



The Effect of Financial Deepening on Economic Growth in the East African Community

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Research Article

Abstract

Purpose: *The study's objective is to determine the effect of financial deepening on the economic growth of the East Africa Community bloc. Specifically, it aims to establish the effect of the rate of broad money, credit to the private sector, and the rate of value of the traded stock on economic growth.*

Methodology: *The study used descriptive research design and employed the fixed effect model in regression analysis. Broad money was used to proxy the rate of money supply, credit to the private sector was used to represent credit financing while the volume of the traded stock was used as a measure for financial market investment.*

Results: *The findings revealed that all three indicators of financial deepening namely, broad money, credit to the private sector, and volume of traded stock had a positive and significant effect on economic growth in East Africa Community. The coefficient for broad money was 0.4410, the coefficient for credit to the private sector was 0.4022, while the coefficient for the volume of the traded stock was 0.1367. The model had an F statistic of 103.50, confirming its suitability.*

Implications: *The study recommends that the East Africa Community governments should place more emphasis on the efficiency and of money supply, investment, and distribution by commercial banks. The study also recommends that the governments of East Africa Community countries should continue pursuing policies that promote access to credit such as ensuring that interest rates are low. Additionally, the capital market authorities of the East Africa Community countries should conduct sensitization campaigns to promote high participation in the stock market and other capital market products.*

Keywords: Financial deepening, Economic growth, Broad money, Credit to the private sector, Volume of traded stock, East Africa

1. Introduction

Sackey and Nkurumah (2012) defined financial deepening as the process which involves increasing the provision of financial services through the supply of financial resources to the economy. Money supply in the economy in this case refers to the supply of quality money and in high quantities with the aim of creating efficiency in various activities that support economic growth and development. A study conducted by Rahman and Mustafa (2015), identified that financial deepening contributes to the flow of goods and services in the economy. The study also identified that various players such as the financial institutions, capital markets, money markets, investors, central banks, and brokers are among the main participants in financial deepening activities.

According to Nguena and Abimbola (2013), financial deepening is a multi-faceted process. The primary approach of financial deepening involves the primary level of money supply in the economy through activities such as retail, small scale businesses, mobile money transfers among individuals and normal purchase of fast-moving products, borrowing, and lending money from family and friend. The secondary approach of financial deepening was considered to be the most important in an economy and this included activities such as mortgages, financial markets, internal borrowing from the public sector, external borrowing, banking, saving institutions, and allocating huge financial resources to infrastructural projects including the construction of roads and other national projects which enhance financial deepening.

Adan (2017) posits that positive financial deepening such as the rapid supply of financial resources within an economy with limited borrowing contributes effectively towards resources and risk management in relation to loss of financial resources through the payment of debt and other leakages. The study established that developing countries encourage innovation, investment, and entrepreneurship with respect to government subsidies to ensure that there's an increased exchange of financial resources in the economy. Other factors considered were increased investment in a planned economy.

Financial Deepening has been measured using a number of variables; broad money which represents, credit to the private sector which represents the rate of credit financing, as well as the volume of traded stock which represents the rate of financial market investment (Sackey & Nkrumah, 2012; Alrabadi & Kharabsheh, 2015).

The notion of financial deepening and its impact on economic growth has received considerable attention in the current financial times. It has been identified that the reason why most of the countries remain underdeveloped is due to lack of sufficient financial support from foreign companies, well-wishers, donors, foreign direct investors and government injection of money to the economy through either subsidies or granting cheap loans (Rahman & Mustafa, 2015). Globalization is among the factors which have been praised to contribute directly towards financial deepening and fiscal progress. This has contributed to the growth of capital markets and foreign direct investment which has enabled investors to invest their financial resources to nations of their choice leading to enhanced flow of financial resources in an economy that affect the gross national product.

Documentation of the nexus between financial deepening and the growth of the economy is extensive both in theory and empirical works. A better comprehension of the nexus between the two has significant implications for policymakers, scholars, and financial sector practitioners. Financial systems serve to mobilize pooling of funds that are channeled towards productive capital which stimulates economic growth (Raghuram & Zingales, 2003). Additionally, financial deepening plays a critical role in broadening its financial resource base, credit creation, and increasing velocity of money supply, this in turn enhances investment and consequently boosts productivity and growth. Conversely, economic growth plays a key role to ensure that financial instruments are in place leading to financial sector development (Levine, 2005).

1.1 Financial Deepening and Economic Growth Nexus in the East African Community

The East African community is a bloc that has six member countries, including Kenya, Tanzania, Uganda, Burundi, Rwanda, and Southern Sudan, with a secretariat that sits in Arusha, Tanzania. Heads of states and council of ministers meet to deliberate on key issues concerning the bloc. The bloc has integrated up to the customs union level but plans are underway to integrate it further into a monetary union, a move which is expected to lead to harmonization and standardization of interest rates, taxation, and other charges, use of a common currency, and one central bank. Therefore, there is a need for a proper financial system to be in place prior to that (Alot and Muller, 2015).

The financial sector in East Africa Community is among the least developed among the economic blocs in Africa. This can largely be attributed to recessive policies in the past that extensively encouraged governments' control of the financial sector and political interference in the working of financial intermediaries. Initially, after EAC countries' independence, the governments believed that they could achieve their development agenda through the selective allocation of credit. However, this was not realized and in the late 1970s and 1980s marked a period of deterioration of the financial and economic conditions. With the advice from IMF through the structural adjustment programs as well as its own initiative, EAC governments embarked on policies to reduce controls and allow for liberalization of the financial markets. They instituted reforms such as granting autonomy to the central banks, privatization of state-owned financial institutions, liberalization of interest rates as well as opening up the economy to international trade. Much of these reforms are still being pursued up to this day, however, financial intermediation is still slow and some measures have even reduced. For instance, the private sector's profit as a percentage of GDP has reduced from 15.4 in 2000 to 9.3 by the end of 2018 (UNECA, 2019).

There have been increased economic activities in East Africa which have more effect on the economic growth of its economies such as the creation of East Africa passport which facilitates the movement of traders and their products to fetch market within the region at minimal tax. Trades in East Africa are largely supported by the modern standard gauge railway, tarmac roads, tourism, food produce among other industrial and manufacturing infrastructure. However, EAC has recorded sluggish economic growth. EAC's GDP growth which is a measure

of economic growth has also been on a declining trend from 6.8 in 2010 to 5.9 in 2018 (UNECA, 2019).

1.2 Research Problem

EAC has made much progress in terms of liberalizing the financial sector and instituting measures meant to encourage financial deepening. Some of the key policies include; granting autonomy to monetary policy committees, privatization of state-owned financial institutions, increased advocacy for low interest rates as well as opening up economies to international trade. However, in spite of these policies and reforms, financial intermediation still remains low in the region as compared to other blocs, and some measures have greatly reduced. Specifically, the credit to the private sector as a GDP percentage has reduced from 15.4 in 2000 to 9.3 by the end of 2018. Additionally, EAC's GDP growth has also been on a declining trend from 6.8 in 2010 to 5.9 in 2017 (UNECA, 2019). It is imperative, therefore, to assess whether financial development has a part to play in this.

Pioneers of empirical works on financial sector growth and its relationship to the growth of the economy include a study by King and Lavine (1993) who by using bank liabilities and credit as proxies to financial development found that financial Deepening confirmed the existence of the long-run GDP growth, capital formation, and increased output in a survey comprising of 77 economies over a period spanning from 1960 to 1989. Similarly, a study by Levine, Loayaza, and Beck (2000) concluded various elements of financial development such as bank liability and bank credit led to increased levels of economic growth. Al-Jarrah et al., (2012); Shaw (2013); Apergis et al., (2007) conducted studies on the financial development and its effects on economic growth. The findings revealed that the world economic giants including the USA, UK, and Switzerland that have been fully reliant on the financial system. Increased financial deepening with respect to financial security and risk management has generally contributed to the creation of economic growth activities such as investment in the money market, banking services, retail, capital market, short term, and long-term securities among others.

It is, however, worth noting that these studies focused on OECD countries and developed countries, excluding sub-Saharan countries and to a greater extent the East Africa Community. Most local studies have been country-specific for example Kilimani (2003), Othiambo (2005), Fille (2011), Buchichi (2013), Bakang (2017) and Ibrahim (2017), none has focused on the influence that financial development has on economic growth in EAC as a bloc. East Africa community has reached advanced stages of economic integration i.e. custom union and negotiations are underway to make it a monetary union. This implies that there will be harmonization and standardization of the currency and therefore there will be a need for integration of the financial sector. It is imperative that EAC goes into these negotiations with the full knowledge of the state of financial sector growth and the implication it is likely to have to the economic growth of the bloc once it attains the monetary union status. It is against this background, therefore, that this survey sought to empirically answer the question: What is the effect of financial deepening on the economic growth of the EAC?

1.3 Research Objective

The general objective of this study is to determine the effect of financial deepening on economic growth in the East African Community. The specific objectives of the study include:

- i. To establish the effect of rate of broad money on economic growth in the East African Community
- ii. To establish the effect of credit to the private sector on economic growth in the East African Community
- iii. To establish the effect of rate of value of the traded stock on economic growth in the East African Community

2. Literature Review

This section presents a literature review on the financial deepening and its possible impact on the growth of the economy of the East Africa Community. The study addresses a theoretical review where theories such as financial intermediary theory and finance-led growth theory are discussed. Concerning the empirical review, the study focuses on both international and local evidence in relation to financial deepening and the growth of the economy.

2.1 Theoretical Literature

This section discusses the theories underpinning this study. The theories under consideration include the finance-led growth theory and the financial intermediary theory.

2.1.1 Financial Intermediation Theory

Financial Intermediary theory was first developed by Mitchell in 2004. The theory emphasizes the significance of having different participants in the financial market with different financial related information and how this information contributes to financial deepening hence affecting economic growth. The financial intermediary theory is pegged from asymmetry information and agency theory (DeMarzo, 2004). Asymmetry information theory focuses on how financial markets end up being effective as a result of participants having different information in relation to investment vehicles and decision making hence making the financial market stable while agency theory focuses on the ability of a financial agent to work on behalf of inventors' interest which is to create wealth and ensure the economy remains stable. Financial intermediation theory comprises individuals or parties with various information, resources, and capabilities to ensure smooth flow of financial resources in the economy hence resulting in financial development which affects the economy positively (Oldfield, 2010).

The theory has been supported by Gorton and Pennacchi (2014), who in their study on financial intermediary and liquidity creation indicated that financial intermediaries are not only middlemen but they can also comprise large institutions such as banks and other investment companies. According to the study, the availability of financial intermediaries has resulted in the creation of liquidity which is quite significant towards economic growth. For instance, the presence of investment banks has ensured that financial securities such as T-bills and corporate

bonds trade easily hence increasing investment in the financial markets and encouraging the circulation of money to the economy which contributes to growth.

The contribution of the financial intermediary model to this research is that it points out the part played by monetary intermediaries such as banks, the stock market, and other financial institutions that act as agents to members of the community and bridge the liquidity gap. The financial intermediaries further, play a critical role in financial deepening through the circulation of financial resources leading to financial deepening and consequently economic growth.

2.1.2 Finance Led Growth Theory

Finance led growth theory was first introduced by Schumpeter in 1911 when the financial sector was limited to its activities. Finance led growth theory, formerly referred to as finance-led growth hypothesis points out that development or growth in the financial sector at large plays a crucial role in the economic growth of a nation (Schumpeter, 1911). The theory was founded on the idea that the financial sector acts as a catalyst to resource mobilization and the financial sector mobilizes financial resources and enhances effective resource utilization through saving and investment. Saving and investments are perceived to be key elements of economic growth (Gberevbie, 2011).

The proponents of this theory include Choong, et al., (2010), who assert that understanding the association between financial development and economic growth is a crucial factor in promoting the economy of a nation. The study however identified that in relation to the recent global and national financial crisis; the governments should play significant roles and to participate in the financial sector regulations to control the circulation of money. Inflation and other harmful activities in the economy are prone to arise when the financial sector is fully controlling the economy.

The theory is applicable for this study as it is explaining the importance of financial deepening and its involvement in the growth of the economy. The theory fits well into this study as the study intends to focus more on the nexus between financial development and economic growth.

2.2 Empirical Literature Review

This section presents studies that have been executed by other scholars in relation to financial deepening and economic growth. The section focuses both on international studies and local studies thus identifying gaps and recommendations conducted.

2.2.1 Global Studies

The association between financial development and economic growth has been widely researched and has produced varied and inconclusive results. Early studies can be traced back to Goldsmith (1969) who investigated the effect of financial structure on the economic development of 35 developed countries covering the years 1860 to 1963. The study established that there was evidence that financial structure positively resulted in economic development. Mackinnon (1973) replicated the same study in Argentina, Chile, Brazil, Germany, Indonesia,

Taiwan, and Korea. By the use of panel data analysis, the study conformed to the findings of Goldsmith (1969), the conclusion was that the improved financial system had a positive and significant effect on economic growth.

The next series of studies that followed, used different techniques to empirically investigate financial deepening and economic growth nexus. King and Levine (1993) on their study of 80 developed and developing countries over a period spanning from 1960 to 1969 established a contemporaneous association between financial development and economic growth. Their study concludes that financial development can have a long-run effect on economic growth up to periods extending between 10 to 30 years. Darrat (1999) conducted a study on the role of financial deepening on economic growth in three countries in the Middle East namely, the United Arab Emirates, Turkey, and Arabia. By using the Granger causality approach, the study found that financial deepening granger causes economic growth, however, the strength of causality varies across measures of financial deepening and countries.

Calderon and Liu (2002) by using the decomposition of variance approach on a panel of 109 developing and developed countries over a time frame of between 1960-1994, established that there was a bi-directional causality between financial development and economic growth. Their study concludes that the causal effect of financial deepening on economic growth is stronger in developing countries than in developed countries.

Onwumere (2012) undertook a research on the impacts of financial deepening on economic growth in Nigeria financial markets cannot generally grow out of blues if the market is not ready to purchase or acknowledge their products. The study which was more focusing on the supply leading hypothesis established that an efficient supply of financial resources generally contributes to economic growth. However, the study pointed out that with increased growth in technology and the adoption of modern systems of enhancing financial supply, only the minorities of investors have welcomed the new system hence creating a surplus in the economy which has affected the ability of the country to grow economically. The study recommended the need for the government to conduct extensive investment in public education and policies to enhance financial institutions' ability to conduct training that encourages technology acceptance to facilitate investment which boosts economic growth (Onwumere, 2012).

Other studies have however produced varying results, for instance, Alzubi et al., (2007) studied the role of financial development on economic growth in the Middle East and North Africa countries over the period 1989 to 2001. By the use of panel data analysis approach, they find that all measures of financial deepening do not affect economic growth as they are insignificant.

2.2.2 Local Studies

Chogi, Aduda, and Murayi (2014) executed a study on the effects of Capital market deepening on economic growth in Kenya and identified that the concept of capital markets and contribution towards economic growth has recently attracted attention among investors in Kenya and the government at large. The study which focused on the descriptive research methodology of financial markets identified that capital markets have been considered among some of the key financial institutions contributing to financial deepening in Kenya and in the

world at large. Investments in capital markets include a lot of participants such as suppliers of financial resources such as individuals, schools, hospitals, insurance companies, pension funds, the government, religious institutions, and non-financial companies. In other terms, the capital market generally has been a key player in the economy hence contributing to economic growth. Likewise, a study conducted by Bakang (2007) on the effect financial deepening on economic growth in Kenya identified that the banking sector in Kenya specifically the central banks and commercial banks, has played a significant role in financial deepening in the economy. The study which focused on quarterly surveys of financial reports in 2012 clearly pointed out that the new regulations in the financial markets early 2012 enhance the ability of banks and other financial institutions to develop in investment and distribution of money to the economy through various financial vehicles. However, the study identified that provided regulations have enhanced the flow of money to the economy, reinforcement hasn't been fully intensified since cases of bad debts and a high rate of financial defaults have been witnessed hence affecting efficiency in economic growth (Bakang, 2007).

3. Methodology

This section presents a research methodology that includes research design, population, sample design, data collection, diagnostics test, and finally data analysis.

3.1. Research Design

According to Cooper and Schindler (2014), a Research design is the structuring of data collection and analysis for the purposes of meeting the research objectives by the use of empirical evidence. In order to answer, the research questions the study adopted a time-series design. According to Kothari (2010), time-series design is essential in showing past and current trends with the intention of drawing inferences and explaining future trends. This design was chosen since it enabled the current account balance trend to be captured appropriately among the countries under study.

3.2. Study Population

The area of the study was the East Africa community bloc covering the period 1999-2018. The year 1999 has been chosen as that is the year that EAC was re-established after its collapse in 1977. The study will analyze the effect of different measures of financial deepening on EAC's economic growth. The EAC has a population of 150 million people and the member countries include; Rwanda, Burundi, Tanzania, Kenya, South Sudan, and Uganda. Southern-Sudan was, however, excluded in the study due to the unavailability of data given it is a recently formed state.

3.3. Data Collection

The study relied on secondary data. The data was collected from various sources covering the period 1999 to 2018. Data on broad money and interest rate was collected from central banks of the respective EAC member countries, data on the total volume of the traded stock was sourced

from member countries security exchange, data on technology was sourced from world development indicator, data on employment was sourced from International Labour Organisation, while data on Gross Domestic Product and credit to the private sector was collected from the Bureau of statistics of the member countries.

3.4. Data Analysis

In order to find out the effect of financial deepening the study used the financial led growth theory where GDP will represent the dependent variable. The independent variables were mainly the different measures of financial deepening and they include, broad money, credit to the private sector, and volume of traded stock. The model also includes other control variables which are essential determinants of growth i.e. Technology which was measured by the value of high-technology exports and employment.

$$GDP = F (BM, CPS, VTS, EMP, TECH) \dots\dots\dots 3.1$$

Shahbaz (2012) Log-log model was used so as to provide more efficient results to eliminate or reduce heteroscedasticity. The parameters of the log-log model have an interpretation as elasticities and constant elasticity is assumed overall values of the data set.

$$InGDP_{it} = \alpha + \beta_1 InBM_{it} + \beta_2 InCPS_{it} + \beta_3 InVTS_{it} + \beta_4 InEMP_{it} + \beta_5 InTECH_{it} + \varepsilon_{it} \dots\dots\dots 3.2$$

Where:

- BM-Broad money
- CPS – Credit to Private Sector
- VTS – Volume of traded stock
- GDP- Gross Domestic Product
- EMP-Employment
- TECH-high technology export
- ε – Error term

3.5 Justification of Variables

3.5.1 Financial Deepening

Pettinger (2017) stated that financial deepening results to increase in investment activities. Investments also result in economic growth. The study identified that financial deepening contributes to an increase in aggregate demand. This clearly means that demand in a country is expected to rise hence creating economic growth in the short run. The research however identified that financial deepening does not only contribute to positive effects on the economy but in the long run, intensified financial deepening such as in financial markets, the advancement of loans and high supply of financial resources in the economy results to inflation when aggregate demand is higher than market equilibrium. The findings clearly indicated that

financial development has both an increasing and decreasing relationship with economic growth.

Financial deepening, especially in the public sector, has resulted in public investment; the economy is expected to grow if a country invests its revenue in activities such as infrastructure, technology, industrialization, and the transport system. Jung (2006) investigated financial deepening in the public sector and established that there are high chances of government to create employment to its people while contributing to operation in positive cash balance which boosts economic growth.

3.5.2 Employment

A study conducted by Ioan (2013) on the influence of employment on economic growth identified that in relation to the public sector, employment results in saving. For instance, in developed economies, the creation of jobs has resulted in households' self-dependency and increased saving which results in to supply of financial resources in the economy hence resulting in investments. The effects of employment are also felt by the government since through employment; limited expenditure on the provision of public services such as housing, health, and education is reduced hence resulting in government saving on social services. Full employment also results in reduced taxation since financial resources flow effectively in the economy hence resulting in economic growth.

3.5.3 Technology

Caliskan (2015) on his study on technology change and economic growth found that in a global economy, the reason why most of the countries have witnessed economic growth is due to increased adoption of modern technology and technology growth. In the current 21st Century, technology is the key to every aspect of a business. Financial security, production of goods and services, and conducting research and development require the need to invest in technology which aids the growth of the economy since limited financial leakage can be witnessed.

A study conducted by Kvochko (2013) on five ways technology can help the economy, identified that one of the most common ways in which technology has contributed to economic growth is through the creation of employment. The prevailing study will only focus on three. It is estimated that 22% of the world labor market has got a job in relation to technology, which is in the ICT department or the use of a computer to enhance organizational performance. The second avenue in which technology has contributed to the growth of the economy is a contribution to the GDP. It is estimated that in Kenya for instance, technology and ICT, in general, have contributed to around 10% of the country's economy. The use of technology-related services is among the extensive measure of technology diversity. The last way in which technology has contributed to economic growth is business innovation. Technology such as in the security market has enhanced the ability of investors to purchase and sell financial securities at the comfort of the zone hence contributing to economic growth through investments (Kvochko, 2013).

3.5.4 Growth in Gross Domestic Product (GDP)

According to Lepenies (2016), gross domestic product is the economic degree of a country's performance. This means that for GDP to be effective, the calculation of a country's final goods and services must be put into consideration. When there is growth in a country's GDP, it clearly means that the country is growing stronger economically hence working towards feeding her people, producing for exports, and investing heavily. If a country's GDP remains constant or diminishes, it's clearly possible that there's no increment in production activities, exports are not growing and funds are being spent on social and economic development activities. For instance, a study published by World Bank (2018) indicated that the top three countries in the world with the most growing GDP include Libya, Ethiopia, and India. Growth in GDP in these countries has translated to economic growth.

Wohlner (2016) identified that GDP is an economic scorecard of a country's economic health. The study identified that GDP is usually annualized or measured on a quarterly basis. The study indicated that growth in a country's GDP has an impact on investors' attraction hence contributing to an increase in foreign direct investment which resultantly enhances economic growth. The study also identified that GDP takes into account the aspect of the country's inflation. Countries with high GDP tend to have low inflation and forces of supply and demand control the economy such as in the USA, Europe, and UAE. Control of inflation has significantly resulted in economic growth.

3.6 Analysis Techniques

The research will use panel data since it seeks to study different countries in the East African Community. Panel data consist of high-resolution data that composes the aspects of time series data which is data over an extended time period and cross-sectional data, which is data across different subjects but a specific point in time. The time-series aspect of the data to be used in this study is the number of years in which the data will be collected, that its 19 years, while the cross-sectional aspect is the number of countries used as the subject in the study, they are the 5 East African Community Data. There are two basic approaches used in measuring panel data, they are random and fixed-effect models. The fixed-effect model operates under the assumption that a specific factor unique to the subject under study may lead to the biasness of the coefficient obtained in the study. Random effect model, on the other hand, is premised under the assumption that there is a random variation across the subjects under study (Woodridge, 2003). In order to make a decision on whether to use Random Effects or Fixed Effects, Hausman (1978) proposed test is run. This test basically ascertains if the unique errors are correlated with the regressor, the null hypothesis states that they are not while the alternative hypothesis is that they are correlated. Diagnostic tests are important in panel data analysis for checking for the validity and robustness of the model. In this regard, both pre estimation and post estimation tests will be conducted (Woodridge, 2003).

4. Results

4.1 Correlation Analysis

Correlation refers to the relationship between two variables. It is measured using a coefficient that shows the degree of linear association between two variables. The coefficient ranges between -1 and +1, where values that tend towards 1 signify a strong and positive correlation, those that tend towards -1 signify a strong and negative correlation. While 0 values that tend towards zero in absolute terms signify weak correlation.

Table 1: Correlation Analysis

	LnGDP	LnBM	LnCPS	LnVTS	LnEMP	LnTECH
LnGDP	1					
LnBM	0.8916	1				
	(0.000)					
LnCPS	0.8040	0.9746	1			
	(0.000)	(0.000)				
LnVTS	0.3198	0.5461	0.5246	1		
	(0.012)	(0.000)	(0.000)			
LnEMP	0.9855	0.8965	0.8101	0.3829	1	
	(0.000)	(0.000)	(0.000)	(0.000)		
LnTECH	0.4549	0.5577	0.4861	0.5185	0.4865	1
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	

Note: The values in parenthesis denote P-values

Table 1 shows correlation results, from the Table, the correlation coefficient between the natural log of Gross Domestic Product and broad money is 0.8916, and it is statistically significant at 5 percent as shown by the P-value of 0.000. These results indicate a strong and positive correlation between the two variables, an increase in broad money would lead to an increase in gross domestic product and vice versa. The interpretation of this is that money supply in the economy would lead to economic growth as it would facilitate more investment. The correlation between the natural logarithm of credit to the private sector and the natural logarithm of Gross Domestic Product is 0.8040, an indication of a strong and positive correlation between the two variables. The correlation between the natural log volume of traded stock and Gross Domestic Product is 0.3189 and significant at 5 percent, however, since the value is less than 0.5, the correlation can be said to be positively weak. The correlation between employment and Gross Domestic

Product is 0.9855 and it is significant at 5 percent, there is, therefore, a strong and positive correlation between GDP and employment. Finally, the log of high export technology and the log of GDP have a correlation coefficient of 0.4549 and this is statistically significant at 5 percent, an indication of a fairly weak correlation between technology level and GDP.

4.2 Pre-diagnostic Tests

4.2.1 Panel Unit Root Test

To avoid erroneous estimation problems, the Im, Pesaran, and Shin (2003) procedure was used for panel unit root testing. The IPS tests are based on the heterogeneity of autoregressive parameters and it is the mean of individual Augmented Dickey fuller test without trend and follows a normal distribution. Unlike other panel unit root testing approaches such as Levin-Lin-Chu's (2002), Harris and Tzavalis (1999), Breitung and Das (2005) and Hadri (2000), this method was more appropriate for the study because, in principle, the test is versatile and compatible with other parametric unit-root tests, provided the panel data in question is strongly balanced and all the t-statistics for the unit-root in every cross-section are independently and identically distributed (iid). The implication of this is that the mean and the variance will be constant. This study's variables met the above-mentioned criteria and therefore, Im, Pesaran, and Shin (2003) method was ideal for the study. The results are as shown in Table 2.

Table 2: Panel Unit Root Test

Variable	Statistic	In Levels	P-Value	Order of integration
LnGDP	t-bar	-2.8020	0.087	I(0)
	t-tilde-bar	-1.3627		
	Z-t-tilde-bar	-0.3829		
LnBM	t-bar	-2.1518	0.0577	I(0)
	t-tilde-bar	-2.0431		
	Z-t-tilde-bar	-1.5748		
LnCPS	t-bar	-2.5375	0.0461	I(0)
	t-tilde-bar	-2.5093		
	Z-t-tilde-bar	-1.0971		
LnVTS	t-bar	-4.8878	0.000	I(0)
	t-tilde-bar	-3.8891		
	Z-t-tilde-bar	-6.6844		
LnEmp	t-bar	-2.1388	0.0684	I(0)
	t-tilde-bar	-2.0118		
	Z-t-tilde-bar	-1.4881		
LnTech	t-bar	-2.5331	0.0570	I(0)
	t-tilde-bar	-1.9295		
	Z-t-tilde-bar	-1.5806		

Table 2 presents the panel unit root results. It can be deduced from the Table it can be shown that all the data are stationary in levels as indicated by the T and Z statistics. Therefore, the null

hypothesis of the presence of unit root in the panel will be rejected and conclude that the entire set of series are stationary. The variables can be used in regression at levels and there is no need for differencing the data.

4.2.2 Hausman Specification Test

Prior to performing the panel regression analysis, it is vital to carry out tests to determine the suitable regression model to be used. In this regard, this study adopted the Hausman (1978) specification test to make a choice between the Random and Fixed effect models. According to Hausman's (1978) null hypothesis, the random effect is preferred to the fixed effect model while the alternative hypothesis states that the fixed effect is preferred to the random-effect model. The Fixed Effect model makes an assumption of homogeneity whereas the Random Effect model will allow for modeling heterogeneity across units. The results are as shown in Table 3.

Table 3: Results for Hausman Specification Test

Chi-Square		P-value
Degrees of freedom	Statistic	
5	87.95	0.0000

Table 3 shows the results of the Hausman test of the model. The results indicate that the P-value is significant at a 5% level of significance and therefore fixed effect is the most appropriate regression model.

4.3 Regression Analysis

From the Hausman specification test, a fixed effect was identified as a suitable model for the analysis. Fixed-effects models are a class of statistical models in which the levels (i.e., values) of independent variables are assumed to be fixed (i.e., constant), and only the dependent variable changes in response to the levels of independent variables. This class of models is fundamental to the general linear models that underpin fixed-effects regression analysis and fixed-effects analysis of variance, or ANOVA (fixed-effects ANOVA can be unified with fixed-effects regression analysis by using dummy variables to represent the levels of independent variables in a regression model (Salkind, 2010). The regression results are shown in Table 4.

Table 4: Results Obtained from the Fixed Effect Model

Variables	Coefficients	Standard Errors	T-statistic	P-value
Constant	4.6025	0.51967	8.86	0.000
LnBM	0.4410	0.0524	8.41	0.000
LnCPS	0.4022	0.0796	5.05	0.000
LnVTS	0.1367	0.0199	6.88	0.000
LnEMP	1.2360	0.0798	15.50	0.000
LnTech	0.02325	0.0090	2.57	0.010
R-squared	Within=0.8524 Between=0.9928 Overall=0.9832			

The coefficient for broad money is positive and significant as projected. This is shown by the coefficient of 0.4410 and the P-value of 0.000, this implies that a 10 percent increase in the broad

money will result in a 4.41 percent increase in Gross Domestic Product. The results are in agreement with the works of Bakang (2007) who asserted that the central bank plays a critical role in financial deepening through instituting mechanisms and regulations that enhance the flow of money in the economy. Specifically, the study identified the critical importance of increasing broad money through investment and distribution of money in the economy through various vehicles. The rate of increase of broad money supply in the economy triggers the velocity of money in the economy, and therefore, individuals can hold money for various motives such as transactional, speculative, and precautionary. This, therefore, increases the aggregate demand in the economy leading to economic growth.

The coefficient for the natural log of credit to the private sector is 0.4022, and the P-value is 0.000. These results indicate that a 10 percent increase in credit to the private sector would lead to a 4.02 percent increase in GDP. The results are as expected and are consistent with the study by Onumwere (2012) who established that credit to the private sector is an important aspect of financial deepening that ensures increased access to credit, which when channeled to investment and generation of more capital can contribute to an increased level of Gross Domestic Product.

The coefficient for the natural log for the volume of the traded stock is 0.1367 and significant at 5 percent as shown by the P-value of 0.000. The results can be interpreted as a 10 percent increase in the volume of traded stock will lead to a 1.36 percent increase in Gross Domestic Product and vice versa. These findings are consistent with the findings of Chogi, Aduda, and Murayi (2014) who found a positive effect on the volume of traded stock and GDP. The study recognized the importance of the capital market in financial deepening, the rationale was that volume of traded stock represents the rate of financial market investment, a situation which can only occur when there is high financial inclusion and deepening.

The coefficient for the log of employment is positive, 1.2360, and statistically significant as expected. The results indicate that a 1 percent increase in employment would lead to a 1.2 percent increase in Gross Domestic Product and vice-versa. These results are in line with the works of Loan (2013) which established that employment has a positive effect on GDP. This effect can be proven by the fact that employment increases the levels of household income which in turn leads to increased savings and investment, and hence economic growth. Additionally, the effects of employment are also felt by the government since through employment; limited expenditure on the provision of public services such as housing, health, and education is reduced hence resulting in government saving on social services. Full employment also results in reduced taxation since financial resources flow effectively in the economy hence resulting in economic growth.

Finally, the coefficient of the natural log of technology is 0.0235 and is statistically significant at 5 percent as shown by the P-value of 0.010. Technology in this study was proxied by the value of high technology export, the rationale for this variable was that a country produces the surplus after it has satisfied the domestic demand. The results show that a 10 percent increase in the value of high technology export would lead to a 0.2 percent increase in the GDP. The results are consistent with the study by Caliskan (2015) which established that technology change had a

positive effect on economic growth. The justification for these findings is that technology would improve efficiency in the production of goods and services in the economy, additionally, it will facilitate the transfer of financial resources which can boost the economy.

4.4 Post-Estimation Test

To ensure the validity and robustness of the model, post estimation tests were conducted. The study used a modified Wald test for GroupWise heteroscedasticity to measure whether the variance of the error term was constant or not. The study also used Allerano and Bond procedure to measure serial correlation. The output is as shown in Table 6.

Table 5: Post Estimation Diagnostic Tests

Modified Wald Test for GroupWise Heteroscedasticity

Chi2(5) = 7.77, Prob > Chi² = 0.1695

Arellano-Bond test for zero autocorrelation

Z=0.53044, Prob>z= 0.5958

Table 5 shows the results for post estimation tests after regression analysis. The results indicate that the model is homoscedastic as shown by the P-value of 0.1695 in the modified Wald test from GroupWise Heteroscedasticity. On the other hand, the results show that there is no autocorrelation as indicated by the P-value of 0.5958 in the Allerano and Bond test for zero autocorrelation. Therefore, the results of the regression model can be concluded to be efficient and consistent.

5. Conclusions

It can be concluded that the objective of the study in analyzing the effect of financial deepening in the economic growth of the EAC community bloc has been met. The framework of the study had conceptualized that broad money, credit to the private sector, and volume of traded stock as the key indicators of financial deepening and had a positive effect on economic growth.

The study established that broad money has a positive effect on the economic growth in the EAC. This was in line with the theory of financial intermediation which postulates that financial intermediaries play a critical role in financial deepening. The central bank sets regulations and provides mechanisms for monetary transmission in order to ensure that there is a smooth flow of money in the economy. It does this by providing an enabling environment for commercial banks and other financial intermediaries to enhance the flow of money in the economy. Commercial banks aid in achieving this aim through investment and distribution of money in the economy through various vehicles, which consequently contributes to economic growth.

It can also be concluded that credit to the private sector has a positive effect on economic growth in the EAC. This is shown by the positive and statistically significant regression coefficient. Credit to the private sector has been characterized by the ease in access to credit by households, which has been exacerbated by financial technology and innovation and individuals can borrow credit form mobile applications. Many of these loans are used to boost

business operations and thus fostering investment in the EAC countries, thus leading to increased Gross Domestic Product level.

The conclusion drawn from the third objective is that the volume of traded stock has a positive effect on economic growth in the EAC. The capital market plays a critical role in financial deepening, as it reflects the rate of the financial market investment. As individuals invest in the stock market this shows that the capital market is functioning well, which in turn increases economic efficiency, investment, and growth.

6. Recommendations

As established by the findings, broad money contributes positively to economic growth. It would, therefore, be of interest to the EAC government central banks should put more emphasis on the efficiency of money supply, investment, and distribution by commercial banks who are the financial intermediaries. Secondly, the central banks of EAC member states should continue instituting measures of ensuring that interest rates are low to facilitate more access to credit. Finally, the capital market authorities of EAC member states should conduct sensitization campaigns to promote high participation in the stock market and other capital market products.

7. Limitations and Suggestions for Future Studies

The study used secondary data, hence limited by the availability of some data. In addition, the secondary data does not capture the effect of the financial deepening in the short run and long run. Due to the unavailability of the data, the researchers used annual data, leading to a relatively smaller data point. It would have been more prudent if the data was collected on an annually or semi-annually basis to increase the scope of the study.

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