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Research Article

The Impact Of Financial Markets Depth On Economic Growth In GCC Countries

Samer A. Abd[1*], Yamen M. Debs[2]

[1*]Al-Ma'moon University College ORCED: 0009-0002-0686-9017 samer.a.abd@almamonuc.edu.iq
[2]Al-Ma'moon University College ORCED: 0009-0005-5678-2165 yamen.m.ahmed@almamonuc.edu.iq

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ABSTRACT

This research aims to study the impact of financial market depth on achieving economic growth in the Gulf Cooperation Council (GCC) countries during the period 2000-2019 using annual panel data. The study used the composite index of financial market depth approved by the International Monetary Fund, which includes multiple measures to assess the size and liquidity of the financial market, as an independent variable. The natural logarithm of GDP per capita was used as a dependent real variable. Foreign direct investment, technological development, and oil price logarithm were used as control variables, Panel data cointegration tests (Pedroni-Kaw-Fisher) were conducted to study the long-term equilibrium relationship between the variables. The Vector Error Correction Model (VECM) was then applied to estimate long and short-term parameters. Finally, the Granger Causality test was applied to confirm the presence of causal relationship, The study found a long-term equilibrium relationship between the variables based on the results of three tests (Kaw-Fisher). There was a significant positive effect of financial market depth on economic growth in the long term. As for the short term, there was a non-significant positive effect of financial market depth in the previous year on economic growth and a significant negative effect in the year before the previous. Regarding causal relationship, it was absent according to the Granger Causality test.

Keywords: Economic growth, financial market depth, Gulf Cooperation Council (GCC) countries.

JEL Classification: G11, O4, E1

Introduction:

Financial markets play a significant role in mobilizing, allocating, and redirecting resources towards more efficient and profitable investments, contributing to stimulating the national economy. These markets act as a link between savers (surplus units) on one hand, and borrowers (deficit units) on the other hand. This helps achieve economic growth, which is one of the key goals sought by both developing and advanced economies alike.

In theory, financial markets play a crucial role in economic growth, but empirical results have been somewhat conflicting. While many studies have highlighted the role of financial markets in achieving and enhancing economic growth, few have delved deeply into market depth. Observations show that most studies measure market depth using simple indicators like market capitalization, trading rates, and turnover. Thus, this study utilizes the Market Depth Index developed by the International Monetary Fund (IMF) (name and date) which offers a more comprehensive view of market depth by focusing on the size of both the stock and bond markets, providing a clearer and more accurate picture of financial markets.

The Gulf Cooperation Council (GCC) countries in the sample have witnessed significant and notable development in their financial markets in recent years.

This study aims to verify the impact of market depth, as measured by an index, on economic growth in the GCC countries during the period 2001-2019.

With importance given to three other factors: foreign direct investment, technological advancement, and oil prices, as they may have a significant impact on both the financial market and economic growth in the sample countries. Especially with the sample countries achieving advanced ranks in the Network Readiness Index, which is issued annually by the World Economic Forum. As for oil prices, they are crucial for the sample countries, whose economies are predominantly oil-based.

The importance of this study lies in testing the depth of the financial market's impact on economic growth in the Gulf Cooperation Council countries, by examining the existence of long-term equilibrium relationships, and thus determining the impact of the depth of the financial market on economic growth in both the long and short terms. Despite the numerous studies on this subject, no conclusive result has been reached regarding the existence and nature of this impact, whether in the sample countries or elsewhere, emphasizing the importance of retesting the existence of this impact, especially using the International Monetary Fund's Financial Market Depth Index. This study has also been able to reach results showing the impact of financial market depth on achieving economic growth in the sample countries, and the nature of this impact if it exists, which may allow for the provision of recommendations to policymakers and decision-makers in the sample countries.

Previous studies:

Most theoretical literature agrees that the development of financial markets has a significant impact on economic growth. A study by Saadallah (2015) in Morocco, Tunisia, and Jordan during the period 2000-2011 found a very weak positive relationship between the size of the financial market and economic growth in Morocco, a strong positive relationship in Jordan, and a weak negative relationship in Tunisia. On the other hand, a study by Azam (2017) in Palestine during the period 1997-2015 using a multiple linear regression model estimated using ordinary least squares (OLS) method, found a significant positive relationship between financial depth indicators related to financial markets (trading volume and market capitalization) and economic growth, as well as a significant positive relationship between financial depth indicators related to the banking sector and economic growth.

A study by Dahmani & Aabid (2017) in Indonesia and Algeria during the period 1999-2011 conducted Granger causality tests to study the causal relationship in both countries. A VAR model was then estimated. The study found no common integration between the development of financial markets and economic growth in both countries. In Algeria, no causality relationship was found between any of the three market development indicators and economic growth. In Indonesia, a one-way causality relationship was found from market capitalization to economic growth, while no causality relationship was found between trading volume or turnover rate and economic growth. Additionally, a positive relationship was found between economic growth and market capitalization from the previous year.

In contrast, a study by Alam & Hasan (2003) in the United States during the period 1948-2000 using the Johansen-Juselius multivariate cointegration test to examine the integration between variables, found a long-term equilibrium relationship between economic growth and market size. The study also highlighted the positive impact of the financial market size on long-term economic growth. Furthermore, the study indicated that the causality relationship points from the financial market size, measured by market capitalization, to growth. A study conducted in Bangladesh between 1995-2018 by Ali (2020) applied the Johansen-Juselius test for cointegration to examine the long-term equilibrium relationship and utilized the VECM model to estimate parameters of the long and short-term relationship. Additionally, Granger Causality tests were performed. The study found a long-term equilibrium relationship between financial market depth indicators and economic growth, with a positive impact of financial market depth on long-term economic growth. Results for the short term were mixed regarding the three financial market depth indicators and their relationship with economic growth. A causal relationship, as per the Granger concept, was identified between the three market depth indicators and economic growth, pointing from financial market depth to economic growth. This research contributes by highlighting the impact of financial market depth on economic growth. Financial market depth encompasses market capitalization, trading volume, sovereign and corporate financial non-financial bond ratios - as measured by the IMF. It provides a comprehensive view of financial market depth measured beyond simple indicators, such as market capitalization for volume measurement, trading rate, and rotation rate for liquidity measurement. The study also considers important controlling variables such as foreign direct investment, technological development, and oil prices. These variables are expected to have a significant impact on both economic growth and financial markets in the sample countries. According to the researchers' knowledge, these important variables have not been used together in previous studies to measure the impact of financial market depth on economic growth.

Theoretical Framework:

Market Depth and its Indicators:

The concept of market depth in theoretical literature refers to the presence of numerous buyers and sellers available in the market, making it easy to complete any transaction quickly and at market prices at any time without price disruptions. The International Monetary Fund defines a comprehensive concept in relation to market depth, offering a somewhat reliable indicator that provides a clear picture of the depth of financial markets. The IMF measures market depth based on a set of five indicators, four of which are volume indicators (stock market size, bond market size) and the fifth indicator is for market liquidity (trading turnover rate).

Impact of Market Depth on Economic Growth:

Schumpeter was one of the early economists to highlight the impact of the financial sector (institutions and markets) on economic growth in his book "Theorie der Wirtschaftlichen Entwicklung" in 1911, emphasizing the role of financial intermediation in aggregating and allocating funds to high-yield investments. This encourages entrepreneurship and innovation, essential for enhancing and activating economic growth.

Patrick proposed two hypotheses in 1966 to explain the relationship between the financial sector and economic growth: the supply-leading hypothesis - explaining the relationship from the financial sector to economic growth, and the demand-following hypothesis - explaining the relationship from economic growth to the financial sector. Regarding the supply-leading hypothesis, it suggests that the financial sector influences economic growth in developing countries where the presence of financial institutions, financial intermediaries, and efficient financial markets capable of ensuring liquidity, aggregating savings, and transferring them to the best available investments with the highest returns will have a significant impact on enhancing economic growth.

In his book "A Theory of Economic History" in 1969, Hicks pointed out that technological innovations were not the direct cause of the Industrial Revolution in Britain in the 18th century. Instead, it was the well-functioning financial markets that provided a good amount of funds for large projects over long periods that were the main driving force behind the Industrial Revolution. Especially considering that most technological innovations that laid the foundation for the early stages of the Industrial Revolution had been around for a long time, it was the presence of such financial markets that allowed the Industrial Revolution to occur. Discussions by Stiglitz in 1989 emphasized the importance of financial markets in aggregating savings and allocating them efficiently towards sectors, companies, and administrations that deserve them and are most capable of utilizing them to enhance economic growth. He stressed the necessity for financial institutions to direct funds towards the most profitable opportunities (within what he called the function of selection or sorting), which can be done better when there are well-functioning or advanced secondary markets. Additionally, the constraints and accounting standards imposed by the market help ensure that funds are optimally utilized (the function of monitoring). Furthermore, the opportunities provided by financial markets for diversification contribute to risk reduction, thereby motivating investors to engage in more investment projects that will later show positive impacts by achieving high rates of economic growth. As Levine pointed out in 1997, the facilitation of trading and provision of required liquidity by financial markets positively impacts economic growth, as projects with high returns require long-term commitment of capital that investors do not prefer, making them hesitant to enter into such investments in the absence of deep and cost-effective liquid markets that allow them to maintain liquidity in their investments as desired. On the other hand, Bencivenga et al. in 1996 suggested that the impact of financial markets on economic growth is not always positive but is related to transaction costs and the costs of securitization. Investors will be less enthusiastic about entering investments through financial markets if these markets are shallow and inefficient, characterized by high transaction costs.

Research Methodology:

To achieve the research objectives and test the hypotheses, a multiple regression equation was adopted to test the hypotheses using a standard model illustrating the impact of the depth of financial markets on economic growth based on annual panel data for the sample countries during the period 2000-2019. The current study utilized Eviews 12 software for conducting the necessary tests and estimating the model parameters, as follows:

$$Ln\ GDPPCit = \alpha + \beta 1FMDit + \beta 2FDIit + \beta 3TDit + \beta 4OPit + \varepsilon it$$

Where:

Ln GDPPCit is the logarithm of per capita GDP of country i in period t.
FMDit is the financial market depth index of country i in period t.
FDIit is the foreign direct investment of country i in period t.
TDit is the percentage of internet users in country i in period t.
OPit is the present price of the OPEC basket.
$\beta 1, \beta 2, \beta 3, \beta 4, \alpha$ are parameters to be estimated later.
εit is the random error term.

Research Community and Study Period:

The research community, which is the same as the research sample, includes all financial markets in the Gulf Cooperation Council countries. These countries are Saudi Arabia, UAE, Bahrain, Kuwait, Qatar, and Oman. They are considered economically, politically, historically, and culturally homogenous markets.

The study period extends from 2001 to 2019, during which the Gulf Cooperation Council countries experienced significant events such as the US invasion of Iraq in 2003, which had impacts on the Arab Gulf countries, the effects of the 2008 global financial crisis, some Gulf countries like Bahrain being affected by events and crises starting in 2011, the sharp decline in oil prices during 2014-2015, and the dispute between Qatar and some Council countries in 2017.

Variables of investigation and data sources:

Table 1. Description of study variables. (Prepared by the author using Eveus 10).

Study Variables	Measurement Method	Explanation of symbols	Data Source
Dependent variable (Economic growth)			
Individual's share of the total Gross Domestic Product	Ln (GDPPC)= Ln (GDP\MP)	Per capita GDP: The share of the total GDP per individual. GDP: Gross Domestic Product. Mid-year Population: Population count in mid-year.	World Bank Database
Independent Variable (Financial Market Depth)			
The depth of the financial market is an index composed of:	FMD1= MC\GDP	FMD1 Market capitalization ratio. MC Market value. GDP Gross Domestic Product	World Bank Database
	FMD2= TVT\GDP	FMD2 Trading Volume Index. TVT Total Value of Traded Stocks. GDP Gross Domestic Product.	
	FMD3= IDSG\GD	FMD3: International Sovereign Bonds Ratio. IDSG: Value of International Sovereign Bonds. GDP: Gross Domestic Product.	
	FMD5=DSNFC\GDP	FMD5 is the ratio of non-financial corporate bonds. DSNFC is the value of non-financial corporate bonds. GDP is Gross Domestic Product.	
Control Variables:			
Foreign Direct Investment	FDI	Net flows of foreign direct investment	World Bank Database
Technological advancement	TD	Percentage of Internet users per population.	World Bank Database
Oil Prices	OP	Current Price of OPEC Basket	Organization of the Petroleum Exporting Countries (OPEC) Reports.

Results and Discussion:

Table 2. Descriptive statistics for the variables. (Prepared by the author using Eveus 10).

	LNGDPPC	FMD	FDI	TD	OP
Mean	10.22102	0.524123	2.538500	54.88596	64.26105
Median	10.12328	0.565000	1.742000	57.50000	61.08000
Maximum	11.35129	0.780000	15.75100	100.0000	109.4500
Minimum	9.044994	0.150000	-3.176000	5.000000	23.12000
Std. Dev.	0.557911	0.152401	2.876339	31.82996	27.56385
Skewness	-0.013171	-0.512566	1.420566	-0.076004	0.215259
Kurtosis	2.507767	2.437417	6.172890	1.571734	1.922252
Jarque-Bera	1.154191	6.495127	86.16151	9.799485	6.397716
Probability	0.561527	0.038869	0.000000	0.007449	0.040809
Sum	1165.197	59.75000	289.3890	6257.000	7325.760
Sum Sq. Dev.	35.17296	2.624562	934.8858	114485.5	85853.52
Observations	114	114	114	114	114

The previous table shows the significance of the Jarque-Bera test for all variables, reflecting the non-normal distribution of the independent and control variables. This aligns with the values of kurtosis and skewness of the distributions of these variables (right and left). It is noted that the significance of the Jarque-Bera test for the dependent variable indicates its adherence to a normal distribution, with skewness close to zero and kurtosis close to 3.

For the sole independent variable in the study - financial market depth - Appendix (1) presents graphs illustrating the evolution of financial market depth in each country of the sample individually during the period 2001-2019. It is observed that in most countries of the sample, financial market depth did not consistently improve over time, but rather experienced several declines and decreases, especially in the period between 2009-2013 before rising again until 2015 and declining once more in most countries of the sample. The first decline between 2009-2013 could be attributed to the impact of the global financial crisis in 2008, from which the sample countries had not fully recovered by 2010 before experiencing disruptions in 2011, especially in Arab countries. As for the second decline in 2016-2017, it could be explained or linked to the decrease in oil prices during 2014-2015, particularly since the sample countries are major oil producers. Additionally, political differences between Gulf Cooperation Council countries in 2017 may have deterred some investors from financial markets due to uncertainty and increased instability.

As for the dependent variable - economic growth expressed as the natural logarithm of GDP per capita - its evolution over time during the period 2001-2019 is presented in appendix (2) for each country in the sample individually. Generally, it shows a stable trend towards growth and increase over time, more consistently than the previous variable during the study period. However, the impact of the global financial crisis in 2008 on the economic growth of all sample countries was evident, with a noticeable decline that continued until 2009 before rebounding and improving until the oil crisis of 2014-2015, which also had a clear impact on the economic growth of all sample countries. Nevertheless, it resumed improvement in 2016.

Firstly, the correlation between the independent and control variables needs to be studied in order to eliminate any strong correlations that may lead to false results later. The correlation between the variables is analyzed based on the correlation matrix values and the values of the variance inflation factors, with their results shown in the following two tables:

Table 3. Correlation matrix test results. (Prepared by the author using Eveus 10).

Td	**Op**	**Fdi**	**Fmd**	
0.287662	0.139690	0.165319	1	**Fmd**
0.176985-	0.134430	1		**Fdi**
0.449135	1			**Op**
1				**Td**

The results of the correlation matrix show a weak correlation between the study variables, with the highest correlation coefficient reaching 0.449135 between oil prices and technological development. As long as it is less than 0.5, it is considered acceptable and good.

Table 4. shows results of variance inflation. (Prepared by the author using Eveus 10).

R sequare	**VIF**
0.132866	1.153224
0.138314	1.160516
0.250562	1.334333
0.329806	1.492105

The results of the variance inflation factor indicate that the largest value is 1.492105, which is less than 2.5, therefore, the null hypothesis stating no linear correlation issue among variables is accepted. Both the correlation matrix and variance inflation results show a weak correlation among the model variables, thus allowing the transition to testing for individual correlation between sections.

Table 5. presents the results of the Pesaran CD test for individual correlation. (Prepared by the author using Eveus 10).

Probability	TheVale
0.1453	1.969433

According to the probability value of the Pesaran CD test, the null hypothesis of no individual stability in the residuals cannot be rejected at a significance level of 5%. It is now possible to move on to the study of the stability of the time series. Studying the stability of time series is very important to avoid obtaining false results later on.

Table 6. presents the results of unit root tests.

Stable in	ADF -Fisher Chi –sequare		Im, Pesaran & Shin W-stat		Levin, Lin & Chu			
	Intercept	Intercept & trend	Intercept	Intercept & trend	Intercept	Intercept & trend		
(1)	*20.4533	6.07976	**1.98992-	1.42294	***3.57243-	1.11187-	Level	Ln Gdppc
	***48.7209	***45.9551	***5.40370-	***5.18778-	***7.79620-	***7.95912-	1st diff	
(1)	17.2386	16.5735	*1.41082-	1.20681-	*2.45193-	**2.20347-	Level	Fmd
	***54.3442	***45.7350	***6.01620-	***5.07061-	***6.83775-	***4.96275-	1st diff	
(1)	17.2209	17.5484	*1.46175-	*1.43369-	1.06887-	-0.30502	Level	Fdi
	***60.4889	***43.6343	***6.63414-	***5.04674-	***6.90377-	***5.73797-	1st diff	
(1)	12.9831	2.98209	0.90889-	1.74222	1.16151-	0.28181-	Level	Op
	***46.9397	***34.4002	***5.22306-	***3.95586-	***7.90498-	***7.31489-	1st diff	
(1)	5.18537	9.46167	1.89706	1.20347	*1.47556-	2.34029	Level	Td
	***45.0051	***43.0520	***4.88804-	***5.00621-	***5.56872-	***6.42687-	1st diff	

*** , ** , *refer to the significance levels of 10%, 5%, 1% respectively.
The lag periods were selected based on the Schwarz information criterion Newey-West automatic bandwidth selection and Bartlett kerne
To determine the stability of the variable, the stability of the series was assessed at both levels, with a constant, trend, and structural break. When the test results differed, the outcome of two out of three tests was relied upon at a significance level of 5%.
The results in the previous table indicate that all variables are unstable at the level but cointegrated at the first-order. Therefore, the Johansson methodology for cointegration can be applied.

Cointegration tests for panel data:

Since the study variables are cointegrated of the same order, three cointegration tests can be conducted: Pedroni and Kaw tests based on the Engle-Granger approach, and the Fisher test based on the Johansson approach. To obtain the best results from cointegration tests, the option with a trend and structural break will be determined based on graphical representations of the study variables in Annex (3). The decision was made to suit the majority of variables, as the graphs showed that lngdppc, fdi, and fmd each contain a constant and trend. As for the lag lengths, they will be automatically determined using the Schwarz info criterion.

Table 7. Pedroni Test Results. (Prepared by the author using Eveus 10).

Pedroni Residual Cointegration Test
Series: LNGDPPC FMD FDI TD OP
Date: 09/04/22 Time: 19:25
Sample: 2001 2019
Included observations: 114
Cross-sections included: 6
Null Hypothesis: No cointegration
Trend assumption: Deterministic intercept and trend
Automatic lag length selection based on SIC with a max lag of 2
Newey-West automatic bandwidth selection and Bartlett kernel

Alternative hypothesis: common AR coefs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	1.199666	0.1151	1.367718	0.0857
Panel rho-Statistic	1.588806	0.9439	1.678382	0.9534
Panel PP-Statistic	-0.845228	0.1990	-0.554582	0.2896
Panel ADF-Statistic	-0.783041	0.2168	-0.584484	0.2794

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	2.574764	0.9950
Group PP-Statistic	-4.000752	0.0000
Group ADF-Statistic	-1.442266	0.0746

The Pedroni test results show no significant results for ten out of eleven tests, therefore the null hypothesis stating no common integration among variables cannot be rejected. The analysis will now move to the Fisher test.

Table 8. Fisher Test Results. (Prepared by the author using Eveus 10).

Johansen Fisher Panel Cointegration Test
Series: LNGDPPC FMD FDI TD OP
Date: 09/04/22 Time: 19:33
Sample: 2001 2019
Included observations: 114
Trend assumption: Linear deterministic trend
Lags interval (in first differences): 1 1

Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)

Hypothesized No. of CE(s)	Fisher Stat.* (from trace test)	Prob.	Fisher Stat.* (from max-eigen test)	Prob.
None	231.5	0.0000	151.6	0.0000
At most 1	120.9	0.0000	73.37	0.0000
At most 2	62.19	0.0000	37.73	0.0002
At most 3	37.53	0.0002	28.83	0.0042
At most 4	31.77	0.0015	31.77	0.0015

* Probabilities are computed using asymptotic Chi-square distribution.

The results of the Fisher test show significance at 1%, allowing the rejection of the null hypothesis and acceptance of the alternative hypothesis suggesting a common integrated relationship between the study variables. In case of conflicting results between the Pedroni and Fisher tests, the analysis will proceed to the KAW test, the third test, with its outcome being the decisive result.

Table 9. Results of the KAW Test. (Prepared by the author using Eveus 10).

Kao Residual Cointegration Test
Series: LNGDPPC FMD FDI TD OP
Date: 09/04/22 Time: 19:29
Sample: 2001 2019
Included observations: 114
Null Hypothesis: No cointegration
Trend assumption: No deterministic trend
Automatic lag length selection based on SIC with a max lag of 4
Newey-West automatic bandwidth selection and Bartlett kernel

	t-Statistic	Prob.
ADF	-4.428288	0.0000
Residual variance	0.005218	
HAC variance	0.006495	

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID)
Method: Least Squares
Date: 09/04/22 Time: 19:29
Sample (adjusted): 2004 2019
Included observations: 96 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID(-1)	-0.302301	0.054330	-5.564134	0.0000
D(RESID(-1))	0.309603	0.087653	3.532147	0.0006
D(RESID(-2))	0.301365	0.093826	3.211965	0.0018

R-squared	0.327278	Mean dependent var	0.001238
Adjusted R-squared	0.312811	S.D. dependent var	0.081395
S.E. of regression	0.067474	Akaike info criterion	-2.523410
Sum squared resid	0.423399	Schwarz criterion	-2.443274
Log likelihood	124.1237	Hannan-Quinn criter.	-2.491018
Durbin-Watson stat	2.090145		

Based on the results of the Kaw test, the null hypothesis stating no cointegration between variables can be rejected in favor of the alternative hypothesis, indicating a cointegration relationship among the study variables. Following the findings of two out of three tests, it can be suggested that there exists a long-term equilibrium relationship between the study variables, allowing for the estimation of long and short-term relationship parameters using the VECM model. Consequently, a long-term equilibrium relationship between the depth of the financial market and economic growth in the sample countries has been established, in line with previous studies (Alam & Hasan, 2003) and (Ali, 2020).

Table 10. Error Correction Model (VECM) Template. (Prepared by the author using Eveus 10).

Vector Error Correction Estimates
Date: 09/04/22 Time: 19:35
Sample (adjusted): 2004 2019
Included observations: 96 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
LNGDPPC(-1)	1.000000
FMD(-1)	1.278655 (3.73691) [0.34217]
FDI(-1)	0.615743 (0.21244) [2.89844]
TD(-1)	0.009315 (0.02419) [0.38506]
OP(-1)	0.154023 (0.02573) [5.98645]
C	-23.92357

Error Correction:	D(LNGDPPC)	D(FMD)	D(FDI)	D(TD)	D(OP)
CointEq1	-0.014523 (0.00339) [-4.28889]	-0.001427 (0.00179) [-0.79860]	-0.261734 (0.06578) [-3.97913]	0.201167 (0.12705) [1.58340]	-2.246591 (0.48526) [-4.62763]
D(LNGDPPC(-1))	0.277605 (0.21187) [1.31023]	0.131714 (0.11180) [1.17816]	1.195150 (4.11555) [0.29040]	-12.67946 (7.94918) [-1.59506]	-32.31167 (30.3618) [-1.06422]
D(LNGDPPC(-2))	-0.006512 (0.21564) [-0.03020]	0.011292 (0.11378) [0.09924]	-4.056946 (4.18874) [-0.96854]	11.35825 (8.09055) [1.40389]	-4.799786 (30.9018) [-0.15532]
D(FMD(-1))	0.306802 (0.22068) [1.39026]	-0.028107 (0.11644) [-0.24138]	-1.574791 (4.28659) [-0.36738]	-2.504179 (8.27955) [-0.30245]	8.680504 (31.6237) [0.27449]
D(FMD(-2))	-0.459709 (0.22082) [-2.08197]	0.058537 (0.11651) [0.50240]	-0.936407 (4.28923) [-0.21832]	-3.229595 (8.28464) [-0.38983]	-42.76187 (31.6431) [-1.35138]
D(FDI(-1))	0.010060 (0.00520) [1.93360]	0.001889 (0.00275) [0.68824]	-0.128082 (0.10106) [-1.26741]	-0.162529 (0.19519) [-0.83265]	1.075553 (0.74554) [1.44264]
D(FDI(-2))	0.005545 (0.00537) [1.03263]	0.001961 (0.00283) [0.69211]	0.001155 (0.10431) [0.01107]	0.142643 (0.20147) [0.70800]	0.739157 (0.76952) [0.96054]
D(TD(-1))	0.006694 (0.00296) [2.25854]	-0.000186 (0.00156) [-0.11916]	-0.018692 (0.06767) [-0.32467]	0.073005 (0.11120) [0.65652]	0.631675 (0.42473) [1.48725]
D(TD(-2))	-0.003287 (0.00314) [-1.04759]	0.001758 (0.00166) [1.06146]	0.018241 (0.06095) [0.29925]	-0.169912 (0.11773) [-1.43469]	-0.129922 (0.44968) [-0.28892]
D(OP(-1))	-0.000569 (0.00153) [-0.37305]	-0.000653 (0.00080) [-0.81175]	0.007446 (0.02963) [0.25131]	0.079556 (0.05722) [1.39023]	0.401380 (0.21857) [1.83639]
D(OP(-2))	0.000231 (0.00159) [0.14486]	0.000701 (0.00084) [0.83355]	0.046862 (0.03096) [1.51377]	-0.089846 (0.05979) [-1.50260]	-0.027262 (0.22838) [-0.11937]
C	0.007793 (0.02743) [0.28407]	-0.006974 (0.01446) [-0.48178]	0.020870 (0.53290) [0.03916]	5.561488 (1.02929) [5.40322]	0.459663 (3.93137) [0.11692]

The first section of the error correction model results shows the long-term relationship parameters that were identified through cointegration tests. Based on this, the long-term model can be written as follows:
GDPPC = -23.92357 + 1.278655* FMD + 0.615743* FDI + 0.009315* TD + 0.154023* OP + εit
It can be said that the depth of the financial market has a positive and significant impact on achieving economic growth in the sample countries in the long term, estimated at 1.27. This means that an increase in the financial market depth by one unit is expected to improve economic growth by 1.27 in the long term. This aligns with theoretical literature stating the positive impact financial markets have on enhancing economic growth by mobilizing and optimizing resources optimally, as well as fostering innovation and entrepreneurship.
Therefore, the second hypothesis stating the existence of an impact of financial market depth on economic growth in the sample countries in the long term is accepted, consistent with the findings of both (Alam & Hasan, 2003) and (Ali, 2020).

Table 11. Short-term parameter significance. (Prepared by the author using Eveus 10).

Dependent Variable: D(LNGDPPC)
Method: Panel Least Squares
Date: 09/04/22 Time: 19:42
Sample (adjusted): 2004 2019
Periods included: 16
Cross-sections included: 6
Total panel (balanced) observations: 96
D(LNGDPPC) = C(1)*(LNGDPPC(-1) + 1.27865535041*FMD(-1) + 0.615743011635*FDI(-1) + 0.00931527798411*TD(-1) + 0.154023116056*OP(-1) - 23.9235689473) + C(2)*D(LNGDPPC(-1)) + C(3)*D(LNGDPPC(-2)) + C(4)*D(FMD(-1)) + C(5)*D(FMD(-2)) + C(6) *D(FDI(-1)) + C(7)*D(FDI(-2)) + C(8)*D(TD(-1)) + C(9)*D(TD(-2)) + C(10)*D(OP(-1)) + C(11)*D(OP(-2)) + C(12)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.014523	0.003386	-4.288892	0.0000
C(2)	0.277605	0.211874	1.310234	0.1937
C(3)	-0.006512	0.215642	-0.030198	0.9760
C(4)	0.306802	0.220680	1.390257	0.1681
C(5)	-0.459709	0.220816	-2.081870	0.0404
C(6)	0.010060	0.005203	1.933598	0.0565
C(7)	0.005545	0.005370	1.032631	0.3047
C(8)	0.006694	0.002964	2.258540	0.0265
C(9)	-0.003287	0.003138	-1.047586	0.2978
C(10)	-0.000569	0.001525	-0.373054	0.7100
C(11)	0.000231	0.001594	0.144859	0.8852
C(12)	0.007793	0.027434	0.284072	0.7771

Root MSE	0.114754	R-squared	0.338629
Mean dependent var	0.034113	Adjusted R-squared	0.252021
S.D. dependent var	0.141847	S.E. of regression	0.122678
Akaike info criterion	-1.242045	Sum squared resid	1.264183
Schwarz criterion	-0.921501	Log likelihood	71.61816
Hannan-Quinn criter.	-1.112476	F-statistic	3.909900
Durbin-Watson stat	2.065857	Prob(F-statistic)	0.000140

It appears that the error correction coefficient is negative and significant at 1%, with a value of -0.014523, indicating the speed of adjustment from short to long term. This means that 14.5% of the error is corrected annually to return to equilibrium. There is a positive effect of market depth in the previous year on economic growth, but it is not significant. On the other hand, there is a negative and significant effect at 5% of market depth in the year before the previous year on economic growth, estimated at -0.459709. Therefore, there is evidence of the impact of financial market depth on economic growth in the short term in the sample countries. Additionally, there is a significant positive effect at 5% of technological development in the previous year on economic growth in the sample countries.

Table12. Granger Causality Test. (Prepared by the author using Eveus 10).

Pairwise Granger Causality Tests
Date: 09/04/22 Time: 20:40
Sample: 2001 2019
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
FMD does not Granger Cause LNGDPPC	102	2.36505	0.0993
LNGDPPC does not Granger Cause FMD		1.29094	0.2797

We find an inability to reject the null hypothesis stating that the depth of the financial market causes economic growth in the Granger concept, therefore it can be said that there is no causative relationship from the depth of the financial market to economic growth. Hence, the fourth hypothesis positing a causative relationship in the Granger sense from the depth of the financial market to economic growth in the sample countries is rejected. This is consistent with the study by Dahmani & Al Abid (2017) but contradicts theoretical literature stating that the depth of financial markets leads to economic growth.

Discussion of Results:

There is a long-term impact of financial market depth on long-term economic growth in the sample countries, and this impact is positive and significant. This aligns with Schumpeter's assumption that well-functioning financial intermediation, which effectively aggregates and allocates funds to investments with higher returns, encourages more entrepreneurship and innovation, crucial for enhancing and activating economic growth. This result is consistent with the leading supply theory, which suggests that the financial sector influences economic growth in developing countries, where the presence of financial institutions and financial intermediaries has a significant impact on enhancing economic growth. It also agrees with Levine (1997), who suggests that functioning financial markets facilitating trading and providing necessary liquidity have a positive effect on economic growth. Additionally, it aligns with the practical findings of Ali (2020) study in Bangladesh, which found a positive impact on economic growth, as well as with the results of Alam & Hasan (2003) study in America. In light of the focus on financial markets in the sample countries, efforts should be directed towards developing, deepening, and liberalizing them, as well as attracting more technology for its positive impact on economic growth.

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