Journal of International Trade, Logistics and Law, Vol. 5, Num. 2, 2019, 41-58

THE DYNAMIC RELATIONSHIP BETWEEN FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH: EMPIRICAL EVIDENCE FROM ETHIOPIA

Ejigayehu BIRRU,
Jimma University, Ethiopia

Yilkal WASSIE,
Jimma University, Ethiopia

Tekilu TADESSE
Jimma University, Ethiopia

Received: Nov 02, 2019 Accepted: Dec 05, 2019 Published: Dec 30, 2019

Abstract:
There are different evidences in the literature regarding the relationship between financial development and economic growth. Some studies have found bidirectional causality, others a unidirectional relationship while some found no causality between the two variables. The aim of this study was to see the direction of causality and to investigate the existence of a long run relationship between financial development and economic growth in Ethiopia. We use two variables namely private sector credit as percentage of GDP and broad money supply as percentage of GDP to indicate financial development and employ Auto Regressive Distributive lag Model(ARDL) to Bounds Testing to examine the long and short-run impact of financial development on Economic growth and Granger Causality Tests has conducted by using Vector error correction Model . The Bound test results suggest that long-run relationships exist between economic growth and both financial development indicators as well as other explanatory variables. Moreover, our findings support both supply leading and demand following hypotheses. The direction of the short-run and long-run causal relationship between economic growth and financial development depends on which financial development indicator is used. Particularly, improvements in financial development indicators related to the resource allocation function of the financial system lead to economic growth whereas economic growth causes financial development through increasing banks' assets in the long run.

Keywords:
Financial Development, Economic Growth, ARDL Bounds Test, Cointegration, Granger Causality

1. Background of the Study
There are different issues which economist has debated on the role of financial development in economic growth. The first version of endogenous growth theory (AK) which did not make an explicit distinction between capital accumulation and technological progress produced by Frankel (1962) - model find three ways through which the financial development sector can affect productivity and economic growth. First it increase the productivity of investments second decrease transaction costs and widens the share of the savings channeled to productive investments lastly, it affect saving rates (kiovu.2002).
Financial development exerts higher influence on economic growth, poverty reduction and economic stability (Levien, 2005), (Shabri, 2008). In the study of Ndebbo (2004) financial development has a positive impact on economic growth. Since the pioneering work of Schumpeter (1911), a lot of both theoretical and empirical literature has been developed arguing importance of finance on economic growth. The findings of the study showed that financial sector contribute to economic wellbeing by identifying and redirecting funds towards innovative projects Smith (1776) include financial system lower cost of transaction smooth trade, specialization of major resource to technological innovation.

Financial development contributes to economic growth by stimulating investment in the country through the level and efficiency effects. The efficiency effect argues that the reforms and regulations in the financial sector ensure transparency and regular reporting systems within the sector; this ensures investors' confidence thus, attracts both domestic and foreign investors. In addition, the efficiency effect argues that financial sector allocates financial resources to the most profitable projects. There is positive correlation between financial development and economic growth in efficiency effects arguments. A financial developed sector improves the efficiency and effectiveness of financial institutions and also promotes financial innovations within the sector. This promotes economic development. The financial sector is said to develop when: financial inclusion increases, the sector`s stability increases, the amount of money that is intermediated by the financial institutions within the country increases, the number of financial institutions increase, the number of services or products offered increase and improve, the sector becomes more competitive and more efficient (DFID, 2004). This means there is no single measure that can include all dimensions of financial development. One way which can enable a country to achieve high economic growth is by building a capacity to mobilize financial resources and by ensuring their efficient allocation to the projects with highest returns.

The financial sector does this role by mobilizing savings and allocating these resources to the most productive projects. Other roles of the financial sector that promote economic growth include risk management, obtaining information on investment opportunities, facilitating the exchange of goods and services, facilitating and encouraging inflows of foreign direct investment, amelioration of information asymmetries, among others (Levine, 1997; DFID, 2004).

Although research in the area of the relationship between financial development and economic growth abound both in advanced and developing countries, the direction of causality has not been resolved. From the findings, it is not clear whether financial development is the cause of economic growth or economic growth is cause of financial development. Several views on the direction of causality between financial development and economic growth have been observed and yet studies have been drawing different views.

Empirical studies which support the supply-leading 'hypothesis that is, the unidirectional causation that runs from financial growth to economic growth include, [Ang 2009, Baliamoune-Lutz, 2008; Gries,2011, Levine, 2000; majidandmahrizal, 2007; meron, 2016. Odhiambo, 2007, Shahbaz, 2013, Uddin, 2013]. On the other hand, the demand-following 'hypothesis that is, the unidirectional causation from economic growth to financial development has been Proved by the findings of [Ang, 2008; Gurley and Shaw, 1967; Goldsmith, 1969; Levine, 2005; Majid and Mahrizal, 2007; Odhiambo, 2008; Handa and Khan, 2008; Gries. 2009; Odhiambo, 2010; Gries.2011]. Several other studies have documented the bidirectional relationship between financial development and economic growth [Greenwood and Smith, 1997; Blackburn and Hung, 1998; Blackburn. 2005; Ang and Mckibbin, 2007; abubader and Abu-Qarn, 2008; Wolde-Rufael, 2009; Jenkins and Katircioglu, 2010; and Gries, 2011]. Still other studies conducted in developing nations support the widespread existence of both bidirectional and unidirectional causality between the variables, others such [asram 1999; De Gregorio and Guidotti, 1995; Change, 2002; Majid and Mahrizal, 2007; and Gries, 2009 argue that there is no causality between financial development and growth].

Closed nature of the Ethiopian financial sector in which there are no foreign banks, a non-competitive market structure, and strong capital controls in place (Kiyota, 2007) as well as dominant role of state owned banks which is the cause for inefficiency and also deter economic growth. Furthermore, Ethiopia is a unique country among the Sub Saharan African country by not having a capital market and very limited informal investing in shares of private companies. This study in detail investigates the causality between financial development and economic growth by using time series data of over the period 1980–2017G.C. the researcher deals with multivariate causality between financial development and economic growth in which previous studies failed to address the omitted variables biasedness raising from bi-variate causality. Moreover, in addition the controversial result obtained previous studies; most of earlier studies conducted in Ethiopia used only one proxy for financial development which might come up with misleading the conclusion (Kayota, 2014). The overcome the problem associated with financial development indicators, this study included critical variable namely money supply and private credit as percentage of GDP in our investigation. Therefore, the general objective of this paper is to investigate the dynamics relationship between financial development and economic growth using time series data over the period 1980–2017.

2. Literature Review

2.1. Theoretical literature

From Schumpeter (1911), who put the role of financial intermediation at the center of economic development? It is the first time that Schumpeter articulates statements about how financial transactions take central stage in economic growth. He suggested that the economic growth is advanced majorly through the banking systems by the financial intermediation. The financial mediation ensures allocation of capital; mobilize the savings and advancing technological changes. According to him, the financial services should only be provided by the banking system since there is advancement of technological progress. Schumpeter said that services provided by the financial intermediaries are major drivers of innovation and Economic growth. Friedman (1959) and Johnson (1969) also did the earliest theoretical work that links the financial development and economic growth. This was by indicating that the production function contains a major element in the name of real money balance. Samuelson (1947) and Pakinin (1965) postulated that the utility function has a greater element in the name of real money balance.

The economic function of finance in the microeconomic explains financial intermediaries serve as a bridge the difference in interests between borrowers and lenders concerning the size of investment, its maturity and risk. Moreover, it connects financial services with asymmetric information and agency costs given the financial system a more prominent role in accomplishing an efficient allocation of capital (Thiel, 2001). Financial development occurs when financial instruments, markets, and intermediaries' alleviate the effects of imperfect information, limited enforcement, and transaction costs (Levine, 2005; World Bank, 2012).

From all the above, it's indicative that whenever there is a positive correlation between real money balance and the output, then the final effect will be that increase in real money balance will lead to increase in growth in real output. In this regard, it will be seen that development of the financial sectors will positively affect the economic growth of a country. Since economic growth is a subset of economic development, there will be economic development of a country. This has been demonstrated by Mckinnon (1973), Shaw (1973), Galbis (1977) and Mathieson (1980) who opined that the development of financial policies has an impact on economic development. Levine (2005) has developed a broader definition that focus on what the financial system improves in the (1) production of ex ante information about possible investments, (2) monitoring of investments and implementation of corporate governance, (3) trading, versification, and management of risk, (4) mobilization and pooling of savings, and (5) exchange of goods and services. But, financial sectors differ evidently in how well they provide these key services.

Mckinnon (1973) and Shaw (1973) said that financial repression make domestic agents to hold their assets in non-monetary terms which are unproductive instead of productive monetary terms like depositing assets in the bank. This leads to less investment as there will be no money to lend in the economy. Therefore, a market associated with the forces of demand and supply which is without government interferences leads to optimal savings allocation. Based on data from 13 Sub-Sahara African countries Ghirmay (2004) examined the causal relationship between financial development and economic growth in these countries. His findings supported bidirectional causal relations in six countries (Ethiopia, Kenya, Malawi, Tanzania, Rwanda and South Africa

There are four main types of relationships between financial development and economic growth. There is supply leading hypothesis (financial development leads to economic growth), Demand leading hypothesis (Economic growth causes financial development), Bi-Directional hypothesis (both financial development and economic growth causes each other) and Independent relationship hypothesis (neither financial development nor economic growth causes each other. The first one is Finance led growth (Supply leading hypothesis). This argues that financial development causes economic growth. King and Levine (1993) argue that financial institutions increase capital accumulation and also influence the productivity of the factors of Production positively. Bodie et al (2008) postulated that the major functions of financial development in stimulating economic growth are: ensuring ease of trade on goods and services, regulations, policing and ensuring corporate governance, mobilizations of savings, management and diversification of risk, access to cheaper information about potential investments and allocating capital. These contribute positively to economic growth. The second one is Growth driven finance/ Demand leading hypothesis. Demand leading hypothesis argues that economic growth leads to increased financial development. This view is still under great debate among researchers and has not received much consensus. According to Levine (2001), economic growth may reduce the cost of accessing financial services and more people join the financial intermediaries, hence economic growth causes financial development as more financial intermediaries will be launched. This means that the factors that promote economic growth are not within the purviews of the financial sector. The third one is Feedback/ Two-way causal relationship. Two-way causal relationship means that both financial development and economic growth causes each other in a positive way. According to Lewis (1995), a two-

way relationship exists between financial development and economic growth. This means that the financial sector develops because of economic growth which in turn feeds back into the system and acts as a stimulant to economic growth. The fourth and the last one is Independent relationships. Having looked at the three relationships above, there is a fourth relationship whereby both financial development and economic growth are independent of each other. This was demonstrated by Lucas (1988). This means that factors that determine financial development and economic growth are elsewhere and not within the two.

2.1. Empirical Literature

There have been a lot of studies investigating the relationship between financial development and economic growth. The studies range from cross country to country specific, using cross-section data and some using time series data. The studies have also used various proxies for financial development and different methodologies.

The crucial importance of financial development on economic growth is generally acknowledged in the literature. However, there is yet to a consensus on the determinants of financial development and, in particular, the impact of public sector borrowing from domestic banking system on financial development and private sector credits. Thesis attempts to contribute this literature by investigating the determinants of financial development and private sector credits for a panel of 85 developing and industrial countries using annual data from 1980 to 2006 Kenourgios and Samitas (2007) examined the long-run relationship between finance and economic growth for Poland and concluded that credit to the private sector has been one of the main driving forces of long-run growth. Hagmayr et al. (2007) investigated the finance-growth nexus in four emerging economies of Southeastern Europe for the period 1995-2005 and found a positive and significant effect of bond markets and the capital stock on growth.

In the global look, Demetriades and Andrianova (2003) study the relationship between finance and growth in England. There result postulated that there is candid importance of the financial intermediaries for the achievement of economic growth. They provide the means of payment and as well provide the link between current and future consumption. They found that the liquid liability of money drives the economy. Mohd (2012) through his investigation on the causality relationship between economic growth and the developments of non-bank financial intermediaries of Malaysia between 1974 and 2004.The study showed the causality running from the non-bank financial intermediaries' development to economic growth. Choe and Moosae, (1999) in the study of South Korea about the causality between financial development and economic growth, found that financial development leads to economic growth.

In sub-Saharan Africa, Akinlo and Egbetunde (2010) studied the direction of causality between financial development and economic growth of ten sub-Saharan African countries. The study found a positive relationship between economic growth and financial development. Using the vector error correction model (VECM), the study finds that financial development is co-integrated with economic growth in the selected ten countries in sub-Saharan Africa. The study found bi-directional relationship in some countries. Ndebbio (2004) studied the relationship between financial development and economic growth of some Sub-Saharan countries. The proxies of financial development used were ratio of M2 to GDP and real money balances growth rate. The study found that financial development leads to economic growth. Chistopoulos and Tsionas (2004), on the study of 10 developing countries showed long-run causality running from financial development to economic growth. There was no direction of causality in the long run. Songul, Ilhan and Ali (2009) investigated between 1975 and 2005 found bi-directional causality between financial development and economic growth in sub-Saharan Africa.

In Kenya, Onuonga (2014) in the study between 1980 and 2011 on empirical relationship between economic growth and financial development in Kenya showed long-run relationship among, financial development, trade openness and economic growth in Kenya. It also finds that financial development has a significant positive effect on economic growth. Odhiambo (2008) through the use of proxies such as broad money (M2), currency ratio and credit to private sector Said that direction of causality depends on the indicators used for financial development in Kenya. Odhiambo (2002) in his study considering impact of financial reforms and savings on economic growth found that financial development leads to economic growth. Odhiambo (2009) inhis study found that financial development caused by interest rate reforms influences economic growth. In this study, annual growth rate of real GDP is used as a proxy for economic growth (GDP). This proxy has been used extensively in the literature Odedokun, 1996; Shan and Jianhong, 2006; and Majid, 2008). Existing empirical studies conducted using Nigerian data largely concentrated on the relationship between credit and economic growth. Hashim and Mamman (2013) provide evidence to show statistical significant impact of the credit to the private sector and real sector growth in Nigeria. They therefore,

concluded that the government should increase the credit flow to the private sector Nwakanma, Nnamdi and omojefer (2014) because of its strategic importance in creating and generating growth of the economy.
The study deals with multivariate causality between financial development and economic growth in Ethiopia by including additional proxy for financial development. The choice of these variables as intermittent variables is underpinned in the theoretical and empirical links between each one of them and economic growth; and between each one of them and financial Development.

3. Model Specification

The vast research available on finance-growth causality is based on a bivariate frame-work, yet it is now known that results from such a model suffer from the omission of variable bias (among others, see Pradhan, 2011; Odhiambo, 2011; Loizides and Vamvoukas.2005). To address the weakness of bivariate Granger-causality, this study will utilizes multivariate Granger-causality model based on the autoregressive distributed lag (ARDL) bounds-testing approach developed by Pesaran and Shin (1999) and later extended by Pesaran et al. (2001), to examine the dynamic causal relationship between broad money and private sector credit financial development, and economic growth in Ethiopia. Human capital (secondary school enrolment), investment (gross capital formation), inflation (consumer price index) and trade openness were the intermittent variables in the multivariate model.
In this study, annual growth rate of real GDP is used as a proxy for economic growth (GDP). The causality model used in this study originates from Granger's definition of causality, based on the notion that the future cannot cause the past but the past can cause the future. The study utilizes the newly proposed autoregressive distributed lag bounds testing approach to examine the causal relationship each other's, broad money, private sector credit and economic growth in Ethiopia. The choice of this test is based on the numerous advantages it has over conventional estimation techniques such as the residual-based technique by Engle and Granger (1987) and Juselius (1990) – see, among others, Pesaran and Shin (1999), Duasa (2007), Odhiambo (2008) and Majid (2008). The production function model can apply for the study of growth problems by Solow (1990). Solow began with a production function of the Cobb-Douglas:
Y = A K a L b ……..1
Also expressed as Y = A K a L1-a
Where, A= positive constant
a and b =positive fraction measure the share of capital and quality adjusted labor in the aggregate economy respectively.
b = 1-a, Y is gross domestic product, A, is constant technology, K is capital stoke and L is labour
Makes it possible to change the algebraic form in log linear form,
Log Y = Log A + a log K+ b log L……2
Now, developing the same theoretical model based on relationship between financial development and economic growth in Ethiopia with case point financial development and human capital in economic growth. The researcher examines financial development on economic growth; capital stock is delivered in to bank sector and stock market. However, in Ethiopia context, the stock market is missing. So, it is ignored from the model specification. The equation can be rewritten as follows;
Yt = At Kα FDt, Lβ t Hδ t……3
Then the effect of constant A is divided into α0 and ε, make the equation log linear form;
lnYt = α0 + αlnK FDt, + βln L t, + δ ln H t + εt
Where; = α0 is constant, β, δ is coefficient, ln is natural logarithm, t is time lag and εt is error term.
Assuming a generalized Cobb Douglas production function and extending this growth model to include selected variable in relation between financial development and economic growth in addition to the above we can't use labour in the equation because include it in human capital. The study deals with the relationship between financial development and total out-put growth.
LNRGDP = F (LNM2, LNPSC, LNHC, LNIN, LNGCF, TO, SER)

3.1. Autoregressive Distribution Lag Model

The ARDL bounds testing approach does not impose the restrictive assumption that all the variables must be integrated of the same order. The approach can be applied to test the existence of a relationship between variables, even if the underlying regressors are integrated of order zero or order one. While conventional co-integration methods estimate the long-run relationship within the context of system of equations, the ARDL method is based on only a single reduced form equation (Pesaran and Shin, 1999). Furthermore, the ARDL approach provides unbiased long-run estimates and valid t-statistics, even when some of the regressors are endogenous (Odhiambo, 2008). The ARDL test also considers a sufficient number of lags to capture the data generating process in a general-to-specific modelling framework to obtain optimal lag length per variable. To top it all, the technique has superior small sample properties, making it suitable even when the sample size is small. Therefore, the ARDL approach is considered to be suitable for the analysis of the underlying relationship. The approach has also been increasingly used in empirical research. The long-run equilibrium relationship among the variables – economic growth, bank-based financial development, human capital and private sector credit, inflation, trade openness – is first established using the co-integration test before causality is tested. The co-integration test utilized in this study is ARDL-based and is conducted by making each variable a dependent variable, one at a time.

3.2. ARDL Bound Test for Co-integration

The ARDL co-integration approach was developed by Pesaran and Shin (1999) and Pesaran et al. (2001). It has three advantages in comparison with other previous and traditional co-integration methods. The first one is that the ARDL does not need that all the variables under study must be integrated of the same order and it can be applied when the under-lying variables are integrated of order one, order zero or fractionally integrated. The second advantage is that the ARDL test is relatively more efficient in the case of small and finite sample data sizes. The last and third advantage is that by applying the ARDL technique we obtain unbiased estimates of the long-run model (Harris and Sollis, 2003).

The bounds testing procedure to co-integration is developed within an autoregressive distributed lag framework. The bounds test is becoming a popular method to test for co-integration (Pesaran et al2001). In order to empirically analyses the long-run relationships and short run dynamic interactions among the variables of interest (Economic growth, broad money, private sector credit, capital investment, inflation, secondary school enrolment and trade openness), I apply the autoregressive distributed lag (ARDL) co-integration technique. The ARDL bounds test is based on the assumption that the variables are I(0) or I(1). In the presence of variables integrated of order two, we cannot interpret the values of F statistics provided by Pesaran et al. (2001). In other word, ARDL bounds analysis is used to investigate the presence of long-run relation among the variables included in the model. In order to undertake co-integration test with help of ARDL bound test, the maximum lag length must be determined. This is because an important issue addressed in employing ARDL is selecting optimum lag length. The model was estimated by ARDL and the optimal lag was selected by Akaike Information criterion (AIC) method. AIC is employed to choose at the best ARDL mode (Lutkephl, 2005).

3.3. Granger Causality Test

An error correction model belongs to a category of multiple time series models most commonly used for data where the underlying variables have a long-run stochastic trend, also known as co-integration. ECMs are a theoretically-driven approach useful for estimating both short-term and long-term effects of one-time series on another. The term error-correction relates to the fact that last-period's deviation from a long-run equilibrium, the error, influences its short-run dynamics. Thus ECMs directly estimate the speed at which a dependent variable returns to equilibrium after a change in other variables yule (1936) and Granger and Newbold (1974). This study has employed the Granger causality test to determine the direction of causality between co-integrated variables applying the vector error correction version of granger causality tests which would enable us to track the long- and short-run causality among interested variables (Kyophilavong et al., 2016). In other words, the long-run association can be deduced from the significance of the lagged error correction terms, while the short-run association is deduced from the coefficient of the lagged differenced variables.

Therefore, the requirement for long-run causality is that ECT coefficients must be negative and statistically significant. The short-run causality has been tested using the Wald test ($\chi 2$). The basic rationale of Granger causality is that the change in financial sector development Granger causes the change in economic growth if past values of the change in financial sector development improve unbiased least square predictions about the change in economic

growth. The null hypothesis H0 tested is that X does not granger-cause Y and Y does not granger-cause X. The ECM-based multivariate Granger-causality model adopted in this study follows Hamdi et al. (2013), Odhiambo (2011), Narayan and Smyth (2008) and Ang and mckibbin (2007). Is expressed as follows:

$$\Delta LNRGDPt = \gamma 0 + \gamma 1 LNRGDPt\text{-}1 + \gamma 2 LNM2t\text{-}1 + \sum_{(i=)}^{n} 1\alpha 3 \Delta LRGDPt\text{-}1 + \sum_{(i=)}^{n} 1\gamma 4 \Delta LNFDt\text{-}1 + \theta ecmt\text{-}1 + Ut \quad \ldots\ldots 7$$

$$\Delta LNFDt = \delta 0 + \delta 1 LNRGDPt\text{-}1 + \delta 2 FDt\text{-}1 + \sum_{(i=)}^{n} 1\delta 3 \Delta LNRGDPt\text{-}1 + \sum_{(i=)}^{n} 1\delta 4 \Delta LNFDt\text{-}1 + \theta ecmt\text{-}1 + Ut \quad \ldots\ldots 8$$

Where:

GDP = growth rate of real gross domestic product (a proxy for economic growth)

FD = is indictor of proxy of financial development (broad money as % GDP, and private credit as % of GDP,), Hc is human capital proxy for expenditure on education and health sector as % of GDP), trade openness (TO) is proxy by Summation of export plus import as % of GDP which measures degree of openness of the economy

$\gamma 0$ and $\delta 0$ = respective constants; $\gamma 1$- $\gamma 4$ and δ 1- $\delta 4$ respective coefficients; $\gamma 3$ -$\gamma 4$ and $\delta 3$- $\delta 4$ measures short run relationship, $\delta 1$- $\delta 2$ and $\gamma 1$- $\gamma 2$ measures long run relationship Δ = difference operator; ln is natural logarithm n = lag length; t = time period; Ut, white-noise error terms which is assumed to be to be serially uncorrelated and Ecm is error correction model which measures long run relationships.

4. Result and Discussion

4.1. Unit Root Test Analysis

The bounds test approach to co-integration does not need pre-testing for stationary of the variables included in the model, but still, it is important to carry out stationary tests on all the series. The justification behind the unit root test is to take a care on the order of integration not above I(1) in which we cannot apply ARDL bounds test to co-integration. Therefore, it was necessary to test for stationary of the series before any econometric analysis was done. It is notable that stationary properties of time series are investigated by testing for unit roots. There are several methods for testing for stationary. Thus, this study used the commonly used Augmented Dickey-Fuller (ADF) and the Phillip-Perron (PP) unit root tests.

Table 1: Augmented Dickey-Fuller test statistics (ADF)

	With intercept			**with intercept and trend**		
Variables	**at level**	**1st Difference**	**order of integration**	at level	1st difference	order of integration
ln(rgdp)	4.206823	-5.117515*	I(1) at 1%	3.456786	-5.509835*	I(1) at 1%
Ln(m2)	1.948718	-3.880187*	I(1) at 1%	0.376911	-4.179241*	I(1) at 5%
Ln(psc)	1.091572	-2.906587	I(1) at 10%	-2.776797	-3.153404	I(1) at 10%
Ln(gcf)	2.890218	-7.017090*	I(1) at	-0.776305	-8.142726*	I(1) at

1%				1%		
Ln(cpi)	1.093991	-5.355834*	I(1) at 1%	-1.085966	-5.599359*	I(1) at 1%
To	-1.286513	-5.637944*	I(1) at 1%	-0.997340	-5.659830	I(1) at 10%
Ser	0.557851	-4.700260*	I(1) at 1%	-1.172799	-4.787156*	I(1) at 1%

Table 2: Phillip-Perron (PP) unit root tests

	With intercept			**with intercept and trend**		
Variables	at level	1st Difference	order of integration	at level	1st difference	order of integration
ln(rgdp)	11.38717	-5.116625*	I(1) at 1%	1.298256	-6.808406*	I(1) at 1%
Ln(m2)	1.792781	-5.951012*	I(1) at 1%	-1.010183	-6.319283*	I(1) at 1%
Ln(psc)	0.859567	-5.275363*	I(1) at 1%	-2.765905	-5.444856*	I(1) at 1%
Ln(gcf)	6.893559	-6.997967*	I(1) at 1%	0.026250	-9.943229*	I(1) at 1%
Ln(cpi)	1.141785	-5.362007*	I(1) at 1%	-1.176380	-5.586252*	I(1) at 1%
To	-1.318407	-5.645786*	I(1) at 1%	-1.092762	-5.665297*	I(1) at 1%
Ser	0.456893	-4.682232*	I(1) at 1%	-1.239275	-4.777931*	I(1) at 1%

Notes: The sign of * represents the rejection of the null hypothesis of non-stationary at 10%, 5% and 1% significant level and the numbers without sign *, implies the variables have unit root or non-stationary. The null hypothesis is

that the series is non-stationary or the series has a unit root against alternative hypothesis that the series are stationary. Akaike info criterion (AIC) is used to determine the lag length while testing the stationarity of all variables (Lutkephl, 2005).

4.2. Long-run ARDL Bounds Tests for Co-integration

As far as we determined the stationary nature of the variables, the next task in the bounds test approach of co-integration is estimating the ARDL model using the appropriate lag length selection criterion. In other word, ARDL bounds analysis is used to investigate the presence of long-run relation among the variables included in the model. In order to undertake co-integration test with help of ARDL bound test, the maximum lag length must be determined. This is because an important issue addressed in employing ARDL is selecting optimum lag length. The model was estimated by ARDL and the optimal lag was selected by Akaike Information criterion (AIC) method.

According to Pesaran and Shin (1999) and Nayaran (2004) recommend choosing a maximum of 1 lags for annual data series Therefore, I set recommended the maximum lag length at 1 years for which are sufficiently long enough for annual data series to investigate the variable relationship and then AIC is employed to choose at the best ARDL mode (Lutkephl, 2005).

Table 3: Bound Test for Co-integration

Level	Bound	Critical Values
10%	Lower Bound	2.12
	Upper Bound	3.23
5%	Lower Bound	2.45
	Upper Bound	3.61
2.5%	Lower Bound	2.75
	Upper Bound	3.99
1%	Lower Bound	3.15
	Upper Bound	4.43
F-statistics ARDL((2, 1, 2, 0, 2, 2, 2)		**4.858644*****

Notes: ARDL Model is automatically selected on the basis of minimum value of Akaike info criterion (AIC). I obtain critical values for upper and lower bounds from Peseran et al. (2001) table CI(iii) at page 300 where ARDL model uses unrestricted intercept but no trend with k=6. The sign of *** indicate the level of significance at 10%, 5%, and 1% to reject the null hypothesis of no long-run relationships exist respectively.

According to the result shown in the table 4, I have the upper and lower Narayan (2004) critical values to compare with corresponding F statistics in order to reject or accept the null hypothesis of no long-run relationship among the variables. For small sample ranging from 30 to 80 years' data, we have been used Narayan (2004) critical values in which EViews software provided it automatically.

As the result observed from the table 4 depicts that F-statistic is 4.858 which is greater than the upper bounds critical value at 1% significance level. This clearly evidenced that there is a strong evidenced long-run relationship between economic growth and explanatory variables. Therefore, the null hypothesis of no long-run relationship is rejected at 1% significance level and alternative hypothesis of the existence of long-run relationship between the variables is

accepted. In other words, the variables included in the model have long-run relationship which is a base for estimating the long-run impact of the explanatory variable on economic growth at large.
The next step was determining of an appropriate lag order. This needs to implement the information criteria for selecting the lag-lengths. For this purpose, we used two criteria respectively the graph and table. In this case the optimal lag length is one. We used the Akaike Information Criterion (AIC). It is clear from the graph 1, that the model ARDL (2,2,2,1,2,0,2) is the optimal model since it has the lowest AIC criterion (for more details see Belloumi (2014) and Belloumi and Alshehry (2015).

4.3. Long-run and Short-run ARDL Model Estimation

Once co-integration among economic growth and all explanatory variables through bound test are confirmed, then long-run estimation of the model comes next. Accordingly, The ARDL (2, 2, 2, 1, 2, 0, 2) can be estimated for long-run.

Table 4: Long run coefficients

Variables	coefficient	std. error	t-statistics	p-value
Lnm2	0.218088	0.035491	6.144863	0.0000*
Lnpsc	0.233594	0.052459	4.452853	0.0003*
Lngcf	0.258329	0.076389	3.381772	0.0033*
Lncpi	-0.306725	0.084812	-3.616526	0.0020*
To	-0.007045	0.001562	-4.509242	0.0003*
Ser	0.008552	0.001918	4.458092	0.0003*
C	2.766734	0.189711	14.583978	0.0000*

Source: Author's calculation from E view 9 results, 2019
Notes: The sign of * indicate the levels of significance at 10%, 5%, and 1%.

In long-run, most of the coefficients of explanatory variables have their expected theoretical or hypothesized signs except for trade openness. Consistent with theory, gross investment in Ethiopia has a positive sign and significant on real GDP, inflation has negative sign and significant which case uncertainty over future inflation which may discourage investment and savings and generally economic growth.Similarly, human capital has a positive and significantly determines economic growth in Ethiopia which confirms endogenous growth model that incorporate human capital development as an engine for economic growth. As the results depict that the coefficient of broad money and private sector credit (a measure of financial development) has a positive sign as predicted by the theory and statistically significant at 1% level. This result is also similar to long-run effect of financial development to on economic growth in Ethiopia. It indicates that 1% increase in broad money and private sector credit lead to increase 0.21% and 0.23% in aggregate output growth as measured the real GDP.
This is implying that financial development as proxy by broad money and private sector credit which facilitate supply of investible funds to productive sector which influences overall output growth through increased investment in the economy. This finding is consistent with those of Levin et al. (2000), Afangideh (2009), Murty et al. (2012), Helmi et al. (2013) and Mercy et al. (2015). From the theoretical perspective, this finding is also consistent with the theory of Schumpeter which argued the importance of financial development on the economic growth of a country. Conversely, this result is not consistent with the finding of Fozia (2014) and Bekana (2016) for the case of Ethiopia. To this end, broad money and private sector credit is highly significant impact on aggregate output growth implying that financial development is an engine for long-run economic growth.
The long-run estimated coefficient of trade openness has found to be a negative sign and significant effect on economic growth as confirmed by 1 percent level of significance. In our opinion, justification for the inverse relationship is that the liberalizing trade might have exposed the country's infant industry to foreign competition

thereby adverse effect on long-run real GDP. In this case, domestic investors who are engaged in the non-exportable economic activities were forced to exit from domestic markets. Hence, a percentage increase in the ratio of import plus export to GDP which is trade openness will reduce overall output growth by -0.0070%. The finding is similar to the finding conducted by, Adu et al. (2013) for Ghana, Mercy et al. (2015) for Kenya, Agyei (2015) for Ghana, and Okafor and Shaibu (2016) for Benin (Tekilu T., J. Abafia 2019) for Ethiopia. According to Bibi and Rashid (2014), trade openness could be manifested either positive or negative depending on the values of determinants of trade openness.

4.4. Short-run error correction model

An ECM coefficient in the short-run was negative and statistically significant at 1% level with a value of -0.860264. This implies that 86% of the disequilibrium in the short-run was corrected in the current year which means the short-run distortion is to be corrected towards the long-run equilibrium path. In other words, we found that the deviations in the short-run towards the long-run equilibrium are corrected by 86% each year. Relatively better speed of adjustment in aggregate output growth might be due to the developing competitiveness of the financial sector through wide spread involvement of private sector and fast economic growth recorded since 2003/4 in Ethiopia. The short-run coefficient of the model explains the short-run relationships between overall output growth and explanatory variables are depicted as follows.

Table 5: Short-run Coefficients (Short Run Error Correction Model)

Variables	Coefficients	Std. error	t-statistics	Prob.
D(LNRGDP(-1))	0.211070	0.077684	2.717047	0.0141
D(LNM2)	0.443010	0.040690	10.887498	0.0000
D(LNPSC)	0.082582	0.035689	2.313926	0.0327
D(LNPSC(-1))	-0.117735	0.036903	-3.190390	0.0051
D(LNGCF)	0.222231	0.056262	3.949941	0.0009
D(LNCPI)	-0.009341	0.092388	-0.101111	0.9206
D(LNCPI(-1))	0.196258	0.069408	2.827601	0.0112
D(TO)	-0.002940	0.001164	-2.525455	0.0212
D(TO(-1))	0.002871	0.001387	2.070395	0.0531
D(SER(-1))	0.000702	0.001705	0.411661	0.6854
D(SER(-1))	-0.006639	0.002232	-2.974755	0.0081
C	-0.860264	0.145172	-5.925807	0.0000
Cointeq = LNRGDP - (0.2181*LNM2 + 0.2336*LNPSC + 0.2583*LNGCF -0.3067*LNCPI -0.0070*TO + 0.0086*SER + 2.7667)				

4.5. Diagonestic Tests

Result of Table 6 show that some Diagnostic tests with some the Diagnostic tests: serial correlation, functional form is right with Ramsey"s RESET test, normality, heteroscedasticity, and structural stability. Accordingly, all Diagnostic

test have model passes all of the reported diagnostic tests because all test with all p-value larger than 0.05, associated with the model (Stock & Watson, 2010). I can said that result of research have economic significance and reasonable

Table 6: Long-run ARDL (2, 2, 2, 1, 2, 0, 2) Diagnostic Tests

Diagnostic Tests	**Chi-statistic**	**F-statistics**	**Decision**
Breusch-Godfrey Serial Correlation LM Test	χ^2(1)= 3.739187 Prob. 0.0532	F(1,17)=1.970384 prob. 0.1784	no correlation
Breusch-Godfrey Heteroscedasticity Test	χ^2(1)7 =17.37994 prob. (0.4289)	F(17,18) =0.988305 prob. (0.5078)	No problem of Heteroscedasticity
Jarque-Bera Normality Test	χ^2 (1)= 0.108424 Prob. (0.947231)	_	Residuals are normal distributed
Ramsey RESET Test	_	F(2,16) =0.023122 Prob. (0.9772)	Model is well specified

Source: Author's calculation from E view 9 results, 2019

4.5. Test of Parameter Stability

The stability of the model for long- and short-run relationship is detected by using the cumulative sum of recursive residuals (CUSUM) which helps as to show if coefficient of the parameters is changing systematically and the cumulative sum of squares of recursive residuals (CUSUMSQ) tests which is useful to indicate if the coefficient of regression is changing suddenly. Accordingly, if the blue line crosses redline which is critical line and never returns back between two critical line, we accept the null hypothesis of the parameter instability whereas the cumulative sum goes inside the area (can returns back) between the two critical lines, then there is parameter stability in the short- and long-run. I checked the stability of the long-term these parameters, along with the short-term movement to the equation. Including theory Borensztein et al. (1998), we rely on the cumulative amount (CUSUM) and square cumulative amount (CUSUMSQ), including Pesaran and Pesaran (1997), Mohsen et al. (2002) and Suleiman (2005) to test the stability of the long-run coefficients. The tests applied to the residuals of the ECM model.

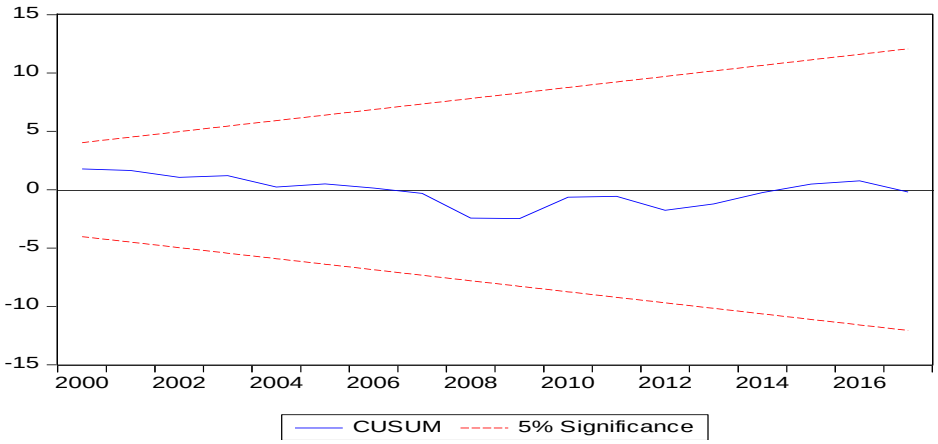

Figure 1: Plot of Cumulative Sum of Recursive Residuals (i)

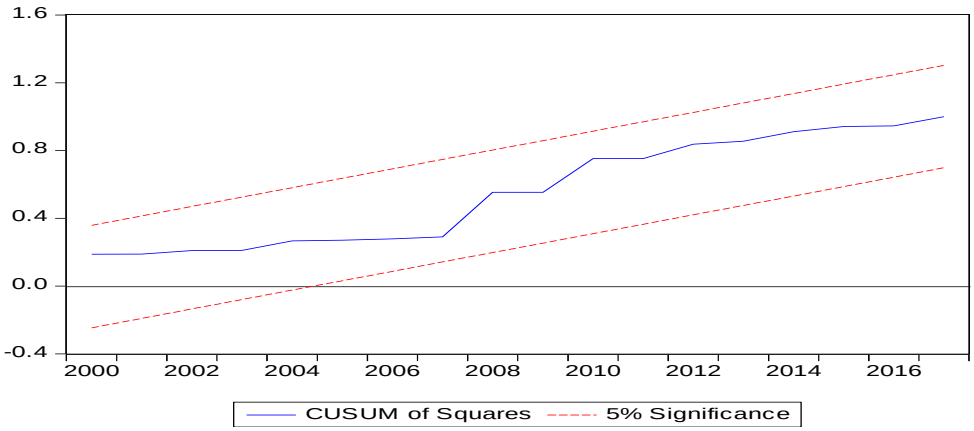

Figure 2: Plot of Cumulative Sum of Squares of Recursive Residuals (ii)

As the result seen from the figure, the plot of CUSUM test did not cross the critical limits. In the same manner, the CUSUMSQ test shows that the graphs do not cross the lower and upper critical limits. So, I can conclude that long-run estimates are stable and there is no any structural break.

4.6. Granger Causality Test

This study has employed the Granger causality test to determine the direction of causality between co-integrated variables applying the vector error correction version of granger causality tests which would enable us to track the long- and short-run causality among interested variables (Kyophilavong et al. 2016). In other words, the long-run association can be deduced from the significance of the lagged error correction terms, while the short-run association is deduced from the coefficient of the lagged differenced variables. Therefore, the requirement for long-run causality is that ECT coefficients must be negative and statistically significant. The short-run causality has been tested using the Wald test ($\chi 2$).

Table 7: Long- run Granger Causality Test

Null hypothesis	Obs.	Lag	Coefficient	prob.
Ln(M2) does not Granger cause Ln(RGDP)	35	2	0.320947	0.8517

Ln(PSC) does not Granger cause Ln(RGDP)	35	2	0.633676	0.7284
Ln(RGDP) does not Granger cause Ln(M2)	35	2	0.232353	0.8903
Ln(PSC) does not Granger cause Ln(M2)	35	2	0.389474	0.8231
Ln(RGDP) does not Granger cause Ln(PSC)	35	2	5.615743	0.0603*
Ln(M2) does not Granger cause Ln(PSC)	35	2	5.186075	0.0748*

Notes: The sign of * indicate the levels of significance at 10%to reject the null hypothesis of the direction of causality.

Table 8: Short-run Granger Causality Test

Null hypothesis	**Obs.**	**Lag**	**Coefficient**	**prob.**
Ln(M2) does not Granger cause Ln(RGDP)	35	2	34.63539	0.0000*
Ln(PSC) does not Granger cause Ln(RGDP)	35	2	1.065981	0.3560
Ln(RGDP) does not Granger cause Ln(M2)	35	2	46.77442	0.0000*
Ln(RGDP) does not Granger cause Ln(PSC)	35	2	1.208603	0.3115
Ln(M2) does not Granger cause Ln(PSC)	35	2	0.039885	0.9609
Ln(PSC) does not Granger cause Ln(M2)	35	2	0.632809	0.5374

Source authors calculation from Eview 9 2019

Note; The sign * implies that the significance of the causality at 1%, 5%and 10% level. Reject the null hypothesis of the direction of causality.

The prerequisite for testing granger causality in the long-run based on vector error correction depends on whether two variables are co-integrated or not (Tamba et al., 2014; Balago, 2014). Accordingly, Granger causality test indicated from above result reveals that economic growth is essential for financial development in Ethiopia that confirms the augment of demand following growth hypothesis in long-run. This result is line with earlier causality study by Patrick's (1966), Roman (2012), and Ofori-Abebrese et al. (2017) who found the demand following hypothesis which postulates a causal relationship from economic growth to financial development, that is an increasing demand for financial services might lead to an expansion in the financial sector as the economy continuous to grows. This result is contradict with early causality study done by Mckinnon (1973) and

Shaw (1973), works of King and Levine (1993), and the later study by Helmi et al. (2013) and Agyei (2015) which supply leading hypothesis of financial sector development is essential for accelerate economic growth. There also causal relationship from broad money to private sector credit. However: in contradict to this independent relation between broad money (financial development) and economic growth. Lucas (1988) argues that monetary do not have any effect on economic growth and therefore there is no causal relationship between financial development and economic growth.

The result at table 9 reveals that there is bi-directional causality running between broad money (financial development) and economic growth in the short-run. Several other studies have documented the bidirectional relationship between financial development and economic growth [Greenwood and Smith, 1997; Blackburn and Hung, 1998; Blackburn. 2005; Ang and Mckibbin, 2007; abubader and Abu-Qarn, 2008; Wolde-Rufael, 2009; Jenkins and Katircioglu, 2010; and Gries, 2011]. This finding confirmed bi-directional hypothesis that means in order to accelerate economic growth, there is a need of financial sector development (broad money) and for financial development (broad money). there is need of economic growth in the short-run. However: independent relationship between private sector credit (financial development) and economic growth. Lucas (1988) argues that monetary do not have any effect on economic growth and therefore there is no causal relationship between financial development and economic growth.

5. Conclusion and Recommendation

This study examined the causality between financial development and economic growth in Ethiopia during the period from 1980 to 2017. The study employed ARDL bound test approach to examine the long- and short-run relationship between economic growth and explanatory variables and VECM used to investigate the direction of causality between financial development and economic growth. Before employing ARDL model, we have tested stationarity

properties of the variables by using ADF and PP tests. The results of unit root test reveal all variables are stationary at first difference. Regarding to diagnostic and stability test, the result shows that the model is stable and desirable in long run without any evidence of serial autocorrelation and heteroscedasticity as well as no any evidence for structural break. A bound test approach to cointegration indicated that bound test (F-statistic) value is greater than the upper critical value which implies there is a long-run relationship between economic growth their respective determinant.

The results suggest that there exists a unique cointegration relationship among real GDP and the financial development variables that in the short run and long run, the financial development variables exerted positive effects on economic growth. There is short-run mutual relationship between (broad money) financial development and economic growth so that the direction of this relationship is bidirectional. Also, there is an independent short-run relationship between private sector credit and economic growth. There is an independent relationship between broad money and economic growth in long run. Also, there is a one-way long-run causal relationship from broad money toward private sector credit and Uni-directional causality from economic growth to private sector credit; it is required to take necessary steps for economic corrections through banking systems in these countries.

With regard to control variables, except inflation and trade openness all variables were positive significantly influence and expected impact on economic growth in the long-run. Other than inflation, trade openness, human capital, gross investment and financial indicator were the pioneer determinant of economic growth in the short run. Furthermore, VECM granger causality tests show that the direction of causality is running from economic growth to financial development in long run and bi-direction in the short run. This study found the demand-following and bi-directional hypotheses held in the case of Ethiopia.

If policy makers want to promote growth and financial development attention should be focused on long-term and short term policies. Therefore, based on the finding, government should strengthen its current effort on development of both financial sectors to accelerate economic growth and economic growth for sustainable financial development in the country. Moreover, due the evidence of demand following and bi-directional hypothesis, the policy makers should focus long-run policies mainly improving economic growth and short run policies improving both financial sector and economic growth, so as to make the efficient and effective allocation of resources among

the productive sector and financial sector which affects long-run financial sector and short run both economic growth and financial development in Ethiopia.

References

Adebola, S. S. and Dahalan, J. . (2012). Capital Mobility: Application of Saving Investment Link for Tunisia. International Journal of Economics and Financial Issues, Vol. 2 No. 1.

Adu, G., Marbuah, G., & Mensah, J. T. (2013). Financial development and economic growth in Ghana: Does the measure of financial development matter? . Review of Development Finance, 3(4), 192-203.

Adusei, M. (2012). 1Financial Development and Economic Growth: Is Schumpeter Right?;. British Journal of Economics, Management and Trade, 2(3),, 265-78.

Adusei,M. and K. Nkrumah. (2013). Financial Development and Economic Growth: Evidence from Ghana;. The International Journal of Business and Finance Research, 7(5), , 61-76.

Afangideh, U. J. (2009). Financial Development and Agricultural Investment in Nigeria: Historical Simulation Approach;. Journal of Economic and Monetary Integration, 74- 97.

Agyei, C. K. (2015). Financial Development and Economic Growth: The Causal Relationship In Ghana. KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY.

Alemayehu, G. (2006). The Structure and Performance of Ethiopia's Financial Sector in the Pre- and Post-Reform Period with a Special Focus on banking sector:. Research Paper No. 2006/112.

Ang, J. B., and McKibbin,W.J. (2007). Financial development and Economic Growth: evidence from Malaysia. Journal of Development Economics,84, 215-233.

Anthony I.,Sogules, I. W. and Ekpeyoung B. (2012). An Appraisal of Credit Facilities on Agricultural Output and Productivity in Nigeria. British Journal of Humanities and Social Sciences Vol. 7 (2), 24-33.

Anthony, E. (2010). 'Agricultural Credit and Economic Growth in Nigeria: An Empirical Analysis'. Business and Economics Journal, 14,, 1-7.

Balago, G. (2014). Financial Sector Development and Economic Growth in Nigeria: An Empirical Investigation:. International Journal of Finance and Accounting, 3(4), 253-265.

Beck, T and Levine, R. (2004). Stock Markets, Banks and Growth: Panel Evidence. Journal of Banking and Finance, 28.

Bittencourt, M. (2012). Financial Development and Economic Growth in Latin America: is Schumpeter Right? . Journal of Policy Modeling, 34(3).

Bolbol, A., Fatheldin, A. and Omran, M. (2005). Financial Development, Structure, and Economic Growth: the case of Egypt. Research International Business andFinance 19, 171 194.

Caporale, G. M., A Howells, Peter G. and Soliman, Alaa M. (2004). Stock Market Development and Economic Growth: The Causal Linkage. journal of economic development Vol. 29, NO. 1, 33-50.

De Gregorio, J., and Guidotti, P. (1995). Financial development and economic growth. World Development 23, 433–448.

Dejene, B. M. (2016). Does Financial Sector Development Drive Economic Growth in a Post-Communist Economy? Evidence from Ethiopia. Economic Insights – Trends and Challenges, 15-38.

Dickey, D. A.; Fuller, W. A. (1979). "Distribution of the estimators for autoregressive time series with a unit root.

Demirguc-Kunt, A. and E. Detragiache. (1998). Banking Sector Fragility: A Multivariate Logit Approach; . World Bank Economic Review, 14(2),, 287-307.

Ellahi, N. (2011). How development of finance contributes to poverty alleviation and growth: A time series application for Pakistan. African Journal of Business Management Vol.5 (30), pp. 12138-12143, 30 November, 2011, 12138-12143.

Ethiopia, N. B. (2015). annual reports.

FitzGerald, V. (2006). Financial Development and Economic Growth: A Critical View. . Oxford University.

Fowowe, B. (2010). The Finance-Growth nexus in Sub-Saharan Africa: Panel Co integration and Causality tests;. Journal of International Development, , 1-20.

Fozia, M. (2014). The Nexus between Economic Growth and Financial Development: The Case of Ethiopian Economy. Proceedings of 8th National Student Research Forum, (pp. 23-52). Addis Ababa University, Ethiopia.

Gerschenkron, A. (1962). Economic Backwardness in Historical Perspective – A Book of Essays. . Cambridge, MA.: Harvard University Press, .

Gujarati. (2004). Basic econometrics. McGraw-Hill Companies, 4th edition.

Gurley, J. and E. Shaw. (1967). 'Financial Structure and Economic Development;. Economic Development and Cultural Change, 15(3), 257-68.

Hellwig, M. (1991). "Banking, Financial Intermediation, and Corporate Finance",. In: European Financial Integration, Eds: Giovanni, A. and C. Mayer, Cambridge University Press, Cambridge, England, 35-63.

HELMI, H., A. HAKIMI and RASHID, S. (2013). MULTIVARIATE GRANGER CAUSALITY BETWEEN FINANCIALDEVELOPMENT, INVESTMENT AND ECONOMIC GROWTH:EVIDENCE FROM TUNISIA. Journal of Quantitative Economics, 11 Nos.1&2, 112-129.

Imoughele, Lawrence, Ehikioya, Ismaila And Mohammed. (2013). 62. Commercial Bank Credit Accessibility And Sectoral Output Performance in a Deregulated Financial Market Economy: Empirical Evidence From Nigeria, . Journal of Finance and Bank Management, Vol. 1 .

Jalil, A., Ma, Y. and Naveed, A. (2008). 'The finance-fluctuation nexus: Further evidence from Pakistan and China. International Research Journal of Finance and Economics, Issue 14.

Johansen, S. (1988). "Statistical Analysis of Cointegration Vectors". Journal of Economic Dynamics and Control Vol. 12, , 231-254 http://dx.doi.org/10.1016/0165-1889(88)90041-3.

Karbo S.M. and Adamu P.A. (2011). Financial Development and Economic Growth in Sierra Leone. Journal of Monetary and Economic Integration, 9(2) , 31-61.

Kyophilavong, P., Uddin, Gazi S. and Shahbaz, M. (2016). The Nexus between Financial Development and Economic Growth in Laos. Global Business Review 17(2), 303–317.

Levine, R. (2004). Finance and growth: theory and evidence:. NBER Working Paper Series n.10766.

Lutkephl, H. (2005). New introduction to mutple time series analysis. Berlin: spinger.

McKinnon, R. (1973). Money and Capital in Economic Development. . Washington, DC:.

Miftah, A. (2013). Domestic saving – Economic growth nexus. Addis Ababa University: UnpublishedMaster's Thesis.

Mishkin, F. S. (2007). The Economics of Money and Financial Markets. Pearson/Addison Wesley.

Murcy, K., J., Kalio,A., and kibet, L. (2015). Effect of Financial Development on Economic Growth in Kenya: Evidence from Time Series Analysis:. European Journal of Business and Social Sciences, Vol. 3, No. 11, 62 – 78.

Murty, Wondaferahu, Mullugeta, Sreerama, K. and Sailaja, K. . (2012). The Long Run Impact Of Bank Credit On Economic Growth In Ethiopia: Evidence from Johansen's Multivariate Co Integration Approach,. European Journal of Business and Management ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online)Vol 4, No.14, 2012, 20-33.

Nayaran, K. (2004). Reformulating Critical Values for the Bounds F-statistics Approach to Co integration: An Application to the Tourism Demand Model for Fiji". Discussion Papers No 02 Monash University, Victoria, Australia.

Nkoro and Uko. (2013). the financial sector development-economic growth nexus in Nigeria; Vol. 1 No. 2, . Journal of Finance and Bank Management,, pp 55-78.

Odhiambo, N. (2010). Finance-Investment-Growth Nexus in South Africa: An ARDL-bounds Testing Procedure. Econ Change Restruct., 43, 205–219.

Odhiambo, N. M. (2007). Supply-leading versus demand-following hypothesis: empirical evidence from SSA countries. African Development Review, 19, 257-280.

Ofori-Abebrese, G., Pickson, R.B. and Diabah, B.T. (2017). Financial Development and Economic Growth: Additional Evidence from Ghana. . Modern Economy, 8, 282-297.

Ofori-Abebrese, G., Pickson, R.B. and Diabah, B.T. (2017). Financial Development and Economic Growth: Additional Evidence from Ghana. Modern Economy, 8(ISSN Online: 2152-7261), 282-297.

Okafor, Chinwuba and I. Shaibu,Brahim. (2016). 2016)Modelling Economic Growth Function in Nigeria: An ARDL Approach. Asian Journal of Economics and Empirical Research, 2016, vol. 3, issue 1, 84-93.

Patrick, H. (1966). Financial development and economic growth in underdeveloped economies;. Economic Development and Cultural Change 14, 174-89.

Pesaran, H. and Shin, Y. (1999). An Autoregressive Distributed Lag Modeling Approach to Co-integration Analysis. UK: Cambridge University Press.

Pesaran, H. M., & Shin, Y. (1995). Autoregressive Distributed Lag Modeling Approach to Cointegration Analysis. Working Paper, No. 95/14. Department of Economics, University of Cambridge, DAE.

Pesaran, H., Shin,Y.,and R. Smith. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. Journal of Applied Econometrics, 16(3), 1924-1996.

Quartey, P. and Prah, F. (2008). Financial development and economic growth in Ghana: Is there a causal link. . African Finance Journal, 10, , 28–54.

Rafindadi, A.A. and Yusof, Z. (2013). Is financial development a factor to the leading growth profile of the South African economy? Measuring and uncovering the ridden secret. International Journal of Economics and Empirical Research, 1(9), 99–112.

Roman, T. (2012). the link between financial development and economic growth in Ethiopia. Adis Abeba: unpublished Masters thesis.

Sargan, J. D.; Bhargava, Alok (1983). "Testing residuals from least squares regression for being generated by the Gaussian random walk". Econometrical. 51 (1): 153–174. JSTOR 1912252.

Shahbaz, M. (2009). A Reassessment of Finance-Growth Nexus for Pakistan: Under the Investigation of FMOLS and DOLS Techniques. The IUP Journal of Applied Economics, 65-80.

Shaw, E. (1973). Financial Deepening in Economic Development. New York: Oxford.

Solow, R. (1956). A contribution to the Theory of Economic Growth. Quarterly Journal of Economics, 70(1), 65-94.

Tamba, J.G, Koffi, F.D, Lissouck M., Ndame M., Afuoti, N.E. (2014). A Trivariate Causality Test: A Case Study in Cameroon . Applied Mathematics, 5, 2028-2033.

Tewodros, A. (2015). The determinant of economic growth in Ethiopia: A time series analysis. Addis Ababa university: unpublished Master thesis.

Tekilu T. & Jemal A. 2019. The Causality Between Financial Development And IMF: Federal Democratic Republic of Ethiopia, (2014) Johansen, S. (1988).Statistical analysis of co integration vectors. Journal of Economic Dynamics and Control, 12, 231–245

Udoh, E. and Ogbuagu, U. . (2012). Financial Sector Development and Industrial Production in Nigeria (1970-2009): An ARDL Co Integration Approach". Journal of Applied Finance & Banking, vol.2, no.4, 49-68.

Zwedu, G. A. (2014). Financial inclusion, regulation and inclusive growth in Ethiopia. Shaping policy for development working paper 408