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Untangling Demand-Following and Supply-Leading Postulate with the Lens of Granger Causality

Mushtaq Hassan[1*]

ABSTRACT

Researcher experimentally examined the interconnectedness among economic prosperity (EG) plus financial prosperity (FD) using the ARDL and Granger methodologies on annual data spanning 24 years, from 1988 to 2012. We measure economic prosperity (EG) by looking at real economic prosperity (GDP), and we measure financial prosperity (FD) by looking at two things: the progress of the financing system, plus the advancement of the stock market. The present study shows that the variables are cointegrated. A signal-directional causal link exists between financial prosperity (FD) and economic prosperity (EG), wherein LGDP granger causes finance lending growth, and financial market capitalization and share trading volume granger cause LGDP. In certain instances, a supply-leading relationship is established, whereas in others, a demand-following relationship is demonstrated. Policymakers should formulate policies to enhance microfinance facilities, thereby fostering investment in small and medium firms. Pakistan's economy would grow faster if the financial sector improved and streamlined its microfinance processes, corporate governance, and risk management.

Keywords: Financial Development, Economic Growth, Causality

1. INTRODUCTION

A country's economic standing determines its progress. Each nation endeavors to identify the true factors that enhance the rate of economic growth. Depending on their economic standing, some countries are classified as industrial, while others are classified as subsistence economies. Developed and industrial economies are defined as those with steady and strong economic growth, whereas subsistence or developing economies are defined as those with erratic economic growth patterns. By lowering transaction costs and easing credit restrictions, a sophisticated financial system can boost domestic economic activity. Reduced economic activity and, as a result, slower

[1] Comsats University Islamabad Lahore Campus, Lahore, Pakistan
[*]Corresponding author's E-mail: mushtaqhassan7@gmail.com
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growth are the outcomes of a broken financial system. To clarify the fundamental forces propelling economic prosperity and its relationship with financial development, numerous empirical and theoretical investigations are conducted worldwide by a variety of academics. While some researchers claim that FD defines EG, others show that EG leads to FD. The EG's financial system was developed by Bagehot (1873) and Schumpeter (1911). While Shaw (1973) emphasized the role of financial liberalization in boosting savings and investment, the main focus of economics pioneers is on the relationship between investment efficiency and financial development (Goldsmith, 1969). Schumpeter (1911) posits that financial development (FD) is the primary source of economic growth (EG), although Robinson (1952) contests the notion that the monetary segment only reacts to the financial desires generated by the increase in the size of the economy. According to Patrick (1966), financial development (FD) results from rapid growth, which calls for more effective financial services. Granger (1969) backs up the claim that both are related. The development of monetary intermediaries can promote economic prosperity, according to proponents of the supply-driving hypothesis (Pagano, 1993). According to Demetriades and Hussein (1996), financial prosperity (FD) and economic prosperity (EG) have a positive reciprocal relationship. Risk is inherent in all investment decisions, and stock markets act as risk diversifiers (Levine, 1991; Greenwood & Smith, 1997; Christopoulos & Tsionas, 2004; Rousseau and Wachtel, 2000). The questions of whether policymakers should focus on economic growth to attract FDI, prioritize economic prosperity to attract FDI, or address both at the same time remain unanswered. Accordingly, traders used the swapping volume merged index, liquidness, transaction volume, and other studies that used trade volume, liquidness, and market capitalization to evaluate the change in share trading marketplace (Agrawalla and Tuteja, 2007; Soumya and Jaydeep, 2008). Researchers agree that Egypt is a supply-leading economy thanks to developments in the fiscal segment. EG promotes the development of the financial industry, which is thought of as a demand-following economy.

1.1. Overview of Financial Intermediaries in Pakistan

In Pakistan, the financial sector is just as essential as any other area of development. Financial institutions facilitate a range of business transactions by acting as middlemen between investors and deposit end users. Transferring savings from households with surpluses to those with deficits is made possible by financial intermediaries. While deficit households relate to borrowing businesses and governmental entities, saver households are consumers. The primary role of the share marketplace and financing sector is that of economic intermediaries. By providing lenders and borrowers with timely information and enabling the apportionment of resources to the greatest fruitful opportunities, the banking sector improves social welfare and economic efficiency (Fase and Abma, 2003). The banking industry has a substantial market share of 88 percent, and the SBP, which was put in place in

1948, soon after the division, under quasi-government ownership (Pakistan Strategy Paper, n.d.). Six nationalized banks were established in 1974 to improve lending practices for industries. The Pakistan Banking Council was in complete control of these banks. Four state-owned banks remained in operation by 1997, but they were up against competition from 27 foreign and 21 domestic banks. Pakistan's financial industry is being actively improved by financial deregulation and a standardized banking sector. Four specialized banks and thirty-four private banks are active in Pakistan (Anwar et al., 2011). Five Islamic banks and 29 conventional banks make up these private banks (SBP, 2012). In order to pool capital, transfer wealth, and share risk, consumers and savers can exchange securities on the stock market (Mehr-un-Nisa and Nishat, 2011). By directing capital toward the most productive industries, the securities exchange, in a state of general equilibrium, is essential to any economy (Nishat and Saghir, 1991). According to Baumol (1965), stock markets in developed countries are closely linked to the overall economy. The causal link between changes in consumption and stock market prices is established by Mookerjee (1987). Both listed companies and total market capitalization, the Pakistani stock market has consistently performed poorly in terms of attracting domestic savings for investment (Nishat and Saghir, 1991). Demand and supply dynamics, which include technical aspects, market sentiments, and fundamental considerations, impact stock market prices (Mehr-un-Nisa and Nishat, 2011). In order to take advantage of its advantages, every developing country is actively working to ascertain the essential grounds of financial advancement. Despite a number of financial reforms carried out by the government between 1978 and 1990, Pakistan's economic history has fluctuated since the country's independence. Unfortunately, research in Pakistan is still insufficient to determine the cause of FD and EG, despite their importance. By employing the Granger Causality Approach while investigating the "Demand-Pushed" and "Supply-Pull" hypotheses in Pakistan, this learning fills the gap.

1.2. Study Aims

The purpose is basically to scrutinize the nature of the connection and ascertain whether there is a supply-side, demand-side, or nonexistent relationship in Pakistan. The goal of the study is:

1. To ascertain how fiscal progress and economic advancement are related.
2. To identify whether there is a supply-leading, demand-following, or nonexistent causal connection between fiscal progress and economic advancement.

A concept overview is given in the study's first section, which then moves on to a discussion of the issue and the establishment of goals. A thorough review of the literature is given in Section II. The research design is covered in Section III, along

with an explanation of the study variables and data sources. The conclusion is given in Section IV.

2. LITERATURE REVIEW

Researchers have identified the degree of FD as a significant determinant of EG. According to the ongoing discussion among researchers, the literature currently in publication exhibits a number of theoretical shifts. As a result, four postulates about the FD and EG domains were proposed by researchers worldwide.

According to the first viewpoint, foreign direct investment is a useful tool for promoting economic expansion. According to Schumpeter (1911), an efficient financial system boosts the growth rate by redistributing resources from unproductive to productive sectors, thereby facilitating technological advancements. According to Rousseau and Sylla (2003), effective securities markets foster economic expansion.

Goldsmith (1969) and Shaw (1973) make substantial contributions to the literature on FD and EG. Shaw (1973) created a liberalization framework and highlighted how important financial liberalization is for increasing domestic savings and boosting growth rates. EG and FDI are found to be related over the long term by Christopoulos and Tsionas (2004).

The second viewpoint is the growth-led finance theory, which is recognized as a demand-following hypothesis. According to Robinson (1952), a larger real sector will require better financial services, which will encourage the financial sector's growth and ultimately spur economic expansion. According to Odhiambo (2007), Tanzania exhibits a supply-leading response, while South Africa and Kenya exhibit a demand-following response between FD and EG. Menyah et al. (2014) support the study's conclusions that EG succeeds pecuniary enhancement.

The third viewpoint explains the reciprocal causal links between monetary expansion and fiscal advancement. The claim that foreign direct investment (FDI) causes EG. Monetary development and fiscal depth are correlated in equal directions (Deb & Mukherjee, 2008; Odhiambo, 2007).

Finally, the fourth viewpoint asserts, no causal connection among variables. According to Lucas (1988), FD and EG have no mutual influence. He claims that economists place too much emphasis on how important financial factors are to economic expansion. The directional relationship between Zambia's economic growth and stock market development was examined by Sililo (2010). The results support the idea that economic growth and stock market development are independent of one another.

Regarding the exact connection between EG and FDI, scholars within Pakistan have differing opinions, which leaves the question open. While some studies support a demand-side approach, others support a supply-side approach, and they look at the

short- and long-term causality between these two forces (Husain and Mahmood, 2001; Kanwal and Nadeem, 2013; Iqbal et al., 2012; Anwar et al., 2011; Zaman et al., 2010).

2.1. Overview of Panel and Time Series Studies

From 1970 to 2010, Ductor and Grechyna (2015) assessed the connection between fiscal development (FD) and EG, as well as the impact on monetary progress (EG) in 101 developed and developing nations. According to panel estimation and cross-sectional regression using the FD-GMM approach, when private credit expands quickly without a corresponding rise in real sector production, the impression of financial progress on progress turns negative.

Menyah et al. (2014) used a panel analysis to look at 21 African nations between 1965 and 2008. In South Africa, Sierra Leone, and Benin, experimental outcomes illustrate a unidirectional connection between FD and EG, supporting the "supply-driving" theory. Only in Nigeria was inverse unidirectional causality from EG to FD found, supporting the "demand-following" theory. Additionally, they discovered a weak causal link between trade liberalization and FDI. It appears that concepts between trade-led growth and finance-led growth are incompatible.

Cavenaile and Sougne (2012) investigated the relationship between FD and EG and critically examined how banks and institutional investors contribute to EG stimulation. According to the output, money is either made available for investment or allocated to the banking industry.

In the study of Dimitris & Efthymios (2004) studied FD and EG in ten emerging countries between 1970 and 2000. Although there was no indication of bi-directional causality between the variables. Moreover, there is no immediate correlation between output and financial deepening.

Arestis and Demetriades (1997) determine how fiscal expansion affects monetary progress in Germany and the United States. According to the Johansen cointegration analysis, banking development has an important impact on progress in Germany, while weak connection in the US. Nevertheless, a directional relationship indicates that real GDP influences the growth of both the stock and banking markets.

Ahmed and Mmolainyane (2014) evaluated how financial integration affected Botswana's economic expansion between 1974 and 2009. The results disprove a direct and meaningful link between Botswana's economic expansion and financial integration.

In order to ascertain whether FD may improve EG, Jedidia et al. (2014) carried out an observational study in Tunisia between 1973 and 2008. The findings suggest that fiscal expansion is a catalyst for long-term monetary progress but is susceptible to financial instability. In addition to arguing that bank intervention in stock markets is harmful to economic growth, this paper suggests a reciprocal.

Samargandi et al. (2014) divided the sectors into oil and non-oil to scrutinize the conclusion of fiscal progress over monetary progress in Saudi Arabia.

Ndlovu (2013) used a multivariate Granger causality test to establish the connection between Zimbabwe's fiscal structure and monetary progress. The outcomes indicate that since economic development is a passive reaction to trade liberalization and related measures to boost economic growth, policy attention should be directed toward these measures. Promoting investments and removing obstacles for foreign investors are two examples of such tactics.

Ogunyiola (2013) conducted an empirical investigation into monetary progress (EG) & FDI within Cape Verde between 1980 and 2011. Results showed no correlation between FD and EG; there is a long-term correlation. According to the paper, there is a one-way causal connection between EG and domestic credit for the private sector.

The long-term impacts of FDI in Ghana were investigated by Adua et al. (2013). The findings show that the choice of proxy used has an impact on the growth effect of FD.

The causal connection among Malaysia's energy consumption, monetary progress, comparative pricing, FDI, and fiscal progress was investigated by Tang and Tan (2014). In Malaysia, EG Granger and energy ingesting are mutually Granger-caused over the long and short terms.

According to Zhang et al. (2012), financial reforms are proceeding as planned since China joined the WTO, and the banking system presently promotes economic expansion.

The effect of FD on EG in Iran was shown by Ara et al. (2012). The study logically comes to the conclusion that both short- and long-term foreign direct investment has boosted the Iranian economy. Long-term real output is significantly and favorably impacted by capitalization and oil revenue. While capitalization has a short-term positive impact, oil revenue has a long-term negative influence on monetary progress.

The directional relationship between Zambia's economic progress and security market expansion was studied by Sililo (2010). It is determined that economic progress and share market development are unrelated.

Shahbaz (2008) uncovered a long-term correlation between Pakistan's economic progress and the development of the security market. Although he finds a long-term feedback affiliation between economic progress and stock market development, causality only works in the short term.

According to research by Bahadur and Neupane (2006), there is a causal relationship and long-term connection between Nepal's economic development and stock market integration.

Muhsin and Eric (2000) evaluated the relationship between monetary progress (EG) and FDI in Turkey between 1963 and 1995. There is a weak correlation between FD and EG, according to the data.

Primarily, King & Levine's (1993b) analysis of IMF data, financial development, growth rates, capital accumulation, and economic efficiency are all positively correlated. They acknowledge the significance of arrangements that alter financial intermediation's effectiveness.

A study, Atje and Jovanovic (1989) found a robust, encouraging association between securities expansion and economic progress.

2.2. Overview of Pakistan-Based Research

Ali et al (2014) studied Pakistan's monetary progress and FDI between 1972 to 2011. The long-term relationship between all proxies was validated by the cointegration test. The bidirectional causation that affects price increases and development, credits and development, and savings and growth further supports the idea of supply driving. Additionally, a unidirectional cause-and-effect affiliation between monetary prosperity and FDI has been established.

The substantial dedication of Pakistani commercial banks to fixed deposits was examined by Kanwal and Nadeem (2013), who also looked into how macroeconomic reasons affected the productivity of publicly traded deposit associations from 2001 to 2011. Results show that ROA, ROE, and EM have a positive connection with the monetary policy rate. Additionally, the study found that GDP has a negligible negative effect on ROE and EM and a negligible positive impact on ROA. Overall, it is found that macroeconomic factors barely affect commercial banks' profitability.

Iqbal et al. (2012) investigate how private sector loans and savings affect economic expansion. They used time series data from 1973 to 2007 to assess this effect in Pakistan. According to the study, private sector credit has a big impact on economic prosperity over the long and short terms.

Jalil and Ma's (2008) study looks at how banking sector reforms affected economic prosperity and FDI. The findings showed that FD and EG significantly correlated, while the deposit liability ratio in China displayed an encouraging and important relationship.

An experimental study by Rahman and Salahuddin (2009) investigated the relationship between monetary prosperity in Pakistan with fiscal market progress, with a particular emphasis on economic growth (EG). The conclusions demonstrate that both short- and long-term monetary progress and an efficient share marketplace are in correlation with each other.

To analyze a link between FDI and economic prosperity in South Asian economies, Fase and Amba (2003) carried out an experimental analysis of nine

emerging economies, including Pakistan. The main finding is that fiscal expansion has a substantial impact on economic progress and a consistent cause-and-effect connection between fiscal structure & monetary development.

Husain and Mahmood's (2001) findings point to a sustained connection between stock prices and macroeconomic factors.

Connection and implications of the association between FD and EG have been the subject of disagreement in the literature. Numerous studies have produced contradictory findings in spite of these findings. To accomplish its goals, this work has developed four postulates based on the previously mentioned theoretical viewpoint.

2.3. Study Hypothesis

The examination of theoretical frameworks and the prevailing literature leads to the establishment of the subsequent study hypothesis:

H_{0a} *There is no connection between development in finance and growth in the economy.*

H_{1a} *Financial development correlates with growth in the economy.*

H_{0b} *There exists no demand-following relationship between development in finance and growth in the economy.*

H_{2b} *A demand-following connection exists between financial development and economic growth.*

H_{0c} *No causal connection in which financial development influences economic growth.*

H_{3c} *A connection exists between financial development and economic growth, characterized by a supply-leading dynamic.*

H_{0d} *The evidence suggests that a causal relationship between financial development and economic growth does not exist.*

H_{4d} *A cause-and-effect connection exists between financial development and economic growth.*

2.4. Theoretical Framework

Numerous panel and time series studies have empirically and theoretically investigated diverse characteristics of the affiliation between financial prosperity (FD) and economic prosperity (EG). The variable that researchers are most interested in determining its actual significance of in EG is the component of FD (Levine,

1997). A linguistic conflict in explaining the connection between FD and EG is revealed by the literature on the subject. Additionally, a number of scientists claim that the association is always positive. While some research suggests a difference in panel or time series analysis results, most scholars agree that causality is reciprocal. A contrasting perspective on whether economic growth is supply-driven, demand-following, or whether there is a causal relationship is demonstrated by thorough research on Pakistan. The following model is used to accomplish the study's goals:

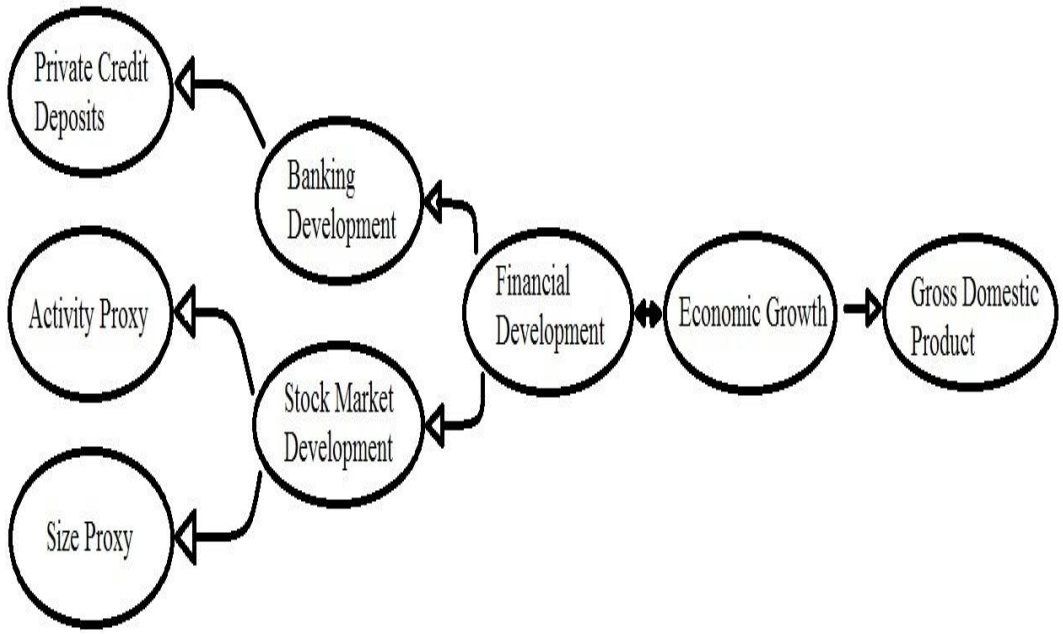

Figure 1 *Study Framework*

The motive of this research is to analytically ascertain the potential correlation and causative relationship between FD and EG. EG is seen as real GDP per person, while FD is measured by two things: the development of the deposit institute and progress in the share market. The ratio of private credit deposits by banks to GDP will help banks grow, while the ratio of capitalization to real GDP and the ratio of stock volume to real GDP will help stock exchanges grow. WDI and Freedom House databases will be used for data collection.

3. DATA AND METHODS

To evaluate FD and EG, numerous studies have been conducted worldwide. The development of the stock market and banking is the two main indicators used by researchers to evaluate financial development (FD) (Samargandi et al., 2014; Anwar et al., 2011). (Cavenaile and Sougne, 2012). Both indicators are assessed through various proxies, including credit provided by deposit and currency ratio, broad

currency ratio, exchange value, issuance of bank instruments, convertible commitments, national lending, broad money, market value, liquidity in circulation, trading volume, and the proportion of private money in deposits.

Studies involving Pakistani researchers who evaluated financial development (FD) through the expansion of the stock market and banking were given special attention. These studies used indicators like currency in circulation, average market capitalization, price increments, credit to private sector deposits, foreign direct investment (FDI), domestic savings, real GDP, real interest rates, national savings, total exports, total imports, consumer price index, bank deposit liabilities, and broad money supply (Anwar et al., 2011; Ali et al., 2014; Kanwal and Nadeem, 2013; Zaman et al., 2010; Muhammad and Mahmood, 2001).

This research uses the following variables:

1. The real market capitalization ratio, also known as the Size Proxy, and the real value traded ratio, also known as the name of Activity Proxy, are the two methods that can be utilized to evaluate the expansion of the stock market.
2. Private credit deposits will be used for the growth of banks.
3. The real market capitalization ratio, also known as the Size Proxy, and the real value traded ratio, also known as the Activity Proxy, are the two methods that can be utilized to evaluate the share marketplace.
4. To determine the rate of economic expansion, the logarithm of GDP is utilized.

We got all of our data from the Freedom House, UNDP, and WDI databases. We used E-Views 8.0 and Microfit 4.0 to look at the data. E-Views checks for stationarity and causality in data, while Microfit uses ARDL.

3.1. Estimation Procedure

A test invented in 1979 with the named of Augmented Dicky Fuller the most common and extensively utilized test for checking for stationarity. This means that the ADF statistic for the individual inconstant is higher than the critical value for that variable. This evaluation comprises assessing the following equation:

$$\rightarrow \quad \Delta y_t = (\phi - 1) y_{t-1} + \sum_{j=1}^{\kappa} \delta_j \Delta y_{t-j} + \varepsilon_t \, \P \qquad \text{Equation 1}$$

ε_t states WN (0, σ_2).

The variable εt has a normal distribution with a mean of 0 and a variance of σ^2. The unit root test requires the assessment of the null hypothesis H0: $(\phi - 1) = 0$. The series is non-stationary, in contrast to the alternative hypothesis H1: $|\phi| < 1$, assuming

that εt is a Gaussian snowy blast. This means finding the standard t-ratio of the estimate of (ϕ – 1) in relation to its standard error.

The extreme order of integration (dmax) is utilized to find out if the arrangement is stationary. A time series is deemed stationary when the mean and variance of the variables are stable, and the covariance remains uniform across successive time intervals. An integrated order one variable, or I(1), is one that stays the same at the first difference. If a variable remains constant after being differenced n times, it is categorized as integrated of order n, represented as I(n).

Experts use Granger (1969) to look into the causal relationship between two variables. The Granger test is usually based on the idea that all variables are stationary, or if they aren't, they must have the same order of integration. In the Granger test, one variable is called x and the other is called y. The variable y signifies historical characteristics that substantially aid in forecasting the future value of another variable x. If prior estimates of x enhance the prediction of y, it is determined that x Granger-causes y.

$$y_t = \beta_0 + \sum_{k=1}^{M} \beta_k y_{t-k} + \sum_{l=1}^{N} \alpha_t x_{t-l} + u_t$$

$$x_t = \gamma_0 + \sum_{k=1}^{M} \delta_k y_{t-k} + \sum_{l=1}^{N} \gamma_t x_{t-l} + v_t$$

Equation 2

The subsequent level consisted of challenging the existence of a long-term balance affiliation between the variables. This study employs the ARDL Bounds testing methodology to determine the enduring connection between foreign direct investment (FDI) and economic growth (EG) in Pakistan. Pesaran et al. (2001) said that it was used for cointegration. In the cointegration approach, all variables must be integrated in the same rank. A long-term connection between the variables can't be made if the order of integration is different. The unit root test is still used to find the order of integration, even though it might not be very good at rejecting the null hypothesis of non-stationarity. Choosing the right lag length is the first step in getting the results of these tests. In studies with small samples, ARDL gives better results because it solves problems that come up when time series data isn't stationary (Majid, 2007, p. 168). It is applicable when the fundamental regression triggers are solely I(0) or entirely jointly interconnected I(1) (Pesaran and Shin, 1999). It is easy to find structural breaks in time series data with ARDL.

After establishing a long-term relationship through ARDL, the subsequent phase entails the development of the ECM, referred to as PSS, in alignment with Pesaran et al. (2001).

The interconnectedness of FD and EG in Pakistan was analyzed through the PSS F-test statistic. The F-statistic outcome is equated to the important rate set by Pesaran et al. (2001). If the F-test statistic is above the upper limit of the critical value, the null claim of the absence of a long-term association can be rejected, regardless of whether the variables are I(0) or I(1). If the F-test statistic is lower than the minimum threshold value, the null hypothesis is accepted. The F-test statistic sample is situated between these two thresholds, yielding inconclusive results. When the integration order of the variables is known and all of them are I(1), a decision is made based on the upper bound. When all variables are I(0), decisions are made based on lower bounds. See Table 1.

Table 1 A*ugmented Dickey Fuller Test*

Variables	Level		1st difference		Conclusion
	Without trend	With trend	Without trend	With trend	
Gross Domestic Product (GDP)	–3.460463**	–3.339077*	–5.797278***	–5.664168***	I(0)
Banking Development (BD)	–0.922339	–0.946640	–3.713599**	–3.826229**	I(1)
Marketing Capitalization (MC)	–2.815574*	–3.539343**	–6.566569***	–6.526810***	I(0)
Stock Volume Traded (SVT)	–1.509900	–1.191609	–4.426958***	–4.492370***	I(1)
Gross Capital Formation (GCF)	–1.281381	–2.135853	–4.598592***	–4.517594***	I(1)
Education (EDU)	–2.505104	1.096961	–3.192530**	–3.915076**	I(1)
LGDP	–3.763574***	–3.682927**	–6.418917***	–6.288384***	I (0)

1%, 5% and 10% critical values for Augmented Dickey Fuller Test (ADF) at level are –3.72, –2.99 and –2.63 for without trend, while 1%, 5% and 10% critical values at with trend are –4.39, –3.61 and –3.24 respectively. 1%, 5% and 10% critical values for Augmented Dickey Fuller Test (ADF) at 1st difference without trend are –3.75, –2.99 and –2.64, while 1%, 5% and 10% critical values with trend are –4.41, –3.62 and –3.23, respectively.

*** $p < 0.01$, **$p < 0.05$, *$p < 0.1$

Table 1 shows that GDP, Marketing Capitalization (MC), and LGDP are stationary at the 1% level ($P < 0.01$) when looked at both levels—without trend and with trend, and at the first difference again, without trend and with trend. The Stock Volume Traded (SVT) for Banking Development (BD) shows non-stationarity at significance levels of 1%, 5%, and 10%, both at the level and when trends are taken into account. When looked at through first differences and without a trend, Gross Capital Formation (GCF), Stock Volume Traded (SVT), and Education (Edu) all show stationarity at 1%, 5% and 10%.

3.2. Results of Model 1

Table 2 indicates that the exceeded value of the upper limit demonstrates that cointegration exists amongst the variables at the 1% significance level.

Table 2 *F-Test*

Lags	F-statistics	Critical values at 1%		Result
1	5.63	3.29	4.37	Cointegrated

K = variables are on the left hand side

Table 3 indicates the usage of AIC at lag 1. The outcome of this study is derived from the AIC at lag 1. We will estimate the ARDL model in the subsequent step.

Table 3 Lag Length Section Criteria

Endogenous variables: EDU GCF LGDP POLRIGHT MC
Exogenous variables: C
Sample: 1988-2012
Included observations: 23

Lag	LogL	LR	FPE	AIC	SC	HQ
0	–223.4278	NA	291.2487	19.86329	20.11014	19.92537
1	–113.2775	162.8310*	0.188481*	12.45891*	13.93999*	12.83140*
2	–92.53524	21.64405	0.392361	12.82915	15.54446	13.51204

* indicates lag order selected by the criterion

In Table 4, serial correlation, functional form, normalcy, and heteroscedasticity are evaluated using a diagnostic test. A functional form value greater than 5% was found using Ramsey's RESET test, indicating that there are no specification errors in the model. The model is normally distributed since the variance stays constant over time, and the normality indicates an acceptable requirement. Heteroscedasticity is not present.

Table 4 *Estimation Results of ARDL Model.*
Dependent Variable: LGDP
Schwarz Bayesian Criterion is selected, and the ARDL based on this Criterion is (1,0,0,1,1)

Variables	Coefficient	Std. Error	t-Statistic	Prob.
LGDP (–1)	0.77192	0.10066	7.6688	0.000
MC	0.0010349	0.3800E-3	2.7232	0.015
EDU	0.0094858	0.0044903	2.1125	0.051
POLRIGHT	0.0027066	0.0045531	0.5944	0.561

POLRIGHT (–1)	–0.012649	0.0051158	–2.4726	0.025
GCF	0.0081629	0.0039445	2.0695	0.055
GCF (–1)	–0.0084814	0.0028536	–2.9722	0.009
C	5.4564	2.3748	2.2977	0.035
R-Square	0.99879	Prob (F-statistic)		0.00
Adjusted R-Square	0.99827	Durbin-Watson statistic		2.1584
F-statistic		1892.8		

Diagnostic Test

Test Statistics		LM Version	F Version
A: Serial Correlation	*CHSQ(1)	0.27872 [0.598] * F (1,15)	0.17624 [0.681]*
B: Functional Form	*CHSQ(1)	4.0147 [0.045] * F (1,15)	3.0133 [0.103]*
C: Normality	*CHSQ(2)	1.4195 [0.492]*	NA*
D: Heteroscedasticity	*CHSQ(1)	2.1461 [0.143] * F (1,22)	2.1605 [0.156]*

3.3. Stability Test

Researchers use to evaluate the model's reliability and consistency parameters. Since the existence of cointegration among variables does not ensure the stability of the calculated coefficients, a stability test is necessary to generate reliable data.

In ARDL, the error correction model is used, and stability is evaluated using CUSUM and CUSUMQ. For both the SUSUM and CUSUMQ tests, every coefficient is considered stable.

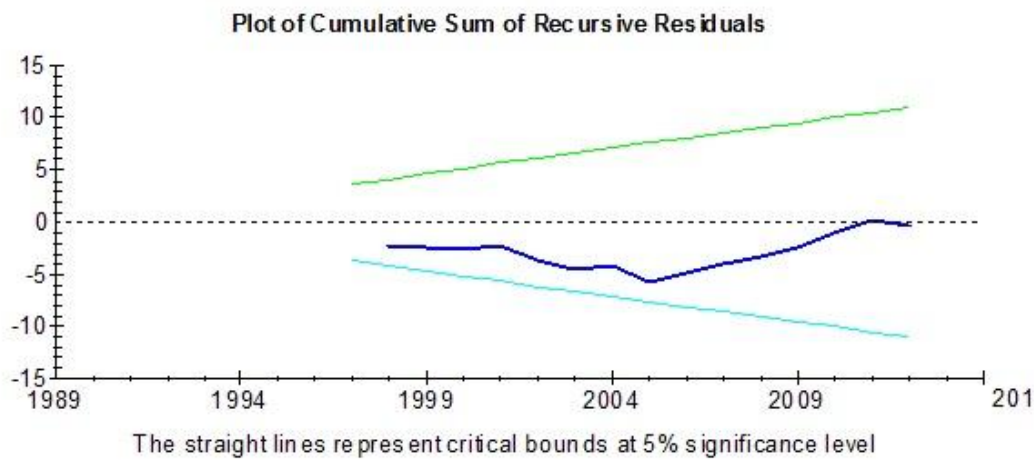

Figure 2 *Plot of Cumulative Sum of Recursive Residuals*

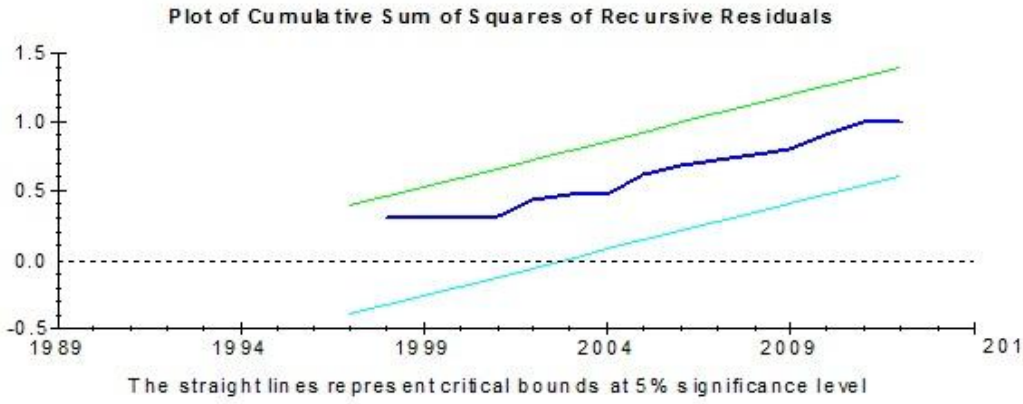

Figure 3 *Plot of Cumulative Sum of Squares if Recursive Residuals*

The break points show how the CUSUM and CUSUMSQ work, in which the null hypothesis is accepted.

Long-term estimates in Model 1 using ARDL methodology are shown in Table 5. At the 10 percent, five percent, and one percent levels of significance, correspondingly, the table shows that MC, Edu, and PolRight have a significant impact on LGDP. Long-term GDP will change by 0.4% for every 1% change in marginal cost. There will be a 4.35% long-term negative impact on LGDP for every 1 index movement in Polright. Table 5 indicates that GCF has a negligible long-term impact on LGDP.

Table 5 *Estimated Long Run Coefficients (ARDL Approach)*
ARDL (1,0,0,1,1) selected based on Schwarz Bayesian Criterion. Dependent Variable is LGDP

Regressor	Coefficient	Standard Error	T-Ratio [Prob]
MC	0.0045375	0.0025850	1.7553 [0.098]
EDU	0.041589	0.0035741	11.6362 [0.000]
POLRIGHT	–0.043593	0.012343	–3.5317 [0.003]
GCF	–0.0013965	0.013660	–0.10223 [0.920]
C	23.9229	0.35550	67.2933 [0.000]

The Error Correction Model estimates for Model 1 are shown in Table 6. At the 10 percent, five percent, and one percent significance levels, in the short term, respectively, the variables MC, Edu, and GCF have a significant impact on the dependent variable LGDP, according to the results in Table 6. Instead, showing divergence, ECM's coefficient is adverse, suggesting convergence towards equilibrium. This shows the long-term rate of adjustment to equilibrium.

Table 6 Error Correction Representation of Selected *ARDL Model*
ARDL (1,0,0,1,1) selected based on Schwarz Bayesian Criterion. Dependent Variable is dLGDP

Regressor	Coefficient	Standard Error	T-Ratio [Prob]
dMC	0.0010349	0.3800E-3	2.7232 [0.014]
dEDU	0.0094858	0.0044903	2.1125 [0.049]
dPOLRIGHT	0.0027066	0.0045531	0.59444 [0.560]
dGCF	0.0081629	0.0039445	2.0695 [0.053]
dC	5.4564	2.3748	2.2977 [0.034]
ecm(–1)	–0.22808	0.10066	–2.2659 [0.036]
R-Squared	0.66994	S.E. of Regression	0.012111
R-Bar-Squared	0.52554	F-stat. F (5, 18)	6.4951 [0.001]
Mean of Dependent Variable	041395	Residual Sum of Squares	0.0023467
S.D. of Dependent Variable	0.017582	Equation Log-likelihood	76.7392
Akaike Info. Criterion	68.7392	DW-statistic	2.1584
Schwarz Bayesian Criterion	64.0270		

3.4. Results of Model 2

Table 7 shows that the F-statistic is higher than the upper limit of the critical value. This proves that the variables are cointegrated at the 1% level of significance.

Table 7 *F-Test*

Lags	F-statistics	Critical values at 1%		Result
1	4.45	3.29	4.37	Cointegrated

K = variables are on the left hand side

Table 8 directs the AIC application at lag 1. This study's result is derived from the AIC at lag 1.

Table 8 *Lag Length Selection Criteria*

Endogenous variables: EDU GCF BD LGDP POLRIGHT
Exogenous variables: C
Sample: 1988 2012
Included observations: 23

Lag	LogL	LR	FPE	AIC	SC	HQ
0	–195.3324	NA	25.30752	17.42021	17.66706	17.48229
1	–78.12994	173.2559*	0.008870	9.402603	10.88368*	9.775091
2	–45.90029	33.63094	0.006800*	8.773938*	11.48925	9.456832*

* Indicates lag order selected by the criterion.

Table 9 showed that the significance value is greater than 0.05. Ramsey's Reset test shows that the functional form value is more than 5%, which shows that the model does not have a specification mistake. The normality signifies an acceptable

criterion, and the variance remains stable throughout the period. There is no heteroscedasticity. The table shows that the lag of the second period doesn't add much to the model.

Table 9 *Estimation Results of the ARDL Model*
Dependent variable: LGDP
Akaike Information Criterion Selected Based on this Criterion is ARDL (2,0,2,1,2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGDP(–1)	0.93747	0.30006	3.1243	0.010
LGDP(–2)	–0.44354	0.33186	–1.3365	0.208
BD	–0.0013313	0.0025723	–0.51753	0.615
EDU	0.010451	0.016490	0.63377	0.539
EDU(–1)	–0.0097361	0.015237	–0.63900	0.536
EDU(–2)	0.021146	0.012805	1.6514	0.127
POLRIGHT	0.010077	0.0061937	1.6269	0.132
POLRIGHT(–1)	–0.021570	0.0066460	–3.2455	0.008
GCF	0.013955	0.0052189	2.6740	0.022
GCF(–1)	–0.010891	0.0043163	–2.5232	0.028
GCF(–2)	0.0081584	0.0047028	1.7348	0.111
C	11.8487	4.3017	2.7545	0.019
R-Square	0.99869		Prob (F-statistic)	0.00
Adjusted R-Square	0.99737		Durbin-Watson statistic	2.3843
F-statistic		759.9407		

Diagnostic Test

TEST STATISTICS		* LM VERSION*	F VERSION*
A: Serial Correlation	*CHSQ(1)	1.9506 [0.163] * F(1,10)	0.92667 [0.358]*
B: Functional Form	*CHSQ (1)	2.1608 [0.142] * F(1,10)	1.0369 [0.333]*
C: Normality	*CHSQ (2)	0.30468 [0.859]*	NA
D: Heteroscedasticity	*CHSQ (1)	1.0874 [0.297] * F (1,21)	1.0421 [0.319]*

3.5. Stability Test

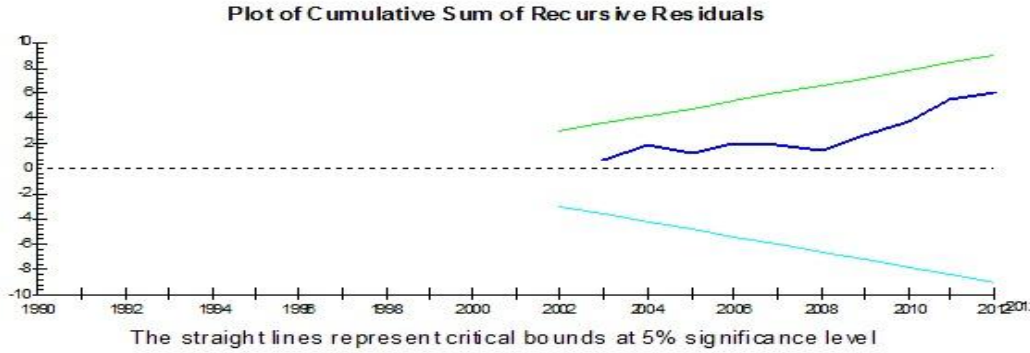

Figure 4 *Plot of Cumulative Sum of Recursive Residuals*

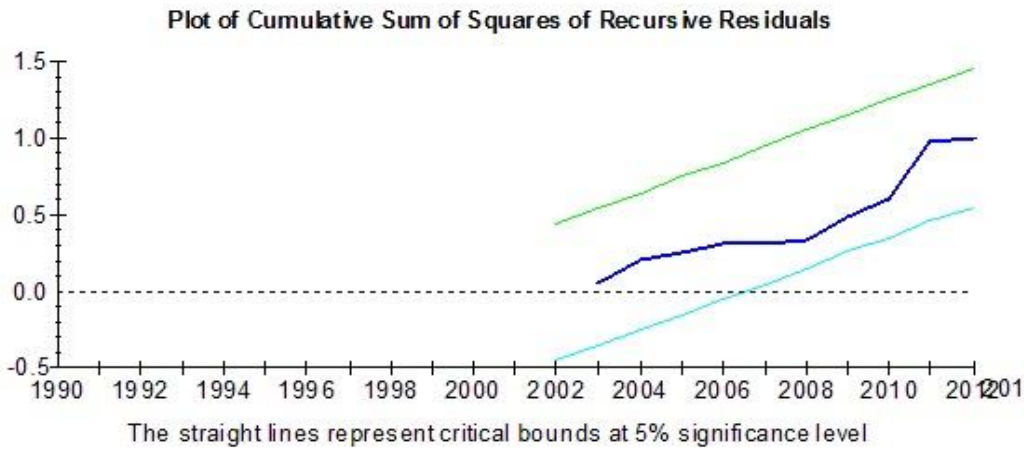

Figure 5 *Plot of Cumulative Sum Squares of Recursive Residuals*

The break points show how the CUSUM and CUSUMSQ work. The null hypothesis is supported. The plot shows how the variables stayed the same over the time period in question.

Table 10 shows the long-term predictions of Model 2 using the ARDL method. Table 10 shows that Edu, PolRight, and GCF all have a big effect on LGDP at the 1%, five percent, and ten percent, respectively. A one-point change in education will cause long-term LGDP to change by 4.3%. A 1-point change in Polright will have a long-term negative effect of 2.27% on LGDP. As shown in Table 10, BD has very little effect on LGDP over the long term.

Table 10 *Estimated Long Run Coefficients (ARDL Approach)*
ARDL (2,0,2,1,2) Selected Based on Akaike Information Criterion. Dependent variable is LGDP
23 observations used for estimation from 1990 to 2012

Regressor	Coefficient	Standard Error	T-Ratio [Prob]
BD	–0.0026306	0.0049255	–0.53408 [0.604]
EDU	0.043196	0.0024382	17.7165 [0.000]
POLRIGHT	–0.022711	0.010967	–2.0708 [0.063]
GCF	0.022176	0.011251	1.9711 [0.074]
C	23.4133	0.21545	108.6736 [0.000]

Table 11 shows the Error Correction Model's estimates for Model 2. Table 11 shows that only GCF has a major impact on LGDP in the short term.

Table 11 *Error Correction Representative for the Selected ARDL Model. ARDL (2,0,2,1,2) Selected Based on Akaike Information Criterion.*
Dependent Variable is dLGDP

Regressor	Coefficient	Standard Error	T-Ratio [Prob]
dLGDP1	0.44354	0.33186	1.3365 [0.203]
dBD	–0.0013313	0.0025723	–0.51753 [0.613]
dEDU	0.010451	0.016490	0.63377 [0.536]
dEDU1	–0.021146	0.012805	–1.6514 [0.121]
dPOLRIGHT	0.010077	0.0061937	1.6269 [0.126]
dGCF	0.013955	0.0052189	2.6740 [0.018]
dGCF1	–0.0081584	0.0047028	–1.7348 [0.105]
dC	11.8487	4.3017	2.7545 [0.016]
ecm(–1)	–0.50607	0.18220	–2.7776 [0.015]
R-Squared	0.68175	R-Bar-Squared	0.36350
S.E. of Regression	0.014290	F-stat. F (8, 14)	2.9455 [0.037]
Mean of Dependent Variable	0.041090	S.D. of Dependent Variable	0.017912
Residual Sum of Squares	0022464	Equation Log-likelihood	73.5546
Akaike Info. Criterion	61.5546	Schwarz Bayesian Criterion	54.7417
DW-statistic		2.3843	

3.6 Results of Model 3

Table 12 shows that the F-statistic is higher than the upper limit of the critical value. This proves that the variables are cointegrated at the 1% level of significance.

Table 12 *F-Test*

Lags	F-statistics	Critical values at 1%		Result
1	6.78	3.29	4.37	Cointegrated

K = variables are on the left hand side

Table 13 directs the AIC application at lag 1. This study's result is derived from the AIC at lag 1.

Table 13 *Lag Length Selection Criteria*

Endogenous variables: EDU GCF LGDP POLRIGHT SVT
Exogenous variables: C
Sample: 1988- 2012
Included observations: 23

Lag	LogL	LR	FPE	AIC	SC	HQ
0	–244.0987	NA	1757.497	21.66076	21.90760	21.72284
1	–130.1950	168.3794*	0.820639	13.93000	15.41108*	14.30248
2	–94.43375	37.31605	0.462788*	12.99424*	15.70955	13.67713*

* Indicates lag order selected by the criterion

Table 14 shows the diagnostic test that was used to check for normality, functional form, and serial correlation. The data shows a good level of normality, and the variance stays the same over time. Results are consistent with those shown in Tables 3 and 5, which show the other two models.

Table 14: *Estimation Results of the ARDL Model*
Dependent variable: LGDP
Akaike Information Criterion Selected Based on this Criterion is ARDL (1,1,2,1,2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGDP(–1)	0.48954	0.13929	3.5146	0.005
SVT	–0.1022E-3	0.1749E-3	–0.58439	0.571
SVT(–1)	0.7303E-3	0.2162E-3	3.3780	0.006
EDU	–0.016741	0.010208	–1.6400	0.129
EDU(–1)	0.0032820	0.011036	0.29740	0.772
EDU(–2)	0.032016	0.0096300	3.3245	0.007
POLRIGHT	0.0066284	0.0050075	1.3237	0.212
POLRIGHT(–1)	–0.021153	0.0050463	–4.1918	0.002
GCF	0.0094747	0.0045014	2.1048	0.059
GCF(–1)	–0.018527	0.0040332	–4.5936	0.001
GCF(–2)	0.013916	0.0040098	3.4705	0.005
C	12.2148	3.2955	3.7065	0.003
R-Square	0.99927	Prob (F-statistic)		0.00
Adjusted R-Square	0.99855	Durbin-Watson statistic		2.4051
F-statistic	1373.7			

Diagnostic Test

TEST STATISTICS*		LM VERSION*	F VERSION*
A: Serial Correlation	*CHSQ(1)	1.8324 [0.176] * F(1,10)	0.86566 [0.374]*
B: Functional Form	*CHSQ(1)	2.6148 [0.106] * F(110)	1.2827 [0.284]*
C: Normality	*CHSQ(2)	0.27540 [0.871]*	NA*
D: Heteroscedasticity	*CHSQ(1)	0.36779 [0.544] * F(1,21)	0.34127 [0.565]*

3.7. Stability Test

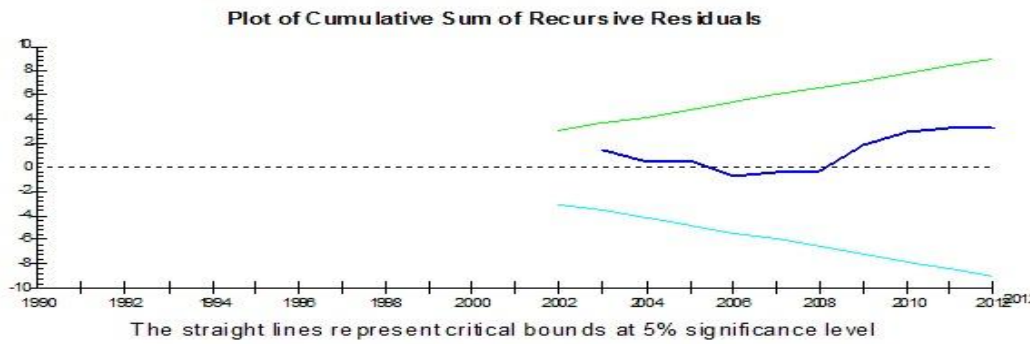

Figure 6 *Plot of Cumulative Sum of Recursive Residuals*

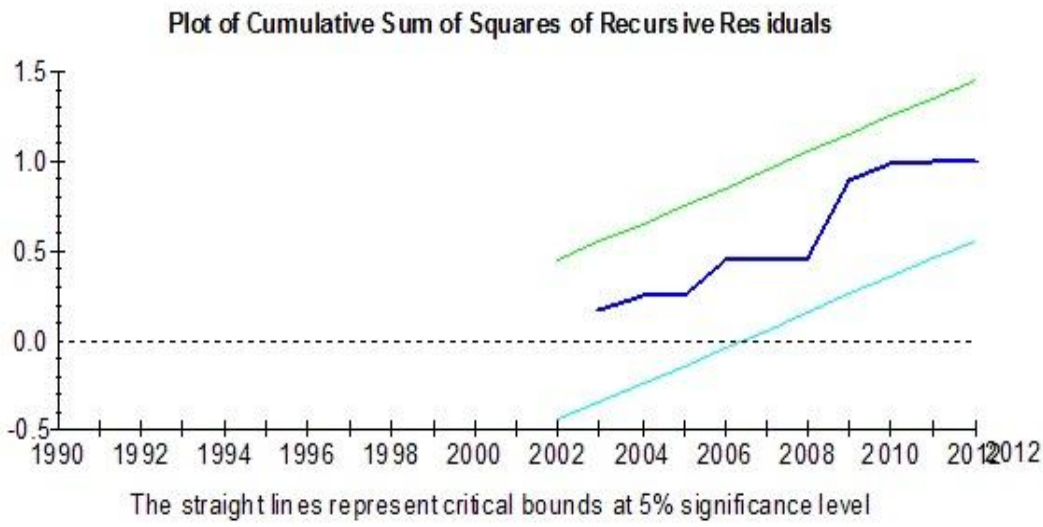

Figure 7 *Plot of Cumulative Sum Squares of Recursive Residuals*

The graph shows that the variables stayed stable during the time of the observation. The relationship between CUSUM and CUSUMSQ, and the breakpoints, is shown by the graphs.

Table 15 shows the long-term predictions of Model 3 using the ARDL method. The table shows that SVT, Edu, and PolRight have a big effect on LGDP at a five percent and one percent implication level.

Table 15 *Estimated Long Run Coefficients (ARDL Approach)*
ARDL (1,1,2,1,2) Selected Based on Akaike Information Criterion. Dependent variable is LGDP

Regressor	Coefficient	Standard Error	T-Ratio [Prob]
SVT	0.0012303	0.5502E-3	2.2363 [0.047]
EDU	0.036352	0.0025678	14.1568 [0.000]
POLRIGHT	–0.028454	0.0088322	–3.2216 [0.008]
GCF	0.0095283	0.0068009	1.4010 [0.189]
C	23.9290	0.21719	110.1748 [0.000]

The Error Correction Model estimates for Model 3 are displayed in Table 16, which shows the variables Edu1, GCF, and GCF1 have a big effect on the dependent variable LGDP.

TABLE 16 *Error Correction Representation for the Selected ARDL Model ARDL (1, 1, 2, 1, 2) selected based on Akaike Information Criterion Dependent variable is dLGDP*

Regressor	Coefficient	Standard Error	T-Ratio [Prob]
dSVT	–0.1022E-3	0.1749E-3	–0.58439 [0.568]
dEDU	–0.016741	0.010208	–1.6400 [0.122]
dEDU1	–0.032016	0.0096300	–3.3245 [0.005]
dPOLRIGHT	0.0066284	0.0050075	1.3237 [0.205]
dGCF	0.0094747	0.0045014	2.1048 [0.053]
dGCF1	–0.013916	0.0040098	–3.4705 [0.003]
dC	12.2148	3.2955	3.7065 [0.002]
ecm(–1)	–0.51046	0.13929	–3.6648 [0.002]
R-Squared	0.82384	R-Bar-Squared	0.64767
S.E. of Regression	0.010632	F-stat. F(7, 15)	7.3488 [0.001]
Mean of Dependent Variable	0.041090	S.D. of Dependent Variable	0.017912
Residual Sum of Squares	0.0012435	Equation Log-likelihood	80.3560
Akaike Info. Criterion	68.3560	Schwarz Bayesian Criterion	61.5430
DW-statistic		2.4051	

3.8. Granger Causality Test

1. LGDP Granger causes monetary progress, whereas monetary progress doesn't Granger cause LGDP. Both are mutually independent. (Refer to Table 17)
2. Capitalization of the market Granger causes LGDP, whereas LGDP doesn't Granger cause Capitalization of the Market. Both are mutually independent. (Refer to Table 17)
3. Stock quantity executed Granger causes LGDP, whereas LGDP doesn't Granger cause stock volume traded. Both are mutually independent. (Refer to Table 17)

TABLE 17 *Ganger Test for Causality*

Null Hypothesis	Observations	F-Statistic	Prob.
LGDP does not Granger cause BD	24	3.52686	0.0743
BD does not Granger cause LGDP		0.04444	0.8351
MC does not Granger cause LGDP	22	2.50837	0.0983
LGDP does not Granger cause MC		0.97686	0.4297
SVT does not Granger cause LGDP	21	2.82843	0.0727
LGDP does not Granger cause SVT		0.62876	0.6512

4. CONCLUSION, DISCUSSION AND SUGGESTIONS

Using annual data from 1988 to 2012 obtained from the World Development Indicators (WDI), this study seeks to determine the nature of the relationship between

EG and FD in Pakistan, specifically whether it is supply-driven, demand-following, non-existent, or causal. The advancement of the securities exchange and the finance industry serves as the two metrics for assessing financial development. Private credit deposits are used to gauge the progress of banking, while activity and size indicators are utilized to gauge progress of the stock exchange. The GCT, model of ARDL, and ADF method analyzed data. When structural discontinuities are present, cointegration between variables is assessed consuming the ARDL bounds testing method. The following are the study's main findings:

1. Cointegration between the configurations surrounding fundamental breaks in the variables is revealed by the results.
2. The subordinate variables—banking development, market capitalization, and stock volume traded in relation to LGDP—have a unidirectional relationship.
3. The study claims a connection between FD and EG which is causal because results show a relationship between circumstances and outcomes.
4. Granger studies show that some variables have a supply-driven relationship, whereas others interact in a demand-following manner. While market capitalization and stock volume traded Granger cause log GDP, LGDP Granger causes banking development. In conclusion, the variables in this causal framework exhibit a unidirectional relationship that is defined by supply-driven dynamics and demand-following behavior.

The study found that financing occurs after growth (Muhsin and Eric, 2000; Regmi, 2012). Furthermore, studies showed that the cointegrating relationship shows that fiscal progress is influenced by monetary progress (Uddin et al., 2013; Ghosh et al., 2014; Abosedra et al., 2015). Furthermore, the study's conclusions are consistent with earlier investigations into Pakistan's economy. The cointegration test and the supply-driven hypothesis, which states that FDI and economic prosperity (EG) are positively correlated, were connected by Ali et al. (2014). Iqbal et al. (2012) provided empirical evidence indicating that the ratio of private sector loans significantly affects economic growth. Anwar et al. (2011) established a causal relationship among fiscal prosperity (FD) and economic prosperity (EG), indicating that FD positively and significantly influences EG. The demand-following theory was validated by Muhammad and Umer (2010). Fase & Abma (2003) found a causal link between financial structure and economic development and noted that financial development (FD) is a byproduct of economic growth (EG).

Every aspect from financial sector influences the Pakistani economy in a way that promotes growth. In order to speed up financial transactions in Pakistan, EG must be improved. By elevating the significance of saving, changes to financial intermediaries would encourage the investment process and increase investment. Research findings indicate that one significant reason contributive to monetary. On the same boat, EG was a key factor in supporting banking expansion. Since a strong

banking industry and a developed stock market are essential for intermediation for economic growth, the expansion of intermediaries can further the development of the financial market. Plan developers frequently argue verbally about whether to prioritize banking expansion or stock market performance.

By the end, expanding the study's aim by including a thorough correlation among other developing countries that have experienced different economic and development fluctuations is very alluring.

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