Financial markets' development and economic growth nexus: An analytical appraisal from Bangladesh

Shakib Hassan Rakib[1], **Md. Shakhaowat Hossin**[1]

[1] *Deptartment of Finance and Banking, Begum Rokeya University, Rangpur, Bangladesh*

JOMEINO
ISSN:
2522-381X (Print)
2521-7054 (Online)
DOI: 10.31039/jomeino

Received 04 October 2022
Revised 01 November 2022
Accepted 24 December 2022

Citation: Rakib, S. H., & Hossin, Md., S. (2023). Financial markets' development and economic growth nexus: An analytical appraisal from Bangladesh. *Journal of Management, Economics, and Industrial Organization*, 7(1), 34-47.

http://doi.org/10.31039/jomeino.2022.7.1.3

corresponding authors:
shakibhassan.brur@gmail.com
shakhaowat@brur.ac.bd

Abstract

The impact of Bangladesh's financial market development on the nation's economic growth from 1993 to 2020 is examined in this article. Unit root tests, cointegration tests, vector error correction models, and causality tests were performed to evaluate the results. As a result, the unit root test at first difference indicated that the variables were stationary. The Johansen cointegration test revealed that the variables were cointegrated, and the vector error correction model revealed that there was a long-term interaction. According to the results of the casualty test, some variables have a unidirectional causal relationship, but other variables do not. The study's findings suggest that promoting financial development frequently affects the economy and the policymakers of the financial market can move forward with potential initiatives by considering the results from this analytical review.

Keywords: Financial market; Economic growth; Bangladesh; Unit root; Cointegration; Vector error correction; Causality.

JEL Classification Codes: O1, O110, O160.

1. Introduction

The development of the financial market and positive economic growth have a long-term link that leads to a rise in the manufacturing of goods and services in an economy. Financial development includes the growth of financial markets, institutions, and the financial innovation they foster as well as the distribution of resources, productivity gains, and technical advancements that make it possible for savers to entrepreneurs to deploy large sums of money. Bangladesh saw several financial advances in the banking industry, most notably the growth of internet banking, agent banking, financing packages to boost entrepreneurship, and mobile banking. Given its broad concept and numerous indicators, financial progress is challenging to measure. There are several indices of economic growth, but GDP is the most used one.

Due to Bangladesh's extensive demographic division, remittance inflows, and over the past 20 years, the nation has enjoyed fast economic expansion and market development mainly thanks to its major exports of clothing. The Securities and Exchange Commission has recently promoted investments in SMEs around the nation that, as a result of economic growth, help SMEs enter the stock market. As a result, Bangladesh saw a significant stock market crash in 1997, 2008, and 2011. However, the stock market is essential to Bangladesh's economy for raising start-up money needed to operate a business by trading shares in the IPO market. While bank deposits are safer than stock investments, the stock market offers access to a staggering quantity of capital funding for economic expansion.

By disbursing loans, banks act as mediators in the financial system. Particularly banks offer deposits with a variety of interest rates that boost depositor savings and can be used to create new capital assets. Commercial banks, specialized banks, and cooperative banks comprise the banking sector. The two stock exchange firms that comprise the stock market are the Dhaka Stock Exchange (DSE) and the Chittagong Stock Exchange (CSE).

2. Research Gap

The previous study only looked at stock market indices of economic growth, such as market capitalization, total value traded, and total turnover ratio. The innovation is that we will now include a new representative variable for the banking sector—financial system deposits—to analyze financial market development's effect on economic growth. From the perspective of an empirical study, the 28-year time series data analysis from 1993 to 2020 is a first for Bangladesh.

3. Statement of Purpose

Bangladesh's economy is growing as a result of the expansion of the financial market sector. Our research is based on Bangladesh's stock market's market capitalization, total value traded, and total turnover ratio, as well as the financial system deposits of banks. Our objectives are:

- To determine whether or not the variables have been incorporated.
- To determine if somehow the variables engage in a long-term interaction.
- Whether there is a causal relationship between the variables can aid a decision-maker in making subsequent judgments.

4. Literature Review

By reviewing the vast body of prior research, we draw the conclusion that Bangladesh's current environment of financial sector development and economic advancement will benefit from the knowledge we have accumulated. Modern specialists assert that there is some dispute around the relationship between financial development and economic growth on the basis of structural market development. By the way, Wu et al. (2010) studied how financial institutions affect economic growth in 13 EU countries in a dynamic way. The results revealed both short- and long-term effects of institutions on growth. According to Harris (1997), Atje and Jovanovic's cross-sectional evaluation of 39 countries between 1980 and 1988 shows that a country's stock market's overall position influences the growth of its GDP per individual.

In Hossin and Islam’s (2019) assessment of the impact of stock market development on Bangladesh's economic growth revealed that the stock market and economic growth were co-integrated, showing a long-term association. Using financial indices that take into account the breadth, accessibility, and effectiveness of financial markets and institutions, Purewal and Haini (2020) analyzed 24 advanced OECD countries again between 1980 and 2017 to ascertain how financial structure affected economic growth.

Hondroyiannis at el. (2005) assessed the empirical connection between the stock marketplace and bank financing that can influence economic growth in the case of Greece over the years 1986-1999. Using the casualty test of 16 countries' time series data, Demetrias and Hussein (1996) demonstrated the association between financial development and real GDP. This study implicitly regards various economies as homogeneous units. Wong and Zhou (2011) emphasized the strong positive correlations between stock market development and economic growth in China, the USA, the United Kingdom, Japan, and Hong Kong, which bolstered the theory that the growth of stock markets is one of the key drivers of growth in both developed and emerging economies.

A study conducted by Al Karim and Alam (2013) used a significant number of financial ratios to evaluate the performance of five selected private commercial sector banks in Bangladesh that are listed on the DSE and CSE. According to Choong and Chan (2011), there is a significant dispute about financial development and economic growth in the literature on growth and expansion. While the empirical study reveals there must be disagreement over how to interpret the findings; as a result, this study analyzes four major disagreements.

The research conducted by Ciftci et al. (2017) enhanced both conceptual and empirical knowledge of how financial sector development affects economic expansion. Theoretically, debt from credit markets and equity from stock markets are both trustworthy long-term determinants of GDP per capita calculations for a panel of 40 countries between 1989 and 2011.

In 48 countries, Shen and Lee (2006) examined the relationship between financial development and real GDP per capita growth. As per their research, only the equity market has a beneficial effect on growth, whereas the banking profession's performance has an unfavorable but not detrimental impact.

Xu (2000) explained the multivariate vector-autoregressive (VAR) approach to examine the effects of stable financial development on domestic investment and output in 41 countries between 1960 and 1993.

Using the VER model and a review of the bank- and market-based financial structures in Australia, Thangavelu (2004) demonstrated the causal relationship between financial market improvement and economic growth. Abu-Bader et el. (2008) examined the relationship between financial development and economic growth in Egypt during the period 1960–2001 using the VER model and strongly support the view that financial development and economic growth are mutually causal. Using a six-equation model for Malaysia, Ang (2008) calculated financial development and economic growth. The results show that encouraging both private saving and private investment financial development results in higher output. The threshold regression model used by Rameez at el. (2020) to study the nonlinear relationship between financial development and economic growth yields a U-shaped relationship for the years 1978– 2017 in Pakistan.

Using annual time-series data, Bojanic (2012) examined Bolivia's economic growth, financial development, and trade openness. The result indicated that there is, in fact, a lengthy equilibrium link. According to an analysis of panel data from 125 Asian countries published by Estrada et al. (2010), financial deepening has a significant positive impact on growth in developing countries. The study also demonstrates that the effect of financial development on the region's growth has not changed significantly since the Asian financial crisis and has even gotten weaker.

Lua at el. (2006) tried to look into the relationship between financial development and the driver of growth in Taiwan, Korea, and Japan. They emphasized the degree of worldwide capital movement in the steps of economic growth, as well as the expansion of the financial sector in terms of banking, equity markets, and monetary policy.

In the study of the relationship between financial development and economic growth in China between 1952 and 2001, Liang and Teng (2006) proposed that there is unidirectional causality between financial development to economic growth. The relationship between the market capitalization ratio to GDP and economic growth is favorable for South Africa, according to Osakwe et al. (2020), who analyzed the impact of stock market capitalization on the economic growth of Nigeria and South Africa but insignificant for Nigeria over a period of 20002018.

Phuong (2020) examined the impact of institutions and macroeconomic factors on the capital base of financial products in East Asian and Pacific countries (EAP) and discovered that, over a time series of data from 2008 to 2018, institutions, economic growth, and savings had a favorable impact, while macroeconomic factors like inflation and high-interest rates had a detrimental effect. Aali-Bujari et al. (2017) examined how the banking spread and stock market capitalization influenced the major Latin American economies between 1994 and 2012; the results revealed that although the banking spread had an adverse effect on economic growth, the stock market capitalization had a favorable effect.

Using secondary data from the years 1998 to 2018, Omodero (2020) efficiency of the Nigerian capital market was evaluated using economic statistics, and it was discovered that the interest rate has a negative impact while the exchange rate and inflation rate have negligible effects. She also discovered that CMC might benefit from the GDP.

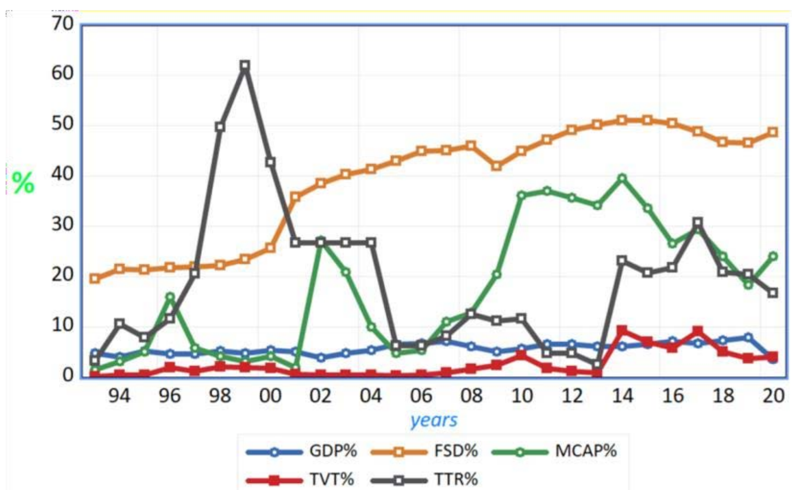
Using the panel causality test, Sethi and Acharya (2018) found that there is a positive and long-term relationship between financial inclusion and economic growth across 31 nations. According to research by Karimo and Ogbonna (2017), the relationship between financial depth and economic growth in Nigeria follows the supply-leading theory between 1970 and 2013. Soedarmono at el. (2011) Empirical findings show that more market dominance in the banking market contributed to higher instability from 2001 to 2007 using a sample of the banking sector from 12 Asian nations. In the under-analysis economies, environmental degradation (CO2 emissions) and economic and financial development, as well as FDI, have a statistically meaningful long-run co-integrating relationship, according to Nasir at el. (2019).

5. Data Sources and Explanation of Variables

Basically, we examined the connections between financial market development and economic growth. As a result, the market capitalization (MCAP), total value traded (TVT), total turnover ratio (TTR), and financial development system (FSD) were used as proxies for the independent variable "financial market development," where MCAP, TVT, and TTR represent the overall performance of the stock market, and the GDP was used as a proxy for the dependent variable "economic growth." On the other hand, in the context of Bangladesh, FSD stands in for the entire banking sector.

To prevent heteroscedasticity issues, all the variables are converted into their natural logarithms (Ln). The variables are taken as secondary data on annual basis from “World Bank Data storage” and “Federal Reserve Bank of St. Louis”. The time series data is taken for 28 years from 1993-2020.

Graph 1: The fluctuation of variables



6. Methodology

To account for the potential effects of independent factors such as market capitalization, total turnover ratio, total value traded, and financial system deposits on GDP as a dependent variable, we offer a straightforward growth model. The regression equation:

$$Ln(GDP)_t = \lambda_0 + \lambda_1 Ln(MCAP)_t + \lambda_2 Ln(TVT)_t + \lambda_3 Ln(TTR)_t + \lambda_4 Ln(FSD)_t + u_t \quad \text{……………………..……. (1)}$$

Where λ_0 is constant, λ_1= the coefficient of market capitalization (LnMCAP), λ_2 = the coefficient of total value traded

(LnTVT), λ_3= the coefficient of total turnover ratio (LnTTR), λ_4= the coefficient of financial system deposits (LnFSD), u= error terms, **t**= time.

By executing vector error correlation estimation where the variables were lagged by two periods. Now the new equation state:

$$\Delta Ln(GDP)_t = \lambda_0 + \lambda_1 \Delta Ln(MCAP)_t + \lambda_2 \Delta Ln(TVT)_t + \lambda_3 \Delta Ln(TTR)_t + \lambda_4 \Delta Ln(FSD)_t + \lambda_5 u_{t-2} + \varepsilon_t \dots\dots\dots\dots (2)$$

Here, the second model can be used in conjunction with the Granger Casualty Test to measure the direction of the relationship in order to investigate the long-run relationship between financial market development and economic growth. u_{t-2} denotes that the variables were lagged by two periods, and ε = residual term.

7. Empirical Result

7.1 Stationary test results

The Augmented Dikky-Fuller (ADF) test and the Phillip-Perron (PP) test are used to determine whether variables like LnGDP, LnMCAP, LnTTR, LnTVT, and LnFSD are stationary in order to eliminate misleading data. According to the ADF and PP, all variables are stationary at the first difference at a level of significance of 1% and 5% respectively for the period 1993–2020. The results are given below from EVIEWS:

Table 1: ADF stationary test at first difference

Variables	***Intercept***	***Intercept & trend***	***None***	***Status***
LnGDP	-4.352533, (-3.711457)* (-2.981038)**	-4.291293, (-4.356068)* (-3.595026)**	-4.485870, (-2.656915)* (-1.954414)**	stationary
LnMCAP	-5.778736, (-3.717457)* (-2.981038)**	-5.699188, (-4.356068)* (-3.595026)**	-5.811794, (-2.656915)* (-1.954414)**	stationary
LnTTR	-5.758769, (-3.711487)* (-2.981038)**	-5.628303, (-4.356068)* (-3.595026)**	-5.884922, (-2.656915)* (-1.954414)**	stationary
LnTVT	-5.706194, (-3.711457)* (-2.981038)**	-5.549819, (-4.356068)* (-3.595062)**	-5.746608, (-2.656915)* (-1.954414)**	stationary
LnFSD	-3.626278, (-3.711456)* (-2.981038)**	-3.785959, (-4.356068)* (-3.595026)**	-3.279488, (-2.656915)* (-1.954414)**	stationary

Note: Significance at 1% and 5% levels is shown by ()*, ()**, respectively. Parentheses around figures indicate critical values. The critical value for denying the unit root applied hypothesis as per Mackinnon (1996). **Source:** Author's Estimation using Eviews 12

Table 2: PP stationary test at first difference

Variables	***Intercept***	***Intercept & trend***	***None***	***Status***
LnGDP	-3.993262, (-3.711457)* (-2.981038)**	-3.940881, (-4.356068)* (-3.595026)**	-4.152868, (-2.656915)* (-1.954414)**	stationary
LnMCAP	-6.507680, (-3.71457)* (-2.981038)**	-6.397368, (-4.356068)* (-3.595026)**	-6.423801, (-2.655915)* (-1.954414)**	stationary
LnTTR	-5.758769, (-3.711457)* (-2.981038)**	-5.628303, (-4.356068)* (-3.595026)**	-5.884922, (-2.656915)* (-1.954414)**	stationary
LnTVT	-5.718223, (-3.711457)* (-2.981038)**	-5.554994, (-4.356068)* (-3.595026)**	-5.767298, (-2.656915)* (1.954414)**	stationary
LnFSD	-3.632335, (-3.711457)* (-2.981038)**	-3.785960, (-4.356068)* (-3.595026)**	3.259915, (-2,656915)* (-1.954414)**	stationary

Note: ()*, ()**, which demonstrate significance at 1% and 5% levels, respectively. Critical values are indicated by parentheses around numbers. According to Mackinnon, the critical value for rejecting the unit root applied hypothesis (1996). **Source:** Author‟s Estimation using Eviews 12

7.2 Cointegration test result

Johansen Cointegration test was applied to identify if there was any long-run relationship that existed among the variables of analysis. The null hypothesis means variables have no cointegrated equation. If the null hypothesis is rejected it means the variables are cointegrated.

Table 3: Unrestricted cointegration rank test (trace)

Hypothesized		**Trace**	**0.05**	
No. of CE(s)	**Eigenvalue**	**Statistic**	**Critical value**	**Probability ** **
*None * *	0.952748	156.0927	88.80380	0.0000
*At most 1**	0.797069	79.78616	63.87610	0.0013
At most 2	0.612906	39.91385	42.91524	0.0967
At most 3	0.326585	16.18663	25.87210	0.4776
At most 4	0.222810	6.301771	12.51798	0.4229

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values

From the above trace statistic Table-3 the null hypothesis is rejected at none* and at most 1* where the probability is less than the significant level of 0.05 that indicates there exists a long-run relationship among the variables or the critical value is less than the statistic value also indicates the same thing.

Table 4: Unrestricted cointegration rank test (maximum Eigenvalue)

Hypothesized	**Eigenvalue**	**Max-Eigen**	**0.05**	**probability**
No. of CE(s)		**Statistic**	**Critical value**	****
*None **	0.952748	76.30654	38.33100	0.0000
*At most 1**	0.797069	39.87231	32.11831	0.0046
At most 2	0.612906	23.72722	25.82321	0.0922
At most 3	0.326585	9.884860	19.38704	0.6311
At most 4	0.222810	6.301771	12.51798	0.4229

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values

The above Eigenvalue statistic Table-4 also supported the rejection of the null hypothesis of long-run equilibrium relationship at none* and at most 1* where the probability is less than the significant level of 0.05 that indicates there exists a long-run relationship among the variables or the critical value is less than the statistic value also indicates the same thing.

7.3 Vector Error Correlation Estimations

VECM was used for the regression model and ran in order to test the presence at what extent the variables are co-integrated in the short run and also to find out the level at which the variables would be correlated in the long run.

Table 5: Vector error correlation estimations

Error correction	*D(LN_FSD)*	*D(LN_GDP)*	*D(LN_MCAP)*	*D(LN_TTR)*	*D(LN_TVT)*
cointEq1	0.035646 (0.05097) [0.69936]	-0.200832 (0.15750) [-1.27510]	0.473859 (0.45056) [1.05171]	0.737887 (0.51140) [1.44287]	0.036851 (0.57237) [0.06438]
D(LN_FSD_(-1))	0.309950 (0.33756) [0.91821]	0.376443 (1.04310) [0.36089]	3.26912963 (2.98397) [1.09556]	-4.640753 (3.38689) [-1.37021]	-4.095227 (3.79073) [-1.08033]
D(LN_FSD_(-2))	0.104921 (0.46748) [0.22444]	0.000831 (1.44458) [0.00058]	2.897154 (4.13246) [0.70107]	7.363646 (4.69048) [1.56991]	5.808911 (5.24974) [1.10651]
D(LN_GDP_(-1))	0.129927 (0.18435) [0.70476]	-0.764309 (0.56968) [-1.34163]	-0.593586 (1.62967) [-0.36424]	-0.446435 (1.84973) [-0.24135]	-1.720263 (2.07028) [-0.83093]
D(LN_GDP_(-2))	-0.167860 (0.17380) [-0.96577]	-0.631488 (0.53709) [-1.17575]	-0.943822 (1.53644) [-0.61429]	0.276473 (1.74391) [0.15854]	-0.965223 (1.95184) [-0.49452]
D(LN_MACP_(-1))	0.011814 (0.04040) [0.29239]	-0.121344 (0.35718) [-0.97185]	-0.152973 (0.35718) [-0.42828]	-0.265016 (0.40541) [-0.65370]	-0.646674 (0.45375) [-1.42517]
D(LN_MACP_(-2))	-0.011112 (0.04147) [-0.26795]	-0.137732 (0.12815) [-1.07471]	-0.104721 (0.36661) [-0.28565]	0.490544 (0.41611) [1.17886]	-0.075889 (0.46573) [-0.16295]
D(LN_TTR_(-1))	-0.030232 (0.04263) [-0.70912]	-0.070471 (0.13174) [-0.53490]	-0.207599 (0.37688) [-0.55083]	-0.470368 (0.42777) [-1.09958]	-0.5468467 (0.47877) [-1.14217]
D(LN_TTR_(-2))	0.024610 (0.04068) [0.60496]	-0.036525 (0.12571) [-0.29055]	-0.475451 (0.35961) [-1.32211]	-0.044875 (0.40817) [-0.10994]	-0.420715 (0.45684) [-0.92092]
D(LN_TVT_(-1))	0.008258 (0.04372) [0.18886]	0.131550 (0.13511) [0.97360]	-0.087179 (0.38652) [-0.22555]	0.282112 (0.43871) [0.64304]	0.391366 (0.49102) [0.79704]
D(LN_TVT_(-2))	-0.038883 (0.04184) [-0.92930]	0.146977 (0.12929) [1.13676]	0.366903 (0.36987) [0.99198]	-0.226030 (0.41981) [-0.53841]	0.350292 (0.46987) [0.74551]
c	0.024943 (0.02334) [1.06843]	-0.006525 (0.07214) [-0.09046]	-0.103417 (0.20637) [-0.50112]	-0.079974 (0.23424) [-0.34142]	0.079776 (0.26217) [0.30429]

Source: Author"s Estimation using Eviews 12

A value of (-0.200832) indicates that variables exist in a lengthy equilibrium relationship based upon the estimation made using time series data and the lag (2) results at cointEq1. From the Table-5, the other measurement using different lags indicates long-run interaction. Here the standard error in (….) and t statistic in [….].

7.4 Granger casualty test result

The Granger casualty test helps to identify the effect of one time-series variable on another variable. We verified whether there is any granger casualty that denies the null hypothesis when the F-statistic is noteworthy at a p-value of 5% or less by applying the suitable lag value.

Table 6: Granger casualty test result

Null Hypothesis:		*Obs*	*F-Statistic*	*Prob.*
LN_MACP_ does not Granger Cause LN_GDP_		26	1.55025	0.2355
LN_GDP_ does not Granger Cause LN_MACP_			1.85741	0.1808
LN_TTR_ does not Granger Cause LN_GDP		26	0.23498	0.7926
LN_GDP_ does not Granger Cause LN_TTR_			0.21485	0.8084
LN_TVT_ does not Granger Cause LN_GDP_		26	0.28061	0.7581
LN_GDP_ does not Granger Cause LN_TVT_			1.53362	0.2389
LN_FSD_ does not Granger Cause LN_GDP_		26	3.96392	0.0346
LN_GDP_ does not Granger Cause LN_FSD_			0.74381	0.4874
LN_TTR_ does not Granger Cause LN_MACP		26	1.36737	0.2765
LN_MACP_ does not Granger Cause LN_TTR_			0.07349	0.9293
LN_TVT_ does not Granger Cause LN_MACP_		26	0.66633	0.5241
LN_MACP_ does not Granger Cause LN_TVT_			0.59310	0.5616
LN_FSD_ does not Granger Cause LN_MACP_		26	5.16879	0.0149
LN_MACP_ does not Granger Cause LN_FSD			0.05346	0.9480
LN_TVT_ does not Granger Cause LN_TTR_		26	0.24251	0.7868
LN_TTR_ does not Granger Cause LN_TVT_			4.27170	0.0277
LN_FSD_ does not Granger Cause LN_TTR_		26	0.73118	0.4931
LN_TTR_ does not Granger Cause LN_FSD_			2.78943	0.0842
LN_FSD_ does not Granger Cause LN_TVT_		26	2.34863	0.1200
LN_TVT_ does not Granger Cause LN_FSD_			0.84266	0.4446

Source: Author‟s Estimation using Eviews 12.

Following the Table-6 the null hypothesis FSD does not granger cause GDP is rejected and shows a unidirectional causal relationship between FSD and GDP. Likewise, the null hypotheses FSD does not grander cause MCAP and TTR does not grander cause TVT are rejected and hold also a unidirectional causal relationship. But the other null hypotheses are not rejected and convey no causal relationship.

8. Conclusion and Recommendation

The empirical result of this article's investigation into the interactions between the variables shows how the development of financial markets and economic growth are intertwined. According to the unit root test of the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) models, the variables are stationary at the first difference, and the Johansen cointegration test reveals that the variables are primarily cointegrated among them. In addition to the Granger causality conclusion, which also establishes a unidirectional causal relationship between the financial system deposits (FSD) and GDP, the financial system deposits (FSD) and market capitalization (MCAP), the total turnover ratio (TTR), and the total value traded (TVT), the vector error correlation estimation also demonstrates the existence of long-run relationships.

The findings of the present study should not be taken as conclusive empirical proof with regard to the precise role that financial market development plays in economic growth, but rather as an additional stimulus for further investigation in this field.

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