

Research Article

Financial development and economic growth: An application of ARDL model on developed and developing countries

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ABSTRACT

Financial development and economic growth are vital for both developed and developing nations because it determines a country's economic growth rate and the complexity of its financial system. A sample of developed and developing economies from 2005-2019 was used in this study to observe whether there is an association between financial development and economic growth. The purpose of this study is to compare the association between financial development and economic growth in developed and developing countries. An ARDL model was used to analyze secondary data from the top 15 Developed countries (United States America, Japan, Germany, United Kingdom, France, Italy, Canada, Korea, Rep., Australia, Spain, Netherlands, Switzerland, Poland, Belgium, Austria) and top 15 Developing countries (China, India, Brazil, Russian Federation, Mexico, Indonesia, Thailand, Nigeria, Argentina, Philippines, Malaysia, South Africa, Colombia, Egypt, Arab Rep., Pakistan) based on GDP 2019 (Current US\$). Findings of the study shows some interesting insights for long and short run relationship among study indicators based on ARDL model. This research might help developed countries to enhance their financial structure and economic growth rate over time, while for developing countries suggests new policies initiatives.

Keywords: *Financial Development; Economic Growth; ARDL Model; Developed Countries; Developing Countries*

1. INTRODUCTION

Economic growth is a growing force in a nation's productivity of products and services over time. According to economic theory, the key determinants of growth are rises in the number of available inputs of production such as labor, capital, and land. With time, some economists have begun to include financial development as a factor in economic growth. Many coverages, in 20th century, has gotten by correlation of financial development and economic growth. Degree of impact, cause and effects of financial development on economic growth is also dispute over the way. Goldsmith (1969), McKinnon (1973), and Shaw (1973) pioneering contributions on the direct association between them have continued a hot subject of discussion in these economies. A mature financial system reduces operational and monitoring costs, increasing intermediation performance; it is considered a theoretical argument for these connections. However, the success of any

financial component's development is contingent on the existence of such factors. Firstly, foreign investors do not want or are unable to invest in those nations with underdeveloped infrastructure if there were no strong banks to impose repayments. Banks, on the other hand, are inadequate receivers and converters of knowledge when it comes to distributing investments and savings, according to Allen and Gale (2007). Second, market-based institutions with good risk-management capabilities do better when it comes to distributing investments and savings. It is possible to utilize a bank or a market-based growth strategy.

Financial mediation is the procedure of converting savings into investment. Financial intermediaries are beneficial because they offer knowledge generation, liquidity transformation, and diversification services. The existence of a diverse range of financial assets allows households and intermediaries to diversify their investments. The expansion of financial markets and intermediaries increases the availability of long-term capital needed to fund entrepreneurial, housing, infrastructure, and other development projects. The money market offers short-term finance that is insufficient to build infrastructure that would boost economic development. Consequently, the prominence of the money market could restrict economic growth in developing nations. The emphasis is changed to the markets during good times. Because of the symbiotic relationship between financial markets and financial intermediaries, the shift occurs (Cournède et al., 2015). To encourage future buyers, a strong capital market must be balanced with macroeconomic stability. As a result, financial development stimulates domestic as well as international capital spending.

A country's economy suffers because it lacks a mature domestic financial system, which facilitates capital flight (Bayoumi & Melander, 2008). Even if the empirical data helps the define the role of the financial advancement in the expansion of the economy, Levine (2002) settled the financial system debate when he found no evidence to support any financial intermediaries or markets. The market-based school of thought focuses on how to solve the bank-based financial system's issues. About the fact that banks have been shown to outperform marketplaces in the early stages of growth, this report would not aim to support one of the financial sector's two divisions. According to (Ibrahim & Alagidede, 2016), the availability and supply of funds, as measured by financial depth, is the most important requirement for growth. This is by the school of thought known as "financial services" Honohan and Beck (2007). Financial markets, according to Demirguc-Kunt et al. (2011), are more developed than banks as economies grow. The term "economic growth" was first used by mercantilists. They described the economic expansion as an improvement in the country's foreign currency (Appleyard et al., 2010). Physio rats added to the concept by stating that economic expansion is the consequence of increased production efficiency. As a result, economic expansion is distinct as a rise in the worth of a country's products and services produced (Aminu et al., 2008).

Many countries throughout the world require immediate financial and economic development. In both developed and developing nations, whether financial development occurs before or after the economic expansion is a difficult subject. Developed nations have more developed policies, as well as a more sophisticated financial system than

developing nations. The next point to consider is the techniques via which financial development has a favorable influence on increasing speed of economy. The aim to conduct this research is to investigate direct association between Financial Development and Economic growth. Impact of interest rates, inflation, exchange rate, trade openness, and domestic credit on Gross Domestic Product (GDP) growth rate are over basic objective to conduct this research for developed and developing countries.

The previous literature has examined the association between financial advancement and overall development extensively. However, some significant factors are missing from these empirical findings, the first is that while examine the direct association, they do not contain all of the aspects of fiscal development. The basic goal of this work is to fulfill a methodological gap in how many researches calculate their financial development indicators, which might lead to inconsistency in the results. The study's second contribution is its use of advanced panel econometric methods to found the influence and fundamental link between them, which allows for significant heterogeneity. In first part we include an overview of the study. In second part we include a relevant literature review of these factors. In third part we include research methodology in detail also the technique used for the econometric model. In fourth part, we demonstrate the analysis and results of the study. In fifth part we will discuss on conclusion, recommendations, findings, implications, and limitations of this study.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

A well-developed financial system is the need of every nation. A businessman can get enough finance to invest in the business in many countries. On the other hand, many countries cannot get enough money to continue their business because of the dearth of funding. In the absence of the classic banking industry, it prompts companies to help individuals in financing their investment. It involves high risks for the lender as well as borrower, firstly; a risk of delay because companies cannot take loans from individuals because they can't find firms to lend them money and also asking for peoples to seek out companies to borrow them money. Secondly, just because Lender and borrowers have not information about each other so there is a risk involve of high cost due to unstructured financial setup. Demirgüç-Kunt and Maksimovic (2002) recorded that there is a comparable link at the industry and business levels, finance-growth literature finds four different methods. First and foremost, finance is a source of Economic growth (Levine (2005). (Al-Yousif (2002); Masten et al. (2008) considered Economic growth as the result of investments, savings, and funds allocation to productive industries by which capital efficiency increases. Second, when the economy grows, so does the need for financial services, which benefits Financial Development (Panizza (2012). Third, the finance-growth nexus has unidirectional causation. Third, bi-directional correlation, according to studies of (Al-Yousif (2002), exist between them. Fourth, there is no positive direct correlation exists between them. Kargbo11 and Adamu (2009), to check weather direct correlation exist between them in Sierra Leone, study data for the year of 1970 to 2008 and conclude that in Sierra Leone financial development, according to their findings, has a direct positive impact on Economic growth and also support the finance-

led growth theory. They further conclude that the growth of the economic investment is the vital channel through which financial advancement leads to expansion in economy. Quartey and Prah (2008) in their study to support demand following hypothesis. Find some data. According to David and Halbert (2014), investigation it is stated that Financial integration, especially in countries where a high industrial efficiency exists, plays a significant conduit for financial development. Legal origin, according to (Ibrahim & Alagidede, 2017), describes a large portion of cross-country disparities in Sector Financial Development in S.SA.

For developing and developed countries, Mishra et al. (2015) conduct a study of 43 countries to conclude that as long as a state's level of Development is increase/above (decrease/below) its cross-sectional averages, economic growth is positively (negatively) affected by Financial development.

Swami (2017) research shows that Insignificant effects of INF, I, and population dependency, as well as the direct positive mediated result of trade openness, moderate the association between them. Economic growth operates differently whether it remains below or over a specific threshold limit, according to non-linear relationships. The study used panel data from 140 developed and developing economies from 1960 to 1998 and proposed 1-3% criteria for Pakistan and a 7-11 % threshold for developed countries. Munir and Mansur (2009) discover an unexpected association between INF and Economic growth for the Malaysia for the period of 1970-1975 and argue that their finding reveals that there is a significant correlation between inflation and Economic growth. For SAARC countries, Abbas and Sgro (2011) analyzed panel data to investigate and conclude a link between Foreign Direct investment (FDI), inflation (CPI), and Economic growth. FDI and GDP have a positive and significant association, but FDI and inflation have a strongly negative association. The study employs several regression models.

A positive and strong connection exists between Economic growth and INF below the threshold level of INF, according to many empirical studies. Fabayo and Ajilore (2006) used period annual data from 1970 to 2003 to evaluate the existence of a threshold effect in inflation increase in Nigeria. The research concluded that a level of inflation of 6% was a good starting point. Below the 6% inflation threshold, inflation and economic growth have a positive association. Following the financial crisis, the initial consequences in the Albanian economy were some variations in banking sector credibility, which was accompanied by deposit withdrawal, as well as some liquidity issues, which resulted in higher interest rates. The influence of the financial crisis increasingly expanded to the real economy in the fourth quarter of 2008, with GDP growth falling and monetary indicators firing back (Bank of Albania, 2009).

Deidda and Fattouh (2002) discovered evidence that the correlation between financial deepening, interest rate, and Economic growth is exclusively beneficial for developed states. High fixed resource costs associated with the supply of financial services stifle growth in less developed states. They stated that financial liberalization and Economic growth have a nonlinear association. By getting and utilizing time-period data on Malaysia from 1960 to 2001, Ang and McKibbin (2007) analyzed the finance and growth

correlation by examining savings, investments, trade, and real interest rates. They discovered that long-term productivity increase leads to financial depth. Using quarterly data from 1980 to 2002, Law et al. (2006) make their part to the argument on Malaysia's economy. Finance was discovered to have a critical part in economic growth promotion using a broad collection of measurements for Financial Development, including real interest rates and capital stock.

H_1 : Interest rate negatively affects the GDP growth rate of developed and developing countries.

Assumed the present period of increased globalization, fiscal deregulating, and financial crises, such inquiries are expected to continue Katusiime et al. (2016). Because of the growing relationship between people's economic well-being and a state's degree of worldwide attractiveness, exchange rate variations continue to worry national governments. In emerging states with weak financial structures and high sensitivity to external shocks, reducing exchange rate volatility is extremely crucial (Aghion, Bacchetta, et al., 2009). Several macroeconomic indicators, including employment growth rate, exports of goods, rate, inflation, productive investment, and overall Economic growth, are affected by exchange rate volatility Ibrahim and Alagidede (2016). While exchange-rate changes have apparent negative effects, their inferences for Economic growth are usually ignored. According to conventional economic theory, there is two primary effects of exchange-rate depreciation on economy. Positive supply shocks were found to be the primary source of exchange rate depreciation. Real exchange-rate instability is greater in emerging economies than in developed economies, due to variations in shock vulnerability. Devereux and Lane (2003) found that external fiscal obligations, such as external loans, might lower a nation's acquaintance to outside shocks and thereby lower real exchange-rate instability in developing nations. Devaluation's impacts on Economic growth have also been thoroughly researching.

H_2 : Exchange Rate positively affects the GDP growth rate of developed and developing countries.

Domestic currency devaluation is regarded has as an important factor of trade policy reform by orthodox stabilization programs. In comparison to non-tradable commodities, the deflation of local money helps in improving the price of traded items. Depending on the domestic economy's capabilities, drive reserve reordering and the manufacture of resident replacements for imported commodities (Damaraju et al., 2012). Deflations also serve to boost worldwide competitiveness by increasing the manufacturing of exported goods and services, as exports are less expensive than imports. Other studies have always had conflicting results. For example, Abdel-Haleim and El-Ramly (2008) discovered that negative impact of exchange rate variations on Economic growth continued for many years until an expansionary result occurred. Meanwhile, Obeng (2017) investigated Ghana by using an ARDL co-integration model to check the effects of exchange rate instability on untraditional exports. Exchange rate changes have a negative and bad effect on Ghana's nontraditional exports and also significant is for long period than the short period, according to this study. Similarly, Phiri (2018) used smooth transition regression

(STR) to test the usual supposition of a linear association between exchange-rate instability and Economic growth in South Africa and discovered a nonlinear relationship between the two.

H_3 : Inflation negatively affects the GDP growth rate of developed and developing countries.

Chandrashekar et al. (2018) and Fetahi-Vehapi et al. (2015) are two empirical pioneering studies in this framework. There is positive and significant correlation on India's economic growth, according to Chandrashekar et al. (2018) while study the outcome of trade openness on India's economy. Similarly, Fetahi-Vehapi et al. (2015) investigated the impact of trade openness on Southeast countries economy. They found that increase in trade liberalization has a strong positive impact on Economic growth. The literature on Economic growth has established the threshold of Financial Development and the level of foreign trade openness as two of the significant macroeconomic indicators that are strongly associated with growth performance across countries. Empirical data, as of (Honohan and Beck (2007); Baltagi et al. (2009) study, meaning that as the economy expands, Financial Development helps the poor countries in trying to catch up to the real economy and that finance is not just anti but also pro-poor.

H_4 : Trade openness positively affects the GDP growth rate of developed and developing countries.

Domestic credit (DC) refers to monetary incomes providing to the private sector (PS) by the financial division. Domestic credit (DC) also reflects a country's Financial Development (Bui, 2020), helps to effective investment distribution (Bencivenga and Smith (1991), and, most importantly, boost the economy (Botev et al., 2019). To put it another way, an economy of rapidly increasing domestic credit grows faster than others (Bayoumi & Melander, 2008). As a result, many scholars discovered a positive connotation between Domestic credit and Economic growth (Thierry et al., 2016); Cournède et al. (2015) say that it may also have bad influence on Economic growth. Botev et al. (2019) looked at the nonlinear influence of Domestic credit on Economic growth but were unable to find an acceptable threshold. As a result, it is vital to inspect the nonlinear association between Domestic credit and Economic growth. A depository institution, for example, may take benefit of the rule of big facts to get a relatively stable return by accumulating deposits from many people and make an investment in a huge, expanded variety of ventures. Well-functioning financial institutions will also assist in the elimination of agency issues by tracking borrowers and ensuring that they are using their loans for constructive reasons rather than for personal benefit or else cheating the ultimate moneylenders (Aghion, Blundell, et al., 2009). Quartey and Prah (2008) used 4 different indicators of Financial Development to look at a bivariate fundamental relation among Financial Development and Economic growth in Ghana: Broad Money to GDP ratio, DC to GDP ratio, PC to GDP ratio, and PC2DC ratio. When the expansion in the Domestic credit to GDP ratio, PC to GDP ratio, and PC2DC ratio are used as indicators for Financial Development, however, there is no sign to support either the supply-leading or demand-following hypotheses. However, the question of the way of connection between Financial

Development and Economic growth is becoming a hot topic in the finance–growth literature (Choong & Chan, 2011). So, a myriad of experiments has been undertaken to better explain this relationship (Choong & Chan, 2011). For example, Al-Yousif (2002) argues that the most present studies incline to exaggerate the connection between Financial Development and Economic growth, failing to understand that a connection between these two variables is merely a reflection of linear interaction rather than causality.

H_5 : Domestic credit positively affects the GDP growth rate of developed and developing countries.

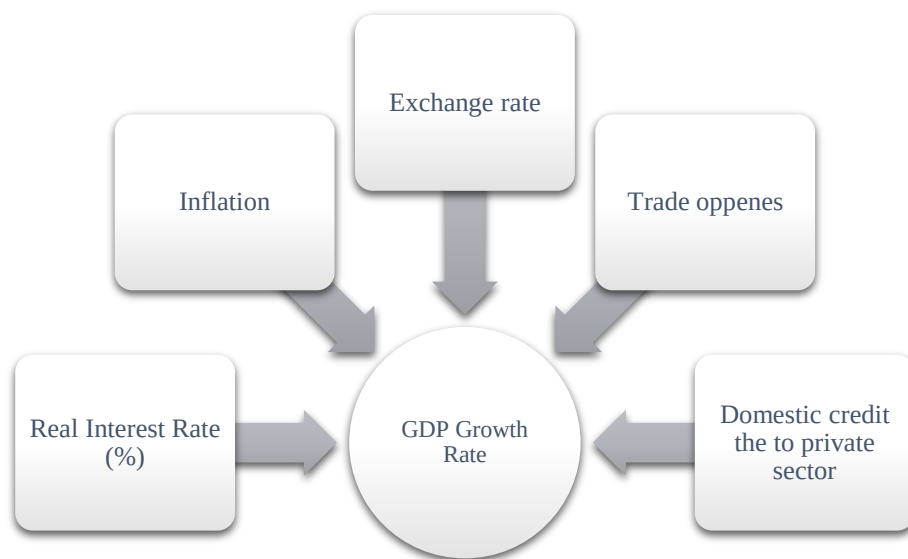


Fig. 1. Proposed Theoretical Framework

3. RESEARCH METHODOLOGY

The appropriate techniques and models to be utilized to technically expose the connection between financial and economic expansion were described in detail in this section. The sampling period is made up of annual observations from the 30 countries. The dataset used consists of panel data of 15 developed and 15 developing countries that were studied between 2005 and 2019. According to Eberhardt and Teal (2011), heterogeneity is a crucial consideration to remember when understanding the growth method. The selection of countries is determined by the accessibility of data on the chosen variables for financial development. To run the analysis, panel data was used, with a total of 450 observations from every 30 countries over 15 years. This study includes 30 Countries ($N = 30$) from the year 2005 to the year 2019 ($t = 15$), total observations will be 450 (30×15). World Bank's indicator WDI and GEM databases are used to collect secondary data. Descriptive tests, correlation tests, ARDL co-integration, Stability, and diagnostic tests were part of the research analysis design. This quantitative study is carried out with the help of the E-Views 10 software. GDP Growth rate, Inf, I, XR, Trade Openness, and DC2PS are the variables that have been selected to be used. The source of data and categories of used variables are enlisted in Table 1.

Table 1. Source of the Data and Nature of Variables

Type	Variables	Source of Data
Dependent Variable	GDP	WDI
Independent Variable	Inflation	WDI
	Real Interest Rate	WDI
	Exchange Rate	GEM
	Trade Openness	WDI
	Domestic credit to private Sector	WDI

The ARDL approach is suitable for dealing with endogeneity and serial correlation, two common econometric problems in financial results. Endogeneity and serial similarity can be corrected, according to Pesaran et al. (2001), if ARDL is used with enough lags. According to Yaoxing (2010), using enough lags in ARDL models assists to rectify the connection among residuals and tackles the endogenous regressors problem. This analysis allows for variation in-person real fixed effects across countries by using not stationary dynamic panel research approaches. Pesaran et al. (1999) created the EC version of the ARDL co-integration model, which has the following general formula:

$$\begin{aligned} \Delta GDP_{ti} = & \alpha_0 + \sum_{i=m}^n \Delta GDP_{t-i} + \sum_{i=m}^n b_i \Delta I_{t-i} + \sum_{i=m}^n c_i \Delta Inf_{t-i} + \sum_{i=m}^n d_i \Delta XR_{t-i} \\ & + \sum_{i=m}^n e_i \Delta T_{t-i} + \sum_{i=m}^n f_i \Delta DC2PS_{t-i} + \delta_1 GDP_{t-m} + \delta_2 I_{t-m} + \delta_3 Inf_{t-m} + \delta_4 XR_{t-m} + \\ & \delta_5 T_{t-m} + \delta_6 DC2PS_{t-m} + \varepsilon_{it} \end{aligned}$$

Where:

ΔGDP_{ti} the dependent variable

α_0 is the drift constant.

ΔGDP_{t-i} is a lagged dependent variable.

$\Delta I_{t-i}, \Delta Inf_{t-i}, \Delta XR_{t-i}, \Delta T_{t-i}, \Delta DC2PS_{t-i}$ are the independent variables.

b_i, c_i, d_i, e_i, f_i are short-term parameters.

$\delta_1, \delta_2, \delta_3, \delta_4, \delta_5, \delta_6$ are long-term parameters.

ε_{it} is a white noise error

4. DATA ANALYSIS

To determine the significance between variables, use Panel data and the ARDL model. This section includes descriptive statistics, correlation tests, co-integration techniques, stability, and diagnostic test.

Table 2. Summary of Descriptive Analysis

Constructs	GDP	INF	I	XR	TRADE	DC2PS
Mean	3.0538	4.2085	4.1781	562.8709	68.3720	89.1479
Median	2.7914	2.7062	3.3131	11.0176	57.7623	89.8285
Maximum	14.2308	53.5000	44.6351	14234.37	203.8546	206.6707
Minimum	-7.7999	-1.3528	-12.8569	0.4997	20.7225	8.1203
Std. Dev.	2.8995	4.9618	6.62385	2056.705	38.0325	53.1563
Observations	450	450	450	450	450	450

Table 2 displays the outcome of the descriptive test for GDP Growth rate, I, INF, XR, Trade, DC2PS for the year 2005-2019. GDP Growth has an average (median) of 3.053867 (2.791431) which represents that the average growth rate is about 3.05% for 30 developed and

developing nations. Inflation has an average (median) of 4.208529 (2.706236). In this study, the sample has maximum inflation is 53.50%. Interest has a maximum of 44.63517%, and a mean (median) of 4.178164 (3.313106). XR has an average (median) of 56.87 (11.01766). Trade (% of GDP) has a maximum of 203.8546% of GDP, and an average (median) of 68.372 (57.7623). DC2PS has a mean (median) of 89.14793 (89.82855).

Table 3. Correlation Test

Test Variables	GDP	INF	I	XR	TRADE	DC2PS
GDP	1.0000					
INF	0.0846	1.0000				
I	-0.1077	-0.0294	1.0000			
XR	0.1329	0.0444	0.0393	1.0000		
TRADE	-0.0473	-0.3289	-0.1632	-0.1383	1.0000	
DC2PS	-0.2445	-0.5271	-0.1383	-0.2162	0.1918	1.0000

To check the correlation between variables and indicators, a correlation test had to be run. Table 3 shows that GDP has a weak negative connection with Interest and DC2PS. However, GDP has a strong positive impact on INF and the XR. Furthermore, there are no association between GDP and Trade. Furthermore, Table 3 shows that Inf has a positive connection with XR but a negative relationship with other variables. Interest has a negative connection with Trade and DC2PS but a positive connotation with the XR. The XR has a negative connection with Trade and DC2PS. While Trade has a strong positive connection with DC2PS. Below mention table presenting the unit root analysis for stationarity of the variables.

Table 4. ADF-Fisher and PP Unit Root Test

Test Variables	ADF-Fisher χ^2 at Level I(0)		ADF-Fisher χ^2 at 1 st Difference I(1)		Decision
	t-Statistics	Prob.	t-Statistics	Prob.	
GDP	145.158	0.0000	273.573	0.0000	I(0)
I	102.970	0.0005	189.293	0.0000	I(0)
Inf	125.099	0.0000	237.853	0.0000	I(0)
XR	36.4845	0.9879	147.455	0.0000	I(1)
Trade	66.3311	0.2679	168.881	0.0000	I(1)
DC2PS	73.7850	0.1088	127.558	0.0000	I(1)

Phillip-Perron Fisher Unit Root Test

Test Variables	PP-Fisher χ^2 at Level I(0)		ADF-Fisher χ^2 at 1 st Difference I(1)		Decision
	t-Statistics	Prob.	t-Statistics	Prob.	
GDP	207.812	0.0000	536.390	0.0000	I(0)
I	166.433	0.0000	420.684	0.0000	I(0)
Inf	153.727	0.0000	499.007	0.0000	I(0)
XR	28.3320	0.9996	155.654	0.0000	I(1)
Trade	92.4410	0.0045	397.246	0.0000	I(0)
DC2PS	86.4147	0.0144	220.118	0.0000	I(0)

ADF unit root test outcomes are shown in Table 4. This report's levels I (0) and the 1st difference I (1) reject the null hypothesis that GDP growth rate, I, INF, XR, Trade, and DC2PS non-stationary. These results indicate that; GDP, I, and Inf are stationary at levels on 5% level, and on the other hand, XR, Trade, DC2PS is not stationary at levels, on 5% level is insignificant. Alternatively, all variables at 1st difference have no unit root, at the level of

5%; this permits us to accept the null hypothesis. PP-Fisher unit root tests are used to support the result of ADF. The variables in the model are a mixture of Levels I (0) and 1st difference I (1), according to these two-panel tests.

Table 5. Optimal Lag Selection

Lag	Log L	LR.	FPE	AIC	SC	H.Q
0	-12470.23	NA	7.99e+16	55.94721	56.00237	55.96895
1	-10633.94	3614.938	2.49e+13*	47.87416*	48.26029*	48.02640*
2	-10600.20	65.50891*	2.52e+13	47.88430	48.60140	48.16704
3	-10585.87	27.43715	2.78e+13	47.98148	49.02955	48.39471
4	-10569.57	30.76750	3.03e+13	48.06984	49.44887	48.61356

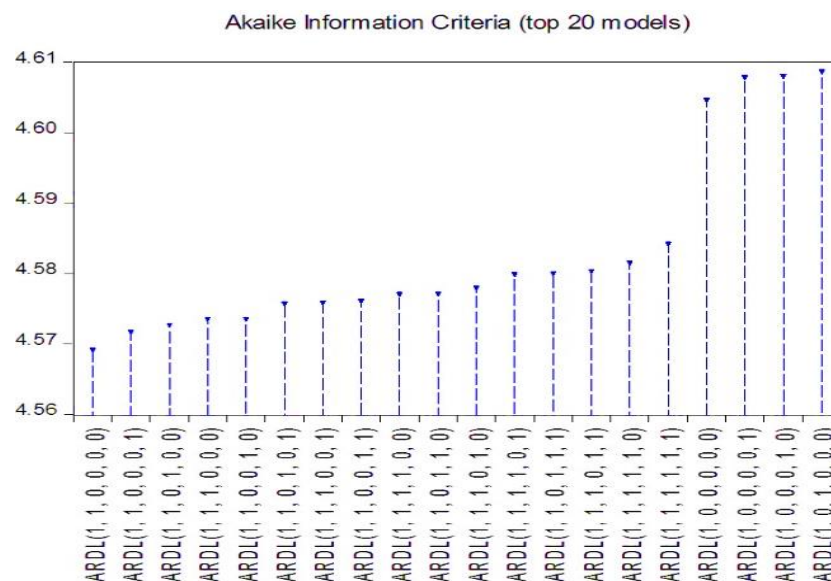


Fig. 2. ARDL Model

The co-integration outcomes are presented in this part to highlight the long-run association between the variables. To run the ARDL model, the suitable lag duration must be determined to calculate the cointegration and sacrifice the lowest degrees of freedom. To get the complete types of the variables, an adequate number of delays must be chosen. The optimal lag length for the SC and HQ criterion is shown in Table 5. The number of lags with the shortest value under its criterion is used to identify the optimal lag length. Different optimal lags criteria show in the result of Table 5. The optimal lag for SC and HQ is lying at 1. Though, the SC is strong in selecting the length. Henceforth, this model ARDL was be constructed on 1 lag. ARDL (1, 1, 1, 1, 1) is best model.

Table 6. Bounds Test for Co-integration

Test	Computed Value	Critical Value at 0.01 (1%)		Critical Value at 0.025 (2.5%)		Critical Value at 0.05 (5%)		Conclusion
		I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	
F-Statistic	19.52653	3.06	4.15	2.7	3.73	2.39	3.38	Long run relationship exist

Following the specification of the appropriate ARDL model, the F-statistic of boundaries co-integration test should be used to determine whether the used variables have a long-run relationship. Table 6 shows the outcomes of this test. Which shows that the

accounted F-statistic (19.52653) is larger than the critical values of lower and upper bounds at different significant levels (1%), (2.5%), and (5%). As a result, the bounds co-integration test rejects the null hypothesis that the used variables have no long-run relationship ($H_0: \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0$) and accepts the alternative hypothesis ($: \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq 0$).

Table 7. Long-run Estimation

Dept. Variable: GDP, ARDL Model (1, 1, 1, 1, 1), Observation: 449			
Variable	Coefficient	t-Statistic	Prob.
GDP(-1)	-0.472783	-11.62185	0.0000
I(-1)	-0.025768	-1.381486	0.0478
INF(-1)	-0.049513	-1.581298	0.0145
TRADE(-1)	-0.001791	-0.546200	0.5852
XR(-1)	0.000114	0.936817	0.3494
DC2PS(-1)	-0.009015	-3.263693	0.0012
C	2.648140	5.088323	0.0000

After verifying the existence of the long-run relationship between the used time series, by using the optimal lag model (1,1,1,1,1,) Table 7 shows the result of the long-run relationship. Table 7 shows that the impact of Interest (I), Inflation (INF), and Domestic Credit (DC2PS) on GDP growth rate is significant but has the expected inverse sign. Trade openness (Trade) has an unexpected insignificant and negative relation with the GDP growth rate. Exchange rate (XR) indicators are positive and highly insignificant at a 5% level. This shows that there is an impact of the long-run period on economic growth.

Table 8. Short-run Estimation

Dept. Variable: GDP, ARDL Model (1, 1, 1, 1, 1), Observation: 449			
Variable	Coefficient	t-Statistic	Prob.
D(I)	-0.143689	-5.461370	0.0000
D(INF)	-0.061234	-1.904067	0.0476
D(TRADE)	0.000472	0.050390	0.9598
D(XR)	0.000125	0.896297	0.3706
D(DC2PS)	-0.015520	-2.156985	0.0316
CointEq(-1)*	-0.472783	-11.77125	0.0000
R-squared	0.301701	Mean dependent var	-0.005622
Adjusted R-squared	0.293820	S.D. dependent var	2.792998
S.E. of regression	2.347083	Akaike info criterion	4.557496
Sum squared resid	2440.397	Schwarz criterion	4.612378
Log-likelihood	-1017.158	Hannan-Quinn criter.	4.579129
Durbin-Watson stat	2.154375		

The outcomes of the Error Correction Model illustrated to the chosen ARDL (1,1,1,1,1) model was described in Table 8. Results indicate that Interest (I), Inflation (INF), and Domestic Credit (DC2PS) have a negative and significant influence on GDP growth rates in Long-term as well as short-term periods. Trade and Exchange Rate (XR) both have a positive but insignificant influence on GDP growth rate in short-term periods.

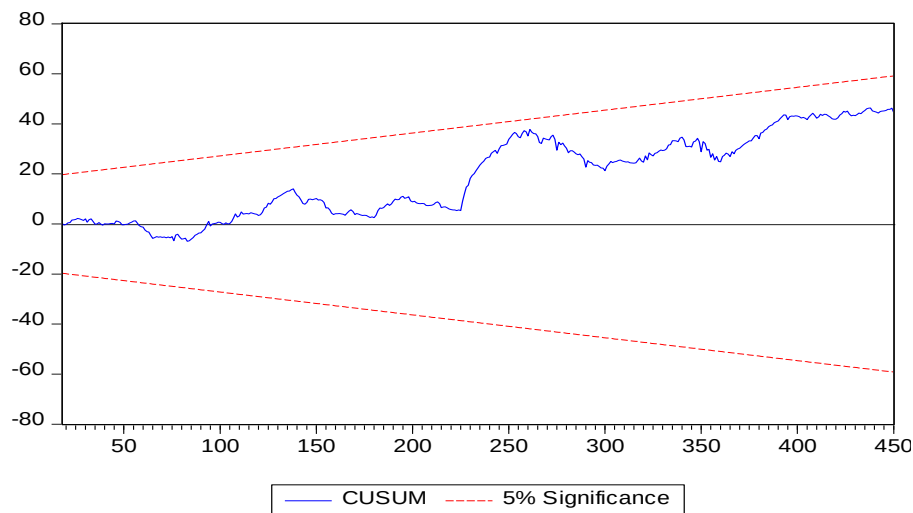


Fig. 3. The plot of Cumulative Sum (CUSUM)

Cumulative Sum (CUSUM) stability tests recommended by Brown, Durbin, and Evans (1975) have been accomplished to inspect whether the predictable short-term and long-term models based on estimations of ARDL models are stable. Fig. 3 plot (CUSUM) stability tests for ARDL models. Fig. 1 display that all the plot data are inside the 5% critical values and no one direct lines are crossed by (CUSUM). The null hypothesis of (CUSUM) stability tests suggested that model are stable, for the ARDL model and cannot be rejected. This states that all coefficients are stable.

Table 9. Diagnostic Tests

Test	Results
LM Serial Correlation	10.5128 (0.0013)
Ramsey RESET	1.3237(0.2602)

Note: Figures between (.) reports ρ - value

The model was subjected to two diagnostic tests. Firstly, the null hypothesis of no serial correlation is compared to the alternative hypothesis of serial correlation using an LM test. Second, Ramsey (1969) developed a Ramsey RESET Test to detect improper functional form by assessing the model's null hypothesis as correctly described using ($H_0 : \delta_1 = 0, \delta_2 = 0$). Table 9 reveals that the results of the first test, the LM test do not reject the null hypothesis of no serial correlation among residuals. This shows all models have no serial correlation. Second, In Ramsey RESET since the estimated probability is (0.2602) is greater than 0.05, we conclude that the model is well stated.

5. DISCUSSION, CONCLUSION AND IMPLICATION

The aim to conduct this research is to investigate direct association between fin Financial Development and Economic growth. The implications of the research problem will be discussed in this chapter. This chapter includes a list of statistical analyses and a discussion of the key findings, study's implications, limitations, future recommendations, and conclusion would be made to bring this study to an end. Financial development has major contribute significantly to economic growth, but this is not the final result and is relay on the development of adequate governance frameworks. Predictable indicators of

financial depth are described as a shift from banks to capital markets in the case of private assets and financial development and are not continuously correlated with greater rates of economic growth. Financial liberalization leads to more productive and flexible financial intermediation, but it does not appear to enhance overall savings or investment rates. In terms of capital availability and corporate responsibility, short-term foreign capital flows may eclipse the efficiency obtained through the old approach of financial liberalization. The production is transferred to labor, capital, and land inputs, according to Adam Smith, the classical economist. Output growth was aided by increases in population, investment, and land, as well as advancements in overall productivity. It was endogenous since the rate of savings determined investment. Generally, the scale of the banking industry and its level of financial growth had the greatest influence on economic development for the research in terms of financial growth opportunities. Collectively, entire elements were utilized to analyze the financial position of any country's economy and can be associated with future development and expansion, according to the analysis of numerous indicators of financial development. To round out the research, an observation about the financial framework indicated that as a country's financial development rises, so does the availability of financial services.

Finally, it was discovered that this is a common consequence of endogenous growth models with financial intermediation.

5.1. THE IMPLICATIONS OF THE STUDY

In this section we will discuss some implications of the study. The study's empirical results have significant policy implications for both developed and developing economies. While the results show some proof of development towards greater financial integration, further actions must be made to get this international integration to a maturity level that will yield the most economic benefit. This argues that developed and developing economies should work together to improve financial integration and cooperation since this would lead to improved growth chances and risk management. Furthermore, to achieve a deeper financial segment, it is essential to concentration more on the worth and nature of financing rather than growing the financial sector. Furthermore, developed and developing economies must strengthen the globalization of their banking sectors in an international context. When a country liberalizes its financial sector and makes it more market-oriented, one of the possible benefits might be a faster rate of technological advancement. However, if the country does not have a robust R&D sector, as most developing countries do, this advantage may not be completely realized. Policymakers should focus on long-term strategies to strengthen the financial division in low-income economies. It further stated that the bad impact of domestic lending on the private sector in limited nations makes policies to decrease non-performing resources and support credit securities much more urgent. Moreover, policymakers need to work on growth strategies that help in the growth of private institutions. Another major policy conclusion of his work is that policymakers should place a greater priority on growth-related actions or financial policy, as the short-run connection is found to be demand following.

5.2. LIMITATION OF THE STUDY

Although we believe this research contains a lot of information, it does have certain limits, which are listed. However, there are numerous limitations to this research. For example, all financial sectors or indicators were not considered in this study, which leaves an amount of opportunity for future research on this topic. The data on financial development indicators is another limitation of the study. To get a clear view of amount of financial advancement in these nations, several variables must be evaluated. These variables should indicate the complexity and effectiveness of the financial sector, such as parameters about financial accessibility, economic sustainability (stock market performance), and financial system performance, to name a few. The analysis was limited by the difficulty to gather data of required indicator as well as for required years that covered all features of the level of financial growth in these nations. As a result, the study showed in this word limited the range of financial development variables to the most openly used indicators that have been examined in the earlier works, depending on data accessibility. Finding complete and comprehensive financial market information is not always possible. Data are all connected to the World Bank Development Indicators Series and World Bank Global Economic Monitor Series, as a result, data cannot always be checked or confirmed by a third party that is not affiliated with the World Bank. Many alternative models can still be utilized to find the most significant results, however, not all can experiment due to time limits. Other factors may have been included in the study, however, due to time restrictions and a lack of data, it was impossible to extract them.

5.3. RECOMMENDATIONS FOR FUTURE RESEARCH

This study provided new evidence for the association between financial deepening and overall growth, considered as fundamental information, models, and research. Though, because of various limitations in the present work, more research in this area is required. This research examined statistics from the world's top 15 developed and developing countries from 2005 to 2019. Moreover, we urge that more research be done that takes into account other features of the financial system, for example, the bond market, as well as other financial development indicators. With the study's limitations, we believe creativity added to the study of finance and growth in developing and developed countries. This kind of research play an important role for the growth of economy in these countries. To measure the financial sector's inclusiveness, data on microfinance institutions and other institutions that provide financial services to the financially excluded must be included in the dataset. Microfinance institutions are a significant part of the financial segment in developing nations, as they provide facilities to a huge segment of the population those are not financially stable.

5.4. CONCLUSION

The research concludes that financial development has an influence on economic growth based on the level of state's financial structure development as well as its level of income. The ARDL estimates demonstrate there is a long-time period association between

financial development and economic growth in these nations, on the other hand, the results demonstrate that expansion of the economy effected by more financial development. The model utilized in this research tries to come up with a complete approach for analyzing financial development. Each of the elements used to measure financial development result on economic growth differently. In this study to inspect temporary association or prolonged association between them an ARDL model will be used. ARDL model indicate that economic growth prolonged influenced by I, Inf, and DC2PC. On the other hand, Trade and XR have no prolonged correlation with economic growth. In case of short term association, the results shows that Inf, I and DC2PC have a direct associate with economic growth and other indicators such as Trade and XR have positive but insignificant effects on economic growth.

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