Causal Effect Relationship between Financial Deepening and Economic Growth in Kenya

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Abstract: The study sought to establish the effect of financial deepening on the economic growth of Kenya. The research design adopted for this study was descriptive. Secondary data used in this study was sourced from the Nairobi Securities Exchange, Central Bank of Kenya websites and Kenya National Bureau of Statistics as well as World Bank development indicators. The study population was quarterly data for 11 years giving a total of 44 observations per variable. The study used both descriptive and inferential statistics in analyzing the data. First, the data collected was sorted, classified and collated. Descriptive statistics such as mean and standard deviation for each variable were calculated and tabulated using tables and inferential statistics. The STATA computer software was used in the analysis of data. Data was analysed using inferential statistics informed by regression and correlation analysis. To measure the effect of financial deepening on the economic growth of Kenya the researcher used regression analysis. The effect was examined at a 95% confidence level while employing a student t-test. The data was subjected to diagnostic tests to evaluate conformity with multiple regression model assumptions. The study employed normality, heteroscedasticity, multicollinearity, serial correlation and unit root diagnostic tests. The study results established that banking deposits had a statistically insignificant effect on economic growth measured, capital market capitalization had a statistically significant effect on economic growth, Mobile banking had a statistically significant effect on economic growth and that direct capital inflows had a statistically significant effect on economic growth. The study concludes that financial deepening has a significant effect on the economic growth of Kenya.

Keywords: Financial Deepening, Economic Growth, Banking Deposits, Capital Market Capitalization, Mobile Banking and direct capital inflows.

1. Introduction

According to Sessional paper No. 1 of 1986 on Economic management for economic reforms in Kenya, the financial market is key in achieving meaningful economic growth and development. Capital markets assist in liquidity provision, price discovery, general reduction in transaction costs, and risk transfer. They reduce information costs through the generation and dissemination of information on firms leading to efficient markets in which prices incorporate all available information (Yartey & Adjasi 2007). The Capital market in Kenya dates back to 1922 when the Stock exchange was started, however, there was little activity until the late 1980s when the government adopted reforms that were aimed at reviving the financial sector. The Capital markets in Sub-Saharan Africa, Kenya displayed extreme thinness and illiquidity compared with other emerging markets of South East Asia (Ziorklui, 2001). In 1986, The Government of Kenya made a deliberate policy effort to foster the growth of the Capital Markets through the adoption of The Sessional Paper No.1 of 1986, which recognized the Capital Markets as key to achieving meaningful economic growth and development. The Government through the policy; recommended that a regulatory framework be set up to regulate and facilitate the development of the Capital Market in Kenya. The birth of The Capital Markets Authority in December 1989 was a step forward following the deliberations of The Sessional Paper No.1 of 1986. The Capital Markets Authority Act (Chapter 485 a) facilitated the setup of The Capital Markets Authority

and its functions, but even after the establishment of the Capital Markets Authority, Kenya still lagged with a thin and illiquid capital market (Ngugi, 2003). While Kenya's financial sector is viewed as substantially diversified, it is dominated by banking institutions which have not evolved to provide long-term capital adequately (Ngugi, Amanja & Maana, 2008). Economic growth can be described as the sustained increase in the welfare of an economy. For some, economic growth is synonymous with —economic development and is associated with such things as the growth of population (especially the working population), development of resources, technological advancement and increasing capital formation. Generally, economic growth means growth of output and discussions of economic growth are conducted in quantitative terms. Economic growth is commonly measured as the annual rate of increase in a country's gross domestic product (GDP) by economists or by related indicators, such as gross national product (GNP) or gross national income (GNI) which is derived from the GDP calculation (Arthur, 1964) Iram and Nishat (2009) describe economic growth as the indicator of the health of an economy, and that capital is one of the pre-requisites to maintain and enhance the momentum of growth. Simply put, a country's economic health can be measured by 4 looking at the country's economic growth and development. Economic growth is what mainly determines the material well-being of a nation.

Financial deepening is a term used to refer to the increasing provision of financial services. It can refer to both a wider choice of services and better access for different socioeconomic groups. One of the key features of financial deepening is that it accelerates economic growth through the expansion of access to those who do not have adequate finance themselves. Typically, in an underdeveloped financial system, the incumbents have better access to financial services through relationship banking. Moreover, incumbents also finance their growth through internal resource generation (Goswami & Sharma, 2011). Financial deepening refers to the improvement or increase in the pool of financial services that are tailored to all levels of society. It also refers to the increase in the ratio of money supply to GDP that ultimately postulates that the more liquid money is available in the economy, the more opportunities exist in that economy for continued and sustainable growth. It supports the view that: Development in Financial sectors leads to the development of the economy as a whole (Cole, 1974). Conceptually, financial depth is often understood to mean that: sectors and agents can use a range of financial markets for savings and investment decisions, including at long maturities (access); financial intermediaries and markets can deploy larger volumes of capital and handle larger turnover, without necessitating large corresponding movements in asset prices (market liquidity); and the financial sector can create a broad menu of assets for risk-sharing purposes (hedging or diversification). In other words, deep markets allow savers to invest in a broad range of quality investment and risk-sharing instruments and allow borrowers to tap a broad range of financing and risk management instruments (Goswami & Sharma, 2011).

The Kenyan government has a vision of transforming the country into the middle-income level and industrializing economy by the year 2030 and they have identified the financial sector as one of the areas that would help in attaining this critical target. The Capital Markets Authority of Kenya acknowledges that the Kenyan financial markets are at different stages of development. Whereas Kenya has a well-developed and liquid government bond market, the equities market on the other hand is characterized by relatively few listings, which are skewed towards financial companies, and low liquidity (Capital Markets Master Plan, 2014). Ambitious targets have been set for improvements in listings, liquidity and performance of new product areas to develop the Kenyan financial markets. The first is to improve the ratio of equity market capitalization to GDP which currently stands at 50% to 70% by end-2023. The second target is the number of GEMS listings, which reflect the supply of future main board listed companies, to increase by 3-4 annually. The third target is to raise the ratio of corporate bonds outstanding to GDP to reach 40% by the end of 2023 and lastly, the value of outstanding exchange-traded derivative contracts to reach USD 200 billion by end-2023 which is an ambitious target, given that the market has not yet been launched, but is achievable by comparison with other markets (Capital Markets Master Plan, 2014). Kenya is one of the countries in the African continent having a well-developed financial system based on the ground. During the last two decades, several reforms translated by developments and innovations have taken place in the Kenyan banking sector that have led to an increase in the sector's assets. Such developments have mainly been driven by financial innovations in the sector. Specifically, the reduction of the retention ratio from 6 to 5.25 per cent by the Central Bank of Kenya (CBK) made loans more affordable to the public; the transformation of Non-Bank Financial Institutions (NBFI) into commercial banks(e.g. Equity and Family banks); and the introduction of new products and financial service delivery channels (such as M-pesa, Islamic banking, mobile banking, agency banking and the integration of Automated Teller Machines (ATMs) by microfinance institutions) to name a few (Bakang, 2015).

Even with the studies already done in Kenya, happenings in the financial sector have not been interrogated in the context of financial deepening and economic growth. In 2016, the parliament passed capping on interest rate charged by commercial banks on loans hence affecting the ability of commercial banks to create credit. Additionally, the last few years have seen a major shift from brick-and-mortar banking to mobile-based banking hence transforming the process of financial intermediation greatly in terms of mobile banking loans and other transactions that have a bearing on financial deepening. There is a need therefore to address the relationship between financial deepening and economic growth, especially by incorporating the role of mobile banking, and direct capital inflow in financial deepening and economic growth. This study therefore seeks to fill the gap by studying the effect of financial deepening and the growth of Kenya's economy. This study therefore sought to answer

the question: what is the effect of financial deepening on the economic growth of Kenya?

2. Literature Review

2.1 Theoretical framework

Several theories have been advanced in financial literature to postulate the relationship between financial deepening efficiency and economic growth. The current study specifically relied on three theories that served as the base of the study. The theories include financial intermediation theory, financial liberalization hypothesis and Keynes theory.

2.1.1 Financial Intermediation Theory

Financial intermediation is a process that involves surplus units depositing funds with financial institutions that then lend to deficit units. Bisignano (1998) and Leland and Pyle (1977) identify that financial intermediaries can be distinguished by four criteria: first, their main categories of liabilities (deposits) are specified for a fixed sum which is not related to the performance of a portfolio. Second the deposits are typically short-term and of a much shorter term than their assets. Third, a high proportion of their liabilities are chequeable (can be withdrawn on demand). And fourth their liabilities and assets are largely not transferable. The most important contribution of intermediaries is a steady flow of funds from surplus to deficit units. According to Scholtens and van Wensveen (2003), the role of the financial intermediary is essentially seen as that of creating specialized financial commodities. These are created whenever an intermediary finds that it can sell them for prices which are expected to cover all costs of their production, both direct costs and opportunity costs. Financial intermediaries exist due to market imperfections. As such, in a 'perfect' market situation, with no transaction or information costs, financial intermediaries would not exist. Numerous markets are characterized by informational differences between buyers and sellers. In financial markets, information asymmetries are particularly pronounced. Borrowers typically know their collateral, industriousness, and moral integrity better than do lenders. On the other hand, entrepreneurs possess inside information about the projects for which they seek financing (Leland and Pyle, 1977). Moral hazard hampers the transfer of information between market participants, which is an important factor for projects of good quality to be financed.

2.1.2 Shaw's Financial Liberalization Hypothesis

Shaw (1973) advanced financial liberalization theory to explain the relationship between the deregulation of the financial sector and financial deepening. According to Shaw's (1973), financial deepening hypothesis, financial liberalization tends to raise the ratio of private domestic savings to income. With the real growth of financial institutions, many investors have access to borrowing. There arise incentives for saving with many players and borrowings become cheaper. Savings also tend to rise in the Government sector. With financial deepening, savings from the foreign sector respond to financial liberalization. There is an inflow of capital and easy access to foreign capital markets, which remove distortions in relative prices. Liberalization permits the financial process of mobilizing and allocating savings to displace inflation and foreign aid. Liberalization enables superior allocation of savings through widening and diversifying financial markets wherein investment opportunities compete for savings flow. The savers are offered a wider menu of portfolio choices. The market is broadened in terms of scale, maturity and risk (Shaw, 1973). Information is available more cheaply. Local capital markets are integrated and new avenues for pooling savings and specializing in investments are possible. Prices are used to discriminate between investment opportunities. In this context, Shaw (1973) states that "Financial depth seems to be an important pre-requisite for competitive and innovative disposition of savings flows." Thus, financial liberalization and allied Policies bring an equal distribution of income. It reduces monopoly rents arising out of import and other licenses to a few importers and bank borrowers. It contributes to the stability of growth in output and employment (Shaw, 1973). Critics of financial liberalization policies have argued that the efficient markets paradigm is fundamentally misleading when applied to capital flows. In the theory of the second best, removing one distortion need not be welfare-enhancing when other distortions are present (Evans, 2017). If the capital account is liberalized while import-competing industries are still protected, for example, or if there is a downwardly inflexible real wage, capital may flow into sectors in which the country has a comparative disadvantage, implying a reduction in welfare (Okpe, 2018). If information asymmetries are endemic to financial markets and transactions, in particular in countries with poor corporate governance and low legal protections, there is no reason to think that financial liberalization, either domestic or international, would be welfare-improving (Stiglitz, 2000). Moreover, in countries where the capacity to honour contracts and to assemble information relevant to financial transactions is least advanced, there can be no presumption that capital would flow into uses where its marginal product exceeds its opportunity costs.

2.1.3 Keynes Theory

John Maynard Keynes (1936) advanced Keynesian theory in in financial economic analysis. This theory assumes equilibrium with less than full employment where both employment and income are fluctuating. The theory views interest as a reward for parting with liquidity. It provides that the interest rate is determined by the demand and supply of money. The

theory opined that the supply of money is usually determined by monetary authorities while the demand for money is a function of income and interest rate (Keynes,1936). This theory assumes equilibrium with less than full employment where both employment and income are fluctuating. The theory views interest as a reward for parting with liquidity. It provides that the interest rate is determined by the demand and supply of money. The theory opined that the supply of money is usually determined by monetary authorities while the demand for money is a function of income and interest rate.

The theory further explained that the transitory and precautionary motive of liquidity is dependent on income while the speculative motive is dependent on interest rate, it is interest elastic. The Keynesian theory implies that a low-interest rate as a component of cost administered is detrimental to increasing savings and hence investment demand. Proponents of this theory argue that an increase in the real interest rate would have strong positive effects on savings which can be utilized in investment because those with excess liquidity would be encouraged to save because of the high-interest rate, thus banks would have excess money to lend to investors for investment purpose thereby raising the volume of productive investment. Keynes also emphasized that the rate of interest is purely a monetary phenomenon.

This theory introduced the concept of a liquidity trap, a situation where low-interest rates discourage savings and consequently reduce investments due to a lack of investable funds. Anyingang and Udoka (2012), in their study, observed that the Keynesian liquidity preference theory of interest rate is a stock theory. It is a stock analysis because it takes the supply of money as given during the short run and determines the interest rate by liquidity preference or demand for money. This theory alludes to the Nigerian situation under the regulated interest era, where the monetary interest rate set by government authorities was low and the real interest rate was even lower because of inflation. The low interest rate encouraged inefficiency in the use of capital and the resultant negative growth trend in investment. The negative trend was also because of a lack of investable funds as people preferred to hold liquid cash as there was no adequate inducement to part with liquidity. Keynes's theory is regarded as an improvement over classical theory as it considers interest as a monetary phenomenon that links the present and the future. This theory abandoned the assumption of full employment and introduced the concept of unemployment therefore, it considered the change in the income level and its relation with savings and investment. Thus, in Keynesian analysis more investment leads to more consumption, or in other words, investment and consumption go together. Keynesian analysis is more realistic in the context of the unemployment of resources prevailing in the economy. Opponents of this theory insist that it is an indeterminate, incomplete, inadequate and unrealistic theory of interest rates.

2.2 Empirical Review

A study by Ndebbio (2004) on financial deepening, economic growth and development. This study identifies the range of financial assets that can adequately approximate financial deepening, which simply means an increase in the supply of financial assets in the economy. FD is represented by two variables, the degree of financial intermediation/development (M2/Y) and the growth rate in per capita real money balances (GPRMB). Because of a lack of data on other measures of financial assets in most SSA countries, broad money (M2) was used as a numerator for both variables. Estimations depending on the two measures of FD and other explanatory variables of interest were done with the ordinary least squares (OLS) multiple regression procedure. Three modelled equations, with justifications for each, were estimated and analyzed. A cross-country regression was used for 34 SSA countries. To even out year-to-year fluctuations as well as reflect underlying structural changes, the variables were calculated on a decade-average basis. Two policy implications derive from the study: that SSA countries should strive hard to make real money balances grow, and that these countries should also come up with policies to improve financial development/intermediation. Given such factors as price stabilization, elimination of fiscal deficit and removal of various restrictions on financial institutions, real money balances could be made to grow. Financial intermediation/ development could positively affect output growth if, among other suggested ways, the volume of investment is raised.

Research by Nzotta & Okereke (2009) examined financial deepening and economic development in Nigeria between 1986 and 2007. The central focus is that a high level of financial deepening is a necessary condition for accelerating growth in an economy. This is because of the central role of the financial system in mobilizing savings and allocating the same for the development process. The study made use of secondary data, sourced for 22 years. The study specified nine explanatory variables for the study based on theoretical underpinnings. The study sought to establish a relationship between these variables and the financial deepening index. The two stages' least square analytical framework was used in the analysis. A trend analysis was also done in the study. At the end of the study, the study found that the financial deepening index has been low in Nigeria over the years. The study also found that the nine explanatory variables, as a whole were useful and had a statistical relationship with financial deepening. However, four of the variables; lending rates, financial savings ratio, cheques/GDP ratio and the deposit money banks/GDP ratio had a significant relationship with financial deepening. The study concluded that: the financial system has not sustained an effective financial intermediation, especially credit allocation and a high level of monetization of the economy. Thus, the regulatory framework should be restructured to ensure good risk management and corporate governance and to stem systemic crises in the system.

A study by Nwanna and Chinwudu (2016) examined financial deepening and economic growth in Nigeria from 1985 to

2014. It focused on the impact of the stock market and bank-deepening variables such as money supply, market capitalization, private sector credit and financial savings on the economic growth of Nigeria. Stock market provides the avenue through which long-term funds can be raised for investment projects. It is reputed to perform critical functions, which promote economic growth and prospects of the economy. The study adopted the supply-leading hypothesis. The study used annual time series data from 1985 to 2014 obtained from the Central Bank of Nigeria statistical bulletin. The ordinary least square (OLS) econometric techniques were employed in which variations in the dependent variable, economic growth, measured by gross domestic product growth rate were regressed on money supply ratio to gross domestic product, private sector credit ratio to gross domestic product, market capitalization ratio to gross domestic product and financial saving ratio to gross domestic product using time series data from 1985 to 2014. The result of the analysis reveals that both bank-based and stock market financial deepening proxies have significant and positive effects on economic growth and that the banking sector and stock market in Nigeria have an important role in the process of economic growth. Based on the findings there should be improvement by encouraging more participation in the stock market. Easing restrictions on international capital and entry into the stock market to ensure more companies are listed.

A study by Sindani (2013) set to establish the impact of the financial sector deepening on economic development in Kenya. The study adopted a Quantitative comparative design. The target population for this study was: 44 banking institutions (43 commercial banks and 1 mortgage finance company - MFC), operating in Kenya as of 31st December 2011. The study used secondary data collected from the Central Bank of Kenya and Deloitte reports. Since the data used was secondary, the study conducted a census of the Banking sector where all the 44 commercial banks were included. This study established that the financial sector was stable during the study period as witnessed by the stable number of banking institutions following stringent regulations by the Central Bank of Kenya which had reduced the frequency of commercial banks becoming bankrupt. During the period of the study (2007-2011), financial sector deepening was high as the commercial banks strived to leverage their operations through the adoption of new technologies including automation of bank processes and adoption of Automated Teller Machines as opposed to offering their services only through physical brick and mortar branches. The economic growth started at a high of 7.1 then fluctuated to a low of 1.5 in 2008.

A paper by Bakang (2015) investigated the effects of financial deepening on economic growth in the Kenyan banking sector. The study achieves this objective using quarterly time series data from 2000 to 2013. Financial deepening, the independent variable was captured by four alternative indicators: Liquid Liabilities (LL) as a ratio to nominal Gross Domestic Product (GDP); Credit to the Private Sector (CPS) as a ratio to nominal GDP; Commercial Bank Assets as a ratio to commercial bank assets plus Central Bank Assets (CCBA); and Commercial Bank Deposits (CBD) as a ratio to nominal GDP. The dependent variable, economic growth, was measured by real GDP. All the variables were integrated at level I (1) and the Johansen Jeliusus cointegration test showed evidence of cointegrating equations between GDP and financial deepening indicators. Four models were estimated to determine the long-run and short-run effects. The study found that the banking sector in Kenya has an important role in the process of economic growth. Specifically, the empirical results reveal that liquid liabilities, credit to the private sector, commercial-central bank assets and commercial bank deposits have positive and statistically significant effects on GDP. The study recommends therefore to reinforce existing policies that would encourage the public to save more money with commercial banks. Increasing the interest rate paid to depositors on their deposits, for example, would incite people to save more. In addition, the study recommends the intensification of financial inclusion policies through increased access and usage of formal banking services while reducing bank transaction costs. This would encourage more people to participate in economic activities and to borrow and invest more.

A study by Gries, Kraft, & Meierrieks (2009) sought to establish Linkages between Financial Deepening, Trade Openness and Economic Development in Sub-Saharan Africa. The study tested for causality in 16 Sub-Saharan African countries. The study used principal component analysis to obtain a broad indicator of financial deepening. The study employed unit root and cointegration tests to analyze the properties of the investigated time series and to identify possible long-run relationships between them. Subsequently employing Hsiao's version of Granger causality testing within a VAR/VECM.. The empirical results can be summarized as follows. First, cointegration evidence shows that finance, growth and openness do not share significant long-run relationships for most of the sample. Second, the study detected only limited support for causal interactions between financial depth and economic development. In particular, there is evidence of finance-led growth only in three out of 16 cases. Third, for most countries, the study detected either a demand-following or insignificant relationship between finance and growth. We thus provide support for more sceptical views on direct finance-growth linkages. Fourth, the study was not able to identify any predominant causal relationship for SSA. Additionally, there is only limited evidence that suggests that either financial deepening has promoted economic development indirectly via influencing trade openness or that openness has enhanced growth as a byproduct of its impact on financial development.

3. Methodology

The research design adopted for this study was descriptive. The descriptive approach to this study was the most preferred as the study attempts to investigate what effect financial deepening has on economic growth in Kenya. Descriptive research studies are those studies which are concerned with describing the characteristics of a particular individual, or of a group, whereas diagnostic research studies determine the frequency with which something occurs or its association with something else (Kothari, 2004) Secondary data was used in this study. The data on capital market capitalization was sourced from the Nairobi Securities Exchange. Data on cash transfers from abroad, mobile banking transactions, and commercial bank deposits were sourced from Central Bank of Kenya websites whereas data on real economic growth (GDP) and direct capital inflow was sourced from the Government of Kenya through the Kenya National Bureau of Statistics (KNBS) as well as World Bank development indicators. The study population was quarterly data for 11 years giving a total of 44 observations per variable. The study used both descriptive and inferential statistics in analyzing the data. First, the data collected was sorted, classified and collated. Descriptive statistics such as mean and standard deviation for each variable were calculated and tabulated using tables and inferential statistics. The STATA computer software was used in the analysis of data. Data was analysed using inferential statistics informed by regression and correlation analysis. To measure the effect of financial deepening on the economic growth of Kenya the researcher used regression analysis. The effect was examined at a 95% confidence level while employing a student t-test. The study adopted a multivariate regression model to determine the effect of financial deepening on economic growth to regress the independent variables against the dependent variable. The general form of a multiple regression model is as given in equation (1).

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Where:
Y= Dependent variable is Gross Domestic Product Growth rate: Measured using Nominal GDP growth rate.
X1= Total deposits of the banking industry: Natural logarithm of aggregate deposits in the commercial banking sector.
X2= Capital market Capitalization: Natural logarithm of capitalization of the Nairobi stock exchange.
X3= mobile banking innovation: Natural logarithm of the total commercial banking mobile banking transactions volume.
X4 = Direct capital inflow: Natural logarithm of total cash transfers from abroad.
β_0: Intercept term measuring the level of economic growth when financial deepening is held constant.
β_i: Coefficients of independent variables measuring the responsiveness of economic growth due to a percentage change in financial deepening proxies.
ε: Stochastic Term that captures other variables that also affect economic growth which are not part of the model.

The data was subjected to diagnostic tests to evaluate conformity with multiple regression model assumptions. This would ensure the validity of the results. The study employed normality, heteroscedasticity, multicollinearity, serial correlation and unit root diagnostic tests. The test is conducted to test whether data exhibits a normal distribution. If the data is not normally distributed, it may not display the correct relationship between the variables studied (Garson, 2012). The study employed the Shapiro-Wilk test to test normality. The test is most appropriate for a sample size of 50 or less. The choice of this test is informed by the small number of samples to be studied. Data is normal if the significance values for Shapiro-Wilk tests are greater than the P-value statistic test of 0.05. A value below 0.05 depicts that the data is not normally distributed. Gujarati (2003) described heteroscedasticity as lacking constant error variance. The study used the Breusch-Pagan / Cook-Weisberg test by using the regression residual value of the independent variables. There is no heteroskedasticity if the significance values are greater than the P-value statistics test of 0.05. Kothari (2004) postulates that multicollinearity exists if there is an association of independent variables. Therefore, independent variables ought to be linearly independent of each other. Cooper and Schindler (2006) assert the existence of multicollinearity leads to invalid significance tests due to the distorted regression coefficients. The study employed the Variance Inflation Factor (VIF) to test the existence of multicollinearity. If VIF is less than 5, then there is no existence of multicollinearity (Gujarati, 2003). Gujarati (2003) posits that serial correlation exists if an error term of one period is correlated with that of subsequent periods. The study used the Wooldridge Drukker test to test the existence of autocorrelation. Data has no serial correlation if the P value is greater than the 5% level of significance. Unit root test is conducted to ensure that the variables are stationary. Gujarati (2003) posit that data has no unit roots if the variance, autocorrelation and mean of the data structure do not vary with different periods. Wooldridge (2012) asserted that stationarity ensures that the regression results are not spurious thereby guaranteeing robust regression results. The study employed the Augmented Dickey-Fuller (ADF) unit root test to evaluate the availability of unit roots in the data. If the P-value is greater than a 5% level of significance, it implies the data is not stationary i.e. availability of unit roots.

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4. Results

The study initially targeted to collect data on financial deepening and economic growth in Kenya. The study targeted quarterly data for 18 years beginning 2000-2017 but due to fact that data on mobile banking was only available from 2007 to 2017 accounting for 11 years.

4.1 Descriptive Analysis

Table 1: Summary of Descriptive Statistics

Statistics	Direct capital inflow	Mobile banking	GDP	Banking deposits	Capitalization
Minimum	42685.79	0.064391	315849	983.2	689.045
Maximum	188168.3	301.63	1150141	2845.3	2447.72
mean	93827.41	135.2931	660790.4	2234.2	1521.20959
standard Dev	39782.04	106.4297	335411.7	465.7	671.400264
Obs	44	44	44	44	44

Direct capital inflows capture the finances received from abroad into the domestic economy. The results are presented in Table 1. The mean direct capital transfers was Ksh. 93827.41 million suggesting that the average quarterly direct capital inflow from aboard was about Ksh. 93827 million. The standard deviation for quarterly direct capital inflow was Ksh. 39782.04 demonstrating that direct capital inflows were spread around the mean with about Ksh.3978 Million. The minimum quarterly direct capital inflow was Ksh. 42685.79 million and the maximum quarterly direct capital inflow was ksh.188168.3 million. Mobile banking was measured by the value of mobile banking transactions. The mean quarterly mobile banking was Ksh. 135.2931 billion suggesting that the average mobile banking was about ksh.135 billion. The standard deviation for quarterly mobile banking was Ksh.106.4297 billion demonstrating that mobile banking was spread around the mean with about Ksh 106 billion. The minimum quarterly mobile banking was ksh.0.064391 billion and the maximum mobile banking was Ksh. 301.63 billion. Capital capitalization was measured by the value of all publicly was measured by the value of mobile banking transactions. The mean quarterly capitalization was Ksh.1521.209 billion suggesting that the average capital market capitalization was about ksh.1,521 billion. The standard deviation for quarterly capital market capitalization was Ksh. 671.400264 billion demonstrating that the capital market was spread around the mean with about Ksh 671 billion. The minimum quarterly market capitalization was Ksh. 689.045 billion and the maximum market capitalization was Ksh. 2,447.72 billion. The mean banking deposits were Ksh. 2234.2 billion suggesting that the average banking deposits were about 2.3 trillion. The standard deviation for the quarterly banking deposits was Ksh. 465.7 Billion in Kenya and was spread around the mean with about Ksh. 466 billion. The minimum and maximum quarterly commercial banking deposits were Ksh.983.2 billion and Ksh. 2845.3 billion Respectively. The proxy for Economic growth was the real GDP for Kenya. The mean quarterly economic growth was Ksh. 660,790.4 million suggesting that the average economic growth was about Ksh. 661 billion. The standard deviation quarterly economic growth was Ksh. 335411.7 million demonstrating that quarterly economic growth was spread around the mean with about Ksh. 335412 million. The minimum quarterly economic growth was Ksh. 315849 million and the maximum quarterly economic growth was Ksh. 2845.3 million.

4.2 Diagnostic Tests

Panel data was subjected to diagnostic tests to evaluate conformity with multiple regression model assumptions. This ensured the validity of the results. The study employed normality, heteroscedasticity, multicollinearity, serial correlation and unit root diagnostic tests. The study employed the Shapiro-Wilk test to test normality as presented in Table 2

Table 2: Shapiro-Wilk test to test normality

Variable	Obs	W'	V'	z	Prob>z
Direct capital Inflows	44	0.91578	3.972	2.587	0.00485
Mobile	44	0.79247	9.788	4.278	0.00001
Deposits	44	0.88966	5.204	3.093	0.00099
CAP	44	0.8885	5.259	3.113	0.00093
GDP	44	0.76983	10.856	4.472	0.00001

From Table 2, one rejects the null hypothesis H_0 direct capital Inflows (p = 0.00485), Mobile banking (p = 0.00001), bank

Deposits (p = 0.00099) Capital market capitalization (p = 0.00093) and economic growth (0.00001). This owes to p-values lower than 0.05. The data is not normal since the sample size was small however, this cannot affect the estimation of the coefficient of explanatory variables used in the study. The study utilized the Breusch-Pagan / Cook-Weisberg test for heteroskedasticity test by using the regression residual value of the independent variables. There is no heteroskedasticity if the significance values are greater than the P-value statistics test of 0.05. The results are shown in Table 3.

Table 3: Breuch-Pagan Test

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of GDP
chi2(1)   =   0.97
Prob > chi2 =   0.3255

There is no heteroskedasticity if the significance values are greater than the P-value statistics test of 0.05. The results show that the p-value was greater than chi2 hence the hypothesis that variances are constant was accepted thus, it can be concluded that there was no heteroscedasticity. The study employed the Variance Inflation Factor (VIF) to test the existence of multicollinearity. The results are shown in Table 5.

Table 1: Variance Inflation Factor

Variable	VIF	1/VIF
Direct Capital Inflows	2.06	0.485437
CAP	2.84	0.352113
Mobile	3.39	0.294985
Deposits	1.08	0.925926
Mean VIF	2.3425	

Results in Table 5 show that all the variables had a variance inflation factor (VIF) of less than 5 and an overall VIF of 2.3425. These results show that the multicollinearity problem was very low. The study used the Wooldridge Drukker test to test the existence of autocorrelation. A data has no serial correlation if the P value is greater than the 5% level of significance. The results are shown in Table 6

Table 2: Autocorrelation Tests

Wooldridge test for autocorrelation
H0: no first-order autocorrelation
F(1,   10) =   0.332
Prob > F =   0.5770

The value of P was greater than the 5% level of significance. The results are shown in table 6. The study therefore concludes that the was no serial correlation problem and thus error term of one period is correlated with that of subsequent periods. The study employed the Augmented Dickey-Fuller (ADF) unit root test to evaluate the availability of unit roots in the data. If the P-value is greater than a 5% level of significance, it implies the data is not stationary i.e. availability of unit roots. The results are shown in Table 7

Table 3: Augmented Dickey-Fuller Unit Roo

Variable Name	Statistic (Adjusted)	P-Value	Comment
Banking deposits	-9.1936	0.000	Stationary
Capital market capitalization	-25.2806	0.000	Stationary
Mobile banking	-14.6408	0.000	Stationary
Direct capital inflows	-18.2333	0.000	Stationary

All the values of P were less than a 5% level of significance, which implies the data is stationary i.e. absence of unit roots. Results are shown in Table 7.

4.3 Regression Analysis

Regression analysis was multiple as there were four independent variables. The independent variables were direct capital transfers, mobile banking, bank deposits and capital market capitalization. The dependent variable was economic growth measured by Real GDP. Multiple regression analysis involved the calculation of the coefficient of determination, Analysis of Variances (ANOVA) and regression coefficients (Table 8).

Table 4. 4: OLS Regression Analysis

Source	SS	df	MS	Number of obs =	44
		F(4, 39) =			184.88
Model	11.2905935	4	2.82264838	Prob > F =	0
Residual	.595416423	39	.015267088	R-squared =	0.9499
		Adj R-squared =			0.9448
Total	11.8860099	43	.276418836	Root MSE =	0.12356
GDP	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Cap Inflows	.4853428	.1112539	4.36	0.000	.2603105	0.710375
Mobile	.0621813	.0178975	3.47	0.001	.0983824	0.0259801
Deposits	.0085088	.0042794	1.99	0.054	.0001471	0.0171647
CAP	.8682275	.0996484	8.71	0.000	.6666696	1.069785
cons	1.662703	.8293403	2.00	0.052	-.0147961	3.340202

Tables 8 indicate that the model explains only 94.48% of the variations in Economic growth (GDP) as shown by the coefficient of determination (R^2) value of 0.9448 hence only 5.52 % of Variations in economic growth are explained by other factors not included in the model. It is therefore clear that financial deepening explains only 94.448 % of variations in economic growth. Additionally, according to Table 8, the overall significance of the model was 0.000 with an F value of 184.88. The level of significance was lower than 0.05 and this means that financial deepening does show a statistically significant effect on economic growth in Kenya (GDP). Table 8 further shows the coefficients of independent variable financial deepening proxies and the values of p and values of t. The model was thus estimated as

GDP = 1.662703 + .4853428 Direct capital inflows **+ .0621813** Mobile banking **+ .0085088** bank deposits **+ .8682275** Capital market capitalization**.**

The estimated model above shows the causal effect relationship between the independent variable financial deepening and the dependent variable Economic Growth of Kenya. The estimated intercept term 1.662703 shows the level of economic growth in terms of Real Economic Growth when the independent variables are held constant. The coefficients estimate of the model are explained in detail in the following discussion. The researcher established that banking deposits had a statistically insignificant effect on economic growth measured by GDP (β_1 = .0085088, p = 0.054 > α = 0.05). Capital market capitalization had a statistically significant effect on economic growth (β_2 = .8682275, p = .000 < α = 0.05). Mobile banking had a statistically significant effect on economic growth (β_3 = .0621813, p = 0.001 < α = 0.05). Finally, direct capital Inflows had a statistically significant effect on economic growth (β_4= .4853428, p = .000 < α = 0.05).

5. Discussion

The researcher established that banking deposits had no significant effect on the economic growth of Kenya using regression analysis it was established that real GDP that was used as a proxy of banking deposits had a statistically insignificant effect on economic growth measured by GDP (β_1 = .0085088, p = 0.054 > α = 0.05). The value β_1 was positive showing that an increase in banking deposits leads to an increase in economic growth in Kenya however the effect was not statistically significant implying the relationship between banking deposits is not strongly associated with the economic growth of Kenya. The insignificant effect could be explained by the fact that it is not enough to generate savings that lie idle in commercial banking institutions. For savings to contribute to meaningful economic growth, the funds need to be invested in economic activities. The coefficient of banking deposits (β_1) measures the responsiveness of economic growth to changes in banking deposits. Any increase in banking deposits by one unit should lead to an increase in economic growth by .0085088 units. Using OLS regression analysis, it was established that Capital Market capitalization had a statistically significant effect on

economic growth measured by GDP ($\beta2$ = .8682275, p = .000 < α = 0.05). The value of coefficient of capital market capitalization ($\beta2$) was positive showing that any increase in capital market capitalization should lead to economic growth. The relationship was statistically significant implying that when the activities at the capital market in enhanced and the number of firms trading their shares at the capital market improves their likely to be positive economic growth. The value of the coefficient of capital market capitalization shows that for every one-unit increase in capital market capitalization, Economic growth increases by .8682275 units. The researcher also sought to establish the effect of mobile banking on economic growth finding that mobile banking had a statistically significant effect on economic growth ($\beta3$ = .0621813, p = 0.001 < α = 0.05). The value $\beta3$ was positive showing that any increase in mobile banking leads to economic growth in Kenya. The effect was statistically significant implying that mobile banking is a major contributor to the economic growth of Kenya and that mobile banking leads to improved economic growth by allowing economic units access to financial services including deposits, transfer of money, payment of transactions and credit, all this mobile banking services have the potential of stimulating economic growth. The value of the coefficient of mobile banking shows that for every one-unit increase in mobile banking activities, the rate of economic growth increases by .0621813 units. The study established that Direct capital inflows had a statistically significant effect on economic growth measured by GDP ($\beta4$= .4853428, p = .000 < α = 0.05). The value $\beta4$ was positive showing that an increase in direct capital inflow from abroad leads to improved economic growth in Kenya. The effect of direct capital inflow was statistically significant implying that the inflow of funds from abroad inform of foreign investment, transfers from Kenyan citizens living abroad and repatriation of profits back home from Kenyan firms abroad leads to improved financial deepening as more funds are made available for investment purposes that should translate to economic in Kenya. The value of the coefficient of direct capital inflows shows that every one-unit increase in direct capital inflow leads to improved economic growth by .4853428 units.

6. Conclusions

Given the fact that banking deposits had a statistically insignificant effect on economic growth measured by GDP, the study concludes that banking deposits had a weak effect on economic growth because it is not enough to generate savings that lie idle in commercial banking institutions. For savings to contribute to meaningful economic growth, the funds need to be invested in economic activities. Given that Capital Market capitalization had a statistically significant effect on economic growth, the study concludes that there was a strong relationship between capital market capitalization and economic growth and that an enhanced number of firms trading their shares in the capital market improves their likelihood of being positive economic growth. Given that the findings showed that mobile banking had a statistically significant effect on economic growth, the study concludes that mobile banking is a major contributor to the economic growth of Kenya and that mobile banking leads to improved economic growth by allowing economic units access to financial services including deposits, transfer of money, payment of transactions and credit. Finally, given that Direct capital inflows had a statistically significant effect on economic growth the study concludes that direct capital inflow has a major and strong relationship with economic growth since funds from abroad lead to improved financial deepening as more funds are made available for investment purposes that should translate to economic in Kenya. The current study has roots in the empirical literature. A study by Nwanna and Chinwudu (2016) established that both bank-based and stock market financial deepening proxies have significant and positive effects on economic growth and that the banking sector and stock market in Nigeria have an important role in the process of economic growth. A paper by Bakang (2015) revealed that liquid liabilities, credit to the private sector, commercial-central bank assets and commercial bank deposits have positive and statistically significant effects on GDP. A study by Gries, Kraft and Meierrieks (2009) detected only limited support for causal interactions between financial depth and economic development.

Based on the findings and conclusions of the study, several recommendations can be made. Given that banking deposits lead to an increase in economic growth in Kenya and that the relationship between banking deposits is not strongly associated with the economic growth of Kenya. The study recommends that the government should not just focus on savings mobilization in the economy rather they should focus on policies and strategies that translate savings to investments. For savings to contribute to meaningful economic growth, the funds need to be invested in economic projects. Given that the relationship between capital market capitalization was statistically significant implying that when the activities at the capital market in enhanced and the number of firms trading their shares at the capital market improves their likely to be positive economic growth. The study recommends that the government should continue strengthening the capital market by putting in place a supportive business environment that encourages the setup of companies that may list their shares at the Nairobi securities exchange. The government through capital market authority should put in policies to attract capital into the capital market. Because mobile banking had a statistically significant effect on economic growth, the study concluded that mobile banking is a major contributor to the economic growth of Kenya. The study recommends that the government of Kenya through the central bank and communication authority should continue strengthening mobile banking. Strong mobile banking should lead to improved economic growth by allowing economic units access to financial services including deposits, transfer of money, payment of transactions and credit. Finally, given that Direct capital inflows had a statistically significant effect on economic growth and

the conclusion that direct capital inflows were strongly related to economic growth, The study recommends that the government continue putting in place policies that encourage improved capital inflows from abroad. The inflow of funds from abroad in the form of foreign investment, transfers from Kenyan citizens living abroad and repatriation of profits back home leads to improved financial deepening as more funds are made available for investment purposes that should translate to economic in Kenya.

Conflicts of Interest

"The authors declare no conflicts of interest."

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