L1.lnINFLA	-	0.08	**	First-lag positive adjustment

In view of Table 10 the VAR and ARDL results reveal that economic growth is highly persistent, with lagged GDP consistently exerting a strong positive effect across all specifications. Equity market variables—stock market capitalization (SMC) and turnover (SMT)—positively influence GDP, with contemporaneous and lagged SMC and SMT showing significant short-run effects, while stock market shocks display limited feedback from GDP. In contrast, government bond yields (GBY) and bond prices (GBP) do not exert statistically significant short- or medium-term effects on economic growth, indicating weak transmission from bond market dynamics. Inflation (INFLA) negatively affects GDP contemporaneously, though a partial rebound occurs in the following period, with the error correction mechanism confirming a slow but stable adjustment toward long-run equilibrium. These findings suggest that equity markets are the primary financial channel influencing short-term growth, while bond market variables play a limited role, and inflationary pressures impose a temporary but meaningful drag on output.

CONCLUSION

This study shows that economic growth is highly persistent and primarily driven by its own past values, with equity markets—particularly stock market capitalization and turnover—exerting significant short-run effects. In contrast, government bond yields and prices have limited impact on output, while inflation negatively affects growth contemporaneously, with partial adjustment in subsequent periods. The error correction mechanism indicates slow but stable convergence toward long-run equilibrium. These results highlight that equity markets are the main financial channel influencing growth, and that sustained price stability is crucial for economic performance. Policymakers should therefore focus on developing efficient and liquid stock markets and maintaining macroeconomic stability to support both short- and long-term growth, as bond market fluctuations alone appear insufficient to drive real economic activity.

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