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Research paper

The Role of Institutions in Finance-Growth Nexus: Empirical Evidence from Emerging Market Economies

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Abstract

The study examines the role of institutions in the finance-growth nexus in 22 emerging market economies (EMEs) for the period 1998-2022. The Generalized Method of Moments (GMM) System approach has been used for the estimation of panel data. A composite index of financial development comprising various indicators of financial depth and efficiency is constructed to measure financial development. Using the four-way classification of institutions, the empirical results show that the role of institutions in explaining the finance-growth nexus is significant. The empirical results reveal that financial development is indispensable to promoting economic growth, but too much finance is detrimental to growth. Moreover, institutions can play a vital role in intermediating the negative impact of too much financial development on growth. The outcomes are robust to the use of alternative indicators of institutional quality. Overall, the empirical findings suggest policy guidelines to boost the level of output by using financial development and institutions as economic tools.

Keywords: *Financial development; Institutions; Economic growth; Panel data; Emerging economies*

1. Introduction

The finance-growth nexus always remains a hotly debated topic among economists, social scientists, and politicians. The existing empirical evidence documents different sources of financial development and their impact on economic development. The role of institutional quality in stimulating financial sector development has recently received remarkable attention, but this role is still not well explored. In this backdrop, we attempt to empirically examine the finance-growth nexus by incorporating the role of institutions in emerging economies. Economic theory advocates that the better institutional quality significantly improves the contribution of the financial sector to output growth. Thus, the role of institutions is imperative in explaining the finance-growth relation in a comprehensive way.

Gurley and Shaw (1960) asserted that economic growth contributes to financial expansion, and on the other hand, financial expansion leads to enhancing economic growth. Goldsmith (1969) documented that output growth always supports financial market development. The theoretical viewpoint attributes this positive finance-growth linkage to the improved allocative efficiency of investment. The efficient allocation of resources to avail more profitable opportunities can only be possible through better financial intermediation. McKinnon (1973) and Shaw (1973) advocated that the less regulated financial setup might lead to an increase the savings and investment, which eventually spur real output. McKinnon (1973) and Shaw (1973) further refuted the policy of financial repression by using rigorous statistical data; this work has been named as McKinnon-Shaw hypothesis.

Although the proposition "more finance, more growth" is intact in the empirical research but the researchers have recently shifted their focus to the "better finance, more growth" proposition. This proposition implies that a financial system integrated in a better institutional structure is more effective in increasing income per capita in the long term (Law et al. 2013). It further follows that financial development may not necessarily enhance output growth; rather, it may route credit allocation to wasteful activities or unproductive investments owing to greater political interference or corruption in the banking system (Law et al. 2013). The proposition of "better finance, more growth" largely leverages on the role of institutional quality since the quality of regulations and the rule of law determine the quality of finance (Hall and Jones, 1999; Demetriades and Andrianova, 2004; Rodrik et al., 2004).

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Acemoglu and Robinson (2001) establish a major role of institutions on income per capita in European countries. According to these authors, the most important determinant of the income differentials among the nations is the difference in economic institutions. The secret of development in an economy lies in the reformation of economic institutions. Economic institution reforms are determined by the political institutional structure of a country. A sound political system leads to the formation of better political institutions, and henceforth, aids in the formation of growth-promoting economic institutions. The process of institutional restructuring is dependent on the political system of an economy. In the nations' way towards the institutional reforms lie many obstacles, which are based on their political bottlenecks. The countries having better political systems can form better institutions and achieve higher growth rates successfully. Therefore, the proper working of institutions increases economic development. Institutions can promote economic development through the protection of property rights, the efficacy of financial markets, and effective law enforcement. A rising level of expropriation and oppression discourages investment and reduces total output growth. Institutions enhance the level of a country's output through financial development (Fernández and Tamayo, 2015).

The empirical contributions on finance-growth linkages by incorporating the role of institutions remain extremely sparse in the case of emerging economies. This study contributes to the current research on the issue in four ways. Firstly, it examines the effect of financial development on output after incorporating the institutional quality in the emerging economies. Secondly, a system GMM approach is adopted to deal with the potential endogeneity bias. Thirdly, this study computes the marginal effect of financial expansion on growth conditional on institutions by utilizing Brambor et al. (2006) interaction approach. Fourthly, this paper uses a composite index of financial development and four-way classification of institutions (market-creating, market stabilizing, market regulating, and market legitimizing) as suggested by Rodrick (2005) and Law et al. (2018). Based on the aforementioned points, this endeavor may be considered a major contribution to the finance-growth literature.

2. Literature Review

Many studies argue that capital market development is essential to accelerate long-run output growth (Levine, 1997; Rajan and Zingales, 1998; Beck et al., 2000; Ghirmay, 2004; Ang, 2008; Fung, 2009; Akinlo and Egbetunde, 2011). Numerous research studies examine the behavior of stock markets and the complex implications for economic development (Meher et al., 2024; Hassan et al., 2023; Aman et al., 2024; Raza et al., 2025).

Acemoglu (2006) explored that the difference in per capita GDP between South Korea and North Korea is due to the difference in the institutional quality of both countries. South Korea has better institutions, which is why it has a higher per capita GDP than North Korea. Recently, studies have examined the finance-growth nexus by using non-linear and threshold techniques and reported various findings. For instance, using a semi-parametric estimation in a sample of more than 100 economies, Arcand et al. (2012) revealed that when banking sector development reaches the threshold of 100percent of real output, its impact on output turns out to be negative, which lends support to the "vanishing effect" of finance. Using pooled OLS on the sample of 50 developing and developed economies, Cecchetti and Kharroubi (2012) reported the inverse U-shaped link between finance and the level of a country's total output.

Using the two-regime threshold regression, Huang and Lin (2009) demonstrated a positive but non-linear effect of finance on total output in low-income economies. Ergungor (2008) applied the two-stage least squares on a panel of 46 advanced and developing economies and reported a non-linear connection between finance and real output. The author noted that countries with a firm judicial system grow rapidly in the presence of a bank-oriented financial system. In the dynamic heterogeneous panel setting of 52 middle-income economies, Samargandi et al. (2015) re-examined the finance-growth nexus. They reported that developed capital markets and economic growth follow an inverted U-shaped path in the long run, while the same relationship appears to be statistically insignificant in the short run, which suggests a hampering effect of too much finance on total productivity.

Recent studies examine the association between institutional structure and financial expansion in relation to factors such as the importance of equity markets, political forces, property rights, democracy characteristics, institutional improvement thresholds, democratic transformation, political stability, social capital, and governance. In a cross-country setting, Rajan and Zingales (2003) emphasized the role of the political elite in designing policies for better financial development. They indicate that in an elite-controlled political decision, potential access to finance may be denied, thereby obstructing financial expansion. Girma and Shortland (2008) examined the influence of regime change and democracy on financial development and reported that stable political conditions and the level of democracy have a considerable impact on the development of the banking sector. They further indicated that the capital market developed more quickly in fully democratic regimes, while the banking sector gains optimal benefits from increased democracy and stable regimes.

Demetriades and Law (2006) showed that when financial markets are integrated within a better institutional framework, the impact of the capital market on the economy is positively larger. They further noted that in the middle-income economies, the impact of capital markets on output appears to be more potent in the presence of better institutions. In contrast, in low-income economies, the growth-enhancing impact of the capital market seems to be fragile since, without a better institutional framework, more finance can be counterproductive. Chinn and Ito (2006) also found that with an improved and better institutional and legal framework, financial systems, on average, reap more optimal benefits from financial liberalization than those systems with a poorly developed legal framework. Similarly, Huang (2010), Roe and Siegel (2011), Flachaire et al. (2014), Hermes and Meesters (2015), and Law et al. (2018) noted a significant influence of institutional improvement on the expansion of financial structure in developed as well as developing economies. Berhane (2018) reported that financial markets and institutions are the main drivers of output growth in African countries. In this connection, our work aims at exploring the effect of financial development and institutions on the economic growth of emerging economies.

Aman et al. (2023) validate the role of institutions as a catalyst for the financial sector development in 21 emerging market economies. The two-stage least squares approach empirically proves that institutional quality and finance are mutually reinforcing. Bashir et al. (2023) extend their research to Sub-Saharan African countries and confirm that the banking sector development has a strong and positive impact on economic growth; however, market-based financial development negatively affects economic growth, especially in the emerging market economies with fragile institutional structures.

By employing a dynamic panel GMM estimation approach on data from 61 developing economies, Jungo (2024) confirms that weaker institutions significantly constrain public expenditure in developing and emerging market economies.

Agyemang et al. (2025) utilized a panel ARDL estimation to find that financial sector development and efficiency positively affect economic growth, particularly in the upper-middle-income African states. However, the benefits of financial development are vague to some extent in the lower-income countries. Girma & Huseynov (2025) examine the nexus between finance and output growth in Africa using a Panel ARDL model. The study revolves around 30 African countries. The findings propose that a one-size-fits-all approach is insuffi-

cient. So, policymakers should scrutinize different dimensions of financial development to understand its relationship with economic growth.

3. Empirical Methodology

3.1 The variables

This section describes the measures of financial development and institutional quality. The dependent variable, economic growth, is also mentioned along with control variables. The econometric model is based on an annual data set covering 22 emerging economies during 1998-2022. The list of emerging economies is illustrated in Appendix, Table A1.

- **Financial Development**

The financial sector provides a variety of financial services to its customers. As a result, it is very difficult to measure financial development by using a single indicator, as several institutions and agents play their roles in the financial intermediation process. Different proxies have been used in empirical literature to measure the level of financial development.
Following empirical literature, we have selected eight indicators to measure the development of financial markets. The first five indicators: 'Liquid Liabilities' (LLiab), 'Private Credit' (PrivC), 'Commercial-Central Bank Assets' (CCBassets), Stock Market Capitalization (StockMC), and Total Value Traded' (TVTraded) are used to measure financial depth. The first three indicators measure the size of financial intermediaries, while the last two indicators measure stock market activity. The next three indicators express the financial sector efficiency. The first one is 'Overhead Cost' (OCost), the second one is 'Net Interest Margin' (NetIM), and the last indicator is 'Turnover Ratio' (TORatio). The Global Financial Development Database (GFDD) is the data source of these indicators.
Following Ang and McKibbin (2007), the above-mentioned indicators are aggregated into three new measures of financial development by employing principal component analysis (PCA). The first measure constructed with the help of PCA is denoted as FDev, captures the overall level of financial development. This measure is based on a set of eight indicators, namely, LLiab, PrivC, CCBassets, OCost, NetIM, StockMC, TVTraded, and TORatio, and explains about 59 percent of the total variation in these eight indicators. The second measure defines the depth of financial intermediations, which is denoted as FDpth, and it is based on five indicators: LLiab, PrivC, CCBassets, StockMC, and TVTraded. The first principal component of these five measures accounts for 68 percent of the variation. The third measure, which is denoted as FDEfcy, captures the financial efficiency and is based on three indicators, OCost, NetIM, and TORatio. This measure explains 64percent of the total variation in these indicators. The Appendix table- A4 enlists the proportion explained and the eigenvector of each first principal component.

- **Institutional Quality**

According to Rodrik (2005) and Law et al. (2018), the institutions can be classified into four categories, namely, market-creating(MAR_{cr}), market-regulating(MAR_{reg}), market-stabilizing (MAR_{stab}), and market-legitimizing(MAR_{lig}). The institutions namely MAR_{cr} warrant contract enforcement, property rights protection, and preventing market failure, and is measured by the law-and-order index of the International Country Risk Guide (ICRG). The institutions namely MAR_{reg} are evaluated by using the aggregate index of credit market regulation, labor market, and business sector regulations by taking data from the Economic Freedom of the World Index by the Fraser Institute (FI). Market regulating institutions play their role in minimizing the risk of financial catastrophe, reducing macroeconomic uncertainty, and averting inflationary pressures. The Fraser Institute's sound money index is utilized as a measure of MAR_{stab} institutions. This type of institutions plays their part in providing social protection, handling redistribution, and managing social conflict. Following Rodrik (2005), democracy is measured by the Polity IV index is used as a proxy for MAR_{lig}institutions. The index values range from 0 to 10. The higher values indicate superior institutional quality and vice versa. A single index of institutional quality(INS) It is constructed by the summation of all these types of institutions. Hence, the range of the final institutional quality index is 0 to 40.

- **Economic Growth**

The log of annual GDP per capita at constant 2010 $US is used to measure economic growth($EGrowth$). This variable captures the overall well-being and living standards in a country. The data on economic growth comes from the World Development Indicators (WDI).

- **Control Variables**

The control variables are explained as follows:
The trade-to-GDP ratio($TRade$)is the sum of exports and imports as a ratio to GDP. It is used to measure the trade openness of an economy. This variable can also be an expression for the degree of economic integration of a country. Inflation(INf) is represented by the consumer price index (annual percentage change). It measures the change in the general price level within an economy. Investment (INv)is the ratio of investment to GDP. It is a major driver of economic growth and reflects the government's policies. Human Capital($HCap$) It is a crucial factor in the long-run economic growth. Human capital index, based on years of schooling and returns to education, is used in our empirical analysis. The data on trade and inflation are extracted from the WDI.
The data on $INv$and $HCap$ is taken from the Penn World Table. The preliminary statistics for all series are described in the Appendix, Tables A2 and A3. Correlation matrix results specify that $EGrowth$ and $FDev$are positively related, and a higher correlation is observed between $EGrowth$and $HCap$.

3.2 Econometric Model

Following Levine and Zervos (1996) and Law et al. (2018), a dynamic linear model is specified as follows:

$$EGrowth_{it} - EGrowth_{it-1} = (1-\beta)EGrowth_{it-1} + \lambda_1 FDev_{it} + \lambda_2 INS + \gamma z_{it} + \omega_i + \mu_{it} \quad (1)$$

Equation (1) may be rewritten as follows:

$$EGrowth_{it} = \beta EGrowth_{it-1} + \lambda_1 FDev_{it} + \lambda_2 INS + \gamma z_{it} + \omega_i + \mu_{it} \quad (2)$$

where $EGrowth_{it}$ is real economic growth, $FDev_{it}$measures the financial development, INS denotes institutions, $z_{it}$is the set of auxiliary variables (trade, investment, human capital, and inflation) that affect economic growth. The term ω_i is a time-invariant country-specific effect and μ_{it} represents an independently and identically distributed error term.
To study the non-linear link between $FDev_{it}$ and $EGrowth_{it}$, a squared term of financial development ($FDev_{it}^2$) is added in equation 3.

$$EGrowth_{it} = \beta EGrowth_{it-1} + \lambda_1 FDev_{it} + \lambda_2 FDev_{it}^2 + \lambda_3 INS + \gamma z_{it} + \omega_i + \mu_{it} \quad (3)$$

The positive and negative coefficients of $FDev_{it}$(linear) and $FDev_{it}^2$(non-linear) implies that the link between $FDev_{it}$ and $EGrowth_{it}$is inverse U, while negative and positive coefficients of linear and non-linear terms suggest that the association between $FDev_{it}$ and $EGrowth_{it}$ It is U-shaped.
In the following step, the interaction terms of financial development and institutions are included in Equation 3 to explain the intervening effect of INS in the finance-growth nexus.

$$EGrowth_{it} = \beta EGrowth_{it-1} + \lambda_1 FDev_{it} + \lambda_2 FDev_{it}^2 + \lambda_3 INS + \lambda_4 (FDev * INS)_{it}$$

$$+\lambda_5 (FDev^2 * INS)_{it} + \gamma z_{it} + \omega_i + \mu_{it} \quad (4)$$

Institutions are used as mediators that are supposed to increase the effect of $FDev_{it}$ on $EGrowth_{it}$. The negative and significant coefficient of $FDev$ while a positive and significant coefficient of the interaction term ($FDev * INS$) support the view that $FDev_{it}$can enhance $EGrowth_{it}$ only when institutional quality has increased to a certain minimum level. On the other hand, the positive and significant coefficient of $FDev$while a negative and significant coefficient of the interaction term ($FDev^2 * INS$)suggest that$FDev$ It can deteriorate the process of economic growth only when institutions play their maximum role. At the margin, the total effect of an increase in $FDev$ due to the INS can be estimated by taking the partial derivative of $EGrowth_{it}$concerning FDev:

$$\frac{\partial EGrowth_{it}}{\partial FDev_{it}} = \lambda_1 + 2\lambda_2 FDev_{it} + \lambda_4 INS_{it} + 2\lambda_5 FDev * INS_{it} \quad (5)$$

The marginal effect explains that the impact of a change in $FDev$on $EGrowth$depends on the value of $INS$and $FDev$itself. Brambor et al. (2006) suggested that the marginal effect of $FDev_{it}$on$EGrowth_{it}$can be evaluated by computing the standard error. Using the covariance matrix, the standard errors are estimated as:

$$\delta_{\frac{\partial y}{\partial x}} = S.E(\hat{\beta}_1) + 4FDev^2 S.E(\hat{\beta}_2) + INS^2 S.E(\hat{\beta}_4) + 4FDev^2 INS^2 S.E(\hat{\beta}_5) + 4FDev\, cov(\hat{\beta}_1\hat{\beta}_2)$$
$$+2INS\, cov(\hat{\beta}_1\hat{\beta}_4) + 4FDevINS\, cov(\hat{\beta}_2\hat{\beta}_4) + 4FDevINS\, cov(\hat{\beta}_1\hat{\beta}_5) + 8FDev^2 INS\, cov(\hat{\beta}_2\hat{\beta}_5)$$

$$+4FDevINS^2\, cov(\hat{\beta}_4\hat{\beta}_5) \quad (6)$$

3.3 Estimation Approach

In the empirical model, the presence of a lagged dependent variable as an explanatory variable indicates the presence of endogeneity bias. In this situation, the preferred estimation technique is system GMM developed by Blundell and Bond (1998). This technique combines regression in difference with regression in level. First difference controls the endogeneity problem. Level equation uses the first differences of lagged explanatory variables as instruments.
System GMM is then transformed into a one-step and two-step estimator. In empirical analysis, the two-step system GMM is found to be more efficient than the one-step system GMM because it utilizes an (Roodman, 2009). The application of system GMM estimators produces biased standard errors and a weekend overidentification test when applied to a panel of small cross-sections (Windmeijer, 2005). These issues result in an instrument proliferation problem (Roodman, 2009). To mitigate these problems, we limit the moment condition to at most two lags of the dependent variable. This aligns with the recommendations of Roodman (2009) and Vieira et al. (2012). A two-step system GMM estimator is used for estimation in this study.

4. Estimation Results

This study has used the composite indices of financial development and institutions along with control variables as explanatory variables. Three different regressions are computed for each of the three alternative indices of financial development, namely, FDev, FDDpth, and FDEfcy. The estimates reported in Table 1 explain that the lagged value of EGrowth is significant, which justifies the use of the dynamic panel estimator technique. The significant and positive estimates of financial development indices in all three regressions justify that the development of financial markets is essential to achieve long-term economic growth in emerging markets. Our results support the 'finance-led growth' hypothesis as documented by Shaw (1973), McKinnon (1973), Rajan and Zingales (1998), Beck and Levine (2004), Law et al. (2014), and Law et al. (2018). The hypothesis explains that financial expansion stimulates economic growth because developed financial markets encourage efficient allocation of financial resources and provide opportunities for international diversification. Hence, the funds are directed towards the most profitable ventures. In this way, the allocative efficiency triggered by a developed financial system leads to profitable investments and stimulates economic growth. The positive coefficient of institutions in all three models supports the findings of Hall and Jones (1999); Law et al. (2013), and Law et al. (2018). The coefficients of auxiliary variables (trade openness, inflation, investment, and human capital) are also shown in Table 1. The coefficients of trade openness, investment, and hu-

man capital are positive, while the coefficient of inflation is found to be negative in all three models. Moreover, the serial correlation test at order 2 cannot be rejected in all models because the p-value of the AR (2) tests shows insignificant results. Finally, the instruments are valid for all models as implied by the p-values of the Sargan test and the Hansen test. Thus, we conclude that estimated models are well specified.

Table 1: System GMM Regression Estimates

Dependent variable:$EGrowth_{it}$						
Variables	$Financial\ development_{it}$=$FDev$		$Financial\ development_{it}$=$\boldsymbol{FDDpth}$		$Financial\ development_{it}$=$\boldsymbol{FDEfcy}$	
	Coefficient	S.E	Coefficient	S.E	Coefficient	S.E
$EGrowth_{it}$ (lagged)	-0.593[a]	0.009	-0.562[a]	0.023	-0.582[a]	0.015
$Financial\ development_{it}$	0.012[a]	0.003	0.017[a]	0.004	0.061[a]	0.002
INS_{it}	0.004[b]	0.002	0.009[a]	0.003	0.006[a]	0.001
$TRade_{it}$	0.007	0.039	0.049	0.044	0.043	0.038
INf_{it}	-0.156[a]	0.004	-0.117	0.210	-0.012[a]	0.003
$\boldsymbol{INv_{it}}$	0.010[a]	0.0008	0.011[a]	0.0004	0.010[a]	0.006
$\boldsymbol{HCap_{it}}$	0.217[a]	0.077	0.269[b]	0.135	0.044	0.093
Constant	6.853[c]	3.615	6.315[c]	3.367	5.685[b]	2.960
Sargen Test	21.01 [0.18]		21.75[0.54]		24.16[0.44]	
Difference in the Hansen Test	15.93[0.46]		16.85[0.77]		14.44[0.417]	
$AR_{(1)}$	-2.32[0.02]		-1.96[0.05]		-2.19[0.029]	
$AR_{(2)}$	-1.27[0.21]		-0.42[0.68]		-1.28[0.16]	
Number of Countries	22		22		22	
Number of Observations	132		132		132	

).$AR_{(1)}$ and $AR_{(2)}$ are serial correlation tests at order 1 and 2. (2). a,b, and c denote reject H_o at 1percent, 5percent, and 10percent level respectively. (3). Time dummies are included in all regressions. (4). Values in brackets are P-values.

The outcomes of the non-linear association between $EGrowth_{it}$ and $Financialdevelopment_{it}$ as specified in equation 3 are illustrated in Table 2. The estimates report that the sign of $Financialdevelopment_{it}$ and $Financialdevelopment_{it}^2$ (linear and non-linear terms) Coefficients are positive and negative, respectively, in all estimated regressions. It indicates that the link between $Financialdevelopment_{it}$ and $EGrowth_{it}$is inverse U-shaped. It suggests that the beneficial effect of $Financialdevelopment_{it}$ deteriorate $EGrowth_{it}$ when a composite measure of financial development exceeds a certain point. This conclusion corroborates the findings of Law and Singh (2014), Samargandi et al. (2015), and Law et al. (2018). The turning points at which financial development starts to decline are 93 percent for $FDev$, 96 percent $FDEfcy$and 89 percent for $FDEfcy$. The findings of Arcand et al. (2012), Law and Singh (2014), and Law et al. (2018) are in support of our results. The results of diagnostic tests (Sargen test, Hansen test, and serial correlation test) are satisfactory.

Table 2: System GMM Regression Estimates

Dependent variable:$EGrowth_{it}$						
Variables	$Financial\ development_{it}$=$FDev$		$Financial\ development_{it}$=$\boldsymbol{FDDpth}$		$Financial\ development_{it}$=$\boldsymbol{FDEfcy}$	
	Coefficient	S.E	Coefficient	S.E	Coefficient	S.E
$EGrowth_{it}$ (lagged)	-0.549[a]	0.200	-0.538[a]	0.020	0.571[a]	0.020
$Financial\ development_{it}$	0.093[c]	0.048	0.077[a]	0.010	0.089[a]	0.010
$Financial\ development_{it}^2$	-0.0005[b]	0.0002	-0.0004[b]	0.0002	-0.0005[b]	0.0002
INS_{it}	0.004[b]	0.002	0.005[a]	0.002	0.004[b]	0.002
$TRade_{it}$	0.175	0.047	0.084[c]	0.050	0.025	0.042
INf_{it}	-0.010	0.006	-0.012[a]	0.003	-0.015[a]	0.004
$\boldsymbol{INv_{it}}$	0.273[a]	0.034	0.303[a]	0.020	0.303[a]	0.019
$\boldsymbol{HCap_{it}}$	0.244[b]	0.118	0.093[b]	0.042	0.087	0.111
Constant	4.686[a]	1.842	7.160[a]	2.083	6.433[b]	2.291
Sargen Test	22.25 [0.10]		22.94[0.85]		25.84[0.56]	
Difference in the Hansen Test	17.22[0.30]		16.69[0.54]		17.33[0.39]	
$AR_{(1)}$	-2.40[0.01]		-2.84[0.06]		-2.19[0.04]	
$AR_{(2)}$	-1.56[0.20]		-1.75[0.39]		-1.59[0.11]	
Number of Countries	22		22		22	
Number of Observations	132		132		132	

).$AR_{(1)}$ and $AR_{(2)}$ are serial correlation tests at order 1 and 2. (2). a,b, and c denote reject H_o at 1percent, 5percent, and 10percent level respectively. (3). Time dummies are included in all regressions. (4). Values in brackets are P-values.

Now, we proceed to describe the significance of institutions in intervening in the effect of financial development on income growth as described in Equation 4. For this purpose, two interaction terms $Financialdevelopment_{it} * INS_{it}$ and $Financialdevelopment_{it}^2 * INS_{it}$ are added in regression (see Table 3). Empirical findings demonstrate that the numerical outcome of $Financialdevelopment_{it} * INS_{it}$is positive, while the numerical outcome of $Financialdevelopment_{it}^2 * INS_{it}$is negative, and the effect of both interaction terms on $EGrowth_{it}$ is significant in all models. Thus, $Financialdevelopment_{it}$ and $EGrowth_{it}$have an inverse U-shaped relation, and institutions play an imperative role in intervening in the link between both variables. The positive and negative signs of interaction terms explain that a well-developed institutional structure enhances the efficiency of the financial markets, which positively contribute to output growth, and the unprecedented expansion of the financial sector has a vanishing effect on output. The outcomes support the findings of Law et al. (2013 & 2018), who found that financial development in the presence of quality institutions enhances economic growth more significantly than more finance in encouraging output growth. Further, the signs of control variables are according to theory and significantly related to economic growth. The results of diagnostic tests are well specified in all three models.

Table-3 also shows the results of the marginal effect of changes in $EGrowth_{it}$ due to change in $Financialdevelopment_{it}$by computing new standard error. The evidence explains that $Financialdevelopment_{it}$and $INS_{it}$are positively correlated at mean ($\bar{X}$) and minimum levels (X_{min}) but negatively correlated at a maximum level (X_{max}). In Column-1, the result demonstra ates that one percentage point increase in $Fin.ancialdevelopment_{it}$ benefits $EGrowth_{it}$ by 1.21 percentage point. However, the marginal effect has a deteriorating impact on$EGrowt.h_{it}$ at the maximum level. It validates that more developed financial markets discourage the process of output growth.

The findings further explain that financial depth has the maximum growth-enhancing effect at the mean level and the highest adverse effect at the maximum level. Our findings are in line with those of Law and Singh (2014) and Law et al. (2018). The authors concluded that well-developed financial markets stimulate economic growth up to a certain threshold level; after that level, the deteriorating effect of finance on growth starts to emerge.

Table 3: System GMM Regression Estimates

Dependent variable: $EGrowth_{it}$						
Variables	$Financial\ development_{it}$= $FDev$		$Financial\ development_{it}$= $\boldsymbol{FDDpth}$		$Financial\ development_{it}$= $\boldsymbol{FDEfcy}$	
	Coefficient	S.E	Coefficient	S.E	Coefficient	S.E
$EGrowth_{it}$ (lagged)	-0.502[a]	0.121	-0.489[a]	0.137	-0.497[a]	0.128
$Financial\ development_{it}$	0.169[a]	0.030	0.085[b]	0.043	0.095[a]	0.025
INS_{it}	0.006[a]	0.002	0.005[b]	0.002	0.005[b]	0.002
$Financial\ development_{it}^2$	-0.006[a]	0.001	-0.007[a]	0.002	-0.006[b]	0.003
$Financial\ development_{it} * INS_{it}$	0.004[a]	0.001	0.003[a]	0.001	0.005[a]	0.0007
$Financial\ development_{it}^2 * INS_{it}$	-0.0005[b]	0.0002	-0.0004[b]	0.0002	-0.0003	0.0005
$TRade_{it}$	0.159[a]	0.041	0.089[a]	0.030	0.062	0.075
INf_{it}	-0.012[a]	0.007	-0.012[c]	0.006	-0.014[b]	0.007
$\boldsymbol{INv_{it}}$	0.016[a]	0.001	0.017[a]	0.001	0.015[a]	0.001
$\boldsymbol{HCap_{it}}$	0.454[a]	0.141	0.454[b]	0.197	0.042	0.168
Constant	5.478[b]	2.163	6.108	3.876	6.341[b]	3.012
Sargen Test	25.47 [0.38]		21.76[0.25]		28.09[0.52]	
Difference in the Hansen Test	15.26[0.77]		19.06[0.82]		16.20[0.39]	
$AR_{(1)}$	-2.00[0.08]		-2.34[0.09]		-2.16[0.02]	
$AR_{(2)}$	-1.81[0.60]		-1.76[0.39]		-1.62[0.47]	
Number of Countries	22		22		22	
Number of Observations	132		132		132	
Marginal Effect						
$\bar{X}$	0.0130[b]		0.0124[b]		0.007[c]	
X_{min}	0.007[a]		0.008[b]		0.006[b]	
X_{max}	-0.031[b]		-0.028[b]		-0.024[b]	

Noes: (1).$AR_{(1)}$ and $AR_{(2)}$ are serial correlation tests at order 1 and 2. (2). a,b, and c denote reject H_o at 1percent, 5percent, and 10percent level respectively. (3). Time dummies are included in all regressions. (4). Values in brackets are P-values.

5. Robustness Checks

For robustness checks, we use the five sub-indices of ICRG: corruption, rule of law, government stability, bureaucratic quality, democracy, and accountability. The estimates shown in Table 4 are obtained from the estimates using new institutional quality indicators. These outcomes are quantitatively like our previous results. The linear and non-linear terms of financial development ($Financialdevelopment_{it}$, $Financialdevelopment_{it}^2$) and both the interaction terms ($Financialdevelopment_{it} * INS_{it}$, $Financialdevelopment_{it}^2 * INS_{it}$) have expected signs and are statistically significant. Therefore, empirical outcomes are robust to the alternative indicators of institutional quality. Further, the mean range of marginal effect is quite like our previous findings, varying from 10 to 13 percentage points.

Table 4: System GMM Regression Analysis

Dependent variable: $EGrowth_{it}$						
Variables	$Financial\ development_{it}$=$FDev$		$Financial\ development_{it}$=$\boldsymbol{FDDpth}$		$Financial\ development_{it}$=$\boldsymbol{FDEfcy}$	
	Coefficient	S.E	Coefficient	S.E	Coefficient	S.E
$EGrowth_{it}$ (lagged)	-0.443[a]	0.024	-0.467[a]	0.062	-0.485[a]	0.027
$Financial\ development_{it}$	0.207[a]	0.047	0.243[c]	0.125	0.081[b]	0.040
$Financial\ development_{it}^2$	-0.005[a]	0.0009	-0.004[b]	0.002	-0.012[a]	0.003
$Financial\ development_{it} * INS_{it}$	0.008[a]	0.002	0.008[b]	0.003	0.003[b]	0.001
$Financial\ development_{it}^2 * INS_{it}$	-0.0003[a]	0.0001	-0.0005[c]	0.0003	-0.0006	0.0004
$TRade_{it}$	0.071	0.074	-0.167[a]	0.064	0.018	0.073
INf_{it}	-0.013	0.011	-0.031[a]	0.008	-0.025[a]	0.006
$\boldsymbol{INv_{it}}$	0.009[a]	0.001	0.019[a]	0.004	0.015	0.001
$\boldsymbol{HCap_{it}}$	0.054[c]	0.029	0.692[c]	0.356	0.193	0.160
Constant	6.061[b]	3.052	9.642[a]	2.743	9.364[a]	2.936
Sargen Test	21.80 [0.19]		24.75[0.54]		25.16[0.44]	
Difference in the Hansen Test	17.59[0.12]		18.85[0.67]		19.10[0.52]	
$AR_{(1)}$	-2.32[0.02]		-2.96[0.05]		-2.19[0.03]	
$AR_{(2)}$	-1.29[0.96]		-1.55[0.83]		-1.77[0.48]	
Number of Countries	22		22		22	
Number of Observations	132		132		132	
Marginal Effect						
$\bar{X}$	0.0131[a]		0.0104[b]		0.011[b]	
X_{min}	0.014[a]		0.013[c]		0.017[b]	
X_{max}	-0.016[b]		-0.018[b]		-0.025[c]	

Ntes: (1).$AR_{(1)}$ and $AR_{(2)}$ are serial correlation tests at order 1 and 2. (2). a,b, and c denote reject H_o at 1percent, 5percent, and 10percent level respectively. (3). Time dummies are included in all regressions. (4). Values in brackets are P-values.

6. Conclusion

This paper examines the significance of institutions in explaining the finance-growth relation by using a dynamic panel data set covering 22 emerging economies for the period 1998-2022. In this study, a comprehensive index of financial development is used to cover the various dimensions of the financial market. The institutional quality is expressed by using four different types of institutions, including market creator, market stabilizer, market regulator, and market legitimizer. The system GMM results state that financial development and institutions significantly affect the real per capita income. Moreover, numerical estimates support the argument that financial expansion in the presence of quality institutions is more pervasive in expanding economic growth in emerging markets. The results of the marginal effect explain that advanced financial markets enhance the output level to a certain extent; after that, the adverse effect of financial advancement on the level of output starts to emerge. Similar outcomes are achieved by using different indicators of institutional quality.

The empirical findings suggest some important implications for future policy. Emerging economies need to strengthen the domestic financial system by developing a rational regulatory and supervisory framework. Appropriate macro-prudential policies may be used to boost resilience. Micro-prudential policy was traditionally recommended by many economists, but macro-prudential policy seems to be more appropriate, especially after the 2007-2008 global financial crisis. Macroprudential regulations are justified because they can mitigate systemic risk. The proper mechanism should be devised to strengthen and monitor the banks and other financial institutions. Establishing proper institutional infrastructure by rule of law enforcement, government effectiveness, and property rights protection may encourage strengthening the domestic market institutions and foster output growth. The financial sector development, along with sound institutional quality, will enable emerging market economies to achieve sustainable economic growth.

The study has some limitations, especially related to the data availability and its quality across emerging market economies, because many institutions are perception-based. Differences in economic structures among the EMEs also limit the generalizability of our findings beyond non-EMEs. Moreover, the challenges of reverse causality and endogeneity between finance, institutions, and economic growth cannot be completely resolved despite robust estimation techniques.

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Appendix

Table-A1: List of Countries

Argentina	Bangladesh	Brazil	Bulgaria	Chile	China
Colombia	Hungary	Indonesia	India	Venezuela	South Africa
Malaysia	Mexico	Pakistan	Peru	Philippines	Poland
Romania	Thailand	Turkey	Ukraine		

Table-A2: Descriptive Statistics (Countries 22, Observations = 132)

Variable	Source	Measurement unit	Mean	Std. Dev	Min.	Max.
$EGrowth$	WDI	US $ at 2010 prices	8.459	0.896	6.11	9.605
		Financial Development				
$\mathrm{LL}_{\mathrm{iab}}$	GFDD	percent of GDP	51.75	32.87	12.42	187.3
$P_{\mathrm{riv}}C$	GFDD	percent of GDP	44.03	32.18	3.70	137.1
$\mathrm{CCB}_{\mathrm{assets}}$	GFDD	percent of GDP	4.963	6.538	-2.58	45.88
$\mathrm{OC}_{\mathrm{ost}}$	GFDD	percent of GDP	4.021	3.120	0.96	29.62
$N_{\mathrm{et}}\mathrm{IM}$	GFDD	percent of GDP	4.979	2.625	1.04	18.32
$S_{\mathrm{tock}}\mathrm{MC}$	GFDD	percent of GDP	44.79	49.18	0.21	256.4
$\mathrm{TVT}_{\mathrm{raded}}$	GFDD	percent of GDP	18.79	25.40	-1.80	174.4

TOR_{atio}	GFDD	percent of GDP	53.68	68.63	0.49	439.6
		Institutions				
MAR_{stab}	FI	Scaled from 0 to 10	7.183	1.933	0	9.71
MAR_{reg}	FI	Scaled from 0 to 10	6.405	1.004	2.85	8.65
MAR_{cr}	ICRG	Scaled from 0 to 10	3.462	1.079	1.00	5.73
MAR_{lig}	Polity IV	Scaled from 0 to 10	6.894	2.839	0	10
		Control variables				
$TRade$	WDI	percent of GDP	67.14	40.14	17.13	212.7
INf	WDI	Percent	19.87	63.54	0.77	41.14
INv	WDI	percent of GDP	24.03	6.461	8.56	47.48
$HCap$	PWT	Index	2.509	0.453	1.46	3.37

Table-A3: Correlation Matrix

	$EGrowth$	$FDev$	$FDDpth$	$FDEfcy$	INS	$TRade$	INf	INv	$HCap$
$EGrowth$	1.000								
$FDev$	0.507	1.000							
$FDDpth$	0.592	0.955	1.000						
$FDEfcy$	0.650	0.792	0.579	1.000					
INS	0.672	0.866	0.174	0.132	1.000				
$TRade$	0.447	0.330	0.402	-0.102	0.219	1.000			
INf	-0.282	-0.281	-0.188	0.425	-0.312	-0.074	1.000		
INv	0.313	0.517	0.500	0.384	0.216	0.056	-0.150	1.000	
$HCap$	0.798	0.195	0.074	0.178	0.389	0.536	-0.043	0.143	1.000

Table-A4: The Indices for Financial Development

Measure	Proportion	LL_{iab}	$P_{riv}C$	CCB_{assets}	OC_{ost}	$N_{et}IM$	$S_{tock}MC$	TVT_{raded}	TOR_{atio}
$FDev$	55percent	0.458	0.462	-0.187	-0.317	-0.337	0.310	0.435	0.262
$FDDpth$	62percent	0.5211	0.548	-0.142			0.407	0.492	
$FDEfcy$	64percent				0.639	0.647			-0.419

Some Visual Aids

Fig. 1: Effect of Control variables

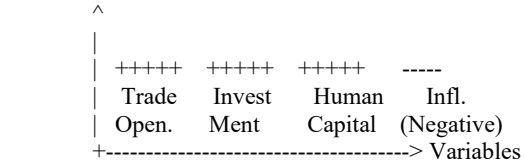
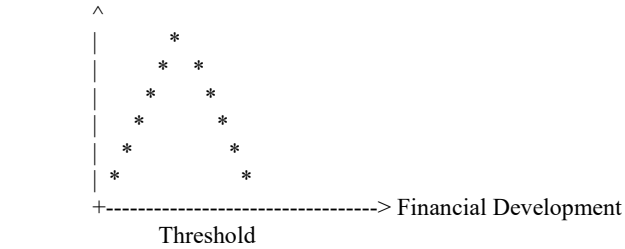
Fig. 2: An inverted U-shape relationship between financial development and economic growth.