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## Stock Exchange Development and Economic Growth: The Case of Poland

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**Abstract:**

**Purpose:** The purpose of this paper is to provide a comprehensive and critical review of the theoretical and empirical literature concerning the relationship between stock exchange development and economic growth along with case study of Poland.

**Design/Methodology/Approach:** The study employs a literature review, analysing a wide range of academic papers, meta-analyses. It reviews theoretical frameworks (supply-leading, demand-following, feedback, neutrality) and evaluates the evolution of empirical methodologies. In case of Poland it employs the ARDL method of estimation of selected variables.

**Findings:** From the theoretical analysis and review of the research the paper asses that while there is a generally positive link between stock market development and economic growth, the relationship is neither linear nor universal. Liquidity (turnover) is identified as a more robust driver of growth than market size (capitalization). The findings also suggest a "threshold effect" where stock markets only contribute to growth once a certain level of institutional quality and banking sector development is achieved. In case of Poland key findings are that GDP growth in Polish economy is significantly driven by foreign investment and stock market development, provided the market expansion represents real capitalization rather than just speculative trading volume.

**Practical Implications:** Findings can be of use to teachers, academics and policy decision-makers.

**Originality/Value:** The research can spur further discussion about the methods and measures of stock exchange development and to what extent this development can affect economic growth.

**Keywords:** Stock Market Development, Economic Growth, Finance-Growth Nexus, ARDL.

**JEL Codes:** C22, 016, G10, G19, E44.

**Paper Type:** Research paper.

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## **1. Introduction**

The intricate relationship between financial development and economic growth remains one of the most debated and extensively researched topics in the field of development economics and finance. Historically, the discourse was dominated by the role of the banking sector, particularly during the post-World War II reconstruction of Europe and the subsequent industrialization of East Asian economies.

However, the global wave of financial liberalization in the 1980s and 1990s, the collapse of the Bretton Woods system, and the rapid proliferation of equity markets in emerging economies shifted the academic focus toward the stock market-growth nexus (Biedny, 2012).

The intellectual lineage of this debate traces back to the early 20th century. Joseph Schumpeter (Schumpeter, 2021), in his ground-breaking 1912 work, argued that financial intermediaries provide essential services - mobilizing savings, evaluating projects, managing risk, monitoring managers, and facilitating transactions - that are paramount for technological innovation and economic development.

Conversely, economists such as Robert Lucas (1988) asserted that the importance of financial matters is "badly over-stressed," suggesting that financial development is merely a by-product of growth rather than a cause. This "neutrality hypothesis" stands in contrast to the "supply-leading" view of Patrick (1966), who postulated that financial deepening propels the real economy, and the "demand-following".

The stock market - economic growth nexus relationship is one, most often than not, difficult to comprehend. However, in the literature we can come across at classification that divides this relationship into four distinct categories: Supply-Leading, Demand-Following, Feedback (Bi-directional), and Neutral.

The supply-leading hypothesis represents view that originated in the work of Schumpeter (Schumpeter, 2021) and later formalized by McKinnon (1973) and Shaw (1973). It suggest a unidirectional causality running from financial development to economic growth, or in other words the development of financial institutions and markets precedes demand (Biedny, 2012).

In this framework, the establishment of a stock exchange acts as a catalyst. By providing a platform for the mobilization of savings from fragmented surplus units, the stock market channels capital to deficit units (entrepreneurs and corporations) with productive investment opportunities.

Patrick (1966) articulated that the supply-leading function is particularly critical in the early stages of economic development. He argued that the creation of financial institutions in advance of demand induces entrepreneurs to transfer resources from traditional, non-growth sectors to modern, high-growth sectors (Karimo and Ogbonna,

2017). In the context of stock markets, this implies that the mere existence and expansion of an equity market can stimulate innovation by allowing entrepreneurs to diversify the risks associated with large-scale projects, which they would be unable to finance through retained earnings or traditional bank debt (Mansur and Nizar, 2023).

In a supply-leading concept, the stock market acts as a screening device. By aggregating information from millions of investors, the market prices assets in a way that reflects their future marginal productivity. This price signal directs capital toward firms with the highest growth potential and away from declining industries, thereby raising the aggregate rate of return on capital and spurring growth (Levine and Zervos, 1998; Thalassinos and Thalassinos, 2006).

Conversely, the demand-following hypothesis, associated with Robinson (1952), asserts that "where enterprise leads, finance follows". According to this perspective, economic growth generates increased demand for financial services. As an economy expands, incomes rise, and business activities become more complex, creating a need for more sophisticated risk management tools and larger pools of capital (Acaravci, Ozturk and Acaravci, 2009; Thalassinos, 2008; Thalassinos and Politis, 2011).

Under this hypothesis, the development of a stock exchange is a passive response to the real economy's requirements rather than an independent driver. As firms grow, their financing needs exceed the capacity of internal funds and bank lending, prompting the development of equity markets to facilitate the issuance of shares. Consequently, empirical findings supporting this hypothesis show causality running from GDP growth to stock market development indicators (Hoque and Yakob, 2017).

In addition, Patrick (1966) suggested a sequential relationship where the supply-leading pattern dominates in the early stages of development, only to be overtaken by the demand-following pattern as the economy matures. As the real sector develops, the financial system must evolve to support the new scale of transactions. If it fails to do so, it becomes a bottleneck. However, in this view, the initial spark comes from the real sector (Karimo and Ogbonna, 2017).

A more nuanced view, often termed the feedback or bi-directional causality hypothesis, suggests that finance and growth are mutually reinforcing. Lewis (1955) and later Greenwood and Smith (1997) proposed that while financial markets facilitate growth by lowering transaction costs and improving resource allocation, economic growth simultaneously provides the resources and volume of transactions necessary to sustain and deepen these financial markets (Hoque and Yakob, 2017).

This interdependence implies that a developing stock market fosters economic growth through capital accumulation, and the resulting economic prosperity generates the savings and investment demand that further develops the market. Empirical evidence, particularly from dynamic panel studies in Asian emerging markets, frequently finds support for this hypothesis, suggesting that financial and real sectors evolve in tandem.

For instance, studies in Ghana have confirmed a bi-directional causality, supporting the view that financial sector development stimulates economic growth and vice versa (Eshun and Tweneboah, 2024).

Finally, the neutrality hypothesis (Lucas, 1988), argues that the relationship between financial structure and growth is non-existent or negligible. According to Lucas growth is primarily driven by real variables such as technological progress and labour force accumulation, with financial markets acting merely as a "veil" over the real economy.

Beyond the direction of causality, theoretical literature identifies specific functional channels through which stock markets theoretically boost economic output. Levine (1991) and Bencivenga *et al.* (1996) highlight several key mechanisms and among them most important is liquidity. Stock markets allow savers to sell assets quickly and cheaply (liquidity) without disrupting the firm's long-term capital base. This encourages long term investment and high-return projects (Saint-Paul, 1992, Levine and Zervos, 1996). Markowitz (1952) stressed the importance of risk diversification.

Markets allow investors to hold diversified portfolios, mitigating idiosyncratic risk. This encourages capital allocation to riskier, innovative technologies that drive growth. According to Holmstrom and Tirole (1993) Information Acquisition is a key channel. Large, liquid markets incentivize investors to research firms.

This information is aggregated into prices, guiding capital to the most efficient firms (Allocative Efficiency). Jensen and Meckling (1976) along with Shleifer and Vishny (1986) look at corporate governance. Stock markets facilitate the market for corporate control (takeovers) and link management compensation to stock performance, aligning managerial interests with shareholders and improving firm efficiency.

Amongst listed liquidity seems to be the most critical channel. Many profitable investments (e.g., building a railway or a semiconductor plant) require long-term capital commitment. However, savers (households) generally prefer to have access to their savings to meet liquidity shocks. Without a stock market, this mismatch discourages long-term investment. A liquid equity market resolves this tension. The firm gets permanent capital, while the savers hold a liquid asset (the stock) that can be sold to another agent. Levine and Zervos (1998) showed that stock market liquidity (turnover) is a robust predictor of growth, whereas stock market size (capitalization) is often not.

## **2. Literature Review**

A comprehensive meta-analysis of 67 studies containing 1,334 estimates suggests a generally positive and statistically significant effect of financial development on economic growth (Valickova, Havranek and Horvath, 2013). However, this relationship is not uniform. The meta-evidence indicates publication bias - there is

little evidence of publication bias driving the positive consensus, though researchers neglecting endogeneity tend to overstate the positive effects. In case of stock markets vs. Banks results suggest that stock markets may support faster economic growth than other financial intermediaries in certain contexts, particularly as economies mature.

However, banks and markets are generally seen as complementary. The presence of temporal heterogeneity, meaning that the growth effect of financial development appears to have decreased worldwide after the 1980s. This may be due to the increasing frequency of financial crises or the saturation of financial services in developed economies (often referred to as the "vanishing effect" (Bijlsma, Kool and Non, 2017; Zieba, 2025).

In developed economies (OECD countries), the relationship is nuanced. While early studies (Levine and Zervos, 1998) found strong positive links, recent data suggests a diminishing marginal return. As financial systems become highly sophisticated, the marginal benefit of further deepening diminishes. In developed markets, liquidity (turnover ratio) is often a more robust predictor of growth than capitalization (size).

Active trading reflects information processing, whereas high capitalization might simply reflect high asset valuations without active capital allocation. There is also the question/hypothesis of "Too Much Finance". Some studies indicate that excessive financialization in developed nations can harm growth. High volatility and the decoupling of the financial sector from the real economy can lead to resource misallocation, where talent and capital are diverted to speculative activities rather than productive innovation.

Recent evidence from European countries shows that while stock markets generally support growth, high levels of domestic credit can sometimes be negatively related to growth, highlighting the risks of over-leverage (Gollopeni *et al.*, 2023). For Emerging and Developing Economies (EMDE), the stock market is often seen as a frontier of development, offering an alternative to bank-dominated financing which may be constrained by credit rationing.

Studies on Asian EMDEs (China, India, Vietnam, Malaysia) consistently show a positive impact of stock market development on growth using GMM methodologies (Doan and Bui, 2021). The mechanism here is often the ability of stock markets to attract Foreign Direct Investment (FDI) and provide long-term capital for industrialization. For instance, in China, shocks from market capitalization and turnover have been shown to increase economic growth in both the short and long run (Azimi, 2022).

In Africa and other low-income regions, the results are mixed. Some studies find a positive long-run association (Karimo and Ogbonna, 2017), while others find no significant relationship or even a negative one. This discrepancy is often attributed to the "threshold hypothesis," which suggests that a stock market needs to reach a critical

size and level of liquidity before it can effectively spur growth. Below this threshold, the costs of volatility and illiquidity may outweigh the benefits (Eshun and Tweneboah, 2024).

Empirical results for Nigeria have been particularly conflicting. Some studies utilizing Vector Error Correction Model (VECM) suggest that stock market development, proxied by market capitalization to GDP, does not contribute significantly to long-run economic growth (Ezeibekwe, 2019).

This is often attributed to the economy's heavy reliance on crude oil, where the stock market does not effectively capture the dominant economic sector, and to the shallow nature of the market. In case of Zimbabwe research indicates bidirectional causality between the stock market and real GDP but points to the destabilizing role of inflation. High inflation erodes the value of shares and destroys investor confidence, severing the finance-growth link. This highlights that macroeconomic stability is a prerequisite for the finance-growth nexus to hold (Chikwira and Mohammed, 2023).

The BRICS nations (Brazil, Russia, India, China, South Africa) offer a unique laboratory for this relationship due to their rapid transition from developing to emerging market status. Research using ARDL and GMM on BRICS nations reveals strong dynamic links between exchange rates and stock market indices. Exchange rate volatility significantly affects stock market performance, which in turn influences growth.

This suggests that for these export-oriented economies, external stability is crucial for domestic financial market performance. In these economies, stock markets and banking sectors are often found to be complementary. The "Feedback Hypothesis" is strongly supported here, where rapid industrial growth demands better financial services, which in turn fuels further growth. (Mourad *at al.*, 2020)

Bui and Doan (2021) investigated the impact of stock market development on economic growth across eight Asian Emerging Markets and Developing Economies (EMDEs), including China, India, and Vietnam, for the period 2008-2019. The authors employed the System Generalized Method of Moments (GMM). This choice was critical to address the endogeneity bias inherent in financial data (where growth might simultaneously cause financial deepening).

The study confirmed a statistically significant positive impact of stock market development on economic growth. It highlighted that efficient capital accumulation and risk reduction are the primary channels. The findings reinforced the endogenous growth theory, suggesting that for Asian EMDEs, policies improving market scale and liquidity are direct levers for GDP expansion.

Azimi (2022) offered a new perspective by applying non-linear techniques to the Chinese economy, arguing that financial shocks do not affect growth uniformly. The

study utilized the Non-linear Autoregressive Distributed Lag (NARDL) model. This allowed to decompose stock market indicators into positive and negative partial sums to test for asymmetric impacts. The results revealed that the relationship is highly asymmetric. Positive shocks to market capitalization and turnover ratio were found to increase economic growth in both the short and long run.

However, shocks to "total stock traded variable" showed mixed results, potentially indicating that excessive speculative trading (volatility) could suppress economic growth.

Eshun and Tweneboah (2024) examined the Economic Community of West African States (ECOWAS), integrating the critical role of institutional quality. The authors utilized panel data estimation techniques that account for threshold effects, specifically interacting stock market variables with governance indicators. The study identified institutional quality as a binding constraint.

Authors found that stock market development only exerts a positive influence on economic growth when specific institutional thresholds (such as government effectiveness and regulatory quality) are met. Below these thresholds, stock markets may fail to contribute to the real economy, supporting the "threshold hypothesis" that infrastructure and governance must precede financial deepening.

Mansur and Nizar (2023) addressed the causality debate (supply-leading vs. demand-following hypotheses) using a high-dimensional dataset for Indonesia. They employed a Factor-Augmented Vector Autoregression (FAVAR) model. This technique allowed for the analysis of a vast number of variables (22 financial and 12 economic) to avoid omitted variable bias common in standard VAR models. Monthly data from 2015M1 to 2023M6 were used.

The study found evidence of bi-causal relationships. Interestingly, the "demand-following" hypothesis (growth driving finance) was more persistent for banking institutions, whereas the "supply-leading" hypothesis (finance driving growth) was influential in the short run for stock and bond markets. This suggests that while the real economy drives the long-term structure of banks, capital markets can provide immediate short-term stimulus.

In a very recent study, Adekunle *et al.* (2025) revisited the Nigerian context with updated data extending to 2023. The researchers applied the ARDL approach to cointegration and the Engle-Granger causality test. Annual time-series data for Nigeria from 1990 to 2023 was employed. Contrary to some earlier studies that found neutrality, this research established a long-run positive relationship. Specifically, market capitalization and value of stock traded had direct positive effects on growth. The causality test supported a uni-directional flow from stock market variables to economic growth, validating the supply-leading hypothesis for the Nigerian market in recent years.

### 3. Research Methodology

The data for the study presented in this article was obtained from World Bank website from a set called World Development Indicators (WDI). The selection of the data was done based upon the review of the literature regarding the datasets preferably used for this kind of research. The data is of yearly frequency from 1995 to 2024. For the dependent variable measuring economic growth the annual percentage growth rate of real GDP per capita was used.

As independent variables, representing stock market indicators to capture the multidimensionality of stock market development, three proxies were used. For market capitalization ratio value of listed shares divided by GDP was used as a proxy for market size.

As a proxy for market liquidity relative to the economy total value of shares traded divided by GDP ratio was employed. Lastly, turnover ratio - value of total shares traded divided by average market capitalization, serving as a proxy for market efficiency and transaction costs, was used. As control variable of choice following indicators were used:

- bank credit: domestic credit to private sector (% of GDP) to control for the banking sector's complementary or substitutive role,
- inflation: Consumer Price Index (annual %) to control for macroeconomic instability,
- trade openness: Sum of exports and imports as % of GDP,
- government expenditure: general government final consumption expenditure (% of GDP),
- foreign direct investment (FDI): Net inflows (% of GDP).

The names of each variables used in various stages of estimation were adjusted as follows:

- GDP growth (annual %).....gdp\_g
- General government final consumption expenditure (% of GDP) ..... gov\_exp
- Domestic credit to private sector (% of GDP) ..... dom\_cred
- Foreign direct investment, net inflows (% of GDP)..... fdi
- Inflation, GDP deflator (annual %) ..... inf
- Market capitalization of listed domestic companies (% of GDP) ..... mkt\_cap
- Stocks traded, total value (% of GDP) ..... stk\_val
- Trade (% of GDP) ..... trade
- Stocks traded, turnover ratio of domestic shares (%).....stk\_turn.

First step in estimation process was to check for Stationarity in data. The Augmented Dickey-Fuller (ADF) test was applied to all variables. The ARDL method requires

variables to be integrated of order 0 I(0) or 1 I(1), or mix of both but never 2 I(2). The results are presented in Table 1.

**Table 1.** ADF stationarity tests

Variable	Level p-value	Order of Integration	Status
GDP Growth (gdp_g)	0.0000	I(0)	Valid
FDI (fdi)	0.0043	I(0)	Valid
Market Cap (mkt_cap)	0.0450	I(0)	Valid
Stocks Traded (stk_val)	0.0435	I(0)	Valid
Stocks Turnover (stk_turn)	0.0010	I(0)	Valid
Gov. Expenditure (gov_exp)	0.2080	I(1)	Valid
Inflation (inf)	0.2110	I(1)	Valid
Trade (trade)	0.7855	I(1)	Valid
Domestic Credit (dom_cred)	0.5490	I(2)	Invalid

*Source:* Author's own calculations.

The variable Domestic credit to private sector was found to be I(2) (non-stationary at level and first difference). This violates the ARDL assumption. To proceed validly, this variable was first-differenced to create *dom\_cred\_diff* (Change in Domestic Credit), which is I(1). The model uses this transformed variable.

Due to the small sample size (30 observations) relative to the number of variables (8 independent variables), the lag length was restricted to avoid model instability. The Akaike Information Criterion (AIC) and *ardl\_select\_order* command suggested a parsimonious structure and maximum lag 1 for both dependent and independent variables.

The model structure for Unrestricted Error Correction Model (UECM) based on ARDL (1,1) was defined as below:

$$\begin{aligned}
 \Delta(gdp\_g)_t = & \alpha_0 + \sum_{i=1}^p \beta_{0i} \Delta(gdp\_g)_{t-i} + \\
 & \sum_{i=0}^{q_1} \beta_{1i} \Delta(gov\_exp)_{t-i} \\
 & + \sum_{i=0}^{q_2} \beta_{2i} \Delta(dom\_cred)_{t-i} + \sum_{i=0}^{q_3} \beta_{3i} \Delta(fdi)_{t-i} + \sum_{i=0}^{q_4} \beta_{4i} \Delta(inf)_{t-i} \\
 & + \sum_{i=0}^{q_5} \beta_{5i} \Delta(mkt\_cap)_{t-i} + \sum_{i=0}^{q_6} \beta_{6i} \Delta(stk\_val)_{t-i} + \sum_{i=0}^{q_7} \beta_{7i} \Delta(trade)_{t-i} \\
 & + \sum_{i=0}^{q_8} \beta_{8i} \Delta(stk\_turn)_{t-i} + \lambda_1(gdp\_g)_{t-1} + \lambda_2(gov\_exp)_{t-1} \\
 & + \lambda_3(dom\_cred)_{t-1} + \lambda_4(fdi)_{t-1} + \lambda_5(inf)_{t-1} \\
 & + \lambda_6(mkt\_cap)_{t-1} + \lambda_7(stk\_val)_{t-1} + \lambda_8(trade)_{t-1} \\
 & + \lambda_9(stk\_turn)_{t-1} + \varepsilon_t
 \end{aligned} \tag{1}$$

where:

- $\Delta$  - represents the first difference operator (i.e.,  $\Delta X_t = X_t - X_{t-1}$ ),
- $\alpha_0$  - the constant (intercept) term,
- $\varepsilon_t$  - the white noise error term (residuals),
- The Short-Run Dynamics is represented by summation  $\Sigma$  terms. The terms with  $\Delta$  and coefficients  $\beta$  represent the short-run effects., while  $p$  and  $q_{\{1-8\}}$  represent the optimal lag lengths for each variable
- The Long-Run Relationship (level terms) is represented by the terms at  $t-1$  (lagged one period, no difference operator) with coefficients  $\lambda$  represent the long-run estimates. In the ARDL Bounds Test approach, you need to perform an F-test on these specific  $\lambda$  coefficients ( $\lambda_1 = \lambda_2 = \dots = \lambda_9 = 0$ ) to check if cointegration exists.

The next step of the ARDL procedure is the calculation of Bounds Test (F-statistic). The Bounds Test checks for a long-run relationship by testing the joint significance of the lagged level coefficients. The Computed F-statistic equals to 3.153. Critical Values (Case III,  $k=8$ , 5% significance) are for Lower Bound  $I(0)$ :  $\sim 1.95$ ; and for Upper Bound  $I(1)$ :  $\sim 3.06$ . Since  $3.153 > 3.06$  (Upper Bound), we reject the Null Hypothesis, so there is evidence of a long-run cointegrating relationship between GDP growth and the independent variables.

In the next step long-run coefficients were calculated. These coefficients represent the long-term elasticity or impact of each variable on GDP growth. They are presented in Table 2.

**Table 2.** Cointegrating coefficients.

Variable	Coefficient	Interpretation
FDI	0.75	Positive long-run impact on growth.
Market Cap	0.17	Positive long-run impact.
Trade	0.02	Slight positive impact.
Stocks Turnover	0.08	Positive impact.
Change in Dom. Credit	0.13	Positive impact of credit acceleration.
Inflation	-0.03	Slight negative impact.
Gov. Expenditure	-0.27	Negative long-run association.
Stocks Traded Value	-0.51	Negative long-run association.

*Source:* Author's own calculations.

After that the Error Correction Model (ECM) was calculated to give the value of Error Correction Term (ECT) Coefficient  $\rho$  which equalled to -1.23 was obtained. It is statistically significant at  $p$ -value  $< 0.01$ . The coefficient is negative, as required for convergence. A value of -1.23 indicates a very rapid speed of adjustment, correcting the entire disequilibrium within a single period and oscillating slightly before settling. The short-run dynamics were assessed in the next step. The short-run effects (coefficients of delta terms) generally follow the signs of the long-run coefficients,

with Government Expenditure (Delta gov\_exp coeff: -1.77) and FDI (Delta fdi coeff: 0.57) showing the strongest immediate impacts.

The residual diagnostics tests were performed in the last step to ensure model stability. The model passed all standard diagnostic tests at the 5% significance level:

- Serial Correlation (Breusch-Godfrey): p-value = 0.071 (No serial correlation).
- Heteroskedasticity (Breusch-Pagan): p-value = 0.237 (Homoskedastic).
- Normality (Jarque-Bera): p-value = 0.814 (Residuals are normally distributed).

The CUSUM was also examined. While the short sample size limits degrees of freedom in the research and makes the test volatile, the residuals do not show persistent explosive behaviour, suggesting reasonable stability for the estimated period.

#### **4. Research Results and Discussion**

The evolution of empirical findings is primarily linked to the advancement of econometric methodologies. Early studies relied on cross-sectional analysis, while modern research employs more advanced time-series and panel data techniques to address endogeneity and heterogeneity.

The work by King and Levine (1993) and Levine and Zervos (1998) utilized cross-country growth regressions. These studies typically averaged data over long periods (e.g., 1960-1989) to smooth out business cycles and focus on long-run relationships.

While these studies established a strong positive correlation, they suffered from severe limitations. First of all, simultaneity bias which caused lack of control for reverse causality (growth causing finance). Omitted variable bias where country-specific factors (culture, legal origin, geography) were often relegated to the error term, potentially biasing coefficients. Loss of dynamic information caused by averaging data over decades, which in turn obscured the cyclical relationship and structural breaks (Abiad *et al.*, 2007).

In order to address the loss of dynamic information and country heterogeneity, researchers turned to time-series analyses for individual countries. They employed Granger Causality to determine the direction of the relationship (supply-leading vs. demand-following) by testing whether past values of one variable predict future values of another. Vector Error Correction Models (VECM) were implemented when variables are cointegrated (share a long-run trend). VECM allows researchers to distinguish between short-run dynamics and long-run equilibrium adjustments.

For example, Asamoah (2018) used VECM to find bi-directional causality in Ghana. Autoregressive Distributed Lag (ARDL) approach, developed by Pesaran, Shin and Smith (2001) has become a dominant methodology in recent years. Its primary

advantage is flexibility; it can be applied whether the underlying variables are integrated purely at  $I(0)$ , purely  $I(1)$ , or a mix of both. This is particularly valuable for stock market data, which often exhibits different orders of integration compared to macroeconomic variables like GDP or inflation.

Studies on Pakistan and China have effectively used ARDL to show asymmetric impacts of stock market shocks (Omar *et al.*, 2022, Bhattacharya, Bhattacharya and Basu, 2019, Gumus and Baba, 2024). Recognizing that cross-sectional regressions ignore time variation and time-series analyses lack the power of cross-country generalizations, literature also focused on dynamic panel data methods, specifically the Generalized Method of Moments (GMM).

The System GMM estimator, developed by Arellano and Bover (1995) and Blundell and Bond (1998), was designed to handle Fixed Effects which can be identified as unobserved country-specific heterogeneity (e.g., cultural attitude toward risk). The problem of Endogeneity which is the likelihood that independent variables (stock market depth) are correlated with past errors or are determined simultaneously with the dependent variable (growth). Lastly, dynamic dependent variables as the presence of lagged GDP as a regressor, which creates bias in standard fixed effects models (Fukase, 2010, Dinc, 2019).

System GMM was then improved with the "Difference GMM" estimator by including level equations instrumented with lagged differences, making it more efficient for variables that are persistent over time, such as institutional quality or stock market capitalization. Recent studies on Asian emerging markets (Vietnam, Malaysia, China) have extensively used System GMM to confirm the positive impact of stock market development on growth while controlling for endogeneity (Doan and Bui, 2021).

The empirical record is vast and, at times, contradictory. The impact of stock market development on growth appears to be contingent on the level of economic development, the specific proxies used, and the time period analysed.

Standard growth regressions include a vector of control variables to isolate the stock market effect. The literature identifies several robust determinants. Inflation consistently exerts a negative impact on both stock market development and economic growth. High inflation obscures price signals and increases the opportunity cost of holding money, thereby dampening stock market activity and growth.

In developed European countries, moderate inflation is seen as positive, but high inflation is detrimental (Omar *et al.*, 2022). Trade Openness is considered to be generally positive factor. Trade openness facilitates technology transfer and allows firms listed on the stock exchange to access global markets. It acts as a conduit for knowledge spill overs. Foreign Direct Investment (FDI) flows are often correlated with stock market development, providing liquidity and validating domestic asset prices.

However, the impact can be sensitive to the type of entry (M&A vs. Greenfield, Fukase, 2010). Human Capital (Education) is a robust determinant of growth and a necessary complement to financial development as a sophisticated financial system requires a skilled workforce to operate it (Abiad *et al.*, 2007).

Recent empirical work indicates that institutional quality acts as a threshold variable. In the Economic Community of West African States (ECOWAS), for example, the growth-enhancing effect of stock markets is contingent on the quality of institutions (Eshun and Tweneboah, 2024). Countries with strong control of corruption, rule of law, and political stability tend to exhibit a stronger positive relationship between finance and growth. (Doan and Bui, 2021).

Strong institutions protect minority shareholders from expropriation by insiders (managers or majority shareholders (Habib, Habib and Batool, 2023). When investor protection is weak, savers are reluctant to buy shares, rendering the market illiquid and unable to fund growth (Khalique, Ahmed and Gadhi, 2023).

Studies often find that the interaction term expressed as stock market times institutional quality is positive and significant. This implies that stock markets in corrupt or unstable environments may actually retard growth by facilitating capital flight or insider looting, whereas in stable environments, they act as powerful accelerators (Agan Celik, 2025).

Macroeconomic stability is equally vital. Volatile exchange rates and high inflation create uncertainty that undermines the informational efficiency of stock prices (Mourad *et al.*, 2020). In such environments, stock price movements reflect nominal shocks (e.g., currency devaluation) rather than real changes in firm fundamentals, severing the link between market performance and capital allocation efficiency. As seen in the case of Zimbabwe, hyperinflation effectively neutralizes the stock market's ability to drive real growth. (Chikwira and Mohammed, 2023).

In the case of the research about the relationship between stock market development and economic growth in Poland carried out analysis confirmed that the variables are a mix of I(0) and I(1), which supports the use of the ARDL Bounds Testing approach.

A critical finding during pre-estimation was that Domestic Credit to the Private Sector (*dom\_cred*) was I(2), which invalidated standard ARDL assumptions. This was successfully corrected by using the change in domestic credit (*dom\_cred\_diff*), ensuring the model's statistical validity. Diagnostic tests confirmed the model is free from serial correlation and heteroskedasticity, and the residuals are normally distributed.

There is evidence of long-run relationship (cointegration). The Bounds Test yielded an F-statistic of 3.153, which exceeds the upper critical bound (I(1) value of ~3.06) at the 5% significance level. This confirms the existence of a stable long-run

cointegrating relationship between GDP growth and the selected macroeconomic and financial variables.

Long-run drivers of economic growth were identified. The estimated long-run coefficients revealed the structural drivers of the economy. Foreign Direct Investment (FDI) is the strongest positive driver (coefficient: 0.75). A 1% increase in FDI inflows relative to GDP is associated with a 0.75% increase in annual GDP growth, highlighting the critical role of external capital. Financial Market Development shows mixed results. Market Capitalization (0.17) and Stocks Turnover (0.08) have a positive impact, suggesting that a larger and more liquid stock market supports growth.

However, the total value of Stocks Traded has a negative coefficient (-0.51), possibly indicating that excessive volatility or speculation (in the form of high value traded without corresponding capitalization growth) may be detrimental. The acceleration of domestic credit (*dom\_cred\_diff*) turned out to positively impact growth (0.13), implying that expanding access to private sector credit stimulates the economy.

As for government policy proxied by government consumption expenditure, it was revealed that it has a negative impact (-0.27) on long-run growth, which is consistent with economic theories suggesting that excessive public spending can crowd out private investment. Inflation also negatively impacts growth (-0.03), though the effect is small.

As for short-run dynamics and adjustment speed The Error Correction Term ( $ECT_{t-1}$ ) is -1.23 and statistically significant. This indicates a very rapid, oscillatory adjustment process. The economy not only fully corrects any disequilibrium within one year but slightly "overshoots" before settling back to the long-run path. This suggests the economy is highly responsive to shocks and policy interventions.

## **5. Conclusions, Proposals, Recommendations**

The article provides a review of the theoretical and empirical literature concerning the relationship between stock exchange development and economic growth. It tries to assess the importance of stock market development from various points of view and various economies in order to understand not only if stock markets contribute to growth, but how and under what conditions they do so.

The complexity of this relationship is underscored by the diversity of empirical findings, which oscillate between positive, negative, and insignificant correlations depending on the region, time period, and methodology employed (Khan and Senhadji, 2000) along with analysis of transmission channels through which stock markets theoretically influence the real economy, including liquidity, information asymmetry reduction, and corporate governance enhancement.

The literature and research strongly suggests that liquidity (turnover) is a more consistent driver of growth than size of the stock market (capitalization). A large but dormant stock market does not facilitate capital allocation. It is the ability to trade, reflecting information flow and risk transfer, that spurs economic activity. The positive impact of stock markets is non-linear.

It is strongest for middle-income emerging economies. In advanced economies, the marginal benefit declines, and excessive financialization can become a drag on growth (Bijlsma, Kool and Non, 2017). Stock markets effectiveness is strictly conditional on the legal and institutional environment. Without property rights and low corruption, stock markets fail to mobilize savings effectively.

The study concludes that GDP growth in Polish economy is significantly driven by foreign investment and stock market development, provided the market expansion represents real capitalization rather than just speculative trading volume. It can be concluded that policies attracting foreign capital are the most effective tool for boosting long-term growth in Poland.

Reducing general government consumption could also be beneficial. While credit growth and market size are beneficial, the negative impact of "Stocks Traded Value" suggests a need for regulation that encourages long-term holding rather than excessive speculative trading, which in turn could improve financial stability in the long term. The model is robust and stable, providing a reliable basis for these policy inferences over the studied period.

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