

**FINANCIAL DEVELOPMENT, HUMAN CAPITAL AND ECONOMIC
GROWTH IN KENYA**

BY

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DECLARATION


This research paper is my original work and has not been presented for a degree in any other University or institution of higher learning.

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DEDICATION

This research paper is dedicated to my parents Mr. Stephen Nzioka and Rose Nzioka.

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LIST OF ABBREVIATIONS

AIC	Akaike Information Criteria
Chi ²	Chi Square
FPE	Final Prediction Error
GDP	Gross Domestic Product
H ₀	Null Hypothesis
HQIC	Hannan and Quinn Information Criterion
LR	Likelihood Ratio
OLS	Ordinary Least Square
Prob	Probability Value
SBIC	Schwarz's Bayesian Information Criterion

ABSTRACT

The Kenyan government has put in place measures to improve human capital and financial development through increased expenditure in education and financial liberalization, but this has not translated into sustainable economic growth as evidenced by most of the human welfare indices. Although many scholars have looked into the effect of financial deepening and human capital on growth in many nations, such investigation is lacking for Kenya. The scope of few of notable studies is narrow since they have studied each of the variables individually. The interaction between the two variables has not been studied. It is on this backdrop that this study seeks to investigate the effect human capital, financial development and their interaction on economic growth in Kenya. Using time series from 1980 to 2021, the results show that human capital, financial development and their interaction positively influence economic growth in Kenya. The study recommends that to improve human capital in Kenya, the government should provide free secondary education to encourage high transition from primary school. To improve financial development, the study recommends that the government through central bank should adopt expansionary monetary policy so as to increase domestic credit to private sector.

CHAPTER ONE

INTRODUCTION

1.1 Background information

Economic growth is the increase in the total output (goods and services) produced in an economy within a given period mostly quarterly or annually (Dornbusch and Fischer, 2005). Quantitatively, economic growth is measured by the growth in real Gross Domestic Product (GDP).

The benefits of economic growth have generated interest among economists and policy makers concerning determinants of economic growth, and as such, it is associated with a number of benefits. First, it reduces poverty and other social problems within the economy. This is because when the economy grows, more output is generated implying that more inputs to production process is needed which mean creation of more jobs opportunities. This in turn means increased opportunities to earn income for the unemployed hence reduction in poverty levels. However, this is possible only if the growth is inclusive. As such, the growth needs to be sustainable (Todaro and Smith, 2011). Second, economic growth results to reduction in income inequality. This is because as economy grows, much investment in public goods is achieved thus improving the living standards of the poor. Further, economic growth results to an increase in public revenue. Growth in public revenue leads to growth in investment in education, health and social security by the government which increases country's human capital thus reducing inequality (Cypher, 2014). Third, economic growth is link to economic development. This is because, economic growth can make a country to realize three components of economic development namely education, longevity and standards of living. Countries that have high economic growth allocate more resources towards their education, health care and hard infrastructure which improves the living standards of their citizens (Todaro and Smith, 2011)

Human capital is a key factor in ensuring economic growth. This is because an increase in the stock of knowledge and skills lead to an increase labor productivity and hence economic

growth. The provision of high quality education services and health care contribute to human capital development which in turn increases economic growth (Ogunade, 2011).

Financial development refers to a situation where financial markets and intermediaries make it easy for economic agents to access financial information and also enjoy low cost of transaction. Financial development is measured by the share of broad money in GDP. This ratio illustrates how deep an economy is monetized (Outreville, 1999). Financial intermediation refers to the process in which financial institutions accepts deposits and lend them out to borrowers who in need for funds for investment. Therefore financial intermediation is responsible for country's economic growth due to its contribution in investment (Wickens, 2011). Financial development has been categorized as a key determinant of economic growth, given that it facilitates financial intermediation within the economy. However, financial intermediation is core in promoting transactions as well as the circular flow of income in the economy which ultimately leads to economic growth. Higher levels of intermediation mean that firms are able to easily mobilize financial resources to finance production hence more output. On the demand side, higher levels of intermediation means that consumers are capable of paying for goods and services at ease hence increased consumption which ultimately lead to economic growth.

The relationship between financial deepening and growth of the economy is not yet clear. Some authors show financial development as endogenous where others show growth as endogenous. For instance, a study by Lewine and Zervos (1998) reveal that it's financial development that sparks economic growth. Again, a study by King and Levine (1993) reveals that it is growth in the economy that sparks development in financial systems. However, a study by Arestis and Demetriades (1997) reveals lack of a clear association between financial development and growth.

1.2 Kenya's Economic Growth Pattern

Kenya's economic growth pattern shows that the country has experienced ups and downs growth rates. Figure 1 shows that the annual GDP growth rate and GDP per capita growth rates have been fluctuating from 1980 to 2021. Negative shocks in these measures appear in periods such as years 1992, 1997, 2002, 2007 and 2012 and 2020. Majority of the negative shocks coincide with years there was general elections in Kenya. These years are 1992, 1997, 2002 and 2007. The contraction of the economy during these years is due to reduced investment as

result of post-election violence. In 1992, individuals' need for agricultural land in Rift Valley was abused by politicians thus leading to violence. In 1997, it is alleged that KANU activists backed armed gangs to attack non-locals resulting to death and displacement of economically productive individuals (Mohamed, 2015). The 1997 poor economic performance can also be attributed to Elnino rains that negatively affected agricultural production (Wawire, 2017). In 2007, the poor economic performance can be linked to post election violence that led to death of about 1200 people and displacement of many people. In 2020, the Kenyan economy performed dismally due to effects caused by COVID-19. To counter the effects of this pandemic, the government introduced restrictions on inter-county movement. Curfews and closure of hotel industry were also introduced. All these measures led to poor economic performance.

In 2003, the Kenyan economy witnessed an impressive economic performance. This continued to 2006. This can be attributed to change in government from president Moi to president Kibaki. It is alleged that individuals felt value for their taxes after free primary education and health services were introduced. This led to increase in tax revenue that led to improvement and start of new infrastructure that revitalized the economy (Murunga, Muriithi and Wawire 2021)

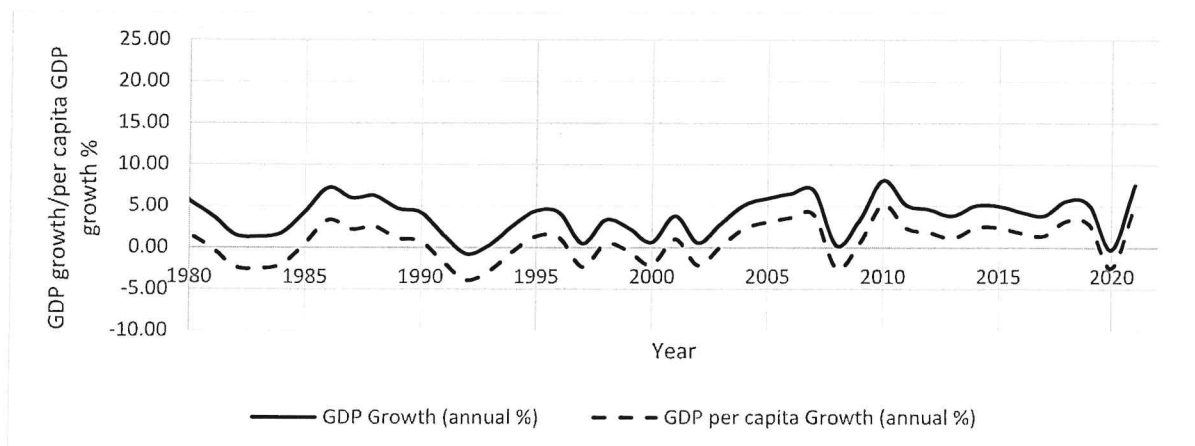


Figure 1: Kenya's growth rate from 1980 - 2021

Source: World Bank Database

1.3 The Financial Development in Kenya

Financial development refers to when financial tools, intermediaries and markets ease the effects of information, enforcement and transaction costs and therefore do an equivalent better

job at providing the key functions of the financial sector in the economy. On the other hand, financial deepening refers to the increased provision of financial services with a wider choice of services geared to all levels of society (Levine, 1997). Development in the financial sector in Kenya can be explained by the developments in the banking industry as well as the development in the stock market.

1.3.1 The Banking industry development in Kenya

The Kenyan banking industry has developed tremendously in the recent past. A review of developments in the Kenyan banking industry reveal that the Kenyan financial sector is made up of the Central Bank of Kenya, which was the governing authority, 40 commercial banks and 14 microfinance banks (Central Bank of Kenya, 2022, Osoro & Kiplagat, 2019). According to Abdul & Ochenge (2019), commercial banks have an important role in the economic growth of a country. In particular, banks enable the flow of credit from sector where funds are surplus to those where funds are inadequate. This intermediation role of commercial banks enables investment in the country which then triggers economic growth. However, changes in interest rates can have far reaching multiplier effects in an economy. Banks alter their lending decisions in response to changing bank market structure.

Looking at the industry's performance, the total asset base for consolidated banking system stood at Kshs. 5.09 trillion in 2020 approximately twice the size of the national budget and with the loan portfolio of Kshs.4.4 trillion. As at December 2020, the total deposits were Kshs. 4.1 trillion (Republic of Kenya, 2021). An impressive financial development can also be shown by upward trajectory financial resources provided to the private sector by other depository corporations in Kenya. Figure 2 shows domestic credit to private sector by banks in Kenya.

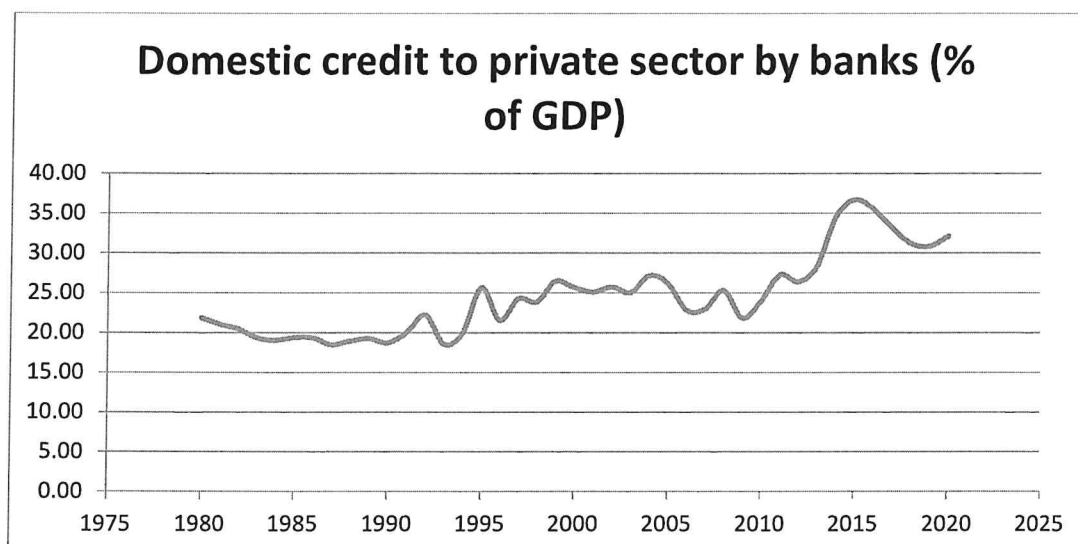


Figure 2: Kenya’s banking industry development

Source: World Bank database

From Figure 1, it was observed that domestic credit to the private sector was 21.81 percent of GDP in 1980 but dropped to 18.5 percent of GDP IN 1993. This drop can be attributed to poor economic conditions that were triggered by high inflation levels. During this year, inflation reached highest of 46 percent in Kenyan history (Murunga, Muriithi and Kiiru, 2016). In recent years, there has been an increase in domestic credit to private sector increasing from 28.26 percent of GDP in 2013 to 32.12 percent of GDP in 2020.

1.3.2 Stock market development in Kenya

Kenya’s stock market has recorded growth over time. The number of the listed firms stood at 61 as at end of 2013 (NSE, 2013). Listed firms grew in number, and this was promoted by the setting up of the Growth Enterprise Market Segment (GEMS) to encourage the SME firms to list in the bourse.

The stock market development indicators show upward trend with upturns and downturns. The overall market capitalization as a proportion of GDP rose from 5.61% to 27.79% in 2014 (figure 3).

However, there was a downward trend in the market capitalization on the 1994 – 2002 periods. This trend was reversed in the 2002 – 2007 period. However the 2007 / 2008 political crises affected the stock market development negatively. Market capitalization as a proportion of GDP fell from 40.51% in 2007 to 27.03% in 2009. The market recovered in year 2009, only to turn downwards in 2010. This coincided with the 2007/2008 global financial crises.

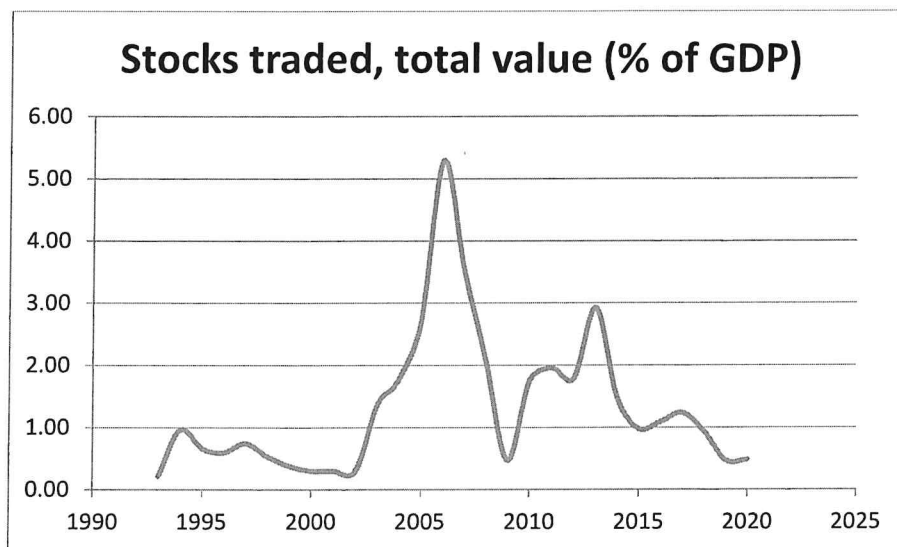


Figure 3: Stock market Development indicators in Kenya, 1993 - 2020

Source: World Bank 2021

From Figure 3, it was observed that stocks traded as value of GDP has been fluctuating between 1993 and 2020. The highest stocks traded as value of GDP of 5.28 percent was recorded in 2006. This impressive performance of the stock market coincide to the period when Kenya witnessed an impressive performance her GDP.

1.4 Human Capital development in Kenya

Development in Human capital is key in promoting economic growth through increased labor productivity. UNECA (1990) define human capital as the knowledge, physical and managerial effort needed to influence technology, land and other resources to produce goods and services needed for consumption. This implies that if a country can harness skills, attitudes, knowledge,

managerial and physical efforts fully, then a country is in position to realize increased labor productivity. On the other hand, Harbison and Myer (1964) attribute differences in socio-economic differences among countries to levels of human capital development and not natural resources endowment. According to the author, human capital development improves productivity and quality of labor which turn translates into economic growth.

Education and training is a major component of human capital (Goldin, 2014). The government of Kenya has formulated and implemented policies in support of education and training thus enhancing human capital development. Some of these policies include free primary education and then introduction of highly subsidized secondary education. The government’s budget allocation to education has been increasing since 1980s. This trend is illustrated in figure 4.

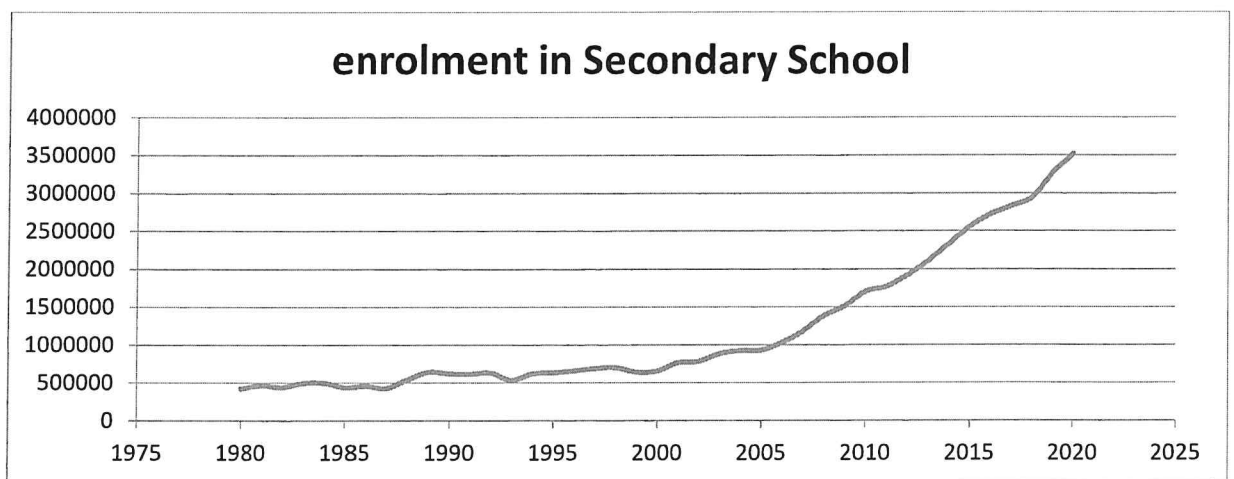


Figure 4: Expenditure on Education in Kenya, 1980 - 2020

Source: World Bank 2016

From figure 4, it is therefore true that the Kenyan government has emphasized on human resource development since 1980 to present. According to Republic of Kenya (2021), total enrolment in public and private secondary schools increased by 10.8 per cent to 3.3 million in 2019 from 2.9 million in 2018. Enrolment in Form 1 stood at 861.4 thousand in 2019 recording an increase of 4.3 per cent from 826.0 thousand in 2018. The growth in enrolment was attributed to the Government policy of achieving 100 per cent transition from primary to secondary education. In 2019, girls accounted for 50.9 per cent and 49.1 per cent of total enrolment in Form 1 and Form 4, respectively.

1.5 Financial Development and Human Capital Linkages

Financial development has attracted attention of policy makers among the developing countries. The policy makers aim at ensuring a substantial amount of their population is banked. These policy makers are guided by the theoretical background which shows how financial development and human capital are interconnected. According to theory, financial development in form of financial inclusion is a tool for the alleviation of poverty through human capital development. Through financial development, low income individuals are in position to access education loans for their children. Attainment of education is a form of human capital development which improves their knowledge, skills, attitudes, physical effort and managerial effort which enhance their employability (Sarwar, Khan, Sarwar & Khan, 2020).

1.6 Problem statement

Human capital is an essential component in achieving growth. However, Kenya has lagged behind in her average levels of human capital which are measured in terms of literacy levels. On the hand, information asymmetry in the Kenyan financial market has been a stumbling block for the country to realize a substantial economic growth. In addition, the country lacks a well-developed and efficiently regulated banking and insurance system (Todaro & Smith, 2015).

Kenyan economy is considered the economic power house of the East African region. The government has put in place measures to improve human capital and financial development through increased expenditure in education and financial liberalization, but this has not translated into sustainable economic growth. The increased education expenditure has resulted into increased university education in Kenya to an extent that almost every county has a university. Further, liberalization of the financial sector has brought on board many people especially through the introduction of mobile money services.

However, most of the human welfare indices which consider income as a result of education and financial development indicate that Kenya is not doing well as compared to her counterparts in the East Asia. Of serious concern is the deterioration of the country's education

system at all levels, especially higher education levels where individuals are trained to take up managerial positions in organizations. In addition, financial inclusion has not reached the desirable levels despite government efforts. For sustainable growth to occur, human capital and financial development must be developed and efficiently used. Strategies aimed at achieving human capital development and financial growth ought to be established by the government. This would in its way eventually lead to economic growth.

Although many scholars have looked into the effect of financial deepening and human capital on growth in many nations, such investigation is lacking for Kenya. The scope of few of notable studies is narrow. For instance, Evans et al. (2002) studied the effect of financial deepening and human capital on Kenya's economy and other 81 countries. In addition, Kiprop et al. (2015) examined the link between financial deepening and growth in Kenya.

This study therefore seeks to fill the gap by investigating the dual effect of both financial development and human capital on Kenya's economic growth. This study will be different from the studies which have investigated developing economies as a whole since Kenya has unique characteristics from other developing countries.

1.7 Research Questions

The study intends to respond to the following questions:

- (a) What is the impact of financial deepening on Kenya's economic growth?
- (b) What's the effect of human capital development on Kenya's economic growth?
- (c) Does the interaction between financial development and human capital have impact on Kenya's economic growth?
- (d) What policy issues can be drawn from the research findings?

1.8 Research Objectives

1.8.1 General Objectives

The overall objective of the research was to investigate the impact of financial development and human capital on Kenya's economy for period running from 1980 to 2021.

1.8.2 Specific Objectives

Specific objectives were in three fold, namely:

- (a) To estimate the impact of financial deepening on Kenya's economic growth.
- (b) To examine the impact of human capital development on Kenya's economic growth.
- (c) To estimate the effect of interaction between financial development and human capital on economic growth.
- (d) To draw policy implications based on study findings.

1.9 Significance of the study

This study is significant in threefold. First, is the contribution of the study towards the country's development blue print, Kenya vision 2030. The blue print is centered on 3 pillars: economic, social and political pillars. The social pillar comprises of education and training aspect. The vision stipulates that the country seeks to offer internationally competitive high valued education, training and research for the purpose of development.

“The main objective is the reduction in illiteracy by increasing education access, improving secondary schools transition rate, and raising the value and importance of education. Kenya intends to expand access to tertiary education from 4.6 percent to 20 percent (Kenya's Vision 2030). This study resonates well with the vision 2030. By showing the link between human

capital development and growth, the findings of the study would contribute in supporting the need for the implementation of the policies under the vision that are geared towards human capital development.

Secondly, this study is important in adding to the economic growth literature. By analyzing the nexus among human capital development, financial deepening and growth, the study will contribute towards adding into the knowledge on how financial development and human capital interact to bring about growth. Many of the existing studies analyze the effect of financial deepening and human capital on growth as standalone variables and not the interaction among them. This study will therefore add into the existing body of knowledge by incorporating an element of how the interaction between financial development and human capital development can affect economic growth.

Thirdly, on the policy front, the findings of the study would be of importance in informing the policy makers such as the Central Bank and Capital Market Authority as a regulator on formulating policies that will foster financial growth and hence economic growth as such. These policies could be touching on enhancing financial market stability through introduction of products to curb financial markets' volatility such as financial derivatives, policies of credit information sharing to deal with credit market information asymmetry, policies towards increasing access and affordability of credit to SMEs thus more financial inclusion among others.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This part covers the literature review for the study. More specifically, the chapter covers the theoretical literature review, empirical literature reviews and the overview of the literature in attempt to highlight the current research gap that the study seeks to fill in.

2.2 Theoretical literature review

Theory shows that financial development and human capital is important determinant of economic growth. The theory of human capital and economic growth dates back to the pioneering works of Mincer (1958) and Becker (1962). The authors believed that human capital should just be treated as physical capital and one can invest in human capital through health, education and training. The theory of financial development and economic growth dates back to the pioneering works of Mackinnon (1973) and Shaw (1973). According to this financial development in form of financial liberalization leads to economic growth through promotion of domestic savings and thus allowing investment. However, Lucas (1978) fails to recognize financial development as an important factor of economic growth.

According to these authors, investment in health, education and training leads to an improved output and hence growth in the economy. The theory of financial development and economic growth dates back to the study by Mackinnon (1973) and Shaw (1973). According to this financial development in form of financial liberalization leads to economic growth through promotion of domestic savings and thus allowing investment. However, Lucas (1978) fails to recognize development in the financial system as a determinant of growth.

2.2.1 Role of financial development on economic growth

The role of financial sector development's on growth is also well elaborated by McKinnon (1973) and Shaw (1973). They were the pioneers of the idea of financial suppression and its effects on economic growth. According to them, a suppressed financial sector depresses both

savings and investment because the rates of return are low compared to what would have been gotten in a competitive market. In such a case, financial intermediaries do not function optimally and fail to direct savings into investment efficiently, thereby hindering the development of the economic system as a whole. They further assert that government control on financial sector can lead to problems in the process of financial sector development that in turn restrict real sector development and hence reduced economic productivity.

Levine (1996) asserts that well developed financial systems ease external financing constraints facing firms, which illuminates one mechanism through which financial development influences economic growth. Further, he points out that financial development is core for economic growth through five main ways namely: Producing prior information on possible investments and allocate capital, monitoring investments and exerting corporate governance after providing finance, facilitating the trading, diversification, and management of risk, mobilizing and pooling savings and Easing the exchange of goods and services.

2.2.2 Role of human capital development on economic growth

Human capital theory demonstrates how education levels increase labour productivity and efficiency of workers by increasing the level of their cognitive skills. This theory dates back to the pioneering works of Mincer (1958), Becker (1964) and Schultz (1961). The theory states that investment in health, education and training leads to an increase in output thus contributing to economic growth. Human capital theorists like Becker (1964) and Schultz (1961) concluded that basic knowledge enhances output of workers of low skill occupations. They further state instruction that demands logical and analytical reasoning that provides technical and specialized knowledge that increases the marginal productivity of workers in high skill positions.

2.2.3 Interaction between financial development and human capital development

The interaction between human capital and financial system development can yield a positive effect on economic growth. Pischke (2000) argues that financial deepening affects human capital development by reducing income poverty and in the long run finance helps reduce the likelihood of poverty by improving health and education. This occurs when individuals invest in acquiring knowledge and in providing services and infrastructure geared towards improving health and the longevity of individuals. Becker and Tomes (1986) asserts that variance in the level of financial market progress and human capital investments explain why some nations develop faster than others.

2.3 Empirical literature review

To study the link between financial development and human capital, various studies have been carried out. Most of these studies investigate each of these variables separately. These studies are discussed below.

Sarwar, Khan, Sarwar and Khan (2020) studied the effect of human capital and financial development on economic growth of the emerging countries. The study used two-step system generalized method s of moments (GMM), dynamic panel estimate using data from 83 emerging countries. The study's findings revealed that human capital, financial development and their interactions positively influence economic growth of the emerging countries. In another study, Allub, Gomes and Kuehn (2019) investigated human capital and financial development using USA data. The study built a dynamic occupational- choice model to quantify how a lack of human capital, financial frictions and joint effect of both restrictions interact to explain cross-country differences in aggregate output per capita, college premia , productivity, average firm size. The study found that the interaction is up to 50 percent larger compared to the sum of the individual effects. In countries with a negligible share of tertiary educated workers, financial development has only small effects on aggregate output

Esso (2010) investigated the effects of financial advancement on economic growth among the ECOWAS using panel regression method for the period running from 1960 to 2005. The study

findings reveal no connection between financial advancement and the level of economic growth.

Abdulsalam *et al.* (2015) examined the relationship between financial deepening, human capital accumulation and growth among ECOWAS using panel regression method for the period running from 1980 to 2011. The study employed the ratios of broad money, domestic credit as a proportion of GDP and bank credits a proportion of GDP as financial development indicators. Bank private credit as a proportion of GDP and domestic credits as a proportion of GDP represent the financial intermediation activities of commercial banks. Human capital development as measured by total school enrolment rate is used as the mediating variable. These study findings establish that development in our financial systems positively influence economic growth of a nation.

Adelakun (2011) examined human capital development and economic growth in Nigeria using OLS methodology. The research findings reveal a strong positive relationship between human capital development and economic growth. The study revealed that investors need to come up with improved means of advancing human capabilities, since it is an important factor for achieving growth in Nigeria.

Falahaty *et al.* (2013) analysed the effect of financial development on economic growth in the MENA region using OLS methodology for the period running from 1991 to 2009. In the study, financial development was measured by banking industry development indicators (private sector credit, domestic credit provided by the banking sector and liquid liabilities) and the stock market development indicators (total share value traded, turnover ratio and stock market capitalization). Human capital development was measured in terms of life expectancy. In addition, population growth and investment share of real GDP per capita were included in the model and as a measure of labour growth and capital stock respectively. The results reveal that financial development is a statistically significant determinant of economic growth.

Oladeji (2015) studied on the effect that human capital development has Nigeria's economy using OLS methodology. In the study human capital was measured by recurrent expenditure on education (REE), capital expenditure on education, recurrent expenditure on health, capital

expenditure on health, primary, secondary and tertiary school enrolment rates. The study findings indicated that human capital positively influences economic growth.

Elena (2015) investigated the impact of human capital on economic growth in Romania using OLS methodology. In the study, human capital development was measured by education expenditure in GDP. Other variables in the model were number of workers with secondary education, amount of exports and the number of patents. The study pointed out human capital as a factor of the growth and that minimal investments in human capital would affect the sustainable development of the countries. The study findings showed that human capital positively influences economic growth.

Ahmad (2012) examined the impact of human capital on economic growth in Iran using OLS methodology from 1978 to 2010. The study used the total number of secondary students as a measurement variable for human capital index. GDP was used as the measure of economic growth and capital stock was used to measure financial capital in the economy. The study findings indicated that human capital positively influences economic growth.

Mobolaji (2010) studied the effect of financial development, human capital and economic growth in Sub-Saharan Africa using panel regression method for the period running from 1970 to 2000. In the study, banking sector development was, measured by that have been used in the liquid liabilities, broad money, private credit and domestic credit each taken as a ratio of the GDP. Human capital was measured by the ratio of educational attainment and population growth rate. The study findings revealed that human capital together with physical capital positively influence region's level of economic growth rate.

Bakang (2015) studied the impact of financial deepening on Kenya's economic growth using OLS methodology for the period running from 2000 to 2013. In the study, financial deepening was measured by LL as ratio to nominal GDP; CPS as ratio to nominal GDP; Commercial Bank Assets as ratio to commercial bank assets plus CBA; and CBD as ratio to nominal GDP. The study results showed that liquid liabilities, loan advances to the private sector, commercial-CBK assets and commercial bank deposits to be significant determinants of GDP.

Onuonga (2014) investigated the impact of financial deepening on economic growth in Kenya using OLS for the period running from 1980 to 2011. Financial development was measured by M2 and domestic credit to the private sector. The study findings showed financial development to be significant and positive determinant of economic growth. The study findings showed that financial deepening enhanced growth and that growth in the economy also led to advancement of financial sector in Kenya.

Odhiambo (2008) examined the nexus between financial deepening and growth in Kenya. He employed OLS methodology for the period running from 1968 to 2002. The study used broad money (M2), currency ratio (CC/M1) and loan advances to private sector as proxies of financial deepening. The research findings established that causality between the two depends on the proxy used for financial development in Kenya.

2.4 Overview and Conclusion

From the literature reviewed, it is clear that varied approaches have been applied in analysing the effects financial deepening and human capital have on growth. The literature has established that development in the financial system and human capital positively affects economic growth. Scanty literature exists on the link between financial deepening and human capital development and how their relationship affects economic growth. Majority of the studies focus on how financial deepening and human capital development affects economic growth. As such this study seeks to add to literature by incorporating financial development influence on growth via its effects on human capital development.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter highlights methods to be utilized to carry out the study in estimating effect of financial development and human capital on economic growth in Kenya. The specific areas included are; theoretical framework, empirical model, definition and measurement of variables, diagnostic tests and data source.

3.1 Theoretical Framework

According to the neoclassical growth model, output is a function of labor and physical capital (Solow, 1956). According to Romer (2012), Solow model can be extended to embrace human capital and physical capital. The model assumes Cobb-Douglas production function which allows quantitative analysis. The desire to perform quantitative analysis further implies that just like the Solow model, the model takes the apportionment of resources to accumulate human capital as exogenous. This gives room to relate the model to observable measures of capital accumulation rather than preferences. The extended Solow model that included human capital can be written as.

$$Y(t) = K(t)^\alpha [A(t)H(t)]^\beta \dots\dots\dots 1$$

Where Y is the total output, K is physical capital, A measures the effectiveness of labor and H is total contribution of all workers of varied ability levels to production. This means it includes raw labor that is skills which people are endowed with and acquired skills that is human capital.

According to Hess (2010), basic Solow model can be extended to include not only human capital but also financial deepening and the link between human capital and financial deepening. To illustrate using a Cobb-Douglas production function, output can be written as a

function of the factors of production namely physical capital, human capital, financial development and the interaction between human capital and financial development which are assumed to be exogenous. The Cobb-Douglas production function can therefore be given as

$$Y(t) = K(t)^\alpha [A(t)H(t)]^\beta F(t)^\gamma F(t) * H(t)^\rho \dots \dots \dots 2$$

Where Y, K, A and H are explained in equation 1. F is financial development variable and F*H is the interaction between human capital and financial development variable. From theoretical perspective it is assumed that β , α , γ and ρ are less than one but greater than zero.

3.2 Empirical Model

The theoretical framework in section 3.1 translates into an operational estimation framework. Equation 2 can be written into an estimable form by introducing logarithms both sides as shown in equation 3.

$$\ln Y(t) = \ln A(t) + \beta \ln K(t) + \alpha \ln H(t) + \gamma \ln F(t) + \rho \ln F(t) * \ln H(t) + \varepsilon_t \dots \dots \dots 3$$

By incorporating other control variables as suggested by the reviewed literature, the study adopts an estimable model shown in equation 4.

$$\ln Y(t) = \beta_0 + \beta_1 \ln K(t) + \beta_2 \ln H(t) + \beta_3 \ln F(t) + \beta_4 \ln F(t) * \ln H(t) + \beta_5 \ln g(t) + \beta_6 \ln op(t) + \varepsilon_t \dots \dots \dots 4$$

Where, $\ln Y(t)$ is natural logarithm of real Output, $\ln K(t)$ is natural logarithm of physical capital, $\ln H(t)$ is natural logarithm of human capital, $\ln F(t)$ is natural logarithm of financial development, $\ln F(t) * \ln H(t)$ is natural logarithm of the interaction between human capital, $\ln op(t)$ is natural logarithm of openness of the economy, and financial development, $\ln g(t)$ is natural logarithm of government size. The coefficients β_0 , β_1 , β_2 , β_3 , β_4 , β_5 and β_6 are parameters to be estimated while ε_t is the error term.

3.3 Variables and Description

3.3.1 Real GDP

Real GDP is used in the measurement of economic growth which is the study's dependent variable. It is calculated by nominal GDP divided by GDP deflator.

3.3.2 Financial development

According to McKinnon (1973) and Shaw (1973), financial development is an important factor in measuring economic growth. It is measured by the Share of assets owned by financial institutions in GDP, share of liquid liabilities in GDP, share of deposits in GDP, share of gross value added of the financial sector in GDP, private sector share credit in GDP or share of broad money in GDP. The study will adopt share of broad money in GDP as a measure of financial development due to consistently recorded data. Following McKinnon (1973) and Shaw (1973) assertion, we expect financial development to have a positive effect on economic growth.

3.3.3 Human Capital

According to Mincer (1958) and Becker (1962), human development in form of education, training and health is an important determinant of a country's economic growth. Human capital development implies development in the people's knowledge and skills hence increase labor productivity which when well utilized leads to high rate of growth in the economy. Again, MRW (1992) argues that human development is important in achieving economic growth of country. The authors argue that the observed evidence shortcoming of the Solow model specifically a large under-estimate of the variation in output of the industrialized and developing economies is due to the omission of human capital. The authors therefore advocate for the addition of the human capital in the traditional Solow model. Further Lucas (1988) model shows that human capital is important determinant of a country's output. Human development is measured by government spending on education and health sector, secondary school enrolment rate. The study will adopt government expenditure on education due to availability of data. Following Mincer (1958) and Becker (1962) assertion, an increase in human capital development will lead to an increase in the economic growth rate.

3.3.4 Financial development and human capital interaction

Human capital and financial development can influence economic growth independently. However, it is possible for the interaction of the two variables to influence economic growth.

This is because human development in form of education speeds up one's ability to take risk which leads to investment. Financial sector development is of great importance to a country that intends to invest in her human capital. The economy can borrow from the financial sector when the domestic savings are not enough to allow adequate investment in human capital (Barrow et., 1992).

3.4.5 Government size

Government size is an important factor in determining a country's economic growth. Government size will be measured by the level of government consumption. High government consumption implies expansionary fiscal policy which results to economic growth through multiplier effects. According to Durden & Elledge (1993), a large government size positively influences economic growth. Following the author's assertion, a large government size has a positive effect on the rate of economic growth.

3.4.7 Openness of the Economy

This will be measured by openness index. The index is calculated as the proportion of the sum country's total imports and total exports to GDP. A higher index implies that the country is doing well in terms of international trade hence attracting foreign investors (Rodriguez, 2000). High foreign direct investment is important for a country's economic growth since it bridges technology and capital shortfalls in a country thus resulting to increased economic growth (Nissanke & Aryeetey, 2003). Following these authors' assertion, we expect an economy's openness to have a positive impact on economic growth.

3.4.8 Gross Fixed Domestic Investment

According to Todaro & Smith (2011), increase in physical capital or investment leads to an increase in output. Physical capital is supplemented by both social and economic infrastructure for instance roads, electricity, water and communication. According to Solow (1956), combination of some amounts of capital, labor and technology yields a given amount of output. Following these authors' assertion, increase in physical capital is expected to lead to an increase in the rate of economic growth.

3.5 Data Source

The study will use time series data running from 1980 to 2021. This period was preferred due to availability of data on all variables. The data on real GDP (dependent variable) will be obtained from WDI database. Data on independent variables will be obtained from WDI database.

3.6 Estimation Procedure

3.6.1 Pre-estimation Tests

Before carrying out regression, there will be need to test for stationarity and order of integration of the series. Stationarity of the variables will be tested using unit root tests. The study will use Augmented Dickey-Fuller (ADF) (1981) unit root test. ADF tests allow running of regression of first differenced series on its first lag, lagged difference terms with specified deterministic components for instance intercept and time trend. If we request for stationarity of a series z_t using ADF test, the equation that is estimated is as shown in equation 5.

$$\Delta z_t = \beta_0 + \beta_1 t + \beta_2 z_{t-1} + \sum_{i=2}^k \beta_i \Delta z_{t-i+1} + \varepsilon_t \dots \dots \dots 5$$

Where ε_t show sequence of stationary error terms that have a zero mean and a constant variance but are uncorrelated.

k shows lag which is optimal and should be chosen in a manner that ε_t will be free from serial correlation. In this case, testing for unit root is done on the coefficient of $\beta_2 z_{t-1}$ p. If the coefficient is found to be statistically not different from zero, then the equation is in the first difference an implication that the variable is not stationary. On the other hand, if the coefficient is found to be statistically different from zero, then the variable is said to be stationary.

If all the variables in the study are integrated of the same order, then the study will proceed to testing for cointegration. The study will use Johansen (1995) test in testing for cointegration. However, before proceeding to Johansen test for cointegration, the study will request for lag length selection so as to establish the number of lags. The Johansen test for cointegration will

be based on two statistics namely trace statistic and maximum Eigen value test statistic. Specification of trace statistic is as shown in equation 6.

$$\delta_{trace} = -N \sum_{i=q+1}^k \log(1 - \delta_i) \dots \dots \dots 6$$

Where δ_i is the i th biggest eigen value and N is the number of observations. In trace statistic, the null hypothesis is that the cointegrating equations are equal or less than the number of indicated cointegrating ranks. The maximum eigen value statistic is calculated as shown in equation 7.

$$\delta_{max} = -N \log (1 - \delta_{q+1}) \dots \dots \dots 7$$

Where δ_{q+1} is the $(q + 1)$ th biggest squared eigen value. In max statistic, $H_0=q=0$ whereas $H_a: q=q+1$ cointegrating equations.

3.6.2 Vector Error Correction Model (VECM)

The VECM, also known as restricted VAR, is a case of unrestricted VAR model, which inserts error correction mechanism (ECM) term. This model is one of most used econometric models. This can be linked to ECM's power to solve the econometric problem of spurious regression and the ability to fit into general and specific approaches to econometric modelling. The model also incorporates an adjustment mechanism that stops error in long-run relation from increasing. According to Granger representation theorem, an effective error-correction illustration describes short-run dynamics of data that pushes equilibrium error to zero (Verbeek, 2008). Therefore, Johansen (1991) VECM methodology was used to estimate this.

To illustrate this, take note of a VAR model of variables integrated of order one (1) denoted by d .

$$d_t = \phi_1 d_{t-1} + \dots + \phi_q d_{t-q} + \varepsilon_t \dots \dots \dots 8$$

The VECM of equation (8) is given by:

$$\Delta d_t = \Pi d_{t-1} + \sum_{i=1}^{q-1} \phi_i \Delta d_{t-i} + \varepsilon_t \dots\dots\dots 9$$

where d_t is k by 1 vector of the endogenous variables in the natural logarithm and Π is square matrix k by k long-run multiplier matrix. The parameter ϕ_i is also a square matrix k by k matrix that describes dynamic effects in short-run, q is lag length, and the ε_t shows the vector of IID innovations with a mean of zero. Πd_{t-1} is a vector error correction mechanism (ECM) that shows both long-run relationship and short-run adjustments in line with the long-run relation. The short-run adjustment illustrates the adjustment effect, showing how the system readjusts due to disequilibrium in the previous period. The estimated VECM model is illustrated in equation 10.

$$\begin{aligned} \Delta \ln Y_t = & \beta_0 + b_{1i} \ln K_{t-i} + b_{2i} \ln H_{t-i} + b_3 F_t + b_4 F_t * \ln H_t + b_5 \ln g_t + b_6 op_t \\ & + \sum_{i=1}^q \beta_{1i} \Delta \ln K_{t-i} + \sum_{i=1}^q \beta_{2i} \Delta \ln K_{t-i} + \sum_{i=1}^q \beta_{1i} \Delta \ln H_{t-i} + \sum_{i=1}^q \beta_{1i} \Delta F_{t-i} \\ & + \sum_{i=1}^q \beta_{1i} \Delta \ln F * \ln H_{t-i} + \sum_{i=1}^q \beta_{1i} \Delta \ln g_{t-i} + \sum_{i=1}^q \beta_{1i} \Delta \ln op_{t-i} + \lambda ECT_{t-i} \\ & + \varepsilon_t \dots\dots\dots 10 \end{aligned}$$

CHAPTER FOUR

EMPIRICAL RESULTS

4.1 Introduction

The chapter presents empirical results. The specific results discussed include the summary statistics of the data, the pre-estimation tests, the unit root tests, cointegration tests, estimated results and post estimation tests. There is also a section where the results are interpreted and discussed.

4.2 The Summary Statistics

The summary statistics of the variables used in the study are presented in Table 4.1 below. The variables that were considered in the study include were natural logarithm of real output, natural logarithm of physical capital, natural logarithm of human capital, natural logarithm of financial development, natural logarithm of the interaction between human capital and financial development, natural logarithm of openness of the economy, financial development and natural logarithm of government size.

Table 4.1: Descriptive Statistics

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
Natural log of GDP	42	13.57	1.73	10.71	16.31
Natural log of secondary school enrolment	42	13.79	0.69	12.95	15.12
Domestic credit (% GDP)	42	24.90	5.60	18.42	41.28
Natural logarithm of physical capital	42	2.995	0.15	2.71	3.24
Trade openness	42	0.52	0.11	0.27	0.73
natural logarithm of government size	42	15.47	2.44	11.74	19.80
Human capital * Financial development	42	346.6	95.35	238.68	624.22

Source: Author's computations based on data from KNBS

The descriptive statistics results showed that the study considered 42 observations. From the results it was observed that among the variables considered in the study trade openness had the least standard deviation of 0.11. This indicated that the values of trade openness as a percentage of GDP have not been changing much in Kenya during the period considered in the study. The

results also revealed that the values of natural log of secondary school enrolment deviated from the mean 13.79 by 0.69.

4.3 Correlation Matrix

Correlation of the variables is examined in the table shown below.

Table 4.2: Correlation matrix

Variables	Natural log of secondary school enrolment	Natural logarithm of physical capital	Human capital * Financial development	Domestic credit (% GDP)	Trade openness	natural logarithm of government size
Natural log of secondary school enrolment	1.00					
Natural logarithm of physical capital	-0.0044	1.00				
Human capital * Financial development	0.90	-0.067	1.00			
Domestic credit (% GDP)	0.86	-0.099	0.99	1.00		
Trade openness	-0.75	-0.029	-0.72	-0.69	1.00	
natural logarithm of government size	-0.87	0.09	-0.76	-0.73	0.56	1.00

Source: Author's computations based on data from KNBS

The correlation results revealed a strong positive correlation between natural logarithm of secondary school enrolment and domestic credit to private sector (% GDP). This strong association can be linked to ability to start a business due to skills gained from education. The individuals seeking to start business then seek loans from commercial banks thus leading to increase in domestic credit to private sector. The results also revealed a moderate negative association between domestic credit to private sector and trade openness. This association can be due to overreliance on imports that make investment in local manufacturing unattractive.

The low investment in manufacturing lead to decreased borrowing from local banks. The study also found a fair negative correlation between natural logarithm of government size and domestic credit to private sector share in GDP. The negative association could be linked to action of government borrowing from domestic banks to finance its programmes thus leading to crowding out effect where credit to private sector reduces.

4.4 Diagnostic Tests

4.4.1 Stationarity Test

The study tested for presence of unit root using ADF and PP. The results are shown in Tables 4.3.

Table 4.3: The Augmented Dickey-Fuller and Phillips-Perron Unit Root Tests

Source: Computations based on KNBS data

Augmented Dickey-Fuller		Phillips-Peron					
		Statistic	Critical value (5 percent)	Order of Integration	Statistic	Critical value (5 percent)	Order of Integration
Natural log of GDP	Level 1 st difference	-0.525 -11.724	-2.955 -2.958	I(1)	-0.724 -12.938	-2.955 -2.958	I(1)
Natural log of secondary school enrolment	Level 1 st difference	1.189 -6.398	-2.955 -2.958	I(1)	1.411 -6.398	-2.955 -2.958	I(1)
Domestic credit to private (% GDP)	Level 1 st difference	-0.073 -5.738	-2.955 -2.958	I(1)	0.316 -5.603	-2.955 -2.938	I(1)
Natural logarithm of physical capital	Level 1 st difference	-2.773 -7.608	-2.955 -2.958	I(1)	-1.059 -8.946	-2.955 -2.938	I(1)
Trade openness		-1.443 -6.687	-2.955 -2.958	I(1)	-1.408 -6.751	-2.955 -2.938	I(1)
natural logarithm of government size		-1.467 -5.880	-2.955 -2.958	I(1)	-1.480 -5.876	-2.955 -2.938	I(1)
Human capital * Financial development		0.418 -5.349	-2.955 -2.958	I(1)	0.820 -5.175	-2.955 -2.938	I(1)

The unit root test results revealed that all the variables used in the study were integrated of order one when both ADF and PP unit root was used. The study didn't proceed to differencing the variables as this could have led to loss of long run information. The study therefore proceeded to test for presence of long run relationship using the Johansen cointegration test. However, before adopting the cointegration test, the study identified the optimal lag length as discussed in the following selection.

4.4.2 Lag length Selection

Before estimating Vector Error Correction Model (VECM), it is important to identify lag length of VEC order. The two lag selection criteria are discussed below.

Table 4.4: Vector Autoregressive (VAR) Lag Selection Criteria

Selection-order criteria								
Sample: 1987 - 2014					Number of observation = 28			
Max rank	LL	LR	Df	Prob	FPE	AIC	HQIC	SBIC
0	-212.65		.		0.00025	3.6e-09*	11.67	11.86
1	-6.33	412.63	49	0.000	6.6e-08	3.28	4.14	5.69*
2	33.71	80.093	49	0.003	1.4e-07	3.75	5.36	8.28
3	90.75	114.07	49	0.000	2.1e-07	3.33	5.69	9.97
4	258.75	336.01*	49	0.000	3.6e-09*	-2.93*	0.178*	5.81

Source: Computations based on KNBS data

The study used the five lag length selection criteria to establish a suitable lag length for the study. The criteria considered were Final Prediction Error (FPE), the Likelihood Ratio (LR), the Akaike Information Criteria (AIC), the Hannan and Quinn information criterion (HQIC) and Schwarz's Bayesian information criterion (SBIC).

From Table 4.4, LR, FPE and HQIC criteria showed that 4 lags should be considered. The AIC, and SBIC criteria suggested one lag and two lags respectively. The study chose 4 lags given that three out of the five lag length selection criteria suggested 4 lags as the optimal lag length. The study therefore considered 4 lags in the Johansen cointegration test and VECM framework.

4.4.3 Johansen Test of Cointegration

After identifying the optimal lag length, the study proceeded to investigate presence of long run relationship using the Johansen cointegration test. It is important to check whether there is long run relationship among the variables (cointegration) or not. To ascertain this, Johansen test of cointegration was adopted and the results are as shown in table 4.5.

Table 4.5: Johansen Test for Cointegration (Max Statistic Model)

Trend: Constant			Number of observation = 38		
Sample: 1984-2021			Lags = 4		
rank	parms	LL	eigenvalue	statistic	value
0	154	66.43	.	384.65	124.24
1	167	151.85	0.99	213.80	94.15
2	178	207.08	0.95	103.34	68.52
3	187	226.28	0.64	64.95	47.21
4	194	243.48	0.60	30.54	29.68
5	199	252.40	0.37	12.71*	15.41
6	202	257.17	0.22	3.16	3.76
7	203	258.75	0.08		

Source: Computations based on KNBS data

From Table 4.5, it was evident that at least there was cointegrating vector between the variables. At a maximum rank 0, null hypothesis (H_0) states absence of cointegration while the alternative hypothesis (H_a) states that there is cointegration. The trace statistic (384.65) at this level was greater than critical value (124.24) at 5 percent level of significance meaning H_0 was rejected thus shifting investigations to maximum rank 1. At this maximum rank, the null hypothesis tests that there is one cointegrating equation against more cointegrating equations. The trace statistic at this level is greater than that the 5 percent critical value thus leading to movement to maximum rank 1. At this point, the null hypothesis is that there is one cointegrating equation where alternative hypothesis shows that there is more than one cointegrating equations. The trace statistic of (213.80) was greater than that at 5 percent critical value (94.15). This implied that the null hypothesis was rejected. The same process continued until at maximum rank 5 where the trace statistic was less than that at 5 percent critical value leading to failure to reject the null hypothesis of 5 cointegrating equation. Thus the Johansen cointegration test revealed presence of long run relationship by establishing 5 cointegration equations. Having identified

presence of long run relationship, the study proceeded to estimate a Vector Error Correction Model (VECM) as discussed in the following section.

4.5 VECM Regression Results

VECM framework was implemented, and the results are illustrated in Tables 4.6 and 4.7. Equation 10 was the one that was estimated. The VECM long run results are shown in Table 4.6 while short run results are shown in Table 4.7.

Table 4.6: VECM Long Run Results

Dependent Variable: Natural log of GDP	Coefficient	Standard Error	t	P Value
Natural log of Secondary school enrolment	1	.	.	.
Natural log of Fixed Capital Formation (% GDP)	2.82	0.393	7.18	0.00
Interaction of Human capital and Financial development	0.0397	0.0099	4.03	0.00
Domestic credit to private sector (% GDP)	0.095	0.153	0.62	0.54
Trade openness (% GDP)	3.93	0.681	5.77	0.00
Natural logarithm of government size	0.75	0.051	14.66	0.00
Constant	22.45	.	.	.
Observations	40			
F(p>ch ²)	0.0000			
R-squared	0.86			
Jarque-Bera	0.17			

From Table 4.6, it was evident the regression performed well with regard to overall model fit. This is illustrated by the significant p-value (0.00) of the F test. This suggests that all variables considered in this model are jointly important determinants of economic growth in Kenya at a 99 percent confidence level. The coefficient of determination (R squared) showed that about 86 percent of the variation in economic growth in Kenya was linked to the explanatory variables considered in the study.

The study went a step further to carry out post estimation tests. Tests performed included normality and model stability. The Jarque Bera test adopted showed that the null hypothesis of normality was not to be rejected since the probability value for all variables (0.17) was greater than 0.05. The results for stability showed that the VECM models were stable, implying that

the results were valid as the roots lay within the unit circle for each model. The graph is shown in Figures A.1 in the Appendix.

The VECM results showed in the long run the coefficients control variables' natural log of fixed capital formation (% GDP), Trade openness (% GDP) and natural logarithm of government size were positive and statistically significant. This implies that fixed capital formation, Trade openness and government size are important determinants of economic growth in Kenya.

The coefficient value of the financial development variable, domestic credit to private sector (% GDP) is 0.095, positive and significant to economic growth. This implies that financial development increases economic growth in Kenya in the long run. The coefficient value of the human capital variable, natural logarithm of enrolment in secondary school is unit, positive, indicating that human capital increases economic growth. The interaction term results also suggest that the combined effect of human capital and financial development increases the growth by 0.0397 percent which shows that the interaction term of financial development and human capital has a positive and significant effect on the economic growth at a 1 percent level of significance. These results are in line with economic theory. The results are also in agreement with earlier study by Sarwar, Khan, Sarwar and Khan (2020) while studying impact of human capital and financial development on emerging economies' economic growth. This studies finding corroborate Allub et al. (2019) study which on using US data found that gains from financial deepening depend on countries' educational attainment positively influence countries economic growth.

The VECM short run results are presented in Table 4.7. The analysis of the VECM short-run relationship is performed on first difference of the variables.

Table 4.7: VECM Short Run Results

Dependent Variable: First Difference of natural log of GDP	Coefficient	Standard Error	t	P Value
$\bar{ce1}$ L1.	0.077	0.0579	1.32	0.186
$\bar{ce2}$ L1.	-0.311	0.25	-1.24	0.214
Lag one of First Difference of natural log of GDP	-0.797	0.255	-3.13	0.002
Lag two of First Difference of natural log of GDP	-0.451	0.337	-1.34	0.181
Lag three of First Difference of natural log of GDP	-0.453	0.237	-1.91	0.056
Lag one of First Difference of Natural log of Secondary school enrolment	0.778	0.334	2.33	0.020
Lag two of First Difference of Natural log of Secondary school enrolment	-0.441	0.365	-1.21	0.227
Lag three of First Difference of Natural log of Secondary school enrolment	0.088	0.315	0.28	0.780
Lag one of Natural logarithm of physical capital formation	-0.173	0.296	-0.58	0.560
Lag two of Natural logarithm of physical capital formation	-0.317	0.186	-1.71	0.088
Lag three of Natural logarithm of physical capital formation	0.192	0.141	1.36	0.174
Lag one of interaction of Human capital and Financial development	-0.0195	0.0118	-1.65	0.098
Lag one of interaction of Human capital and Financial development	0.0146	0.0145	1.01	0.313
Lag one of interaction of Human capital and Financial development	-0.00296	0.012	-0.25	0.805
Lag one of domestic credit to private sector (%GDP)	0.270	0.163	1.65	0.099
Lag two of domestic credit to private sector (%GDP)	-0.185	0.206	-0.90	0.367
Lag three of domestic credit to private sector (%GDP)	0.0292	0.167	0.18	0.861
Lag one of trade openness	0.0989	0.274	0.36	0.718
Lag two of trade openness	0.106	0.268	0.40	0.690
Lag three of trade openness	-0.21	0.283	-0.74	0.458
Lag one of Natural logarithm of government size	0.0059	0.0212	0.28	0.781
Lag two of Natural logarithm of government size	0.011	0.0220	0.51	0.608
Lag three of Natural logarithm of government size	0.017	0.0244	0.70	0.483
Constant	0.315	0.097	3.26	0.001

From Table 4.7, the results revealed that human capital variable lag three of the natural logarithm of secondary school enrolment was positive and statistically significant. Specifically it was revealed that an increase in human capital by one percent leads to an increases in economic growth by 0.778 percent holding other factors constant. The results also showed that

financial development variable, lag one domestic credit to private sector ratio in GDP positively influence economic growth in Kenya in the short run. The coefficient was positive and statistically significant. This implied that *ceteris paribus*, an increase in financial development by one unit leads to an increase economic growth by 27 percent. However, interaction between financial development and human capital was found be not important determinant of economic growth in Kenya in the short run. This was informed by coefficients of the lags of this interaction that were statistically not different from zero.

The VECM results showed in the short run the coefficients control variables' natural log of fixed capital formation (% GDP), Trade openness (% GDP) and natural logarithm of government size were statistically insignificant. This implies that fixed capital formation, trade openness and government size are not important determinants of economic growth in Kenya in the short run.

CHAPTER FIVE

CONCLUSIONS AND POLICY IMPLICATIONS

5.1 Introduction

This chapter presents the summary and conclusion of the study and policy recommendation based on this study's findings of the study. The chapter comprises of three sections. The first section includes summary and conclusions of the study. The second section is on policy implications and recommendations. The last section is on limitations of the study and recommendations of areas for future research.

5.2 Summary and Conclusions

5.2.1 Summary

The study sought to establish the influence of human capital, financial development and the interaction between these two variables on economic growth in Kenya. The major findings are as follows. First the coefficient of human capital was found to have a positive and significant influence on economic growth in the long run. This implies that human capital measured by enrolment in secondary school is important determinant of economic growth in Kenya. Secondly, the coefficient of financial development was found to be positive and significant in the long run. This implies that financial development proxied by domestic credit to private sector is important in influencing economic growth in Kenya in the long run. The coefficient of interaction of human capital and financial development was found to be positive and significant suggesting the variable's importance in determining economic growth in Kenya in the long run.

The human capital and financial development were found to be important determinant s of economic growth in the short run. However, the coefficient of the interaction of these variables was found to statistically not different from zero. Thus, the results implied that the interaction of human capital and financial development is not important determinant of economic growth in Kenya in the short run.

5.2.2 Conclusions

Regarding the first objective of estimating the impact of financial development on Kenya's economic growth, results revealed a positive and statistically significant coefficient of financial development variable. This study therefore concluded that an increase in financial development may lead to increase economic growth in Kenya.

Regarding the second objective of estimating the effect of human capital development on Kenya's economic growth, the study showed a positive and significant coefficient of the former variable. This is an implication that human capital development is important determinant of economic growth in Kenya. This study therefore concluded that an increase in human capital development may lead to increase economic growth in Kenya.

In line with third objective of estimating effect of interaction between financial development and human capital on economic growth, a positive and significant coefficient was found. This is an implication that the interaction between human capital development and financial development is important determinant of economic growth in Kenya. This study therefore concluded that an increase both human capital development and financial development may lead to increase economic growth in Kenya.

5.3 Policy Recommendations

The findings of this study have indicated that human capital, financial development and their interaction have a positive and significant effect on Kenya's economic growth. This study therefore recommends that government through ministry of education to ensure there is a higher transition from primary schools to secondary schools. This assertion is on the backdrop that human capital as proxied by enrolment in secondary school was found to have a positive influence on economic growth. Increased enrolment in secondary school can be realized if government through ministry of education provides free or highly subsidized secondary education.

Secondly, the study recommends that government through central bank of Kenya to provide conducive environment that will ensure sound financial sector in Kenya. This recommendation based on the finding that that financial development as proxied by domestic credit to private

was found to have a positive influence on economic growth. Increased domestic credit to private sector can be realized if government through central bank adopts expansionary monetary policy.

Lastly, the study recommends that government to ensure there is need for government to ensure there is both financial development and human capital development. This is because both have important implications to economic development, as gains from financial development depend on country' educational attainment. This can be achieved through offering free or subsidized secondary education and adopting expansionary monetary policy by government.

5.4 Limitations of the Study

The main weakness of this study is that it focused on only one variable in measuring human capital and financial development due to unavailability of data for other measures. The study used enrolment in secondary school and domestic credit to private sector as a measure of the human capital and financial development respectively. The results could have been better had study also include public expenditure on education and Primary pupil-teacher ratio as measures of human capital. Other than domestic credit to private sector, domestic credit provided by financial sector can also be used if data is available.

5.5 Areas for Further Study

Future researchers can incorporate other measure of human capital and financial development in investigating their effect on economic growth. Some of the measures of human capital that can be considered include public expenditure on education and Primary pupil-teacher ratio. Measure of financial development that can be used in future study include domestic credit provided by financial sector.

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APPENDIX

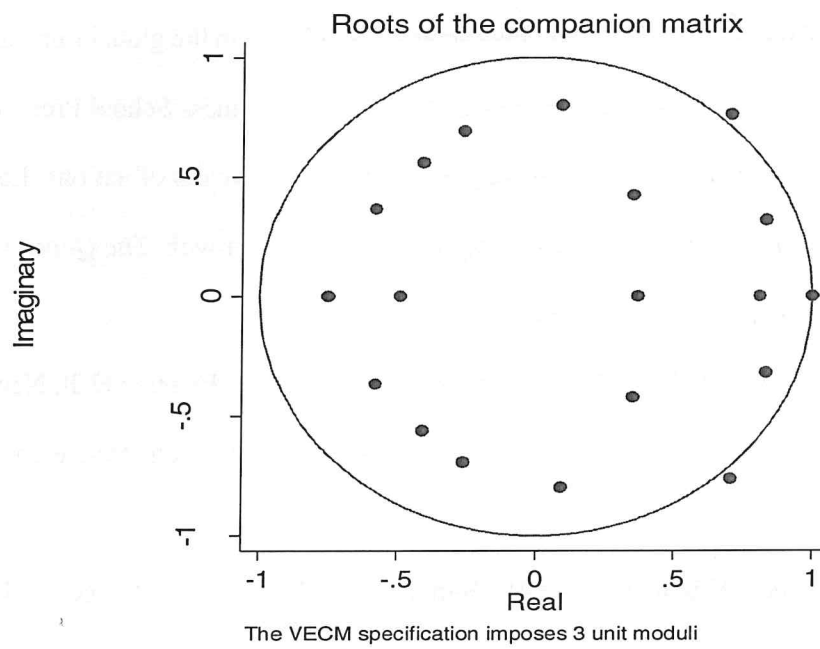


Figure A1: Model Stability

Source: Author's computations based on data from KNBS