

The Effect of Stock Market Capitalization on Economic Growth in Kenya

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Abstract

This study examined the effect of stock market capitalization 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 that stock market capitalization had a negative and significant long run relationship on economic growth in Kenya ($\beta = -0.148$, $p < 0.05$). The capital market authority may relax the listing requirements to enable more firms get listed in Nairobi Securities Exchange to strengthen growth stock markets capitalization and therefore spur economic growth.

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

JEL Codes: GO, G1, G2, G3, F3

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1. Introduction

Economic growth is the increase in the capacity of an economy to produce goods and services from one period of time. It occurs when the productive capacity of a country increases. As an aggregate measure of total economic production for a country, it represents the market value of all final goods and services including personal consumption, government purchases, private inventories, paid-in construction costs and the foreign trade balance. There are two main measures instituted and used to measure economic growth. The first is Gross national product (GNP) that computes the total value of goods and services produced by all nationals within and

outside the country over a given period of time, usually one year, and the second is Gross Domestic Product (GDP) considered as the broadest indicator of economic output and growth. It is designed to measure the value of production of those activities that fall within the boundary of the national accounts system. GDP measures economic growth in monetary terms and looks at no other aspects of development. GDP can be expressed in nominal terms which include inflation or in real terms which are adjusted for inflation. Short term GDP is the annual percentage change in real national output. Long term GDP is the increase in trend or potential GDP. In order to compare countries of different population sizes, GDP per capita is generally used.

Other possible measures of economic growth include total factor productivity, factors of production such as technological change, human capital termed the Schumpeterian approach, other measures of growth ranges from real per capita GDP; the rate of physical capital accumulation etc (Odedokun 1998; King & Levine 1993; Allen & Ndikumama 1998). According to Bencivenga & Smith (1991), consumption goods in the economy are produced from capital and labour. An entrepreneur who owns the capital invested in the business uses it to employ labour in order to produce goods. This result in the production function made up of labour and capital which can be used in estimation.

Market capitalization is defined as the aggregate market value of the outstanding shares of stock of a company. Generally known as "market cap," it is found by multiplying the total number of a company's outstanding shares by the current market price of one share.

2. 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.

Market capitalization is defined as the aggregate market value of the outstanding shares of stock of a company. Generally known as "market cap," it is found by multiplying the total number of a company's outstanding shares by the current market price of one share. Mukundi *et al.*, (2013)

did an investigation on the association amongst financial deepening and gross domestic product in Kenya. The study used time series data for a period spanning from 1993 to 2012. The growth of GDP was used as a dependent variable while the independent variables were the properties of financial market improvement and deepening, namely, market capitalization, liquid liabilities, private credit from banks and stock turnover. The study used the multiple regression model regressing GDP growth rate against market capitalization, liquid liabilities, private credit from banks and stock turnover. Examination was also carried out at 95% confidence interval. The significance of the persistent term of the regression and the coefficient of every of the explaining variables was established by means of t-tests although the significance of the entire regression was analyzed by means of the F-test. The extent to which the difference in independent variables expounded the variation in GDP growth was tested using the coefficient of determination. The research established that the economy would still grow at 6.18% independent of market capitalization, liquid liabilities, private credit from banks and stock turnover.

Nwanna & Chinwudu (2016) examined the effect of financial deepening on economic growth in Nigeria from 1985 to 2014. They aimed at revealing the impact of stock market and bank deepening variables such as money supply, market capitalization, private sector credit and financial savings have on economic growth of Nigeria. The ordinary least square (OLS) econometric technique was adopted. The result of the analysis reveals that both bank based and stock market financial deepening proxies has significant and positive effect on economic growth and that the banking sector and stock market in Nigeria has an important role in the process of economic growth.

Cecchetti and Kharroubi (2012), examined 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. They find 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 suggested that more finance is not always better.

Nguena and Abimbola (2013) investigated the implication of financial deepening dynamics for financial policy coordination in the West African Economic and Monetary Union sub-region (WAEMU). They adopted a hypothetical-deductive theoretical approach and an empirical investigation in both static and dynamic panel data econometrics. The study recommended the implementation of a financial policy directed at increasing the level of savings rate, GDP per capita growth rate and density. It also recommended the reduction of the level of reserves in the sub-region.

Quaidoo, (2011) examined the relationship between stock market capitalization and economic growth in Ghana and used quarterly time series data from 1991 to 2006. The study engaged Johansen multivariate cointegration method and vector error correction model to investigate the long-run relationship and the short-run dynamics among the variables. Furthermore, the standard Granger-causality test was carried out to analyze the causal relationship between the variables.

The study discovered that real economic growth, real stock market liquidity and real gross domestic investment have significant positive influence on the development of the Ghana Stock Exchange. The Granger-causality test results showed that economic growth points to stock

market capitalization (stock market development) without any feedback supporting “demand following” hypothesis.

Nzomoi, & Ikikii, (2013) conducted an evaluation of the stock market development effects on economic growth in Kenya, using the gross domestic product and the two key measures of stock market – capitalization and trade volume. The study findings indicated that variables satisfied apriori expectations, are statistically significant, and positively correlated with feed-back effects. Capitalization, trade volume and economic growth are highly positively correlated in Kenya, with capitalization and trade volume jointly explaining 91% of the variations in the economic growth, over the period under study. Further, the study discovered a positive relationship between stock market capitalization and economic growth in Kenya.

Bayar, Kaya, & Yildirim, (2014) examined the relationship between stock market development and economic growth in Turkey during the period 1999-2013 by using Johansen-Juselius cointegration test and Granger causality test. The study’s empirical outcomes established that there exist a long run relationship between economic growth and stock market capitalization, total value of stocks traded, turnover ratio of stocks traded. The study also discovered there is unidirectional causality from stock market capitalization, total value of stocks traded and turnover ratio of stocks traded to economic growth.

Ngugi, Amanja, & Maana, (2006) aimed at answering the question on whether capital market deepening facilitates economic growth. This study was examined by studying the influence of the capital market in financing investment, the relationship between capital market deepening and productivity and last but not least, the relationship between capital market deepening and economic growth in Kenya. The study results showed that there is a significant relationship between economic growth and capital market and banks variable but not with the non-banking variables

3. 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.

4. Result and Discussion

Unit root results

Table 1: 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

Source: Author (2022)

The results in Table 1 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 2: 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)

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

Source: Author (2022)

Based on Johansen's maximum likelihood procedure, cointegration test results presented in Table 2 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 in this section.

Short Run Relationship

The results for the short run relationship is depicted in table 4.

Table 3: 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

Source: Author (2022)

According to results presented in Table 3, 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 (0.0412) 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

The results for the long run relationship is presented in table 5.

Table 4: Long Run Relationship

Source	SS	Df	MS	No. of Obs	= 32	
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	.	.	.	.	.

Source: Author (2022)

Results presented by Table 4 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.

5. Conclusion

The hypothesis that stock market capitalization does not statistically and significantly affect economic growth in Kenya failed to be accepted by the study. The regression coefficient for stock market capitalization was -0.1477 and the probability value was 0.000. This is interpreted to mean that an increase of stock market capitalization by one percent will cause a decrease in economic growth by 14.77 percent.

The capital market authority may relax the listings requirements to enable more firms get listed in Nairobi Securities Exchange to strengthen growth stock markets capitalization and therefore spur economic growth.

A useful extension of the present study would be to empirically examine the effect of stock market capitalization on inflation, unemployment and poverty eradication in the context of Kenya.

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