

EFFECT OF FINANCIAL DEVELOPMENT ON ECONOMIC GROWTH IN KENYA: EVIDENCE FROM TIME SERIES ANALYSIS

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ABSTRACT

This paper examines the relationship between financial development and economic growth in Kenya using annual time series data. The analysis techniques employed in this study was autoregressive distributed lag (ARDL). This approach was useful in handling small sample size like in this study and to address the problem of endogeneity since the relationship between financial development and economic growth cannot be determined on a priori grounds. The results revealed that financial development exerts a positive and statistically significant effect on economic growth in Kenya hence confirming supply leading hypothesis. This was confirmed both in the short-run as well as in the long-run regression results. From policy perspective the policy makers need to formulate financial sector reform policies to ensure a well-functioning financial system that promotes domestic credit especially to productive sectors of the economy.

Key Words: Economic Growth, Financial Development, Co integration, Kenya

1. INTRODUCTION

The relationship between economic growth and financial development has been the subject of both theoretical and empirical analysis in economic literature for a long period of time. Although there are numerous studies examining this relationship, there is no consensus on the effect of financial development on economic growth. A number of theoretical and empirical analyses indicate that financial development leads to economic growth. Studies that support this view include those of Habibullah and End (2006); Galindo (2007), Ang (2008); Giuliano and Ruiz-Arranz(2009) and Nkoro and Uko (2013). These studies maintain that a well-developed financial sector creates strong incentives for investment and also fosters trade and business linkages and technological diffusion. This is mainly through mobilizing savings for productive investment which thus promotes economic growth. Another school of thought believes that economic growth creates demand for financial services and therefore economic growth precedes financial development. Studies that advocate this view include Sunde (2013), Odhiambo (2008), Wagabaca, (2004) and Agbetsiafa (2003). Another strand holds that financial advancement plays a minimal role, if any, on economic growth (Lucas, 1988) and Adusei (2012). However, in the recent past, there has been empirical evidence that there exist a bi-directional relationship between economic growth and financial development Fowowe (2010), Rachdi and Mbarek (2011).

In light of the above explanation, it is evident that the empirical studies which focus on the link between financial development and economic growth show mixed results and this may be attributed to the estimation methodologies and quality and span of data used as well as the direction of causality. In Kenya, there are few empirical studies that focus on the effect of financial development on economic growth using time series data. In addition, these studies do not examine the short-run and long-run effect of financial development on economic growth. While a significant number of empirical studies in which Kenya is included use panel and cross-section data to examine the relationship between financial development and economic growth, there is no consensus on the findings. This may be due to the fact that these countries have different levels of financial and economic development. In addition, the previous studies have not adequately addressed the problem of endogeneity. The current study, therefore, intends to complement the existing empirical studies by using time series data, co-integration and error correction approach with a view of shedding light on this important relationship, by focusing on the short-run and long-run effect of financial development on economic growth using autoregressive distributed lag (ARDL) technique to address the problem of endogeneity. Hence, this country specific study will be important so as to prescribe policy recommendations deemed necessary to foster further financial development and economic growth in Kenya.

2. LITERATURE REVIEW

Nkoro and Uko (2013) examined the financial sector development-economic growth nexus in Nigeria. In their study employed co integration/Error Correction Mechanism (ECM) with annual dataset covering the period, 1980-2009. Five variables, namely; ratios of broad money stock to GDP, private sector credit to GDP, market capitalization-GDP, banks deposit liability to GDP and Prime interest rate were used to proxy financial sector development while real gross domestic product proxy growth. The empirical results show that there is a positive effect of financial sector development on economic growth in Nigeria. However, credits to private sector and financial sector depth were found to be ineffective and fail to accelerate growth. However, this study did not address the problem of endogeneity which is a problem in time series studies since the relationship between financial development and economic growth cannot be determined on a priori grounds.

In a study to re-examine the long run relationship between financial development indicators and economic growth in Nigeria over the period 1970-2010. Using the Johansen and Juselius (1990) approach to cointegration and Vector Error Correction Modelling (VECM) Abubakar and Gani (2013) found that in the long-run, liquid liabilities of commercial banks and trade openness exert significant positive influence on economic growth, conversely, credit to the private sector, interest rate spread and government expenditure exert significant negative influence. The findings implied that, credit to the private sector is marred by the identified problems and government borrowing and high interest rate are crowding out investment and growth. The authors suggested that financial reforms in Nigeria should focus more on deepening the sector in terms of financial instruments so that firms can have alternatives to banks' credit which proved to be inefficient and detrimental to growth, moreover, government should inculcate fiscal discipline so as to reduce excessive borrowing from the financial sector and thereby crowding out private investment.

The empirical evidence on the link between financial development and economic growth provides mixed results across countries and regions as well as directions of causality (Eschenbach, 2004). A number of empirical results support the supply leading hypothesis. According to a study by King and Levine (1993) where they conducted cross-section analysis to examine the link between financial development and economic growth over the period 1960 to 1989, the authors used the ratio of liquid liabilities of banks and nonbank institutions to GDP, ratio of bank credit to the sum of bank and central bank credit, ratio of private credit to domestic credit and ratio of private credit to GDP as a measure of financial development. The results of the study revealed that the level of financial development predicts future economic growth and future productivity advances. The authors conclude that there is a causal relationship that runs from financial development to economic growth.

According to a study by Allen and Ndikumanu (2000) in which they examined the relationship between financial development using several measures of financial development to investigate the role of financial intermediaries in promoting economic growth in Southern Africa, the authors found that there exists a positive relationship between financial development and economic growth thus supporting demand leading hypothesis.

By employing cross-section data analysis during the period 1960 to 1999 for 159 countries, Khan and Senhadji (2003) examined the relationship between financial development and economic growth. The authors used the two-stage least squares (2SLS) to address the problem of potential endogeneity in the underlying relationship. The results of their study indicated that financial development has a positive and statistically significant effect on economic growth.

Khan *et al.* (2005) examined the relationship between financial development and economic growth in Pakistan during the period 1971 to 2004. By using autoregressive distributed lag method, the findings showed that financial depth has a positive impact on economic growth in the long-run. However the relationship was insignificant in the short-run. The ratio of investment to GDP exerted positive influence on economic growth in the short-run although this was also insignificant in the long-run. The study further indicated that there exists a positive impact of real deposit rate on economic growth. Based on these results, the authors suggested that the policy makers need to pay attention on long-run policies to promote economic growth. This can be achieved through creation of modern financial institutions, in the banking sector and the stock market.

Sanusi and Salleh (2007) investigated the relationship between financial development and economic growth in Malaysia over the period 1960 to 2002. The authors used ratio of broad money to GDP, credit provided by the banking system, and deposit money banks to GDP as a measure of financial development. By using autoregressive distributed lag (ADL) model, it revealed that that ratio of broad money to GDP, and credit provided by the banking system have positive and statistically significant impact on economic growth in the long-run. In addition, they found that a rise in investment will stimulate economic growth in the long-run.

By employing panel data analysis for 15 member-countries of the Organisation for Economic Co-operation Development (OECD) and 50 non-members of OECD countries, Apergis et al. (2007) examined the relationship between financial depth and economic growth. The results found a positive relationship between financial depth and economic growth.

Kiran *et.al.* (2009) used panel data analysis and Fully Modified OLS (FMOLS) to investigate the relationship between financial development and economic growth for ten (10) emerging countries during the period 1968 to 2007. The authors employed ratio of liquid liabilities to GDP, bank credit to GDP, and private sector credit to GDP as measure of financial development. The authors found that financial development has a positive and statistically significant effect on economic growth.

Al-Aawad and Harb (2005) investigate the relationship between finance and growth using the panel cointegration analysis on ten countries in southern and eastern Mediterranean region over the period 1969-2000. The study found the existence of a long-run association between finance and growth. Moreover, in the short-run the financial sector is unable to support economic growth to a high degree of financial repression and a weak financial sector. In a similar study Ben Salem and Trabelsi (2012) explore the importance of financial development as a determinant of growth in seven SEMCs during the period 1970-2006 by applying the Pedroni's panel cointegration analysis. The paper suggests the existence of a long-run relationship between finance and growth. Besides, very weak support is provided to the supply-side hypothesis. Indeed, economic growth leads to financial sector development. The authors attributed the results of the study to macroeconomic imbalances, weak institutional development and the weakness of the private sector in the southern and eastern Mediterranean region.

Karbo and Adamu (2011), while examining the relationship between financial development and economic growth in Sierra Leone over the period 1970-2008 using the method of principle of components to construct an index for financial development and autoregressive distributed Lag (ARDL) model, the results revealed that financial development exerts a positive and statistically significant effect on economic growth and investment is an important channel through which financial development feeds on economic growth.

In the same vein as Hasan *et al.* (2009), Koetter and Wedow (2010) study the relationship between the quality of the financial system measured by cost efficiency and economic growth, using a sample of 97 German economic planning regions. They suggest that the quality of the financial system contributes to economic growth while the quantity proxied by credit volume is not related to growth. In fact, the result indicates that economic growth requires better but not necessarily more credit.

Arcand *et al.* (2012) examined whether there is a threshold above which financial development stops contributing to economic growth. The study found that in countries with a very large financial sector the relationship between financial depth and economic growth disappears. In addition, the authors found that

credit to the private sector above 80-100% of GDP has a negative impact on economic growth. The authors suggested two possible explanation for this negative impact: first excessive credit growth could lead to high economic volatility and probability of financial crisis and secondly, a high credit volume is generally associate with resource misallocation.

According to study by Cecchetti and Kharroubi (2012) examine the impact of size and growth of the financial system on productivity growth and economic level using a sample of 50 countries observed over the period 1980- 2009. The authors found that financial sector size has an inverted U-shaped effect on productivity growth and a further increase in the size of the financial system contributes negatively to TFP growth. This suggests that more finance is not always better.

3. METHODOLOGY

Data Type and Sources

This study utilized annual time series data for the period 1970-2013 obtained from World Development Indicators (WDI), World Economic Outlook (WEO) as well as Penn World Tables. The data obtained was deflated by GDP deflator to convert them into real values in order to remove inflationary effects.

Model Specification

Following theoretical as well as empirical literature, this study used the ratio of credit to the private sector to GDP as a measure of financial development. In this regard, therefore, the empirical model that was estimated to capture the relationship between financial development and economic growth in Kenya was:

$$\ln Y_t = \beta_0 + \beta_1 \ln CPS_{t-1} + \beta_2 \ln OP_{t-1} + \beta_3 \ln GS_{t-1} + \beta_4 \ln INV_{t-1} + \beta_5 \ln TOT_{t-1} + \beta_6 \ln Y_{t-1} + \varepsilon_t$$

Where $\ln Y_t$ = Real per capita GDP growth.

$\ln CPS_t$ = Ratio of credit to private sector to GDP (Proxy for financial development)

$\ln INV_t$ = Real private Investment

$\ln OP_t$ = Openness to trade (Sum of exports and imports as a ratio of GDP)

$\ln GS_t$ = Government size as a ratio of GDP

$\ln TOT_t$ = Terms of trade

\ln = Natural log

β 's = Parameters to be estimated

ε_t , μ_t and v_t are white noise process.

Justification and Measurement of Variables

Financial Development

In this study, the ratio of private sector credit to GDP was used as a measure of financial development. This measure is considered to be a better measure of financial intermediation to the private sector (Favara, 2003). It is expected that this measure will provide accurate information about the relationship between economic growth and financial development since credit to the private sector productivity is more productive than the credit to the public sector (Akinboade, 1998). In addition, this variable has been found to have a significant positive effect on economic growth than other measures of financial development (Levin *et al.*, 2000).

Real GDP Per Capita

The real GDP per capita growth which is obtained by dividing real GDP by total population. It will be used in this study to capture the aggregate demand conditions in the country. This variable was chosen since it takes into account the effects of population. The data for this variable will be obtained from WDI data base.

Private Investment

Private Investment as a ratio to GDP is a powerful catalyst for innovation, increasing productive capacity as well as creating new opportunities for acquiring new and more efficient techniques of production thus increasing the rate of capital accumulation thereby enhancing the productive capacity of a country. Therefore investment is expected to have a positive effect on economic growth. The data for this variable will be obtained from WDI data set

Government Size.

Government size is another explanatory variable that will be used in this study. Increased government consumption will imply that less resources are channeled to development which is critical for economic growth of country. Hence, the effect of increased government consumption leads to decrease in growth rate in per capita GDP of a country.

Openness

Openness to trade, which is obtained by taking the ratio of sum of exports and imports to GDP) is another variable that will be used. Reducing trade barriers through liberalisation creates an advantage to the export sector and thus improves the current account balance and increases investment incentives. In addition, with import opportunities, the available quality and quantity supply of inputs for production increases with increased competitiveness and productivity. Also the more open an economy is, the more likely it would follow appropriate trade and exchange rate regimes and thus the more it would attract private investment and consequently economic growth. But an abrupt increase in exposure to external competition in certain sectors can make these sectors less attractive as a destination for new capital flows. Hence, on a priori and theoretical grounds, the effect of openness of the economy on private investment is ambiguous.

Terms of Trade

Terms of trade is another important factor that determines economic growth. This variable is usually used as a proxy for external shocks to the economy. A negative terms of trade implies that more per unit of exports are needed per unit of imports. This may worsen the current account deficit, which is an indicator for macroeconomic instability, and can exert negative effect on private investment and consequently on

economic growth. If the worsening terms of trade are generated by an increase in the price of imports this would tend to increase the consumer price index. If it is the effect of reduction in export prices then export earnings will fall, which in turn will tend to reduce investment in that sector.

Analysis Techniques

In an attempt to establish the relationship between economic growth and financial development, an appropriate econometric method is to employ co integration and error correction modeling. Thus, the Autoregressive Distributed Lag (ARDL) approach (bounds test approach to co integration) which was popularized by Pesaran and Shin (1999), and Pesaran *et al.* (2001) was used in this study. The ARDL approach has some important econometric advantages over the Engle-Granger (1987) and maximum likelihood-based approach proposed by Johansen and Juselius (1990) and Johansen (1991) Co integration techniques in the following ways: Firstly, the bounds test does not require pre-testing of the series to determine their order of integration since the test can be conducted regardless of whether they are purely an I(0) or I(1). Secondly, the ARDL modeling incorporates sufficient number of lags to capture the data generating process general to specific modeling framework (Jalil *et al.* 2008). Thirdly, the problem of endogeneity is adequately addressed. In this approach Pesaran and Shin (1999) maintain that modeling ARDL with the appropriate number of lags will address autocorrelation and endogeneity problems. According to Jalil *et al.* (2008), endogeneity is less of a problem if the estimated ARDL model is free of autocorrelation. Fourthly, ARDL has the small sample properties over the Johansen and Juselius (1990) co integration test (Pesaran and Shin, 1999). Therefore, the approach is considered to be very suitable for analyzing the underlying relationship and has been increasingly been used in empirical research in the recent years. Hence, ARDL model can be specified as:

$$\begin{aligned} \Delta \ln Y_t = & \beta_0 + \sum_{i=1}^k \beta_{1i} \Delta \ln CPS_{t-i} + \sum_{i=1}^k \beta_{2i} \Delta \ln OP_{t-i} + \sum_{i=1}^k \beta_{3i} \Delta \ln GS_{t-i} + \sum_{i=1}^k \beta_{4i} \Delta \ln INV_{t-i} + \\ & \sum_{i=1}^k \beta_{5i} \Delta \ln TOT_{t-1} + \sum_{i=1}^k \beta_{6i} \Delta \ln Y_{t-1} + \alpha_1 \ln CPS_{t-1} + \alpha_2 \ln OP_{t-1} + \alpha_3 \ln GS_{t-1} + \alpha_4 \ln INV_{t-1} + \\ & \ln TOT_{t-1} + \varepsilon_{1t} \end{aligned}$$

Where Δ is the difference operator, k is the lag length and ε_t error term which is assumed to be serially uncorrelated. The ARDL technique involves two steps. In the first stage, the null hypothesis of no co integration relationship is defined as $H_0 = \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = 0$ and is tested against the alternative hypothesis $H_1 = \alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq \alpha_5 \neq 0$ of the existence of co integrating relationship. The co-integration test is based on the F-statistic or Wald statistic. The F-test has a non-standard distribution. Thus Pesaran and Pesaran (1997) and pesaran *et al.* (2001) have provided two sets of critical values for co integration test. The lower critical bound assumes that all the variables are I(0), meaning that there is no co integration among the variables, while the upper bound assumes that all the variables are I(1). If the computed F is greater than the upper critical bound, then the null hypothesis will be rejected suggesting that there exists a co integration relationship among the variables. If the F-statistics falls below the lower critical bound value, it implies that there is no co integration relationship.

However, when the F-statistic lies within the lower and upper bounds, then the test is inconclusive. In this context, unit root tests should be conducted to ascertain the order of integration of the variables. This is to ensure that the variables are not integrated of order 2 or higher order. The standard test for unit root is to use

Augmented-Dickey (ADF) t-test statistics and Phillips Perron (PP) test. The selection of the model is based on the Schwartz-Bayesian Criterion (SBC) or Akaike Information Criterion (AIC). The SBC uses the smallest possible lag length and therefore described as the parsimonious model.

When co integrating is confirmed, the long-run and error correction estimates of the ARDL model are obtained. The diagnostic test statistics of the selected ARDL model can be examined from the short-run estimates at this stage of estimation procedure. Similarly, the test of the parameter stability of the model can be carried out. The error correction representation of the series can be specified as follows:

$$\Delta \ln Y_t = \beta_0 + \beta_1 \ln FD + \sum_{i=0}^k \beta_{2i} \Delta \ln OP_{t-i} + \sum_{i=0}^k \beta_{3i} \Delta \ln GS_{t-i} + \sum_{i=0}^k \beta_{4i} \Delta \ln INV_{t-i} + \sum_{i=0}^k \beta_{5i} \Delta \ln Y_{t-i} + \sum_{i=0}^k \beta_{6i} \Delta \ln TOT_{t-i} + \gamma ECM_{t-1} + v_t$$

The variable FD in model is financial development representing the credit to private sector as a ratio of GDP as a measure of financial development while the variable ECM_{t-1} is the error correction term which captures the long-run relationship. Theoretically, the coefficient of ECM_{t-1} variable is supposed to be negative and less than one to indicate the speed of adjustment process to correct deviations (disequilibrium) from the long-run equilibrium path.

Unit Root Test

The bound test to co-integration does not require unit root be conducted. However, in order to ensure the validity of ARDL, it is important to carry out unit-root test. This is to ensure that the variables are not integrated of higher order than I(1). This is because most of the time series variables are non-stationary. Non stationary series refers to a variable that has a mean and variance which is time dependent. This implies that there is no long-run mean to which the series reverts to and the variance goes to infinity as time approaches infinity and theoretical autocorrelations do not decay but, in finite sample correlogram dies out slowly (Enders, 1995). A stationary series on the other hand has a constant mean and variance which implies that a stationary series exhibits mean reversion in that it fluctuates around a constant long-run mean, has a finite variance which is time-invariant and has a theoretical correlogram that decay as lag length increases.

Non Stationarity of time series has been regarded as a problem in econometrics analysis. This is because a non stationary series yields regression results that are robust in terms of diagnostic test statistics even when there is no economic sense in the regression analysis. Regression analysis makes economic sense only for data, which is not subject to a trend. Since virtually all economic data series contain trends, it follows that these series have to be de-trended before any sensible regression analysis can be performed and valid inferences drawn appropriately. A non stationary series can be transformed into stationary series by differencing. The number of differencing a non stationary series to make it stationary is equal to the order of integration or the number of unit root that exist in a non stationary series. While differencing of a non stationary series solves the problem of spurious results, it leads to a loss of important information about long-run properties of the variables. Thus to recover the loss of information due differencing one has to estimate an error correction model which combines both the short-run and long-run properties of the regression model.

To test for unit-root in the variables, there are a number of approaches. However, the most recommended methods are the Augmented Dickey-Fuller (ADF) test and the Phillip-Perron (PP) test. In this study, Phillips-Perron test was used because it is a generalization of the Augmented Dickey-Fuller (ADF) procedure that allows for fairly mild assumptions concerning the distribution of the errors in which case the ADF test assumes that the errors are statistically independent and have constant variance. Hence when using the ADF, one has to ensure that the error terms are identically and independently distributed (iid) and have constant variance. Further, this test takes into account the less restrictive nature of the error process.

Table1 presents unit root test results which reveal that all the variables are non-stationary at their levels. However, after differencing once, all the variables became stationary implying that the variables are integrated of order one. This finding, therefore, supports the use of ARDL bounds test approach to co integration so as to determine the long-run relations among the variables in the model.

Table 1: Results of the Unit Root Tests Using Phillip-Perron (PP)

Variable	Level	First Difference	Order of Integration
$\ln y$	-0.985	-4.993 ***	I(1)
$\ln cps$	-1.345	-6.895***	I(1)
$\ln pi$	-1.512	-6.567***	I(1)
$\ln gc$	-0.218	-5.724***	I(1)
$\ln op$	-0.312	-6.421***	I(1)
$\ln tot$	-1.363	-5.364***	I(1)

Notes: The null hypothesis is that the series is non stationary or the series has a unit root.

*** Significant at 1 percent

Co integration Analysis

Since the variables are integrated of the same order, then the next step is to check if the variables have long-run relationship. In this study, bounds test for co integration was used and the results for co integration analysis between real GDP per capita and the regressors are presented in Table 2. The critical values were obtained from Narayan (2004) which are considered to be suitable for ARDL specification using small sample size as used in this study compared to those developed by Pesaran *et al.* (2001). Due to relatively small sample size and the annual data, a lag length of two (2) was used in the bounds test. Pesaran and Shin (1999) and Narayan and Siyabi (2005) suggest that a maximum of two lags is sufficient.

Table 2: Bounds Test Results for Co integration Relationship

Significance Level	Bounds Critical values		Test statistics	Value	Lag
	I(0)	I(1)			
1%	4.324	5.642	F-test	4.27	2
5%	3.116	4.094			
10%	2.596	3.474			

Source: Critical values were obtained from Narayan (2004), Appendix A1-A3, pp. 26-28.

From the results above (Table 2) the F-statistic of the model is 6.75 which is larger than the upper critical bound (5.642) at 1 percent level of significance. This implies that there exists a long-run relationship among the real GDP per capita and regressors in the model.

Regression Results of the Long-run ARDL Model

Since real GDP per capita is co-integrated with the regressors in the model, then long-run parameters of the ARDL model are estimated and the results presented in the Table 3 below. The long-run ARDL model was estimated using the Akaike Information Criterion (AIC) using a lag of two given the annual nature and relatively short sample properties of the data. The regression results were conducted to capture the effect of credit on private sector as a measure of financial development on economic growth. This was to achieve objective one of this study.

Table 3: Long-run Regression Results Based on AIC-ARDL (1, 0, 2, 2, 0)

Variable	Coefficient	Std. Error	t-Ratio	P-Value
<i>ln cps</i>	2.050***	0.578	3.55	0.001
<i>ln pi</i>	0.515***	0.170	3.03	0.005
<i>ln gc</i>	-0.373***	0.126	-2.97	0.005
<i>ln tot</i>	-2.234***	0.450	-4.96	0.000
<i>ln op</i>	-2.428**	0.955	-2.54	0.016
<i>Cons</i>	24.193***	3.945	6.13	0.000

F-Statistics	= 6.52	Durbin-Watson Statistics	= 2.05598
Prob>F	= 0.000	Multicollinearity Mean Vif	= 1.67
Adjusted R²	= 0.6094	Ramsey Reset Test	= 0.0886
MSE	= 0.83797		

Notes: *** denotes significant at 1 percent, ** significant at 5 percent

As shown in Table 3 above, most of the estimated coefficients have their expected theoretical or hypothesized signs. Specifically, the results show that the coefficient of credit to the private sector (measure of financial development) is appropriately signed (i.e. positive) as predicted by the theory and statistically significant at 1 percent level. It implies that a 1 percent increase in credit, the real GDP per capita will increase by 2.050 percent. This confirms the supply leading hypothesis which says that financial development can lead to economic development of country. This is because financial development facilitates supply of investible funds which influences economic growth through increased investment in the economy. This finding is consistent with those of Levin *et al.* (2000), Alofin and Afangideh (2009) Ayo and Arakeji (2010), and Adelakun (2010). However it contrasts those of Degregorio and Guidotti (1995) Ahmed (2008) and Abubakar (2013) who found a negative relationship between financial development and economic growth.

Consistent with theory, private investment in Kenya has a positive sign on real GDP per capita. The coefficient of private investment is significant at the 1 percent level in the long-run. Specifically, an increase in the level of private investment by 1 percent will induce a 0.515 percent increase in real GDP per capita. This result is consistent with several studies done in Kenya including those of Were (2001), Mwega and Ndung'u(2002), and Glenday and Ryan (2003) in which private investment was found to be a significant determinant of growth in Kenya.

The results also demonstrate that government consumption expenditure as a ratio of GDP has a negative effect on economic growth. This is because when the government increases its expenditure on consumption, then little resources will be left for economic development. In addition, due to huge amount of government borrowing from the domestic market leads to crowding out of private sector which is important in influencing economic growth through private investment. Specifically the result of this study indicates that a 1 percent increase in government consumption leads to 0.373 percent decrease in economic growth. This result is consistent with those of Adelakun (2010).

The estimated coefficient of terms of trade is negative and statistically significant at 1 percent. The result shows that a 1 percent increase in terms of trade will lead to 2.234 percent decrease in real GDP per capita. The size of the estimated coefficient suggests that economic growth in Kenya is highly sensitive to external shocks. This is because Kenya is a net importer country particularly for capital goods and its narrow production as well as export base makes the economy vulnerable to terms of trade shocks. Therefore severe terms of trade can lead to macroeconomic uncertainties and other adverse factors which in turn negatively affect economic performance of the country. This result is similar to those of Ouattara (2004).

The openness of the economy may have exposed the domestic private investors to foreign competition through increased trade liberalization which lead to negative effect on long term real GDP per capita. This may have affected most industries in the non-exportable (i.e. non-tradable) sectors of the Kenyan economy. Hence, a percentage increase in the ratio of trade to GDP (i.e. openness) will reduce economic growth by 2.428 percent as this coefficient is significant at the 5 percent level.

The estimated coefficient of determination (R^2) shows that it is statistically significant at 1 percent as shown by F test. This implies that all the regressors are statistically significant and different from zero. The result indicates that regressors jointly explain 60.94 percent of the variation of the dependent variable which is a relative good fit since it explains the largest variation of the dependent variable. The results reveal that

the model passes all the diagnostic tests namely Ramsey reset test which shows that there is no specification error in the model and Durbin-Watson test rejects the presence of serial correlation. Multicollinearity which arises due to correlation among explanatory variables is absent according to variables inflation factor (VIF).

Short-Run Dynamic Regression Results

Once the long-run co-integrating model has been estimated, the third step is to model the short-run dynamic parameters within the ARDL framework. Thus the lagged value of all level variables (a linear combination is denoted by the error-correction term, ECMt-1) is retained in the ARDL model. The Table 4 below presents the results of the estimated error-correction model of real GDP per capita model for Kenya using the ARDL approach. The model was selected based on the AIC.

Consistent with the long-run results, the coefficient of credit to private sector has the theorized positive impact on real GDP per capita in the short-run. That is, credit to private sector influences economic growth both in the short-run and long-run further confirming the supply leading hypothesis. Specifically, the coefficient is statistically significant at 1 percent level. The result show that a 1 percent increase in credit to private sector leads to 0.054 percent increase in economic growth.

The coefficient of previous real GDP per capita indicates that it has positive and statistically significant effect on the current real GDP growth. Specifically, the results show that a 1 percent increases in the previous increase in real GDP per capita will lead to a 0.974 percent increase in the current real GDP per capita.

The results also demonstrate that private investment has a positive and statistically significant effect on real GDP per capita at 1 percent in the short-run, although the estimated coefficient is quantitatively small (0.026). Specifically, the result indicates that a 1 percent increase in private investment in the short-run leads to 0.026 percent increase in real GDP per capita. Therefore the short-run and long-run results reveal that private investment has been a stimulant for economic growth in Kenya.

The short run result also indicates that real government consumption expenditure has a negative and statistically significant effect on real GDP per capita as at 1 percent. This result is consistent with the long-run result. The finding show that a 1 percent increase in real government consumption leads to 0.026 percent decrease in real GDP per capita. This means therefore that the short-run and long-run results indicate that government consumption has not been favourable for economic growth since less resources are committed to growth to enhance development expenditure.

The effect of terms of trade demonstrates that it has a negative and statistically significant effect on real GDP per capita in Kenya. This illustrates that macroeconomic environment has not been conducive for economic growth due relatively high levels of inflation, high levels of deficits which have had a negative and statistically significant effect on real GDP per capita.

The coefficient of openness of the economy has a negative sign consistent with the long-run results. This implies that the liberalization of the economy has led to competition between foreign investors and domestic investors which has had a negative effect of on domestic investors although it is not statistically significant at any conventional level in the short-run.

Consistent with the long-run results, the short-run dynamic regression model passes all the diagnostic tests carried out in this study. In particular, Ramsey RESET test indicates that there is no specification error in the model, LM test statistics shows that there is no serial correlation in the model as well multicollinearity is not a problem as shown by the value of variable inflation factor (VIF). The estimated coefficient of determination shows that the regressors jointly explain 73.24 percent of the variation in the dependent variable which means it fits the data well. Further, the results reveal that the estimated coefficient of error correction term is appropriately signed (-0.262) and statistically significant at 5 percent, although too low. This means the speed of adjustment is 26.2 percent which is relatively low where only 26.2 percent of disequilibrium is corrected in the first year. The implication is that disequilibrium can persist for a long period of time, hence explaining the significance of the lagged effects on economic growth.

Table 4: Short -Run Regression Results Based on AIC-ARDL (1, 1, 0, 2, 2, 0)

Variable	Coefficient	Standard Error	t-Ratio	P-Value
$\Delta \ln y$	0.974***	0.199	4.90	0.000
$\Delta \ln cps$	0.054***	0.014	3.86	0.001
$\Delta \ln pi$	0.026***	0.008	3.29	0.003
$\Delta \ln gc$	-0.026***	0.008	-3.28	0.003
$\Delta \ln op$	-0.035	0.045	-0.79	0.436
$\Delta \ln tot$	-0.207***	0.040	-5.23	0.000
<i>ecmL1</i>	-0.262**	0.019	-2.35	0.021
<i>Cons</i>	0.105	0.088	1.20	0.238
F-Statistics = 6.40		LM Test Prob > Chi-Square = 0.2381		
Prob > F = 0.0001		Multicollinearity: Mean Vif = 1.67		
R² = 0.7324		Ramsey Reset Test = 0.0604		
MSE = 0.03525				

Notes: *** significant at 1 percent, ** significant at 5 percent

4. CONCLUSION

This study set out to determine empirically the effect of financial development on economic growth in Kenya. In order to achieve these objective, this study used one measures of financial development namely credit to private sector and bank deposit liabilities. By employing modern econometric techniques such as testing for unit root test using Phillip-Perron (1988) so as to avoid the problem of spurious results that arise due non-stationary data. Using bounds testing approach to co integration to estimate the long-run static relationship and short-run dynamic relationship of the model. The findings of this study demonstrated that there exist a co integration relationship among the real GDP per capita and the regressors in the model. The regression result indicate that credit to private sector was used as a measure of financial development, the results revealed that credit to private sector exerts a positive and statistically significant effect on economic growth after controlling for variables that are known to influence economic growth in Kenya. This was true for the long-run and short-run regression results. This implies that financial development is important in influencing economic growth both in the short and long-run. This result indicates that supply leading hypothesis dominates in Kenya. The estimated coefficient of the error correction term in both regressions models was too low implying that the adjustment process towards equilibrium is too slow, hence explaining the significance of lagged terms.

From policy perspective there is need for the government to further carry out reforms in the financial sector both in the short-run and long-run so as to continue to promote economic growth. This means that the policy makers need to make policies that can lead to establishment of financial institutions in the rural areas which have limited access to financial services and create enabling legal environment for efficient allocation of credit to the private sector. This can be done through adoption of reforms to strengthen creditor's rights and enforce commercial contracts as well as reinforcing the operations of the Nairobi Stock exchange which provides both short-term and long-term finance to the deficit economic agents for investment. Further, the availability of credit both in the short-run and long-run has a positives effect on economic growth in Kenya. This suggests that the government should reduce its borrowing so as to make it available to private sector who in turn would borrow and invest leading to economic growth. This reduction can be done through either rationalizing the budget deficit with a view to obviate borrowing or meeting borrowing requirements from external sources.

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