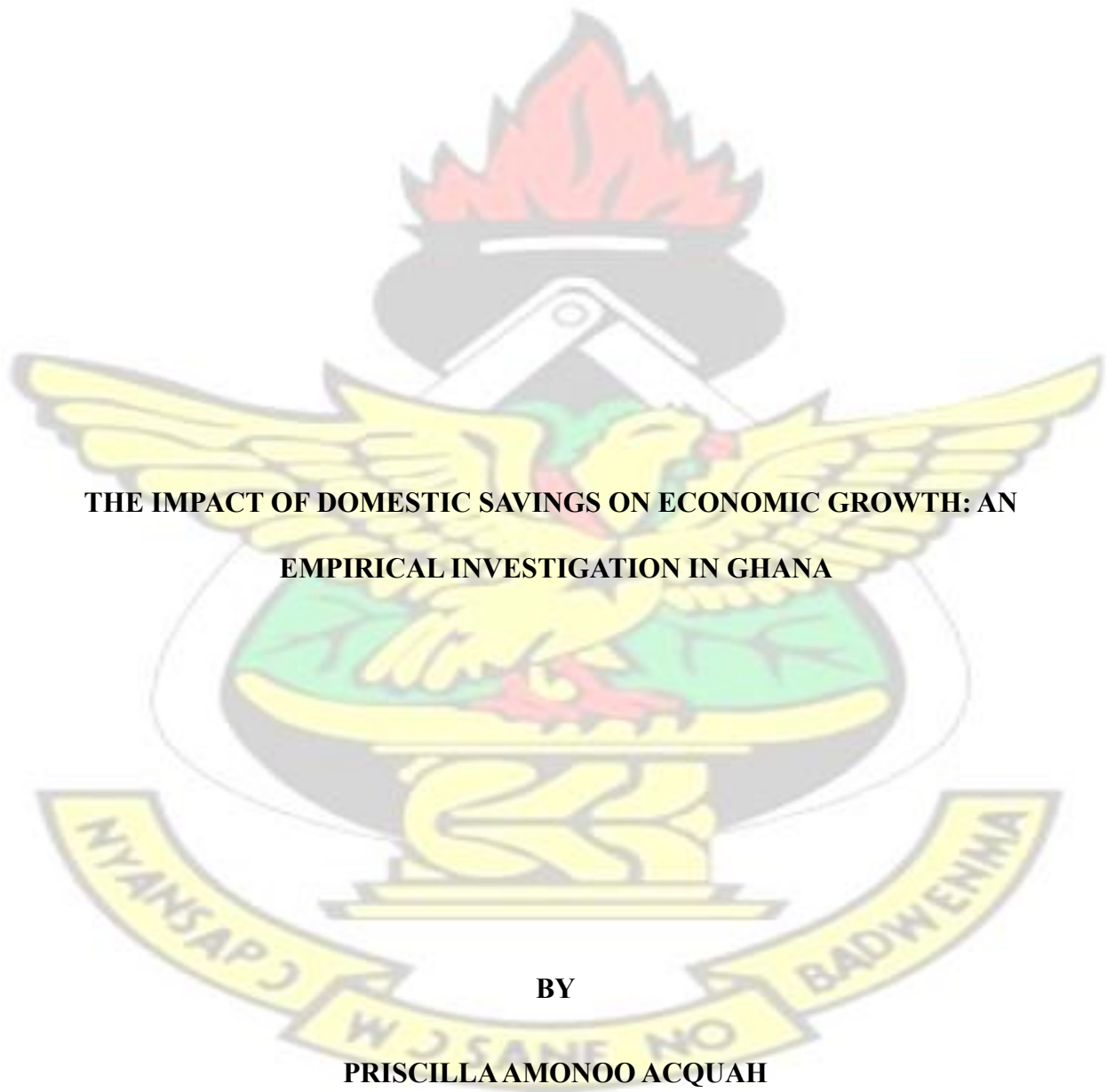


KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF HUMANITIES AND SOCIAL SCIENCES

SCHOOL OF BUSINESS

DEPARTMENT OF ACCOUNTING AND FINANCE



**THE IMPACT OF DOMESTIC SAVINGS ON ECONOMIC GROWTH: AN
EMPIRICAL INVESTIGATION IN GHANA**

BY

PRISCILLA AMONOO ACQUAH

NOVEMBER 2020

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KNUST

By

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A thesis submitted to the Department of Finance, School of Business, College of Humanities and
Social Sciences, KNUST

In partial fulfillment of the requirements for the award of degree in

MASTERS IN BUSINESS ADMINISTRATION (FINANCE OPTION)

NOVEMBER 2020

DECLARATION

I hereby declare that this submission is my own work towards the Masters of Business Administration (Finance option) degree and that to my best of knowledge it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

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DEDICATION

This thesis is dedicated to the Almighty God and my brother Dr. Yaw Asare.



ACKNOWLEDGEMENT

I thank the Almighty God for how far He has brought me, it is by His graces and mercies this dream has become a reality. May His name be praise.

I wish to express my appreciation and profound gratitude to my supervisor Dr. Daniel Domeher of KNUST for his immense help, guidance, and direction in carrying out this project work. My appreciation also goes to all lecturers who taught me and gave me pieces of advice.

To my family (the Amonoo Acquah family), colleagues (Nicholas Anokye) and loved ones (Emmanuel Okyere), for the encouragements, advice and support you gave me, both physically and spiritually during my educational encounters, I say God bless you all.

Special thanks also goes to the management and staff of Bosomtwe Rural Bank for their support, not forgetting Eric Atanga Ayamga.

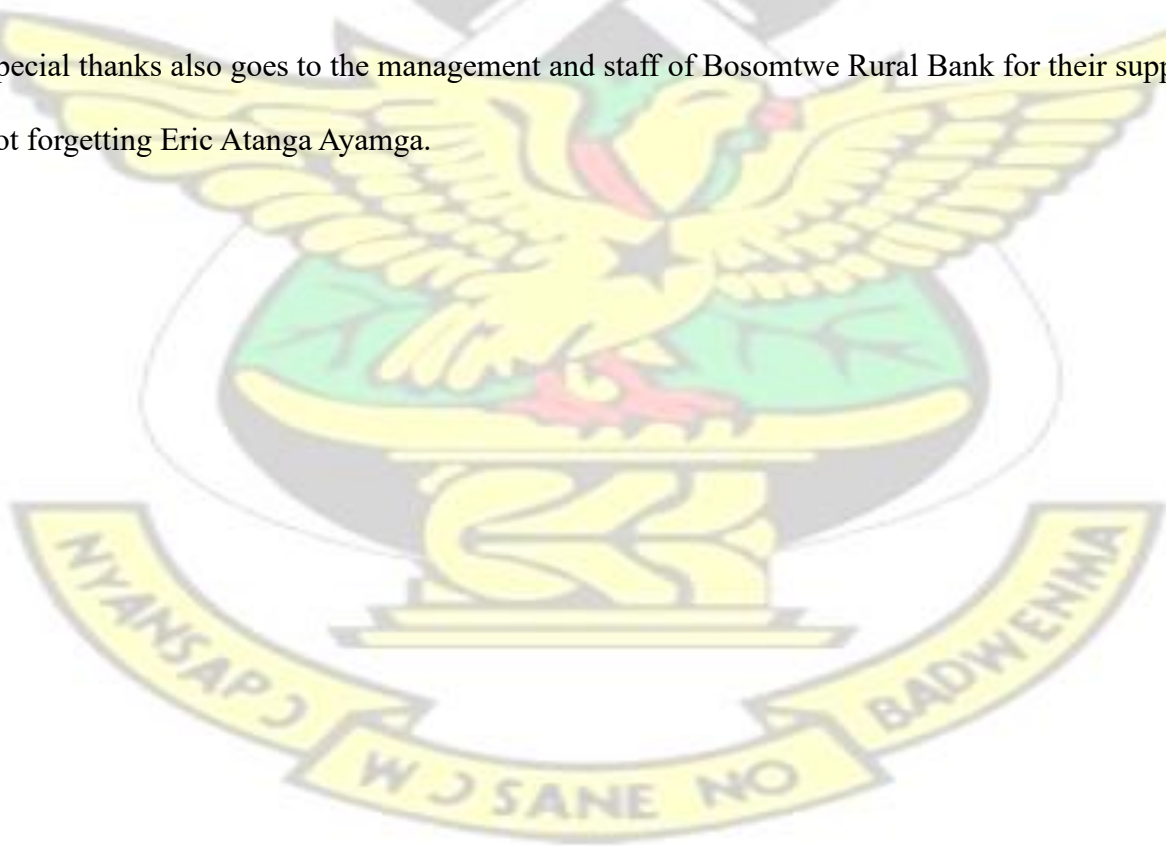


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Abstract

There has been much jubilation and hope after independence on 6th March 1957 that Ghana will steer the African continent towards fast economic growth and development. Though Ghana experienced relatively high growth soon after its independence, it had already shown negative per capita growth in 1965. In 2011, the World Bank projected Ghana to be the fastest growing economy in Sub-Saharan Africa (SSA) as Ghana witnessed a 14% economic growth in that year. This growth can only be realized through accumulation of human and fiscal capital. Domestic savings are crucial in financing high capital formation which leads to increased productivity, sustained growth and development. Unfortunately, Ghana has not witnessed gross domestic

savings above 20% of GDP. This study examined the mechanisms through which savings affect economic growth in Ghana.

The study used the neoclassical production function gross domestic savings and other macroeconomic determinants are the main exogenous variables in the second model. The Thomas Tobin's investment function is used to link gross domestic savings and investment in Ghana. The study used the Autoregressive Distributed Lag model (ARDL) to examine the short run and long run relationships between the independent variables and the dependent variables. The Dickey-Fuller Unit Root was used to check the stationarity of the variables.

The study concluded that gross domestic savings affect economic growth through gross investment only in the short run but this channel does not exist in the long run.



THE IMPACT OF DOMESTIC SAVINGS ON ECONOMIC GROWTH IN GHANA

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Capital is a basic requirement for the effective functioning of any economy. It is necessary to finance current operations and investments needed to support future economic activities. Such capital may be sourced from internal and external sources. It may as well be sourced from government and or from the financial system. Government most times supplies capital to support a wide range of services and infrastructures for enhancing output while the capital needed by economic agents to finance current and future economic activities may be sourced from the financial system (Ubi and Effiom, 2015). In Ghana, there is ample evidence to suggest that those two sources of capital have been inadequate and to that extent the pace of economic activities has decelerated (Adu, 2013 and Aryeetey, 2008). According to IMF (2014), there exist some differences in the saving rates among nations in the world. The saving rates in developed countries are higher as compared to developing or lower middle nations. Even among the rich countries, there are variations in the savings level among citizens.

Ghana's per capita income has evolved over the years since 1957 when she got her independence. Right after independence on 6 March 1957, there were high potential in the economy of Ghana to dominate the continent. However, the story was different in just some few years. In 1965, the nation was already experiencing negative per capita growth. In fact, the per capita income at the time of independence was below its value when in April 2006. In the late 1960s and very early

1970s, economic conditions seemed to be changing considerably. However, in the mid-1970s the per capita GDP had declined significantly in the history of postindependence in Ghana by the start of the 1980s. The economic conditions have significantly changed since the beginning of the 1980s. Growth has not been significantly increased and the income per capita is only at its peak in 1957.

Ghana has sought to achieve reasonable rates of growth and development since independence in 1957. In the 1960s an attempt to rapidly industrialize started with a number of check steps and state interventions. The 1970s continued the initiatives, with little indication of the ultimate objectives for growth (Aryeetey, et al., 2000). Inadequate macroeconomic and structural growth policies and numerous external shocks and low domestic savings induced significant economic performance deterioration by the beginning of 1983 (Adu, 2013). Although the approaches used to incorporate principles of economic growth have been frequently undermined by mobilization and capital formation of low domestic resources.

Many studies laid emphasis on growing the economy through domestic capital formation. But the growth in domestic capital formation depends on the growth of domestic savings. Only adequate savings will allow the accumulation of fixed capital. Inadequate savings and investments have often restricted developing countries, for example insufficient savings and investments, (Wollasa limited economic growth in Sub-Saharan Africa. L. Kumo, 2011). That is one explanation why Africa remains "the poorest continent in the world" (Gimbari, 2002). Savings contribute to the formation of resources and lead further to technological innovation and growth, supporting the economies of large-scale production and increasing specialisation, leading to accelerating labor productivity, thus increasing GDP further. Savings thus result in the productive use of the scarce resources available, the increase in the size of the national production, incomes and jobs, the resolution of inflation, unemployment and payments balances, poverty and disparities, and the

freeing of the external debts and a better welfare situation for the economy. There can also be ample economies in the vicious cycles of poverty in developed countries and this is the key goal of economic growth. Moreover, the low level of national savings is mainly due to the slow rates of third-world growth, which constrain investment potential. This results in lower inflation and growth rates than other economies. The key source of economic growth is usually often known to be saving. Prior studies have shown that in subSaharan Africa, on average, less than 15% is saved, while in eastern Asia, over 30% of GNI, particularly Loayaza (2000-2011) is being taken into account (GNDI).

1.2 Problem Statement

In principle, savings play a major role in Ghana's true economic growth and development by shaping money. Savings decide the national investment and therefore output capability, thus impacting the country's economic growth capacity. Many studies have been conducted to find out the correlation between savings and economic development. According to Romer (1986) and Lucas (1988) growth models, higher saving rates and the resulting increase in capital accumulation would lead to steady growth rates. Hence, the savings rates of a nation have direct consequences on its economic growth. Also, the study of (Barro, 1990; Jagadeesh 2015; Anoruo and Ahmad, 2001; the 2013 World Finance Map) also supports the notion that a nation's saving rates affects its economic development.

Many of the existing literature focused on developed nations with few focused on the African continent. One other deficiency of the existing studies is the data used for the study. Majority of the existing literature are more than a decade old, and hence do not reflect the actual situations on for the study and may impact negatively on the results and analysis. The study therefore seeks to address the existing literature failure to focus on developed nations by using Ghana as the case

study. Also, the data for the study are modern and this helps to present a more current analysis for the impact of Savings on economic growth.

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1.3 Aims and Objectives

The main aim of this study is to investigate the mechanisms through which savings affects economic growth (productivity) in Ghana. In order to achieve this aim, the following specific objectives are set;

1. Investigate the relationship between gross domestic savings and interest rate in Ghana
2. Investigate the relationship between gross domestic savings and investment in Ghana
3. Investigate the relationship between investment and economic growth in Ghana

1.4 Research Questions

The study seeks to answer the following questions

1. What is the relationship between gross domestic savings and interest rate in Ghana?
2. What is the relationship between gross domestic savings and investment in Ghana?
3. What is the relationship between investment and economic growth in Ghana?

1.5 Methodology

The research uses annual time series data from 1975 to 2016 for 42 years. In order to examine decreasing, significantly low savings in Ghana and its impact on the Ghanaian economy, the

analysis was limited to the stipulated time frames because of inconsistency and data not available. The study uses the Autoregressive Distributed Lag Model (ARDL model) to examine the cointegration between the dependent and independent variables in the study. Some residual and model diagnostic tests (such as Heteroskedasticity, autocorrelation, multicollinearity, etc) are carried out in order to check for the reliability of the model estimated.

1.6 Justification

Substantial low resources mobilisation in many developing countries in recent times has being an area of concern to academia's, government economic analyst and policy makers. Hence, the significance of this study is to:

- a) Provide an insight analysis of Ghana's savings profile as well as its impact, magnitude and direction on real gross domestic product.
- b) Provide policy makers and government with a perfect understanding of the impact of low saving on economic growth and policy recommendations to aid prevent its likely consequences.
- c) Dive into the topic and bring out the best out of it, so as to contribute significantly to applied research.

1.7 Organization of the study

The study is organized into five chapters. Chapter one is the introductory chapter which contains the background to the study, statement of the problem, objectives of the study, hypothesis statement, scope of the study, justification of the study and organization of the work. Chapter two elaborates details work on the review of related literature on the research topic, theoretical literature, trends in gross domestic savings and empirical literature review. Chapter three embodies

the research methodology which is made up of the, model specification, theoretical framework, source of data, and method of data analysis, description of variables and a priori expectations. Chapter four entails the analysis of the data collected and the interpretation of the results obtained from the various tests. Chapter five presents the summary of major findings, conclusions and policy recommendations.



CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The chapter reviews empirical literature and theoretical literature on savings, investment, the linkage between savings and economic growth, theories on economic growth and the linkage between investment and economic growth. The chapter also examines the trends in domestic savings, domestic savings and economic growth in Ghana.

2.1.1 Concepts of Savings and Investment

In a narrow sense, savings normally means, for instance, placing money at the bank or microfinance or setting up the retirement scheme or for precautionary purposes. Saving means economization, cost control and so on in a wider context. On the other hand, savings can be defined as money accrued by saving (Mensah, 2004). Saving is a process whereby economic operators are able to assign a portion of their income to invest and improve their potential income capacity. Savings can be divided into three groups of economics: personal, commercial and public savings. Personal savings are classified as personal disposal income less expenditure on personal consumption. In other words, personal savings are revenue not consumed by purchasing products instantly and saving services (Keynes, 1936). Company savings are the company's revenue (profits minus tax payments and dividends). Corporations save when not all their earnings are spent: these amounts are however, typically fairly small on a macroeconomic scale. The budget surplus is simply government or public savings. The government also runs public deficits to dissolve (borrow). The amount of personal, business and government savings is thus the national savings

(brutal domestic savings). The scale of business and government savings however led to the conclusion that the largest and most important part of domestic savings is personal savings (Ogoe, 2009).

The key subject of macroeconomics is investment expenditure for two reasons. First, investment fluctuations are primarily responsible for GDP movement in the business cycle. Second, the rate at which the long-term growth and output of the economy is calculated by investment costs. In macroeconomics, expenditure refers to the flow of expenditure which adds to physical capital. Gross investment components can be divided into three components; fixed investment for businesses, company expenditure on machinery, equipment and factories. The second part consists mainly of housing investment, while the third is inventory investment, which consists of inventory additional investments

2.1.2 Economic Growth

Economic growth is characterized as a growth in a nation's output or per capita income (Nafziger, 2006: p.15). The gross national income (GNI) or gross national product (gNP or GNE), which are interchangeably utilized in the overall economic performance of goods and services, are commonly used for production. Todaro (2015) describes economic growth as a long-term boost in its ability to provide its people with ever more varied economic benefits and is focused on technological progress and its structural and ideological changes. The steady growth of national production is an indicator of economic growth and a symbol of economic development is the ability to supply a large range of products. The foundation or conditions for sustained economic growth are advancing technology. Ro, 2003) 2003) The potential for growth inherent in new technology and the institutional and attitudinal adaptation needed without technological advancement is like an

electricity-free bulb, there is a potential, but nothing happens without additional inputs (Todaro, 2003)

2.1.3 Trends in Ghana's Economic Growth

Ghana was the first African nation to gain colonial political independence on 6 March 1957, with stable economic growth and development, and there was great joy and hope that Ghana would lead the way for Africa as a continent to evolve and expand rapidly. Indeed, Ghana soon experienced relatively high growth, but still negative growth per capita by 1965. In fact, the per capita revenues were below their value at the time of the independence when the coup d'état overthrew the Nkrumah regime in April 1966. In the late 1960s and early 1970s, economic conditions seemed to have changed considerably. But in the mid-1970s, GDP per capita reached its lowest in post-independent Ghana's history, as a result of a major decline in the early 1980's. While the economic conditions have dramatically improved since the beginning of the 1980s, the rate of growth was not significantly accelerated, with per capita income yet to increase in 1957. Ghana has set itself the goal of reaching a high mid-income nation by 2020, with a projected rate of GDP growth of approx. 8% per year. However, the economy has not shown the potential to step toward the goals over the five years since the establishment of the objectives. In 1996-2000, while GDP was forecast to rise between 7.1% and 8.3%, real growth varied between 4.2% and 5.0%. For example, in 1999, all macro-economic priorities were marginalized and the trend continued to increase until 2000. But in the mid-1970s, GDP per capita reached its lowest in post-independent Ghana's history, as a result of a major decline in the early 1980's. While the economic conditions have dramatically improved since the beginning of the 1980s, the rate of growth was not significantly accelerated, with per capita income yet to increase in 1957. Ghana has set itself the goal of reaching a high mid-income nation by 2020, with a projected rate of GDP growth of approx. 8% per year. However, the economy has not shown the potential to step toward the goals over the five years since the

establishment of the objectives. In 1996-2000, while GDP was forecast to rise between 7.1% and 8.3%, real growth varied between 4.2% and 5.0%. For example, in 1999, all macro-economic priorities were marginalized and the trend continued to increase until 2000.

In recent times, Ghana has witnessed positive economic growth according to the World Development Indicators; increasingly large current-account deficits have made sustainability in Ghana questionable. Ghana's journey so far, having now attained lower-middle-income status requires sustainable growth and development. Sustainable growth and development hinges on resources mobilization from domestic and international sources, as well as public and private sectors capacity for capital formation in the Nation (UNDP-GHANA). Capital formation entails sustainable savings particularly from the private sector of the economy.

Considering World Development Indicators (2015), in terms of economic growth for some economies such as China (9.5%), USA (1.6%), UK (1.6%), and Ghana (14%), the World Bank projected Ghana to be the fastest growing economy in Sub-Saharan Africa in 2011. Yet still, in terms of Gross savings (% of GDP), Ghana recorded (15.1%) in 2011 and (16.8%) in 2013, while in most developed countries like the USA, China, Japan and others, gross domestic savings is substantially higher than 20%. Neighbouring developing African economies had low savings rates such as Benin (12%) in 2011 and (13%) in 2012, Nigeria (26%) in 2011 and (33%) in 2012, Cote d'Ivoire had (15%) in 2011 and (16%) in 2013, Botswana (37%) in 2011 and (41%) in 2013. From the reported statistics, it is unfortunate that domestic savings, which provide the path for financing domestic fixed capital formation to cushion the economy against shocks in international capital, is peculiarly low in Ghana which calls for this research paper.

The table below shows the trends in gross domestic savings, gross fixed capital formation and economic growth (gross domestic product).

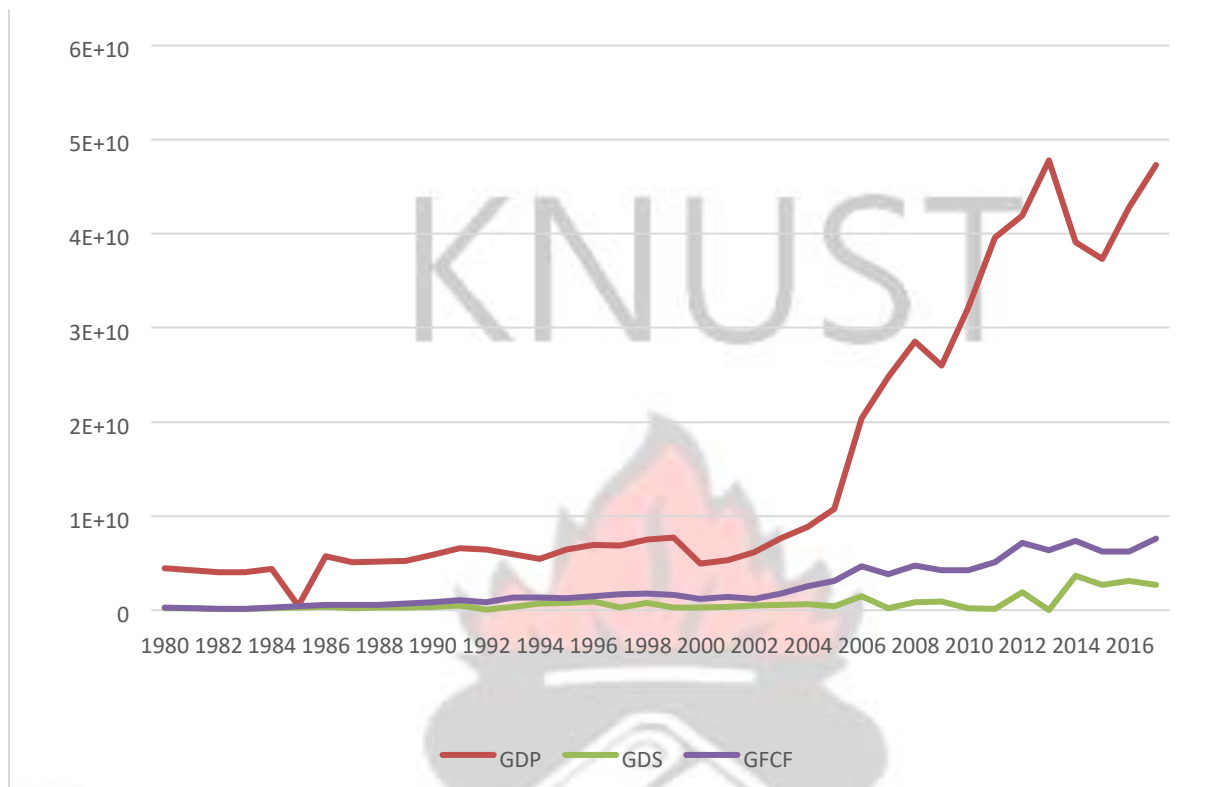


Fig. 2.1 Trends in gross domestic savings (GDS), gross fixed capital formation (GFCF) and gross domestic product (GDP).

2.1.2 Theories of Savings

Many fields and academics tried in various ways to understand savings actions. Economists justify savings from the perspective of revenue and age (Modigliani & Ando 1957), but sociologists consider the principal effects of savings to be class and social stratification (Sorensen, 2000). Furthermore, access, motivation, expectations and facilitation are defined as factors affecting savings (Beverly & Sherraden, 1999). Lead economists and psychologists, however, regard the incentive of self-control and others as affecting savings (Katona, 1975).

These hypotheses, as they form the basis of the study, were explained in this portion.

A. Relative Income Hypothesis

James Duesenberry's relative income theory is that a person's income saved depends on a percentile percentage in the overall income distribution of their relative earnings. So a person shall consume a lesser percentage or save a greater percentage of his or her revenue during a given period by raising his or her absolute income and by increasing his or her relative income distribution role. However, if after an improvement in the absolute income, a person's relative position on the income scale continues to remain the same the proportion he consumes and saves will not change. The relative revenue hypothesis therefore notes that the saving level is determined by the current household level of income relative to the highest previously received level of income. Hence this theory is relevant to this study because as the income of a person increases, the savings and expenditure level of the individual also moves in that same direction. A high level of savings makes funds available for individuals at the bank to establish businesses and most importantly it gives avenue for government to borrow cheaply internally for developmental projects.

B. Friedman's Permanent Income Hypothesis

The hypothesis of permanent income extends the hypothesis of the life cycle income. The theory of permanent income is based on the premise that households prefer to consume optimum by allocating capital efficiently during their lives. Consumption thus depends on lifetime wealth, such as assets and profits both now and in the future. This will depend on interest rates, asset valuation and projections of future post fiscal profits. This is known as a forward-looking decision. The PIH forecasts that optimum consumption is fluid in relation to profits. Friedman concluded that economic agents' choice of their consumption/savings patterns does not depend on current incomes, but on their continuous profits, which is based on longer-term revenue expectations calculated.

Friedman often differentiated permanent consumption from accidental or sporadic expenditure or consumption, such as unexpected medical bills and others (part of scheduled and steady consumption). Then Friedman clarified that permanent consumption is commensurate with permanent profits. The central idea of the hypothesis of permanent income suggested by Milton Friedman in 1957 is clear, according to Schenk (1988), "people base their consumption on what they believe is their "natural" revenues. In so doing, they aim to keep their standards of living reasonably stable, despite the fact that their income varies considerably between months and months or between years. Consequently, rises and decreases in income that people see as temporary effects on their expenditure on consumption."

In a nation where the citizens' income moves up, there is a direct impact on the economic development of the nation because the citizens' income level increases and it affects their savings too. And higher savings increases funds to establish businesses and improve the economic wellbeing of the citizens.

C. Katona's Theory of Savings

Otto (2009) noted that "Katona's theory of saving is based on the assumption that saving/consumption is dependent on the ability to save/ consume and the willingness to save/ consume. The theory stressed the importance of income but thought of the absolute income hypothesis as being too simplistic. Simply having money left over after expenditures on necessities does not mean that this money has been saved or will be saved. To predict saving, the willingness to save needs to be considered as well. In other words, those who are able to save still need to choose to do so, that is, they have to make a decision that requires some degree of willpower. Consumer expectations and consumer sentiment will influence saving decisions as well as pessimism and optimism with regard to a general and one's personal evaluation of the economic

situation. While people save for different reasons, Katona assumes that someone's personal evaluation of the economic situation will influence contractual as well as discretionary saving decisions"

Katona (1975) has suggested three types of savings activities between ordinary people: first, contract saving, when payments for assets such as home mortgages are routines, which are compulsory or compulsory. Secondly, there is discretionary saving when you are actively saving; and thirdly there is residual saving when you do not spend anything in and thus save by chance. Hence this theory draws the conclusion that it is not just the level of income of the person that influences savings, but the person's attitude to risk, the interest rates in the nation and opportunities in the future to use one's savings benefits.

D. Keynes Absolute Income Hypothesis

Keynes (1936) introduced the Absolute income hypothesis (AIH) and the theory explains the relationship between disposable income and consumption hence savings because income is either saved or consumed. Keynes argues that consumption and hence savings have a stable relationship with current income. The hypothesis of absolute revenue, which explains the relation between consumption and profits, is the so-called "foundational psychological law" of consumption, Keynes (1936). The report notes that the basic psychological rule, upon which we are allowed both a priori to be based, is that men are in the main and in the average, able, as their income increases, to increase consumption, but not so much as the increase in their income.

When one's incomes rise, the law explains that consumption is increasing, albeit lower. The proportion of consumption change and income change that is positive and less than one marginal consumption tendency (MPC) (consumption will also increase, but not generally at the same rate). Therefore, as sales increases, the MPC and APC decrease. It means saving (S) also increases with

wages; it's a positive income functions and like MPC, the marginal saving tendency (MPS). Therefore, Keynes emphasizes that with absolute money (disposable income), the savings would increase and that spending would decrease as income rises, with other factors constant. The idea is that a person can be saved only if they have more than enough to meet the basic needs. This means that people can save only when Keynes pays for what is left over, meaning that the rich save a greater portion of their income than those who are not rich. Kuznets (1946), using cross-sectional information from 70 countries subdivided into seven groups by per capita income, estimated the gross and net savings ratio to gross and net goods. Results from his analysis showed a preference for higher savings rates, albeit not reliably, for higher per capita incomes. The results from Kuznets found a strong link between personal savings and disposable income. Houthakker's research have confirmed this (1960).

2.1.3 The Role of the Savings Rate in Growth Models

The function of savings rates for various growth models is reviewed in this section. Under the Harrod-Domar growth models followed by the Solow growth model, the first sub-section addresses the relationship between savings and economic growth. Finally, from the perspective of the modern growth models, the link between savings and economic growth is presented.

A. The Harrod-Domar Growth Model

The first macroeconomic model to formally examine growth problems was developed by Harrod (1939) and Domar (1946). In this regard, particular attention is paid to the relationship between household saving and entrepreneur decision making when these patterns are not technically formed. Currently, following the Keynesian method, the decision on consumption saving is characterized by an exogenous consumer tendency whereas the decision on investments is defined by the accelerator principle. Production is only obtained through physical capital and labor in their

model. Since Keynesians generally assume fixed prices, businesses select the best technique at the given prices. There is also usually only one cost-minimization strategy that means a single determination of the capital/work ratio and the capital/production ratio (Salvadori, 2003). Investment determines the income level, Y_t , which in turn determines the net savings, i.e. the net capital supply for full employment by the secure capital. Investment describes Harrod and Domar's opinion. The current capital stock, optimized according to the accelerator theory and the rates of population growth, defines net capital demand for full capital and a stable labor state (Salvadori, 2003). In its simplicity lies the principal appeal of the Harrod-Domar model. Given the target growth rate, g^* and incremental output-capital ratio, v , the savings needed to achieve g^* can easily be calculated. If there is not an appropriate level of domestic savings to match a certain level, I to achieve g^* , then the model states the amount of capital flows needed to be borrowed from outside Canada. The model also predicts that the higher the saving rate, the higher the growth rate, etc (Ogoe, 2009).

B. The Solow Growth Model

Solow (1956) and Swan established the neoclassical growth model (1956). It consists of a hybrid process for production on a continuous basis, integrating composite production with labor and capital production (with decreasing marginal returns). A fixed part of production is expected to be saved, with technology being exogenously produced (Agénor and Montiel, 2008). Solow's simple growth model (1956) shows that capital accumulation plays a major role in economic growth. The model affects the capital stock and per capita level, but it doesn't affect the economic growth rate. The model also shows that total savings (investment) are a key factor in economic growth, and that capital stock growth is a deciding factor. Although the saving rate has no long-term effects on the per capita growth rates, the per capita income level in the steady state has an effect (positively). But saving rate shifts impact short-term growth rates (Agénor and Montiel, 2008). The result of

the Solow model is that a rise in the savings rate increases per capita per capita production and per capita equity. A higher rate of saving would lead to more investment per unit of production than before, leading in turn to capital expansion per worker. The process nevertheless ends because of given labor growth, as the growing share of investment will be devoted to retaining this higher ratio of equity. The saving rate thus defines the per capita stock level and thus the per capita production against which the economy is balanced rather than the rate at which each quantity changes.

The Solow growth model typically states that the saving rate change the balanced growth path of the economy and thus the per individual output in a stable state, but the rate of output growth per employee is unaffected by the balance of growth paths. Only exogenous improvements in technology will increase per employee's production in a steady state.

C. The New Growth Theory

As population growth and technological change in the neoclassical growth model are considered exogenous, this model does not account for the mechanisms that lead to stable state growth and therefore does not permit an assessment of the mechanisms by which public policies can theoretically affect growth. These shortcomings of the neoclassical model are discussed in the New Growth Literature by proposing a set of channels that endogenously generate stable growth. The new theory of growth emphasizes the importance of creativity as important drivers of economic growth, human capital accumulation, new technology advancement and financial intermediation (Agénor and Montiel, 2008). One way of relieving the supposition of declining returns to capital imposed under the basic neoclassical growth model was adopted in the new growth literature. It involves seeing all inputs of production as some sort of replicable capital, not just physical capital (as highlighted in the fundamental neo-classical framework) but also others, especially human

capital (Lucas, 1988). Rebelo's (1991) so-called AK model is a simple growth model according to which output per employee (y) is a linear role for capital (human or physical) (k). The growth rate of the state in line with the AK model shows a positive (and constant) rate of growth, with per capita incomes increasing without any constraints. The AK model therefore means that the per capita rate of growth is permanently raising compared with the neoclassical model. In addition, the model of the AK suggests that poor countries whose production process is defined by the same degree of technological progress as other countries will often rise at the same rate as rich countries, irrespective of their initial income levels (Agénor and Monti) as a result of the Neoclassical growth model forecasting that rich countries can grow faster than rich countries.

2.3 Empirical Literature Review

Several investigations were carried out in developed countries on the ties between savings and economic growth, but none or very little was done in the channels whereby savings influence economic growth. The research therefore explores the relationship between savings and economic growth only.

2.3.1 relationship between gross domestic savings and interest rate

According to Deev and Hodula, (2016), interest rates has a negative relationship with a nation's economic development. This is because inflation affects the interest rates in a nation. When inflation increases, it reduces the purchasing power of individuals which affects their consumption power thereby reducing their saving levels. Also, Ilyas et al., (2014) studied inter correlation among economic growth, saving and inflation in Pakistan for the period of 1973-2010 by using 2sls estimation method. They found that economic growth is adversely impacted by inflation and real interest rate.

2.3.2 relationship between investment and economic growth in Ghana

Abu-Foul (2010) has been analyzed in the time series for each nation from 1961 to 2007, using the causal link between savings and economic growth in Tunisia and Morocco. The research used the peseran cointegration and the Granger Causality test to verify the long-term relations between the variables and the causality. The study finds that there are long-term ties between variables in the case of Morocco, while Tunisia shows no long-term relationship. In the case of Morocco, the Granger Causal Test supports a bidirectional causality of Tunisia's economic development from saving growth to growth. Najarzadeh et al (2014) explored the relation between savings and economic growth in Iran in a series of time series data from 1972 to 2010. The autoregressive layer model is used for short- and long-term assessment of the relationship between variables. Results show that the saving impact for Iran in the short and long term on total and non-oil growth is positive and significant.

Jagedeesh (2015) analyzed the economic growth impact in Botswana during the 1980–2013 time series. In order to verify the long-term relationship between gross domestic economy and growth in Botswana, this study used the Auto-Regressive Distributed Lag model. The test found that saving and economic growth is very closely related, and the survey supports the HarrodDomar model of growth. Elias and Worku (2015), using the Vector Error Correction (VEC) method, have analyzed the causal relationship between gross domestic savings and Eastern African economic growth: evidence from Ethialopia, Kenya and Uganda. The study confirmed that in Ethiopia and Uganda there is an important correlation between domestic savings and economic development.

2.3.3 relationship between gross domestic savings and investment in Ghana

In Nigeria, Nwanne (2014) studied the effect of savings and investment on economic development. The research investigated the relationship between variables using the Distributed Autoregressive Lag model. The study found that changes in gross domestic spending had a negative significant effect on changes in Nigeria's economic growth and a positive and significant impact on Nigeria's changes in economic expansion through gross domestic investment. Economy effects on Albania's development have been analyzed from 1992 through 2012, and Johansen's co-integration studies were used in Turan and Gjergji (2014). The empirical results from this study have shown that savings and economic growth are thus mixed, implying a stable relationship between long-term equipment. In Kenya, however there was no substantial co-integration approach in the course of the study period. The results of the Granger Causality test showed that domestic savings and economic growth were induced in unidirectional Ethiopia and Uganda. Since they identified a systemic break in 1980, Patra et al (2017) revisit the causal relation between savings and economic growth in India. The empirical evidence shows that the actual operation in pre- and post-pause cycles can only be improved by savings in the short term, although economic growth contributes to savings growth in the before the period.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter discusses the way this study was conducted. It concentrates on model specification, description of variables under the study, priori expectation on the signs of the coefficients to be estimated as well as the model estimation technique.

3.1 Source of Data

In this paper, time series data on savings, investment and economic growth from 1975 to 2017 are used to analyze the ways in which savings impact economic growth in Ghana. The choice for the time frame for this study is relevant as it portrays the period where the economic situation of Ghana was stable and data could be obtained with ease. There is easy access to data for those periods as compared to the earlier days of Ghana. The World Bank Data and Banks of Ghana collect secondary data. Gross domestic product, Gross Capital Training, Gross Domestic Savings, Exports, Inflation and Population are the main variables in this document. These data are processed by the econometric package of Stata windows.

3.2 Model Specification

Time series data from 1975-2017 on savings, investment and growth will be used in this paper to examine the channels by which savings in Ghana influence economic growth. The secondary data from the World Bank and the Bank of Ghana are obtained. Gross domestic product, Gross Capital Education, Exports, Gross Domestic Savings, inflation and population variables are included in this paper. This is done using an econometric kit from Stata Windows.

Model I

The study used the macroeconomic balance model, where domestic investment is equal to domestic savings in a closed economy as stated below

$$I = f(S) \dots\dots\dots 3.1.1$$

This can be extended with some variables since in the opened economy, prices of goods and services, loanable interest rate, trade openness among other variables influence investment decision. Therefore, by extending the model can be written as

$$I = f(GDS, INF, IR, OP) \dots\dots\dots 3.1.2$$

Where, GDS is Gross Domestic Savings, INF is inflation rate, IR is interest rate and OP is trade openness

The specific linear econometric form of the model can be written as;

$$GFCF_t = \beta_0 + \beta_1 GDS_{t-1} + \beta_2 INF_{t-1} + \beta_3 IR_{t-1} + \beta_4 OP_{t-1} + \mu_t \dots\dots\dots 3.1.3$$

Where β_0 to β_4 are intercept and partial slope coefficients

Model II

Following the model used by Jagadeesh (2015) to examine the impact of savings and investment on economic growth and augmented with other variables to suit the prevailing condition in Ghana.

$$GDP = f(GFCF, INF, Exports, POP) \dots\dots\dots 3.2.1$$

The specific linear econometric form of the model can be written as

$$\text{LnGDP}_t = \alpha_0 + \alpha_1 \text{LnGFCF}_{t-1} + \alpha_2 \text{LnINF}_{t-1} + \alpha_3 \text{LnEX}_{t-1} + \alpha_4 \text{LnPOP}_{t-1} + \mu_t \dots\dots\dots 3.2.2$$

Where α_0 to α_4 are intercept and partial slope coefficients

3.3 Description of Variables and Expected Signs

The study uses variables such as inflation, population growth rates and the income level of the citizens as the exogenous variables since they have the potential of affecting the savings of individual. A person is highly motivated to save if the population growth is low and there is low dependency ratio. Also, inflation reduces the value of money, hence a high inflation rate discourages savings from individuals. Also, the endogenous variables which are used to represent economic growth in this study are real gross domestic product and gross fixed capital formation. A higher economic growth means the total value of goods and services produced in the nation is high, and also the total value of purchases or expenditures and investments of companies and individuals are high.

3.3.1 Endogenous variable

a) Real Gross Domestic Product:

GDP is the amount of the money-value of all final domestic-produced goods and services sold for a certain period of time, usually a year in organized markets. Nominal GDP is measured at current prices by estimating production. Real GDP is determined by comparing results at common prices for various years (O. Blanchard and D. R. Johnson, 6th edition). True GDP is thus a much better indicator of improvements in overall output than the nominal GDP. We used real GDP as an indicator of economic growth in this analysis.

b) Gross Fixed Capital Formation:

This calculates the value of the purchase by company, government and pure household of new or existing fixed assets less disposal of fixed assets. As GFCF is part of GDP investment, it informs us about the amount of the new added value spent instead of

absorbed in the economy. Gross Fixed Capital Preparation is being used as an investment proxy for this analysis.

3.3.2 Exogenous variables

a) **Inflation Rate:**

This refers to the rate at which the price level increases over time (O. Blanchard and D. R. Johnson, 6th edition). Inflation makes the market system to function less efficiently thereby worsening the living standard of people and hence reducing growth. Therefore, the study expects inflation to have a negative influence on real GDP.

b) **Population Growth Rate:** PGR refers to the rate at which a country's population

changes overtime. At any point in time, a country can experience either an increase or a decrease in its population due to changes in the level of birth rate, death rate and migration. According to the Solow model, higher population growth rate has a negative influence on economic growth. This is because, an increase in the rate of population holding other factors constant, leads to a decline in the amount of capital per worker.

Therefore, this study expects population growth to have a negative relationship with real GDP.

c) **Gross Fixed Capital Formation:** This measures the value of the acquisitions of new or

existing fixed assets by the business sector, government and pure households less disposals of fixed assets. GFCF being a component of the expenditure on GDP, it tells something about how much of the new value added in the economy is invested rather than consumed.

The Solow growth model takes investment as having direct and positive effect on economic growth. The implication is that, an increase in capital accumulation directly induces

economic growth. Based on this and given that the Solow growth model is the conceptual frame works underlying this study, we expect a positive relationship between GFCF and economic growth.

- d) **Gross domestic savings:** This measures the value of national income or output that is not consumed. This composes of private and public saving. Gross Domestic Saving is always measured as a percentage of GDP and tells how resources the economy is postponing today for future consumption. Gross domestic saving is the main source of funds for carrying out investment projects in an economy for development purposes as predicted by the Solow growth model. Based on this and given the Solow model as the study's conceptual frame, we expect a positive relationship between GDS and economic growth.
- e) **Exports:** the purchase of domestic goods and services by foreign is termed as export (Blanchard & Johnson, 2013). This therefore implies that exports is a measure of the monetary value of all goods and services produced domestically but purchase by foreigner in their home countries. The study expects exports to have a positive influence on economic growth, therefore a positive relationship between them.

3.4 Estimation Techniques

3.4.1 Unit Root Test

This is used to test the stationarity of the time series data. A time series data is set to be stationary, if the mean, variance and covariance are the same overtime. A non-stationary time series data occur when the mean, variance and covariance of the variables are time variant. In the case where the

time series data is non-stationary, the consequences are dire because analysis based on it leads to spurious results. It is thus necessary, before conducting an econometric analysis of data, to check whether the time series data is static or not. In order to know the presence of a stationaries or reliability of the data, the ADF unit root test is performed on all variables. The Time Series data are based on the ADF root test to test the null hypothesis that there is no unit root in the data against the alternative hypothesis (that is the data is stationary).

Rules for taking decision

- If $t > \text{ADF critical value}$, then do not reject the null hypothesis
- If $t < \text{ADF critical value}$, then reject the null hypothesis

3.4.2 Co-integration test

We then start to measure the cointegration between the variables after the variables have been set. This is used to analyze whether there exist long run relationship between exogenous and endogenous variables. As cointegration occurs, a common pattern and long-term balance imply that the endogenous and exogenous variables have a theory. The Auto Regressive Distributed Lag Model is used to examine the cointegration of exogenous and endogenous variables in this review.

3.4.3 Error Correction Model

An error correction model belongs to a group of multiple time series models which have a long-run stochastic pattern, also called cointegration, commonly used for data. ECMs are a theory - based technique that is useful to estimate one-time series effects on another both for the short- and long-term. The word error correction refers to the effect of the short-term dynamics of last-term deviation from a long-term balance.

ECMs thus predict explicitly how easily a dependent variable returns to balance after

adjusting other variables. The research is performed via the program Stata in this report.

3.5 Residual Diagnostic

3.5.1 Heteroskedasticity Test (HT)

HT is the non-constancy in the error variance of the values of the dependent variable conditional on the changing values of the regressors. In other words, either HT refers to the situation where the conditional variance of the dependent variable in a regression increases or decrease with changing values of the regressors. Heteroscedasticity can compromise the efficiency of the estimates in any estimation involving time series data.

3.5.2 Autocorrelation (AC)

AC refers to the correlation between the error terms in different period. The Classical Model for Linear Regression (CLRM) assumes that one observation disturbance term is not affected by the disturbance term associated with any other observation. Thus, $E(U_{t1}U_{t2}) = 0$. AC can either be negative or positive and is mostly prevalent in time series data. If AC exists, though the estimated parameters by OLS are still unbiased, but are no longer efficient because their covariances are enlarged. Hence, the t-statistic, confidence interval and hypothesis testing statements are no longer reliable. Therefore, it is important to check whether the data used in this study suffers from AC or not. In this study, the analysis is done via the Stata software.

3.5 Conclusion

This chapter presents on the model specification, a brief description of variables, conceptual framework, estimation techniques employed as well as types and source of data for the study.

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CHAPTER FOUR

INTERPRETATION OF RESULTS AND EMPIRICAL FINDINGS

4.1 Introduction

This chapter presents the analysis of data and interpretation of results and empirical findings. The chapter also presents the results of the coefficient and residual diagnosis tests discussed in chapter three. These include; Augmented Dickey Fuller unit root test, Cointegration test, Heteroskedasticity test, Autocorrelation test and among others.

4.2 Results of Descriptive Statistics

Table 4.1 Descriptive statistics of the variables

Variable	Minimum	Maximum	Mean	Kurtosis	Skewness
RGDP	6250*	36103*	14572*	0.370	1.199
INF	8.726	122.875	32.470	3.944	2.050
IR	12.5	47	27.026	-0.040	0.357
TOP	6.320	96.048	57.893	-0.958	0.015
POP	0.983	28	18	-1.0968	0.316
GDS	3*	3655*	629*	6.523	2.602
GFCF	142*	7014*	2064*	-0.073	1.106
EXP	134*	1758*	4176*	1.183	1.599

Source: Author's own construct 2020. * denotes measured in millions

From the table above, minimum, mean and maximum (GDS) gross domestic savings (measured as gross private savings plus government savings measured as government budgetary surplus) are 3 million, 629 million and 3655 million dollars respectively.

The table above show that gross domestic savings is a small fraction (less than 20%) of real gross domestic product in Ghana. Loanable interest rate has a mean value of 27 percent with a minimum value of 12.5 percent and a maximum value of 47 percent for the period covered. Loanable interest rates have been high in Ghana, therefore, making the cost of borrowing very expensive hence the low contribution of gross investment to real gross domestic product. Most of the country's investment comes from foreign indirect investment and other small-scale businesses in the country that find it difficult to grow due to high cost of borrowing. Investment in Ghana recorded a mean of 2064 Million dollars with a minimum of 142 million dollars and a maximum of 7014 million

dollars for the period under consideration. Inflation rate has been high over the periods under consideration, registering a mean inflation rate of 32 percent with a minimum of 8.7 percent and a maximum of 122.9 percent. Population, trade openness and gross exports have mean values of 18 million, 58.8 percent and 4176 million dollars respectively for the periods under consideration. Ghana's population has more than tripled with the 47 years under consideration, recording 0.98 million in the first year and 28.2 million in the last year. The growing population has created serious demand for public infrastructure and high demand for jobs (creating a very severe unemployment situation in the country), hence the need to investment more in lucrative businesses that can absorb the increasing unemployment levels in the country. Real gross domestic product (RGDP) recorded a mean of 14572 million dollars in the periods under consideration with the minimum value of 6250 million dollars and a maximum value of 36103 million dollars.

4.3 Correlation Matrix

Table 4.2 Correlation matrix

Variable	RGDP	INF	Lrate	TOP	POP	GDS	GFCF	EXP
RGDP	1.000							
INF	-0.4918	1.000						
Lrate	0.2559	-0.3982	1.000					
TOP	0.5592	-0.5760	0.7819	1.000				
POP	0.9689	-0.6007	0.4714	0.7338	1.000			
GDS	0.7063	-0.2508	0.1485	0.2699	0.6105	1.000		

GFCF	0.9689	-0.5009	0.2017	0.5177	0.9301	0.7066	1.000
EXP	0.9760	-0.4285	0.1324	0.4356	0.8769	0.6858	0.9488

Note: All correlations are significant at 1%

Source: Author's own construct

4.2.1 Relationship between gross domestic savings and investment in Ghana

From the correlation matrix above, gross domestic savings (GDS) is found to have a positive relationship with gross fixed capital formation (GFCF) a proxy for investment and real gross domestic product (RGDP) a proxy for economic growth (performance). Gross domestic savings have a 70.66% and 70.63% positive relationship with gross fixed capital formation and real gross domestic product respectively. This relationship is consistent with the theoretical propositions of Solow (1956) and Schumpeter (1911) and also consistent with the empirical findings of Adu (2016) and Jagadeesh (2015). Gross fixed capital formation is found to also have a positive significant relationship with real gross domestic product, which meets apriori expectations and consistent with the theoretical propositions of Solow (1956), the endogenous growth model and other economic growth determinants theories. From the matrix table gross fixed capital formation have a 97% correlation with real gross domestic product. This finding is consistent with Aryeetey et al (2000), Adu (2016) and Baafi (2010).

4.2.2 relationship between gross domestic savings and interest rate in Ghana

Inflation rate is found to have a negative relationship with gross domestic savings, gross fixed capital formation and real gross domestic product. This indicates that an increase in the inflation rate worsening economic activities through low savings and low capital accumulation. Interest rate has a positive relationship with gross savings, indicating the need for higher interest rates to induce

people to saving more. However, there is no evidence that higher will reduce loanable interest rates in order to encourage investment.

4.4 Results of the Augmented Dickey Fuller Unit Root Test

Here we report the results of the Augmented Dickey Fuller unit root test for the variable used in this study in their log form via the E-views software. The null hypothesis of the ADF test is that the variables under consideration have a unit root against the alternative hypothesis that it has no unit root.

Table 4.3 Results of the Augmented Dickey Fuller Unit Root Test

Variable	Level		First Difference	
	Intercept	Intercept and trend	Intercept	Intercept and trend
LnRGDP	3.272	-2.041	-3.859***	-4.342***
LnINF	-3.261**	-5.571***	-9.044***	-8.925***
LnTOP	-1.063	-1.805	-4.505***	-4.436***
LnPOP	-0.655	-0.515	-1.701	-1.881

LnGDS	-6.976***	-7.888***	-11.091***	-13.001***
LnGFCF	-0.413	-3.212*	-6.855***	-6.760***
LnEXP	0.377	-3.326*	-4.212***	-4.254***
Lrate	-1.934	-1.588	-6.374***	-6.499***

Asterisks (*), (**), and (***) denote significance at 10%, 5% and 1% respectively

Source: Author's own construct

From the table above, It should be noted that the gross domestic product and inflation rate, as seen by the high ADF test figures, are statistically important in their log form. The other variables are statistically insignificant, which in these variables means no stationarity. As some of the variables are not stationary, it is omitted that order I (0) can be integrated into their log levels. This implies that OLS in its level can lead to false findings and catastrophic conclusions when these variables are added. Both variables are however, at first difference, stationary at 5%, except the log of population. This is because the alternative hypothesis has been accepted that at its first differential form there is no unit root. This is because all variables in the same order I are integrated (1). This scenario of mix of integrated variables of zero and one supports the adoption in chapter three of the ARDL model.

4.5 Results of ARDL Bounds test

This test tests the long-term relationship between dependent and independent variables in this analysis. The table below displays the boundary test results.

Table 4.4 Results of the ARDL Bounds Test

Test Statistic	Value	K
----------------	-------	---

F-statistic	2.360	4
-------------	-------	---

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: Author's own construct

The underlying hypothesis for this test is

H₀: there exist no long-run relationship between the dependent and independent variables

H₁: there exist a long-run relationship between the dependent and independent variables

From the table, the bound test F-statistic (2.360) is lesser than the lower and upper bound critical at 5% significant level; therefore, we accept the null hypothesis of no long-run relationship. This means that there exists no long-run relationship between the endogenous and exogenous variables, implying that the exogenous variables does not continue to explain variations in the endogenous variable in the long run. This indicates that gross domestic savings and the other determinants of investment included in the study does not continue to explain the variations in investment in the long run in Ghana.

4.6 Short Run ARDL Results

Table 4.5 Short Run ARDL Results on the impact of savings on investment in Ghana

Variable	Coefficient	P-value
----------	-------------	---------

DlnGFCF(-1)	0.2314	0.014
LnGDS(-1)	0.1281	0.045
LnINF	-0.5825	0.001
DlnTOP	1.0631	0.000
DlnLrate(-1)	-0.0132	0.414
Constant	16.4417	0.000

Source Author's own construct

From the table above, the lag of gross fixed capital formation have a positive significant impact on current gross fixed capital formation. This indicates that a percentage increase in gross fixed capital formation in this period will cause the next period (year's) gross fixed capital formation to increase by 0.23 percent on the average holding interest rate, inflation rate and other variables constant. This means that a onetime increase in investment will tringle down over a period of time due to the multiplier effect. However, the total effect and the periods of which it covers depends on the size of the multiplier effect.

As evident from table 4.5, the first independent variable of interest is LnGDS (log of Gross Domestic Savings), which is statically significant in the short run at 5% level of significance. The coefficient is positive in the short run. This implies that a percentage increase in gross domestic savings by one percent will cause gross fixed capital formation to increase by 0.13% on the average in the next year, whiles other variables are held constant. This is consistent with the Solow growth model that the rate of savings is positive related to the rate of gross investment hence higher rates of economic growth. This result is consistent with the findings of Jagadeesh (2015), Adu (2016), and Turan and Gjergji (2011).

However, the variable LnINF (log of inflation) is significant at the 1% level of significance with a negative coefficient of 0.5825. This means that holding other variables constant, a percentage increase in the inflation rate will cause gross fixed capital formation to decrease by 0.58% on the average. Therefore, inflation has a negative significant influence on gross investment in Ghana. According to James Tobin, inflation is a cost to investment, therefore, to encourage investments in a country, government and policymakers must manage inflation well to a low and stable level in order to boost investment and other economic activities.

Lastly, trade openness is found to have a significant positive impact on gross fixed capital formation in Ghana over the period under consideration. Trade openness is measured as a percentage of the sum of gross imports and gross exports of gross domestic product. An increase in Ghana's trade openness by one percent causes investment (gross fixed capital formation) to increase by 1.06 percent on the average holding other factors that influence investment constant. This is consistent with the findings of Sakyi and Oteng-Abayie and others works in Ghana and Africa as a whole. The last variable is loanable interest rate, which is found to have a negative influence on gross fixed capital formation but rather insignificant. This indicates that loanable interest rates do not significantly influence gross investment in Ghana over the periods under consideration.

4.7 Short run ARDL model results

Table 4.6 Short run ARDL model results on the impact of investment on economic growth in Ghana

Variable	Coefficient	P-value
DlnRGDP(-1)	0.1282	0.021
DlnGFCF	0.1378	0.091

DlnEXP	0.3281	0.000
LnPOP(-1)	0.8289	0.000
DlnINF(-1)	0.0426	0.219
Constant	5.2067	0.048

Source: Author's own construct

From the table 4.6 above, the log difference of real gross domestic product in the previous have a positive significant impact on the log difference of current real domestic product in Ghana for the period under consideration. This indicates that a percent increase in real gross domestic product causes the next year's real gross domestic product to increase by 0.13 percent on the average holding other factors of economic growth constant. This means that an increase in real gross domestic product in a particular period, tends to boost gross savings hence more investment, gross private consumption, exports and government investment expenditures which intend to re-enforce real gross domestic product to increase in subsequent years.

However, the variable LnGFCF (log of Gross Fixed Capital Formation) is significant in the short run with a positive coefficient of 0.1378. This indicates that a percentage increase in gross fixed capital formation will cause gross domestic product (economic growth) to increase by 0.14% on the average in the current period and continue to trigger down with a positive significant impact on economic growth. This is in consistent with the Solow growth model that capital accumulation would increase capital per labour, which would intend increase output per worker. The finding is consistent with the findings of Adu (2013) and Abdullah Hassan et al (2016).

Moreover, gross exports are found to have a positive significant impact on real gross domestic product in Ghana for the period under consideration. Therefore, a percentage increase in gross exports increases real gross domestic product by 0.33 percent on the average holding other factors

of economic growth constant. This means that an increase in exports tend to increase tax revenues for the country and it also increase investment opportunities as a result of higher demand from the international market. It also increases the country's level of gross international reserves, which serve as a liability to the central bank to be used as a buffer in terms of severe economic crises. An increase in investment from higher exports and high foreign reserves tends to increase economic growth in the short and long run. This finding is consistent with the Keynesian national income identity and the arguments of classical and neoclassical economist. Empirically, the finding is consistent with the findings of Leith (1974), United Nations (1964) and World Bank (1984).

Furthermore, the variable LnINF (log of inflation rate) do not have an instantaneous significant impact on economic growth but with a lag of three. The coefficient is positive which is consistent with apriori expectation. Therefore, when other variables are held constant, a percentage increase in the inflation rate will cause economic growth to rise by 0.04% on the average in the next year. It therefore, indicates that inflation rate does not influence economic growth in the short run for the periods under consideration.

Finally, the variable LnPOP (log of population) is statistically significant at 5% level of significance with a positive coefficient 0.8289. This is inconsistent with negative significant impact on economic growth in the long run. Therefore, when other variables are held constant, a percentage increase in the population rate will cause economic growth rate to increase by 0.83 percent on the average in the next year. This means that an increase the population level increases the unemployment level, therefore lowering real wages due to competition. A lower real wage increases labour demand and labour efficiency (according to the efficient wage theory), hence more production leading to economic growth in the short run. However, this registered economic growth only occur in the short run. In the long run, continuous increase in unemployment levels creates

more dependency ratio and lead to social vices, therefore tingling down the registered economic growth.

4.8 Model Diagnostic Test

Here we present the model or residual diagnostic test results of our model in table 4.7 for Model I and 4.8 for Model II below.

Table 4.7 ARDL Model Diagnostic Tests for Model I

Diagnostic	Test	F-Statistic	Probability
Heteroskedasticity	Breusch-Pagan-Godfrey	0.467	0.949
Serial Correlation	Breusch-Godfrey LM	2.175	0.139
Multicollinearity	Variance Inflation Factor	6.231	

Source: Researcher's own construction

The diagnostic tests shown in the table indicate that diagnostic issues with the model do not occur. This implies that because of greater likelihood values ($\text{Prob}(F) > 0.05$), we are unable to reject the null hypothesis of heteroskedasticity and multicollinearity. The Breusch-Pagan-Godfrey test shows that there is no heteroskedasticity, no serial correlation with the Breusch-Godfrey LM test and the inflation factor of variances shows that the variables in the first model have low to moderate colinearity.

Table 4.8 ARDL model Residual Diagnostics Test for Model II

Diagnostic	Test	F-Statistic	Probability
Heteroskedasticity	Breusch-Pagan-Godfrey	3.960	0.941

Serial Correlation	Breusch-Godfrey LM	2.288	0.564
Multicollinearity	Variance Inflation Factor	2.362	

Source: Researcher's own construction

The diagnostic tests shown in the table indicate that diagnostic issues with the model do not occur. This implies that because of greater likelihood values ($\text{Prob}(F) > 0.05$), we are unable to reject the null hypothesis of heteroskedasticity and multicollinearity. The Breusch-Pagan Godfrey test shows that the variance inflation factor shows low and moderate collinearity of the variables in the second model, no serial correlation with the Breusch-Godfrey LM test.

4.9 Conclusion

This chapter presents the results of the unit root test affirming the stationarity of the variables (either level form or first difference) understudied using the Augmented Dickey Fuller Test. Data for all the variables were found to be stationary at either their level log form or first difference log form. The chapter also presents the results based on the long-run ARDL bound test approach affirming the no existence of long-run relationship between the explanatory variables and the dependent variable. Furthermore, the stability of the model was confirmed following the results of first order serial correlation, Multicollinearity and Heteroscedasticity.

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CHAPTER FIVE

SUMMARY OF MAJOR FINDINGS, CONCLUSIONS AND POLICY RECOMMENDATION

5.1 Introduction

This chapter presents the summary of major findings, conclusions of the study and policy recommendations.

5.2 Summary of major findings

Economic growth level of a country have become so important to citizens, governments and policymakers to the extent that citizens measured government based on economic growth in that year. Policymakers and researchers seek to know the main determinant of this economic growth in a country, hence, they can advise government on the policies to be taken to achieve economic growth. Most of these researchers emphasis on the importance of savings to economic growth. Theoretical models such as Solow growth model, Harrod-Domar growth model, classical and neoclassical growth models emphasis on the importance of savings on economic growth. Many empirical studies also looked at the role of savings on economic growth in specific countries. Although, some found no relationship, most studies found a positive significant relationship or causality among savings and economic growth. However, these studies do not indicate the channel or mechanism through which savings affect economic growth. This study therefore, examined the channel through which savings affect economic growth in Ghana.

The paper analyzed the structure or channel by means of time series data from 1975 to 2016 to influence Ghana's economic development. This study is currently influenced by rising poverty, inequality, unemployment rate, and a substantial decline in Ghana's economic growth. The paper reviewed the literature and found that the Solow growth model was the relevant model for testing the process by which economies influence Ghana's economic growth. The research used GDP and its causative factors using ARDL technique. Empirical data have shown that gross national savings affect economic growth in Ghana through gross fixed capital formation are stationary and co-integrated (gross investment). The results confirmed the model of growth of Solow, which demonstrated a positive or direct GDP saving rate. In the study, the endogenous and exogenous variables in the two models used were found to have a shorter correlation. The study showed a significant short-term relationship at a significant 5 percent level between gross domestic economy log and gross fixed investment log. It indicates that there is a short-term relationship between the

development of gross fixed capital and actual gross domestic product. The study found that economic growth and gross fixed-capital formation were also in the short term substantially positive. The study also found, however that population had an important negative effect on long-term economic growth and a strong positive impact on short-term economic growth. In this analysis, inflation also has a positive negligible effect on lagging economic growth (-1). This study therefore found a long-term effect on economic growth on gross household savings and gross fixed capital creation. Population and inflation do not have a long-term impact on Ghana's economic development.

5.3 Limitations of the study

This study was not successful without drawbacks. The study encountered the following drawbacks; inadequate data for some variables, for example the impossibility of extending our data beyond 1975. However, data was not available for some variables such as labour force and among other variables. These drawbacks might have contributed to the insignificant impacts of population and inflation on economic growth in the long run and the unexpected signs of some of the variables in the study

5.4 Policy Recommendations

Based on the analysis discussed so far, the study makes the following recommendations; Empirical findings indicate that Ghana's gross domestic economies are influenced by investment (gross fixed capital formation). The first policy implications of the study are that attempts must be made to increase savings in a sustainable way and an adequate plan must be placed in place to divert savings into productive investment. The government or policymakers should focus on growing domestic private savings, because lack of investment, which restricts economic growth, is a key problem for developing countries like Ghana, and addressing the problem of

unemployment and poverty. Government to improve savings should use the policies recommended below; first, to improve the domestic savings that will help increase growth in Ghana, the government should build a sound and fertile environment. Secondly, to mobilize domestic savings from the small depositors, the Government should create favorable conditions. Finally, the government will transform the economy's financial sector or lift the deposit rate to stimulate more savings.

Gross fixed capital formation was found to have significant positive impact on economic growth in Ghana, both in the short run and in the long run. This implies that, increasing the capital stock of the country could foster economic growth through increase productivity per worker and hence output growth. Therefore, government of Ghana could increase the available capital stock as a means of generating more employment opportunities and hence promoting economic growth and development. Government should not only encourage more investment but should also encourage exports in order not to drive up prices.

5.5 Conclusion

The key argument of this study is that investments and savings influence economic growth through gross investment and are substantially interrelated with economic growth in Ghana. But the paper concludes that Ghana's economy is subject to the Solow development model. The government should therefore take effective approaches to promote savings and economic growth and development.

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