



THE EFFECT OF CREDIT AVAILABILITY TO THE PRIVATE SECTOR ON ECONOMIC GROWTH IN KENYA

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Abstract

This study examined the effect of credit availability to the private sector on economic growth in Kenya. The study adopted explanatory research design that is quantitative. The study was guided by neoclassical endogenous growth theory. The major sources of data were national accounts data from the Kenya National Bureau of Statistics (KNBS) Economic Surveys, Statistical Abstracts and International Financial Statistics (IFS) site for the period 1990-2021. The study used a vector error correction model. The variables were first tested for unit root thereafter Johansen cointegration Technique was used to test the long run relationship of the variables. The study found that there were unit roots at levels but became stationary after first difference. Results showed credit to private sector had a positive significant effect on economic growth ($\beta=0.444$, $p<0.05$) in Kenya. The study recommended widespread use of credit possibilities through efficient banking system and credit mechanism in the economy, resulting in increased economic growth and welfare.

Keywords: Credit Availability, Economic Growth, Gross Domestic Product, Financial Development

INTRODUCTION

A significant portion of credit in Kenya is extended through the banking system, though there are some other institutions such as savings and credit cooperative societies, finance companies and micro finance institutions that provide credit, mainly targeting small and micro enterprises. However, availability of data for the latter is very limited.

Credit is essential for the economy to function well. It funds new investments and allows people to purchase houses, cars, and other items. Of course, excessive lending and borrowing

usually end up in financial crises but, in principle, credit availability is good for economic development. If bank credit to the private sector is about 70 percent of GDP and more, then the country has a relatively well-developed financial system. The amount of credit can even exceed 200 percent of GDP in some very advanced economies. In some poor countries, the credit could be less than 15 percent of GDP. In these countries, firms and households essentially do not have access to credit for investment and various purchases (World Bank, 2022).

Table 1: Banks’ Credit to the Private Sector (% of GDP) between 2017 -2020 for selected countries

Country	2017	2018	2019	2020
Australia	140.54%	139.95%	136.29%	142.29%
China	113.44%	117.77%	124.18%	124.57%
Cyprus	192.42%	136.55%	108.50%	110.23%
Denmark	161.81%	161.26%	160.89%	163.32%
Kenya	33.15%	31.20%	30.83%	32.15%
South Africa	127.24%	118.64%	118.22%	112.00%
U.A.E	81.75%	77.20%	78.30%	88.41%

Source: World Bank (2022)

Figure 1 showed bank credit to the private sector as a percentage of GDP in Kenya for the period 1961-2021. The average value during the period was 21.29 percent with a minimum of 11.8 percent in 1962 and a maximum of 36.70 percent in 2015 (World Bank, 2022). At the current value of 32.15 percent of GDP, bank credit to the private sector still remains relatively low by international standards. Compare that to South Africa, where banks’ credit to the private sector (percentage of GDP) was 112.00 in 2020 with the highest (lowest) value for the past 50 years of 142.42 (50.08) recorded in 2007 (1980.00).

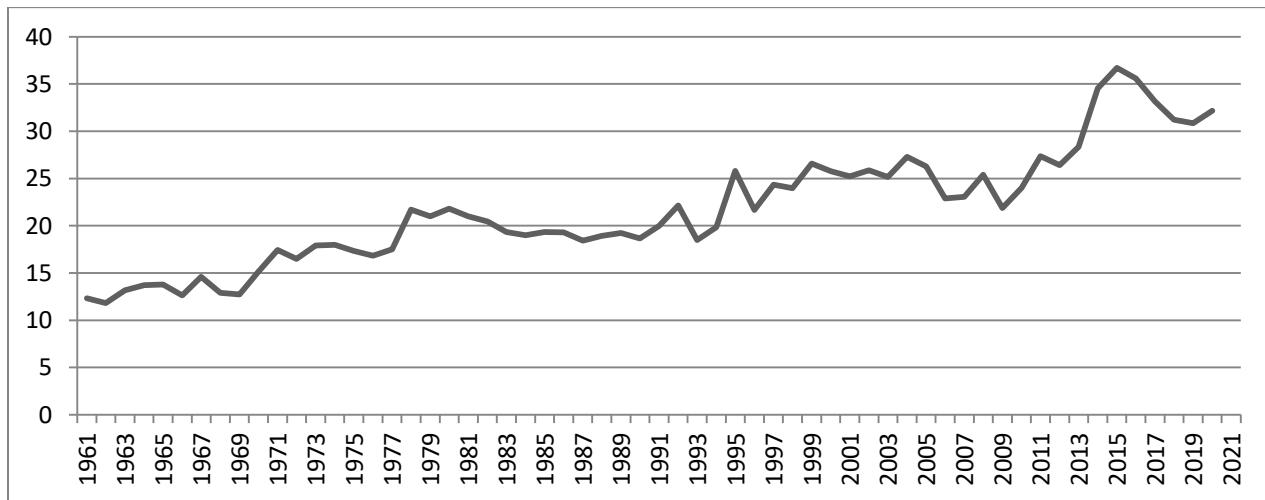


Figure 1: Bank Credit to the Private Sector as a % of GDP in Kenya for the period 1961-2021

Source: World Bank (2022)

Domestic credit to private sector by banks refers to financial resources provided to the private sector by other depository corporations (deposit taking corporations except central banks), such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries these claims include credit to public enterprises (World Bank 2022).

To reduce the cost of credit and increase credit access and deposits in Kenya, the Banking (Amendment) Act, 2016 came into effect on September 14, 2016. It set the maximum lending rate at no more than four per cent above the Central Bank base rate; and the minimum interest rate granted on a deposit held in interest earning account to at least seventy per cent of the same rate. Emerging evidence show that commercial banks have adjusted their business models resulting in declining financial intermediation, directed their lending in favour of large corporate borrowers and Government thereby shunning small and risky borrowers, and reduced transparency. Although the banking sector remains resilient, evidence point towards reduced competition and decline in profitability. The impact on economic growth has also begun to show, though this may be realized in the long run. In March 2018, the Central Bank of Kenya indicated that the cap had probably cut 2017's estimated economic growth rate by 0.4 percent because it throttled credit to small and medium businesses. CBK (March 2018).

In June 2018, the Finance Minister Henry Rotich proposed repealing the interest cap, a move cheered by bankers but rejected by lawmakers. The repeal process has however been initiated. (Reuters March 2019).

THEORETICAL LITERATURE REVIEW

The existence of a relationship between finance and growth seems incontestable as many researchers have worked on the issue and positively confirmed it. What is debatable is the direction of causality between finance and growth. The direction of causality has been described by Patrick (1966) as supply-leading and demand-following theories. This postulation was reinforced by Mckinnon (1988).

When causal relationship runs from financial development to growth, it is termed supply-leading because it is believed that the activities of the financial institution increase the supply of financial services which creates economic growth. Similarly, when the growth within the economy results in increase in the demand for financial services and this subsequently motivates financial development, then it is termed demand-following theory.

The proponents of this theory believe that the activities of the financial institutions serve as a useful tool for increasing the productive capacity of the economy. They believe that countries with better developed financial system tend to grow faster. As previously stated, early

economists like Schumpeter (1911) have strongly supported the view of finance led causal relationship between finance and economic growth. Subsequently, several researchers have supported the findings.

This study is anchored on the supply-leading following theory of the financial deepening–growth nexus. According to Agu and Chukwu (2008), the leading proponent of the supply-leading theory is Schumpeter (1911), supported by Calderon and Liu (2003), Gurley and Shaw (1967), King and Levine (1993), and McKinnon (1973), among others. The theory asserts that financial development has a positive effect on economic growth.

Accordingly, the effect runs from financial development to economic growth and it is caused by an improvement in the efficiency of capital accumulation or an increase in the rate of savings as well as the rate of investment. One of the most significant effects of the supply-leading approach is that, as entrepreneurs have new access to the supply-leading funds, their expectations increase and new horizons (or possible alternatives) are opened up, thereby making the entrepreneur “think big”.

The existence and development of the financial markets brings about a higher level of saving and investment and enhance the efficiency of capital accumulation. This theory contends that well-functioning financial institutions can promote overall economic efficiency, create and expand liquidity, mobilize savings, enhance capital accumulation, transfer resources from traditional (non-growth) sectors to the more modern growth inducing sectors, and also promote a competent entrepreneur response in these modern sectors of the economy.

EMPIRICAL LITERATURE REVIEW

Uddin, Sjö and Shahbaz (2013) looked at the relationship between financial development and economic growth in Kenya over the period of 1971-2011. The study was based on a Cobb-Douglas production augmented by incorporating financial development. The study established that, in the long run, development of financial sector, measured by domestic credit provided by banking sector; domestic credit to private sector; money plus quasi money (M2) as a ratio of money (M1) had a positive impact on economic growth. In the same vein, Koetter and Wedow (2010) studied 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 suggested that the quality of the financial system contributed to economic growth while the quantity proxied by credit volume was not related to growth. In fact, the result indicated that economic growth requires better but not necessarily more credit.

Dejene Mamo Bekana investigated whether developing financial market leads to growth of the Ethiopian economy. The study engaged Vector Autoregressive model and cointegration

approach. Johansen cointegration approach confirmed negative and insignificant coefficient in the long run for the financial development indicators. In the short run, the study found a strong substantiation that internal tribute to the private segment, extent of trade openness, monetization and the spending by the government are the major determinants of economic growth. The study concluded that it was economically wise to boost the activities of financial department in order to grow the Ethiopian economy.

In an empirical analysis of the impact of agriculture credit on economic growth in Nigeria, Enoma (2010) finds credit and interest rate to be some of the important factors in influencing economic growth in Nigeria. Osuji and Chigbu, (2012) investigated the impact of financial development variables on economic growth in Nigeria using three variables: gross domestic product (GDP), money supply (M2), and credit to the private sector (CPS). Granger causality testing and the Error Correction Method (ECM) were employed on time series data from 1960 to 2008 and the results revealed that Money Supply (MS) and Credit to Private Sector (CPS) are positively related to economic growth of Nigeria.

In another study, Nkoro and Uko, 2013 empirically examined the financial sector development–economic growth nexus in Nigeria. In doing this, the study employed the cointegration/Error Correction Mechanism (ECM) with annual datasets 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 and real gross domestic product growth was used to proxy economic growth. The empirical results show that there is a positive effect of financial sector development on economic growth in Nigeria. However, extending credit to the private sector and financial sector depth are ineffective and fail to accelerate growth. This signifies the effect of government borrowing, the problem of huge non-performing loans, and a deficient legal system on the private sector. These severely limit the contribution of Nigeria's financial sector development to economic growth.

Arcand et al. (2012) examined whether there was a threshold above which financial development stops contributing to growth. The study posits that in countries with a very large financial sector the relationship between financial depth and economic growth disappears. Credit to the private sector above 80-100 percent of GDP has a negative impact on economic growth. Arcand et al., (2012) suggest two possible reasons for this negative impact: excessive credit growth could lead to high economic volatility and probability of financial crisis and high credit volume is generally related to potential resource misallocation.

Dr. B.C. Emecheta and R. C. Ibe (2014) in their study to examine the impact of bank credit on economic growth in Nigeria. Their study used time series data over the period 1960 to

2011. The analysis was based on vector autoregressive (VAR) econometric model for time series data in which current GDP was the dependent variable and bank credit to private sector and broad money were used as financial indicator and financial depth respectively. They found out that there was a significant and positive relationship existed between bank credit to the private sector and gross domestic product (GDP) and the direction of causality is from gross domestic product to bank credit to private sector.

Olowofeso et al., (2015) investigated the impact of private sector credit on economic growth in Nigeria. The study used quarterly time series collected since 2000 to 2014 and used the Gregory and Hansen cointegration test in the analysis. This test accounted for various structural breaks and problem of endogeneity. Ordinary least squares technique was engaged in the estimation model. Among the study findings, private sector credit on output recorded a positive and statistically significant coefficient on economic growth.

Lidiema (2018) analyzed the effect of government domestic borrowing on private investment in Kenya. The study employed the Gross fixed capital formation as a dependent variable. The study used time series data that were collected since 1975 to 2014. The independent variables of the study included: Domestic debt (credit to private sector), financial development, gross domestic savings, real interest rate and GDP per capita. The study used the Autoregressive distributed lag model to answer the hypothesis. Stability functions were also tested by way of CUSUM and CUSUMSQ. The study findings showed that Domestic Debt has a negative and significant relationship with Gross fixed capital formation even though this relationship reduces in the long run. Financial Development that was proxied as Domestic credit to private sector was found to have positive and significant relationship with gross fixed Domestic capital formation in Kenya in short and long run respectively.

Gbenga, James, & Adeyinka, (2019) studied the determinant of private sector credit and its implication on economic growth in Nigeria. The study used the time series data which was found from Central Bank of Nigeria statistical bulletin. In order to answer the stated objectives, the study used the Simple regression analysis. The study results established that the determinant of credit supply equation 1 that there was significant relationship between Total credits to private sector and money supply in Nigeria. In addition, the study found out that the Private Sector Credit and Economic Growth Equation two that there existed a statistically significant relationship between private sector credit and economic growth in Nigeria.

Amoo, Eboreime, Adamu, & Belonwu, (2017) evaluated empirically the local conditions and policy environment that influence the absorptive capacity of credit in the Nigerian economy. The study used quarterly time series data that were collected from 1993 to 2013 and used fully modified least squares. The outcomes of the study revealed that credit promote economic

growth, even when trade openness, monetary policy, investment climate and infrastructure are low. In addition, the composite local condition index analysis established that private sector credit increased economic growth when local conditions were conducive.

Igwebuike, UDEH, & Okonkwo, (2019) investigated the effects of financial deepening on the economic growth of Nigeria (1981 to 2016) through two of the basic arms of the financial industry (Insurance companies and Banking Industry). The study utilized time series data that obtained from Central Bank of Nigeria statistical bulletin and Global Financial Development bulletin, 2017 as provided by the World Bank. The study utilized an ex-post facto research method. The tool of analysis that was adopted by the study was Ordinary Least Squares. The findings of the study was that insurance industry premium to Gross Domestic Product had a positive and insignificant effect while credit to private sector by commercial banks to Gross Domestic Product has positive and significant effect on economic growth in Nigeria. Using these study findings, it was established that credit to private sector by commercial banks to Gross Domestic Product has significant effect whereas insurance industry premium to GDP had no significant effect on economic growth in Nigeria.

Branch, Cooper, & Moxey, (2018) explored the causal relationship between economic growth, Government expenditure, and private sector credit, given that for the Bahamian economy, historical trends revealed that periods of either economic boom or downturn are mirrored by changes in credit. The study employed the ordinary least squares method in examining the relationship between the variables, Johansen co-integration test and Granger Causality test. From the regression analysis, the study discovered that economic growth and Government expenditure had a positive and significant effect on credit to the economy. The study findings suggested that for The Bahamas, an expansion in the economy is go together with growth in private sector credit, therefore adding to more robust economic development.

Murungi, & Okiro, (2018) surveyed the impact of government debt on economic growth through extensive review of relevant theoretical and empirical literature in Kenya. The main theories that guided the study were the Adolph Wagner's law of increasing state activity, the debt overhang theory, crowding out theory and the Ricardian equivalence theory. The main objective of the critical literature review was to review the literature done on the impact of government debt on economic growth. The larger results from the reviewed literature reviewed on government debt revealed that there was an influence of government debt on economic growth; some exhibited a positive economic growth whereas others indicated a negative economic growth.

Samargandi, & Kutan, (2016) explored cross-country evidence of the effects of private credit shocks on economic growth. The study employed a Global Vector Autoregressive model,

which allowed capture the dynamics of this relationship in a multi-country setting, and link countries through bilateral international trade. Given the vital role that Brazil, Russia, India, China and South Africa play in the world economy, the study focused on whether private credit shocks in one BRICS member state affects economic growth in the other BRICS. From the analysis, the study found evidence that credit to the private sector has a positive spillover effect on growth in some of the BRICS countries, particularly in China and India.

Puatwoe, & Piabuo, (2017) investigated the impact of financial development on Economic growth by use of time series data in Cameroon. This examination was conducted using three mutual indicators of financial development that is: broad money, deposit/GDP and domestic credit to private sector. The study used the Auto Regressive Distributive Lag estimation method and the conclusion was that there exist a short-run positive relationship between monetary mass, government expenditure and economic growth, a short run negative relationship between bank deposits, private investment and economic growth equally exists. Nevertheless, in the long run, all determinants of financial development showed a positive and significant impact on economic growth. The study therefore suggested the presence of a positive and long-term impact of all the pointers of financial development on economic growth through bound test.

Hassan, & Kalim, (2017) studied the impact of stock market and banking sector development on economic growth in Pakistan. The study used the secondary data that were collected since 1989 to 2013. The results of this empirical study represent that among the proxies of banking sector development only credit to private sector leaves positive and significant effect on economic growth in case when it interacts with all the three proxies of stock market development. Furthermore, the study discovered that stock market and banking sector development respectively are together necessary to promote economic growth in low human developed nations.

Bist, (2018) investigated the long-run relationship between financial development and economic growth in countries with low levels of income and used panel unit root and panel cointegration analysis in 16 selected countries for the period spanning from 1995 to 2014. To analyze the long-run relationship the study employed a fully modified and dynamic OLS models. The study findings revealed that there exists a cross-sectional dependence across the countries. The Pedroni's panel cointegration analysis provides clear support for the hypothesis that there exists a long-run cointegrating relationship between financial development and economic growth. The results for the long-run panel estimates showed that financial development positively and significantly influences economic growth. Furthermore, the results

of the study showed the positive impact of financial development on economic growth in the majority of the countries.

Nzomoi, Were, & Rutto, (2012) investigated the influence of access to bank credit on the economic performance of important economic sectors using sectoral panel data for Kenya. The study found a positive and significant impact of credit on sectoral gross domestic product measured as real value added. Nonetheless, the amount of the impact is smaller once factors such as the labour employed and past economic performance of the sectors are taken into account.

Mbate (2013) estimated a dynamic cross-country model and evaluated the influence of domestic debt on economic growth and private sector credit in a panel of 21 sub-Saharan African countries over the period 1985 to 2010. The study used the generalized method of moments in the analysis and the findings established a non-linear connection between domestic debt and economic growth. Furthermore, domestic debt was found to crowd out private sector credit negatively, discouraging capital accumulation and the growth of private sector.

METHODOLOGY

This study followed the steps of Jalil, Wahid and Shahbaz (2010) and Waiyaki (2013) and adopted the endogenous growth model. Proponents of the endogenous growth models such as Pagano, (1993), hold that capital accumulation can increase the long run trend rate of economic growth. However, to permit capital accumulation it is necessary to increase the savings ratios. Thus, a well-functioning financial system encourages investment, promotes technological innovation that ultimately leads to economic growth through savings. To capture the potential effects of financial deepening on economic growth, consider the simplest endogenous growth model: the “AK” model, where aggregate output is a linear function of the aggregate capital stock

$$Y_t = AK_t \dots \dots \dots 1$$

Where, Y_t is output at time t, A is total factor productivity and K_t is the measure of real capital stock.

The AK model can be derived assuming that the population is stationary and that only capital stock is subject to constant returns to scale. Conventionally to estimate the capital stock, K_t is measured as the previous period amount of capital (K_{t-1}) corrected for depreciation plus gross investment in current period (I_t). Thus, with capital depreciating at the rate δ , the gross investment becomes:

$$I_t = K_{t+1} - (1 - \delta)K_t \dots \dots \dots 2$$

In a closed economy with no government, capital market equilibrium requires that Savings equals investment. However, Pagano (1993) assumes that a proportion of $1 - \theta$ is lost during the process of financial intermediation and thus the fraction (θ) of total savings can be used to finance investment. Therefore, the savings-investment relationship can be written as:

$$\theta S_t = I_t \dots\dots\dots 3$$

From equation (1), we introduce the growth rate at time $t+1$ which is

$$g_{t+1} = \frac{Y_{t+1}}{Y_t} - 1 = \frac{K_{t+1}}{K_t} - 1 \dots\dots\dots 4$$

Using eq. (2) and dropping the time subscripts, the steady-state growth rate can be written as, the steady state growth rate of output becomes:

$$g_y = \frac{AI}{y} - \delta = A\theta S \dots\dots\dots 5$$

The capital market equilibrium condition (3) has been used and denoted the gross saving rate S or $\frac{S_t}{Y_t}$. Thus,

$$S = \frac{S_t}{Y_t} = \frac{S_t}{AK_t} \dots\dots\dots 6$$

Equation 5 expresses that economic growth depends on the total factor productivity (A), the efficiency of financial intermediation (θ), and the rate of savings(S). Financial deepening is assumed to affect growth through the amount of savings put in investment. Wurgler (2000) as quoted by Ngugi, Amanja and Maana (2012) shows that even if financial development does not lead to higher levels of investment, it allocates existing investment better and therefore promotes economic growth. Importantly, when the rate of depreciation is assumed to be constant, economic growth depends on financial deepening. From the above Y_t can be expressed as follows:

$$Y_t = \beta_0 + \beta_1 \frac{S_t}{Y_t} + \varepsilon_t \dots\dots\dots 7$$

Where, Y_t is the natural logarithm of real GDP of Kenya and $\frac{S_t}{Y_t}$ the natural logarithm of savings to nominal GDP that proxies financial deepening ($\frac{S_t}{Y_t} = FD$). β_0 is the intercept, β_1 is the coefficient that gives the effects of financial development on economic growth while ε_t is the error term.

Equation 7 can be rewritten as:

$$GDP = \beta_0 + \beta_1 FD_t + \varepsilon_t \dots\dots\dots 8$$

In equation (8), FD is extended to include each alternative measure namely: Ratio of private sector credit to GDP (CPS), ratio of commercial bank deposits to GDP (CBD), ratio of broad money stock to GDP (BMS), depth of credit information (CINF), lending interest rate (INR) and the ratio of stock market capitalization to GDP (SMC).

The ordinary least square (OLS) regression is the estimation technique employed in this study. The choice of ordinary least square method was due to its simplicity. The researcher however adopted a model by Ohwofasa and Aiyedogbon (2013), which was modified by the researcher to suit the present research.

In order to establish the effect of financial deepening on economic growth in Kenya, the study attempts to isolate key variables underpinning the study. The dependent variable is Gross Domestic Product Growth rate and five covariates: bank credit to the private sector; commercial bank deposits; Broad money stock; banking sector assets and stock market capitalization.

$$Y = f(x_1, x_2, x_3, x_4, x_5)$$

Where, Y is GDP growth rate, and x_i , $i = 1, 2, 3, 4, 5$ represent the covariates bank credit to the private sector; commercial bank deposits; Broad money stock; depth of credit information, lending interest and stock market capitalization.

The model is as specified below:

$$GDPGR_t = a_0 + a_1CPS_t + a_2CBD_t + a_3BMS_t + a_4CINF_t + a_5SMC_t + a_6INR_t + U_t \dots \dots \dots 9$$

Where: GDPGR is Gross Domestic Product Growth Rate, CPS is Ratio of private sector credit to GDP, CBD is ratio of commercial bank deposits to GDP, BMS is ratio of broad money stock to GDP, CINF is the depth of credit information, INR is the lending interest rate and SMC is the ratio of stock market capitalization to GDP. U is Error term and a subscript 't' for time series.

This model being OLS is preferred because it is easy to understand, simple in its computational procedure and parameter estimation. It also possesses the properties of best linear unbiased estimator (BLUE).

The major sources of data to be used in the study was National Accounts Data on the variables obtained from the KNBS Economic Surveys and Statistical Abstracts and International Financial Statistics (IFS) site.

This study makes use of annual data spanning 1990 to 2021 on the following macroeconomic variables: gross domestic product growth rate (GDPGR), credit to private sector (CPS), commercial bank deposits (CBD), broad money stock (BMS), depth of credit information (CINF), lending interest rate (INR) and stock market capitalization (SMC).

The period 1990-2021 was chosen because it will generate a large sample of 32 data points, which are necessary for a normal distribution and provide adequate information on the subject under study. The period is also recent enough to be used for inference on current and future trends.

EMPIRICAL RESULTS

Unit root results

Table 2: Stationarity Using Philip and Perron

Variable	ADF test statistic		Critical values			Conclusion
	T	P	1%	5%	10%	
GDP	2.030	0.9987	-3.709	-2.983	-2.623	Nonstationary
CPS	-1.839	0.3613	-3.709	-2.983	-2.623	Nonstationary
CBD	-1.752	0.4047	-3.709	-2.983	-2.623	Nonstationary
BMS	-3.418	0.0103	-3.709	-2.983	-2.623	Stationary
CINFO	-4.466	0.0002	-3.709	-2.983	-2.623	Stationary
LINT	-1.343	0.6091	-3.709	-2.983	-2.623	Nonstationary
SMC	-2.750	0.0658	-3.709	-2.983	-2.623	Nonstationary

First difference						
Variable	T	P	1%	5%	10%	
GDP	-.3147	0.0233	-3.716	-2.986	-2.624	Stationary
CPS	-5.660	0.0000	-3.716	-2.986	-2.624	Stationary
CBD	-3.526	0.0073	-3.716	-2.986	-2.624	Stationary
BMS	-6.202	0.0000	-3.716	-2.986	-2.624	Stationary
CINFO	-8.310	0.0000	-3.716	-2.986	-2.624	Stationary
LINT	-5.517	0.0000	-3.716	-2.986	-2.624	Stationary
SMC	-6.522	0.0000	-3.716	-2.986	-2.624	Stationary

Note: the Mackinnon critical values at levels **1%=-3.709**, **5%=-2.983** and **10%=-2.623**
Mackinnon critical values at first difference **1%=-3.716**, **5%=-2.986** and **10%=-2.624**

The results in table 2 indicated that both broad money stock and depth of credit information were stationary at levels while the rest had unit root. Upon first difference, all the variables were stationary.

Co-integration Results

According to Cameron and Trivedi (2005), there are two approaches normally used in determination of Johansen cointegration; trace statistic and maximum eigenvalues.

Table 3: Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.924767	220.8402	125.6154	0.0000
At most 1 *	0.777278	143.2251	95.75366	0.0000
At most 2 *	0.738539	98.17024	69.81889	0.0001
At most 3 *	0.600799	57.92619	47.85613	0.0043
At most 4 *	0.513791	30.37748	29.79707	0.0428
At most 5	0.220603	8.744008	15.49471	0.3896
At most 6	0.041353	1.266962	3.841466	0.2603

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Table 3...

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.924767	77.61510	46.23142	0.0000
At most 1 *	0.777278	45.05489	40.07757	0.0127
At most 2 *	0.738539	40.24405	33.87687	0.0076
At most 3	0.600799	27.54871	27.58434	0.0505
At most 4 *	0.513791	21.63348	21.13162	0.0425
At most 5	0.220603	7.477046	14.26460	0.4344
At most 6	0.041353	1.266962	3.841466	0.2603

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Based on Johansen's maximum likelihood procedure, cointegration test results presented in Table 3 indicates there is at most 4 cointegrating relationship as suggested by trace statistic (*) and maximum eigenvalues among the variables. This confirms long run relationship among the variables and prompts estimation of VEC model (the restricted VAR).

Vector Error Correction Model

The results for the short run and long relationship are presented here.

Short Run Relationship

Table 4: Short Run Relationship

Equation	parameters	RMSE	R-sq	Chi2	P > chi2	
	9	0.133	0.4243	15.474	0.0787	
	Coef.	Std.Err	z	p	[95% CI]	
Ce1	0.041	0.004	10.00	0.000	0.039	0.122
LGDP	0.116	0.257	0.45	0.653	-0.389	0.620
CPS	-0.002	0.020	-0.11	0.910	-0.041	0.036
CBD	0.001	0.011	0.12	0.901	-0.021	0.024
BMS	-0.010	0.021	-0.47	0.640	-0.052	0.032
CINF	0.031	0.044	0.70	0.485	-0.055	0.116
INR	0.0002	0.009	0.02	0.984	-0.017	0.017
SMC	0.004	0.005	0.72	0.469	-0.006	0.014
Constant	0.053	0.036	1.45	0.146	-0.018	0.123

According to results presented in Table 4, the coefficient value of ce1 was -0.041 and significant at 0.000. This confirms that a co-integrating relationship between the study variable during the study period, and Hussain (2009) argued that this implies that there was an error correction that gradually corrects the endogenous variables to a long run relationship through

series of partial short run adjustments. It further indicated that indicating that any form of short-term fluctuations between the credit to private sector, commercial bank deposits, broad money stock, depth of credit information, lending interest rates and stock market capitalization gave rise to a stable and a long run economic growth. Therefore, this presence of long run relationship and partial adjustments prompt the use of Vector Error Correction Model (VECM) to test the hypotheses of the study. VECM also referred to as restricted VAR (it is restricted because of the lags selection due to presence of cointegration) is part of VAR where there is cointegration (Greene, 2008). The magnitude of the error term (.0412) coefficient indicates the speed of adjustment with which the variables converge overtime and its reciprocal ($1/0.0412=24.27$) shows it takes approximate 24 years these partial adjustments take to come back to equilibrium (Lutkepohl, 2005; Hamilton, 1994; Floyd, 2005 and Tsay, 2010).

Long Run Relationship

Table 5: Long Run Relationship

Source	SS	Df	MS	No. of Obs		
Model	20.145	6	3.357	F(6,25)	=	18.16
Residual	4.623	25	0.185	P >F	=	0.000
Total	24.768	31	0.799	R-sq	=	0.8133
				Adj R-sq	=	0.7605
				RMSE	=	0.4300

Johansen Normalization Restriction Imposed

Ce1	Coef.	Std. Err	z	P >z	[95% CI]	
LGDP	1	.	.	.	.	.
CPS	0.4437	0.0394	11.27	0.000	0.3666	0.5209
CBD	-0.3678	0.0240	-15.30	0.000	-4150	-0.3207
BMS	-0.3583	0.0405	-8.86	0.000	-0.4376	-0.2790
CINF	-1.7152	0.0992	-17.29	0.000	-1.9097	-1.5207
INR	-0.0626	0.0101	-6.19	0.000	-0.0824	-0.0428
SMC	-0.1477	0.0094	-15.75	0.000	-0.1661	-0.1293
Constant	24.7634	.	.	.	.	.

Results presented by Table 5 are for the long run relationship. It shows that credit to private sector ($\beta = 0.4437, p = 0.000$) positively and significantly affected economic growth. However, commercial bank deposits ($\beta = -0.3678, p = 0.000$), broad money stock ($\beta = -0.3583, p = 0.000$), depth of credit information ($\beta = -1.7152, p = 0.000$), lending interest rates ($\beta = -0.0626, p = 0.000$) and stock market capitalization ($\beta = -0.1477, p = 0.000$) gave a negative and significant effects on economic growth in the long run in Kenya over the study period. The root means square error (RMSE) is small (0.4300) and significance of probability >

$F=0.000$ meaning the model was fit for the data used. RMSE serves to aggregate the magnitudes of the standard errors in predictions for various times into a single measure of predictive power. RMSE is a measure of accuracy in comparing the forecasting errors of different models for a dataset and not between datasets. The value for R square is 0.8133 meaning that the variation of credit to private sector, commercial bank deposits, broad money stock, depth of credit information, lending interest rates and stock market capitalization explained 81.33 percent effects on the economic growth in Kenya.

The relationship between financial deepening and the economic growth can be illustrated by one cointegrating relationship as shown below.

$$ECO = 24.7634 + 0.4437_{CPS} - 0.3678_{CBD} - 0.3583_{BMS} - 1.7152_{CINF} - 0.0626_{LINTRT} - 0.1477_{SMC}$$

Where, ECO-economic growth, CPS-credit to private sector, CBD-commercial bank deposits, BMS-broad money stock, CINF-depth of credit information, L-INTRT-lending interest rates and SMC-stock market capitalization.

The hypothesis stated as Bank credit to the private sector does not significantly affect economic growth in Kenya. Results from vector error correction model presented in Table 5 show a positive and significant effect of credit to private sector on economic growth by the magnitude of $\beta = 0.4437$, ($p = 0.000 < 0.05$). This implies that the hypothesis was rejected in favor of alternative. This indicated that for a unit increase in credit to private sector, economic growth was increased by 44.37 percent.

INTERPRETATION AND CONCLUSION

It was hypothesized that credit to private sector is not a significant determinant of economic growth in Kenya. However, the results of the study rejected the hypothesis. The results were positive and statistically significant. The coefficient was 0.4437 and the probability value was 0.003. This implied that an increase of credit to private sector by one percent will lead to an increase in economic growth by 44.37 percent.

The results of the study are also supported by the supply-leading hypothesis, which posits that financial firms serve as tools for increasing an economy's productive size. The theory further suggest that financial institutions, mobilize money, deploy them appropriately, ameliorate the challenge of information asymmetry, monitor the development of enterprises' production, control potential risks, and concentrate on reducing the interest rate. The Laffer curve theory states that the relationship between any kind of credit or debt and economic growth is not linear. Initial levels of credit, according to this theory, spur economic growth by increasing resources available to finance budget deficits. Conversely, this theory explains further that when a

country's debt stock grows, it develops a debt burden, and economic growth tends to slow down.

A useful extension of the present study would be to empirically examine the effect of credit availability to the private sector on unemployment and poverty eradication in the context of Kenya.

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