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THE IMPACT OF SOVEREIGN CREDIT RATING ON ECONOMIC GROWTH IN SELECTED
SUB-SAHARAN AFRICAN COUNTRIES

YANGA KOPOLO

201605444

A DISSERTATION SUBMITTED IN FULFILLMENT OF THE REQUIREMENTS FOR A
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SUPERVISOR: DR. P. MAKHETHA-KOSI

ABSTRACT

This study investigates the impact of sovereign credit rating on economic growth for the period 2002-2022 in the selected sub-Saharan African countries. Panel data techniques, namely Pooled OLS, random effects, and fixed effects models, were employed. The findings of the Hausman test showed that the fixed effects model is appropriate for the study, and the results of the fixed effects model showed that sovereign credit rating has negative impact on economic growth, though the impact is not significant. However, gross fixed capital formation and government expenditure positively impact economic growth, and the relationships are statistically significant. Even though lending interest rate positively impacts economic growth, the impact is not significant. The policy recommendations are that policy makers should improve economic elements such as fiscal discipline and debt management to lessen vulnerability to rating downgrades. However, even though this study found an insignificant relationship between sovereign credit rating and economic growth, strong elements such as improvement of fiscal discipline may improve credit ratings and borrowing costs, thus indirectly increasing economic growth. In addition, governments in the sub-Saharan region should create a conducive environment which attracts investors, particularly foreign direct investment. The ability for the region to attract foreign direct investment could influence job creation which ultimately assists the region to achieve economic growth.

Key words: *Sovereign credit rating; Economic growth; Sub-Saharan Africa; Panel data*

DECLARATION

On originality of work

I, Yanga Kopolo, hereby declare that this dissertation is of my own original work and each and every resource that was used was acknowledged through complete referencing of sources in reference list. This dissertation has not been submitted before to any university or academic institution for an award or degree purposes.



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I, Yanga Kopolo, hereby declare that I am fully aware of the plagiarism policy of the University of Fort Hare and every precaution has been taken to comply with the regulations.



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DEDICATIONS

This work is a true testimony of Habbakuk 3 VS 19. God has been gracious and kind and all the praises, honour are due to Him. For the Lord is my strength.

Special gratitude goes to my first lady, my mother Lungiswa Kopolo, for always believing in me. She has been such a rock to me, a strong support system. She has been just the best of God's gifts to me and I will remain eternally grateful to her. I dedicate this work to her.

I also dedicate this work to my son, Mihle Asiphe Kopolo; I remember all the nights he slept alone as I needed to do my work. Mommy will always love you.

The work is also dedicated to my family:

- Tulisa Kopolo for always making sure I stayed above water throughout everything;
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LIST OF ACRONYMS

CRA – Credit Rating Agencies

ESM – Enterprise Service Management

EU – European Union

ESG – Environmental, Social and Governance

FDI – Foreign Direct Investment

GDP – Gross Domestic Product

GFCF – Gross fixed Capital Formation

GVE – Government Spending

IR - Interest Rate

IMF- International Monetary Fund

MEC – Marginal Efficiency of Capital

NCA – National Credit Act

OLS – Ordinary Least Squares

SAARC – South Asian Association for Regional Cooperation

SADC – South African Development Community

SCR – Sovereign Credit Rating

SSA – Sub-Saharan Africa

S&P – Standard and Poor Credit rating agency

CHAPTER 1

INTRODUCTION AND BACKGROUND

1.1 Background of the study

Over the last decade, creditworthiness has become an increased concern for developing economies in Africa. White (2010) describes the sovereign credit ratings as independent assessments of a country's creditworthiness. Cantor and Packer (1996) define sovereign credit ratings (SCR) as assessments that are done on countries or governments to test their likelihood in defaulting in their obligation to repay their debts. These assessments are based on the overall creditworthiness of a country. Sovereign credit ratings serve as an instrument that private investors use to illuminate potential risks associated with investing in a specific country. The ratings are assigned by credit rating agencies. According to White (2010), these agencies analyse and evaluate the creditworthiness of corporate and sovereign debt issues.

Companies that assign credit ratings exist to tackle the issue of information failure for investors who seek to understand the borrower's creditworthiness. Chen and James (2016) view credit ratings as an important source of public information. They further explain credit rating by expressing that it also helps those that want to invest to price underlying debt instruments and reflect on an individual's response to the scale of economies in information production.

Ntswane (2014) submits that rating determines borrowers' suitability for liability, cash, and other derivative tools for the portfolios of some institutional investors due to regulations. Drago and Gallo (2017) indicate that a good rating is necessary for assessing funding internationally. Furthermore, credit rating agencies serve as a coordination mechanism. This is the very core of how credit rating agencies work. Literature provides a variety of views on how credit rating agencies add value to an economy. A study by Alfonso, Gomes, and Taamouti (2014) highlights that sovereign credit ratings enhance decision-making by availing information about the market.

According to the IMF (2019), sub-Saharan Africa (SSA) includes 13 smaller and more fragile economies. Of the 54 African countries, 49 constitute the sub-Saharan region. This region consists of a range of income – from countries with high-income to those that are low-income countries. According to the World Bank (2017), SSA countries account for approximately 14% of the population worldwide. SSA is economically diverse. Countries like South Africa have modern economies with diversified industries that range from technology and engineering, financial services, to chemicals and manufacturing, while the majority of countries neighbouring

South Africa rely heavily on exporting their commodities and natural resources such as gold and diamonds to support their ailing economies.

The United Nations Conference on Trade and Development (2009) determined that companies that assign credit ratings may be categorised as recognised and unrecognised. The recognised included the 3 most commonly used rating companies, namely Fitch, Moody's, and Standard and Poor. For regulatory purposes, countries assign supervisors to each agency for supervision. According to the IMF (2021), Fitch has, since the late 1990s, downgraded at least 10 African countries by the end of 2021. Meanwhile, Standard and Poor have approximately 28 African countries under their radar. Lastly, Moody's has about 15 countries under the BB- category.

The World Bank (2021) submits that state debt aids in the economic growth of a country. Though other regions have benefited from public debt, this has not been the case for SSA countries as they continue accruing debt irrespective of their poor historical economic performances. According to Uka (1993), debt management models such as, but not limited to, debt rescheduling, structural adjustment programmes, and debt relief interest rates have been used as conventional approaches to the ever-rising spectrum of indebtedness and poor economic performance.

Since the mid-1990s, economic growth for numerous African countries has been steady. However, they have all failed to build onto and transform that growth into sustainable development policies. According to Mutize and Nkalamba (2020), poor credit rating is subject to increasing government debt and poor currencies. However, not all African countries are evaluated by the above rating institutions. The global financial industry lacks asymmetric information, which gives rise to the continued growth in Eurobond issuance. Moody's, Fitch Ratings, and Standard and Poor have increased the number of African countries that they rate from 10 in 2003 to 31 by 2021. As indicated by the World Bank (2017), some of the countries that are evaluated by credit rating agencies have experienced a recent downgrade. These include Kenya, Lesotho, Ghana, Rwanda, Namibia, and Uganda. On the contrary, Angola and Gabon have witnessed a credit rating upgrade owing to an increase in oil prices globally as the statistics from IMF (2018) reveal. Moody's, though, has placed the majority of the countries that they evaluate under the low-medium range rating.

Of the 49 countries that are in the sub-Saharan African region, approximately 32 have received a credit rating from at least one of the recognised credit rating agencies. These countries, according to Trading Economics (2022), include Angola, Benin, Botswana, Burkina Faso,

Cameroon, Cape Verde, Congo Brazzaville, Ethiopia, Gabon, Ghana, Ivory Coast, Kenya, Lesotho, Madagascar, Mali, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Democratic Republic of Congo, Rwanda, Senegal, Seychelles, Swaziland, South Africa, Tanzania, Togo, Tunisia, Uganda, and Zambia. These are not all the countries in the region, but they are the focus of this study as not all the sub-Saharan African countries have credit ratings attached to them. Sub-Saharan Africa itself is home to many more countries, some of which are primitive economies, and others are very underdeveloped.

1.2 Problem statement

Studies (Sangaiorgri and Spatt, 2014; Chen, Chang and Yang, 2016; Sangaiorgri and Spatt, 2017) that have written on the nexus of credit rating and economic growth share the common view that there seems to be a direct correlation between the credit rating of a country and the volume of investments it attracts. As indicated by White (2010), the central concern that a lender or an investor will have is whether the potential or actual debtor is likely to repay the loan. This is to say that rating agencies alleviate asymmetric information between users and investors. Credit rating agencies are subject to a vetting process which assists both investors and issuers. As a result, the rating assigned by a credit rating agency plays a key role in the financial agreement between lenders and borrowers.

SSA's economic growth was on a rapid decline between the years 2013 and 2016. This downward trajectory was brought on by corruption within the most active economies in the region. These economies include those of South Africa, Angola, and Zimbabwe. In 2018 however, the SSA growth was predicted to pick up from 2.8 per cent to 3.4 per cent (IMF, 2018). Furthermore, the IMF (2018) was of the view that this trajectory change would be influenced by stronger global growth, higher commodity prices, and favourable finance conditions. An estimated 2 out of 3 countries in the SSA region have higher growth prospects. Economies such as Cote d'Ivoire, Ethiopia, Senegal, and Ghana grew rapidly at an average rate of 6%. However, these were countries that experienced a decline in per capita income and hence it is still difficult to reduce poverty and make borrowings meaningful as opposed to accumulating large public debt when unemployment remains rife, and infrastructure is still underdeveloped (IMF, 2018).

Furthermore, according to Trading Economics (2020), as of May 2020, Standard and Poor and Finch had affirmed South Africa's sovereign rating outlook on BB-, which is three notches below the investment grade. Despite the COVID-19 pandemic lockdown restrictions and how they affected business and trade, South Africa has managed to avoid any further downgrade.

According to Mhlanga (2021), what has kept South Africa away from another low rating is the work done in revising national accounts, which has seen the size of the economy being 11% larger than the estimates done in 2020. That then brings us to the gist of this paper and its purpose.

The major issue is the low credit rating that persists in the SSA as noted by scholars like Sani (2014). This issue is what is argued by scholars like Agbloyor, Gyeke-dako, Kuipo, and Abor (2016) to limit access to finance. The IMF eLibrary hosts authors like Ndulu (1998) who carry the view that, to grow their economies, countries in the current global economy need access to foreign direct investment. The concern arises from there; could it be that countries in the SSA are struggling with economic growth, and or to find stability in the GDP because of this limited access to financing? Therefore, this study probes how it is possible that even though South Africa has been graded below the investment portfolio, by all three credit rating agencies, it manages to continue attracting foreign direct investment. Furthermore, the study sought to provide evidence of how the JSE All Africa index continues performing well despite the junk status outlook by the credit rating agencies.

1.3 Aim and Objectives

The study sought to examine the impact of sovereign credit rating on economic growth in selected sub-Saharan African countries. The objectives of the study were to:

- provide an overview of the sovereign credit rating and economic growth in the selected sub-Saharan African countries, and
- use econometric techniques to help study positive or negative impact that the sovereign credit rating has on economic growth in selected Sub-Saharan African countries.

1.4 Hypothesis

H_0 = sovereign credit rating has no impact on economic growth in selected sub-Saharan African countries.

H_1 = sovereign credit rating has an impact on economic growth in selected sub-Saharan African countries.

1.5 Justification of the study

The impact of sovereign credit ratings and their bearings on African economies has not been sufficiently studied to date, thus giving this huge significance. This study contributes to the scarce literature on this subject. Not all African countries are covered by the rating agencies; hence, the study focused on just some sub-Saharan African countries. Furthermore, this study only covers the three most commonly known credit rating agencies, namely Fitch, Moody's, and Standard and Poor. In addition, the findings of this study should aid countries in Africa to understand the impact of foreign direct investment on their individuals. Furthermore, sub-Sahara African counties should be able to devise a solution after having understood the impact of credit ratings.

Chodinika (2012) shares a view that credit rating agencies play quite a key role in the economic performance of a country. This view is substantiated by how a sovereign credit rating is an ability to replay a particular government's debt and economic development ratio for the assessed countries. Chodinika (2012) further explains how this is possible by elaborating on the magnitude of influence that interest rates have on the sovereign rating sphere. However, even though there are studies on the impact of sovereign ratings on the economy, Chen *et al.* (2016) state that they do not consider how rating changes and how a second rating of a country would affect economic growth. Finally, using the findings reported in this study, policymakers will be able to determine whether they should curb or stimulate economic activity.

1.6 Organisation of the study

This study consists of six chapters. The first chapter gives a background on the study, the problem statement, and the objectives that the study aims to achieve. Chapter 2 of the study provides an overview of the sovereign credit rating agencies, their ratings, and the economic performance of the sub-Saharan African countries. Chapter 3 contains both the theoretical and empirical literature review. Chapter 4 focuses on the methodology. Chapter 5 gives an interpretation of the results, and the last chapter (Chapter 6) summarises the study and gives the main conclusions and recommendations of the study.

CHAPTER 2

AN OVERVIEW OF THE SOVEREIGN CREDIT RATING AND ECONOMIC GROWTH IN SUB-SAHARAN AFRICA.

2.1 Introduction

As indicated in the organisation of the study, this chapter discusses and provides an overview of the sovereign credit rating and gross domestic product in the selected countries of the sub-Saharan African region. This narrative is driven by the show of figures, graphs, and tables of the ratings given by the three major sovereign credit rating agencies, namely Moody's, Fitch, and Standard and Poor. The chapter shows what kind of effect the credit ratings have on the economy. The background in this chapter entail the trends of economies in sub-Saharan Africa, bringing into the open not only what makes these economies thrive, but also what challenges they face. The background also gives a synopsis comparison between the African context and the European context in terms of growth trajectory. The chapter also highlights trends of the three major credit rating agencies, which outlook includes data on which African countries are rated and what their respective outlooks are.

2.2 Sub-Saharan African region economic performance

Kilish, Mobolaji, Yaru, and Yakubu (2013) argue that the African economy is diverse in nature, consisting of industries such as agriculture, human resources, trade, and industry as the main resources in the continent. Because Africa is a resource-rich continent, there has been steady growth even though the margins are low. This growth can be attributed to sales, commodities, services, and manufacturing. Sub-Saharan Africa is a region of African countries that consists of 49 diverse economies. Sub-Saharan Africa itself is home to many more countries, some of which are primitive economies and others are underdeveloped. In the African context, however, developing economies are a common base of referral. According to Rodrik (1998), this region is home to many types of economies, such as Nigeria, South Africa, Kenya, and Angola, to mention a few. These countries are home to very diverse economies. What makes the economy peak and the challenges the economy should face, although different, serve a similar structure of growth. They are the same in that their industries are very strong and assist the economic growth trajectory. South Africa, for instance, is home to many different industries such as automotive, mechanical, and chemical.

Of the 49 countries found in the sub-Saharan African region, approximately 32 have received a credit rating from at least one of the recognised credit rating agencies. According to Trading

Economics (2022), the countries that have received rating are Angola, Benin, Botswana, Burkina Faso, Cameroon, Cape Verde, Congo Brazzaville, Ethiopia, Gabon, Ghana, Cote d'Ivoire, Kenya, Lesotho, Madagascar, Mali, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, the Democratic Republic of Congo, Rwanda, Senegal, Seychelles, Eswatini, the Republic of South Africa, Tanzania, Togo, Tunisia, Uganda, and Zambia. In addition to the SSA countries as noted above, some African countries may be included in the study for the benefit of comparison and justification. This is primarily because not all SSA countries have made it to the radar of credit rating agencies. Thus, at times, a justification or comparison may be required to drive a particular point in this study. These African non-SSA countries are Egypt, Libya, and Algeria.

According to the IMF (2020) the impressive 5.7% growth expansion witnessed in Asia, excluding Japan, stands in stark contrast to sub-Saharan Africa's modest 3.1% growth rate. Notably, the sub-Saharan region is amongst the poorest in comparison to other regions in the world, with GDP per capita approximately six times lower than the global average. However, in the view of the IMF (2020), despite this, it holds the largest potential for growth, given that poorer economies tend to expand faster than wealthier ones. Furthermore, the sub-Saharan Africa is blessed with abundant mineral resources, holding nearly a third of the world's reserves, and it predominantly comprises a youthful population. The figure below shows the Real GDP growth for sub-Saharan and Asia for the period 2011-2026.

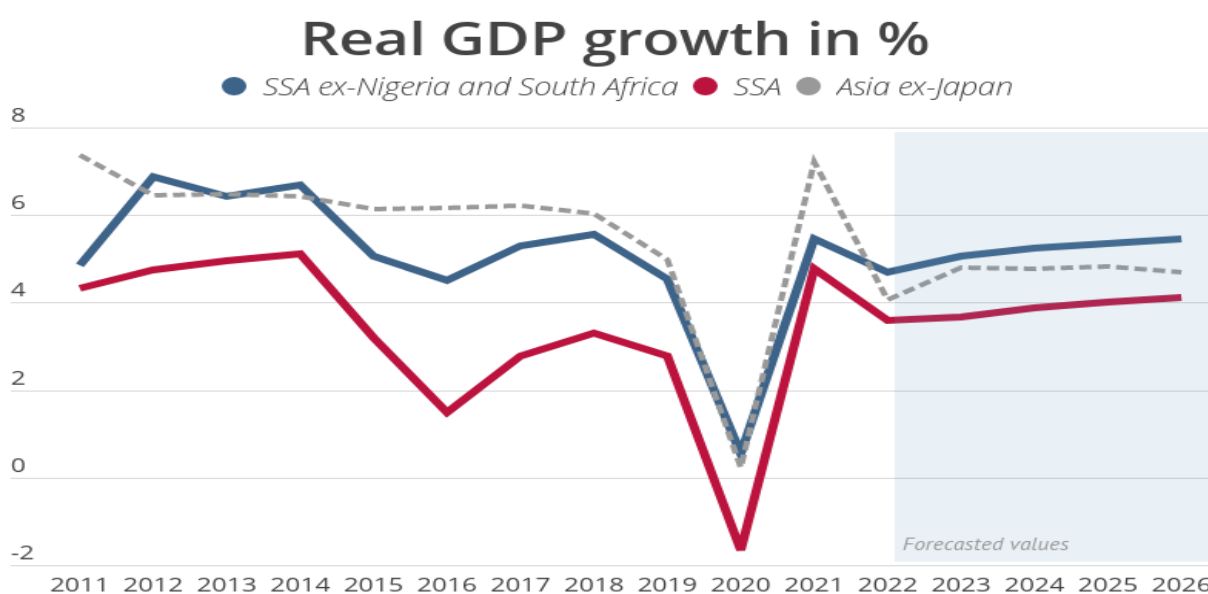


Figure 2.1: Real GDP growth for Sub-Saharan and Asia for the period 2011-2026

Source: Focus Economics Consensus forecast (October 2022)

The SSA is a diverse region, as alluded to by Aemro and Hakobyan (2021) that South Africa and Nigeria constitute the larger part of the overall economic outlook of the SSA, and that these two countries' ailing economies constitute 40% of what is understood to be the sub-Saharan African economy, as depicted in the graph above. If one were to remove Nigerian and South African economies from SSA, then the average growth would navigate towards that observed by Asia in recent years. Therefore, Africa is often talked about as the continent of the future and evidence should manifest over the next few years – by inching closer to realising that potential. The forecast for the continent by the International Monetary Fund (2021) remains positive as some of the world's most dynamic economies are projected to be African. Such countries include Ethiopia, Rwanda, and Uganda. As depicted in the graph above, growth in sub-Saharan Africa is noted to fluctuate at similar periods. The troughs and peaks of the depicted graph indicate that the growth and the decline of the region and the two major performing economies are concurrent. This occurrence happened at the backdrop of the benefit accruing from the application of the African Continental Free Trade Area (AfCFTA), as well as gradual improvements in governance standards.

The International Monetary Fund (2022) predicted the Sub-Saharan African region's economy to expand by 3.8 per cent by 2022. Although it might look good on paper, the contraction in 2020 was a consequence of the COVID-19 pandemic that hit very hard. Sub-Saharan Africa is struggling to develop for several reasons, some of which include information and trade obstacles. Furthermore, the slow growth of these economies can be credited to issues such as poor economic policies, lack of human development, and restricted private investment levels.

According to IMF (2022), the sub-Saharan African region has been on a recovery trajectory from the economic slump caused by the COVID-19 pandemic. This recovery, however, is coming as rapidly as what is required to sustain the region's economy. The IMF (2022) notes that this region is characterised by increasing inflation and public debt. The expected growth of the region's economy for 2022 was expected to decline from 4.7 in 2021 to 3.6 in 2022 (IMF, 2022).

Depicted on Table 2.1 below is a list of sub-Saharan countries' GDP aggregates. The countries are sorted according to data from the IMF (2022). The data shown below do not factor in the possible variations that may exist related to the cost of living across different countries. As a result of those variations, the results can fluctuate significantly from year to year owing to changes in the exchange rates and potentially altering a country's ranking from year to the next.

Table 2.1: Sub-Saharan countries' GDP

Rank	Country	Nominal GDP (million USD)	Per Capita (million USD)
1	Nigeria	504,203	2,326.230
2	South Africa	411,480	6,738.926
3	Angola	124,794	3,790.704
4	Kenya	114,858	2,255.480
5	Ethiopia	111,181	1,097.584
6	Tanzania	76,582	1,245.040
7	Ghana	75,996	2,418.436
8	Ivory Coast	68,630	2,418.436
9	Democratic Republic of the Congo	63,909	660.210
10	Uganda	48,352	1,105.590
11	Cameroon	44,212	1,584.003
12	Zimbabwe	38,280	2,420.220
13	Senegal	27,542	1,558.144
14	Zambia	27,025	1,348.360
15	Gabon	22,221	10,281.775
16	Mali	18,434	7,347.738
17	Burkina Faso	18,268	824.884
18	Botswana	18,005	7,347.738
19	Benin	17,547	1,366.871
20	Niger	14,486	561.222
21	Republic of Congo	14,486	2,945.102
22	Chad	12,945	743.373
23	Namibia	12,488	4,808.922
24	Rwanda	12,098	912.744
25	Malawi	11,554	522.963
26	Somalia	8,416	539.001
27	South Sudan	4,784	327.898
28	Liberia	3,900	735.185

29	Lesotho	2,404	1,098
30	Cape Verde	2,786	5,421
31	Seychelles	2,198	21,633

Source: IMF (Sub-Saharan countries' GDP): *List of African countries by GDP (nominal)*

Sub-Saharan Africa's economic recovery has faced an unexpected setback. According to Trading Economics (2022), the region experienced a 4.7 percent GDP growth in 2021, but growth was projected to slow to 3.6 percent in 2022 owing to global economic challenges such as a slowdown, tighter financial conditions, and increased inflation. This has led to heightened impact on vulnerable populations, with rising food and energy prices exacerbating the situation. In addition, public debt and inflation levels are at their highest in decades, forcing many countries into a delicate position with limited options. The short-term future is uncertain as the region's prospects hinge on global developments while some countries grapple with domestic socio-political and security challenges. Considering these circumstances, policymakers must address socio-economic crises promptly and work to reduce vulnerabilities to future shocks (Adams, 2009). Ultimately, sustainable recovery will necessitate high-quality growth and the implementation of impactful policies to steer countries away from the current precarious situation, as emphasised by Adams (2009).

2.2.1 An overview of the top five individual economies in sub-Saharan Africa

The following is a synopsis of the general economies of the top five performing countries in the sub-Saharan African countries. These economies are dynamic in resources and in the manner that they conduct trade, though they have grave growth challenges. These countries are Kenya, Ethiopia, South Africa, Angola, and Nigeria. The following includes an understanding of how each of these economies have performed over time, what has propelled the countries to be at the level at which they are now, and the challenges that might have been encountered. These countries are presented in no particular order.

2.2.1.1 Kenya

According to the World Bank (2021), in 2021 Kenya's GDP was valued at 110.35 billion US dollars. Kenya's GDP represents only 0.05 per cent of the world's economy. Figure 2.2 below is an overview of Kenya's GDP for the period 2013-2023.

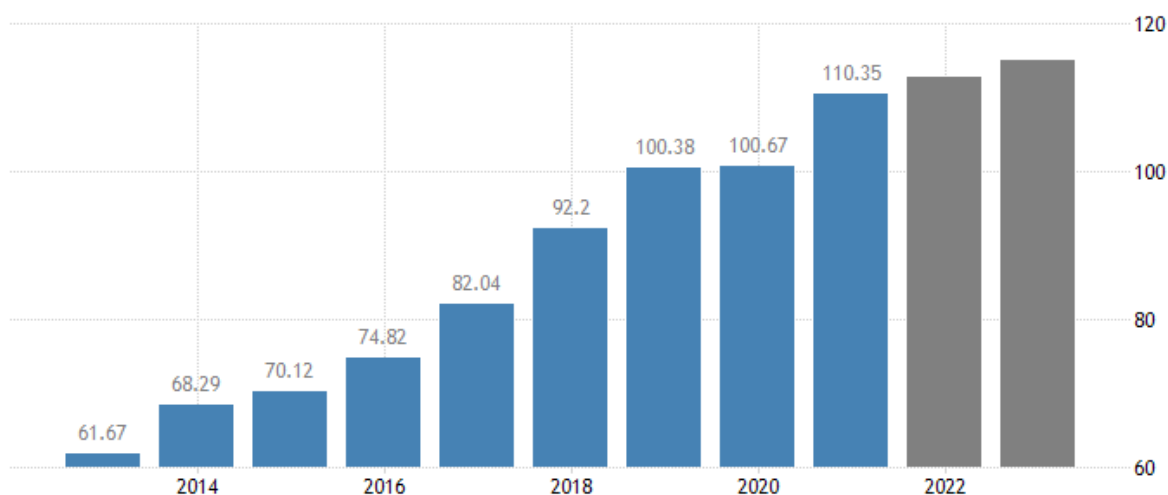


Figure 2.2: Overview of Kenya for the period 2013-2023

Source: Trading Economics (September 2021)

Figure 2.2 above illustrates an analysis of 10 years, with the final two (2) years being a forecast based on recent activity. The economic activity of Kenya represented above shows a steady increase in the growth of the economy from 2014 to 2023. This upward trajectory was, however, not without challenges. These are noted later in this chapter. The measure of growth is done so using real GDP.

2.2.1.2 Nigeria

In 2021, Nigeria's GDP was worth 440.83 billion US dollars and only accounted for 0.20 per cent of the world economy (Trading Economics, 2022). Figure 2.3 below is an overview of Nigeria's GDP for the period 2013-2023.

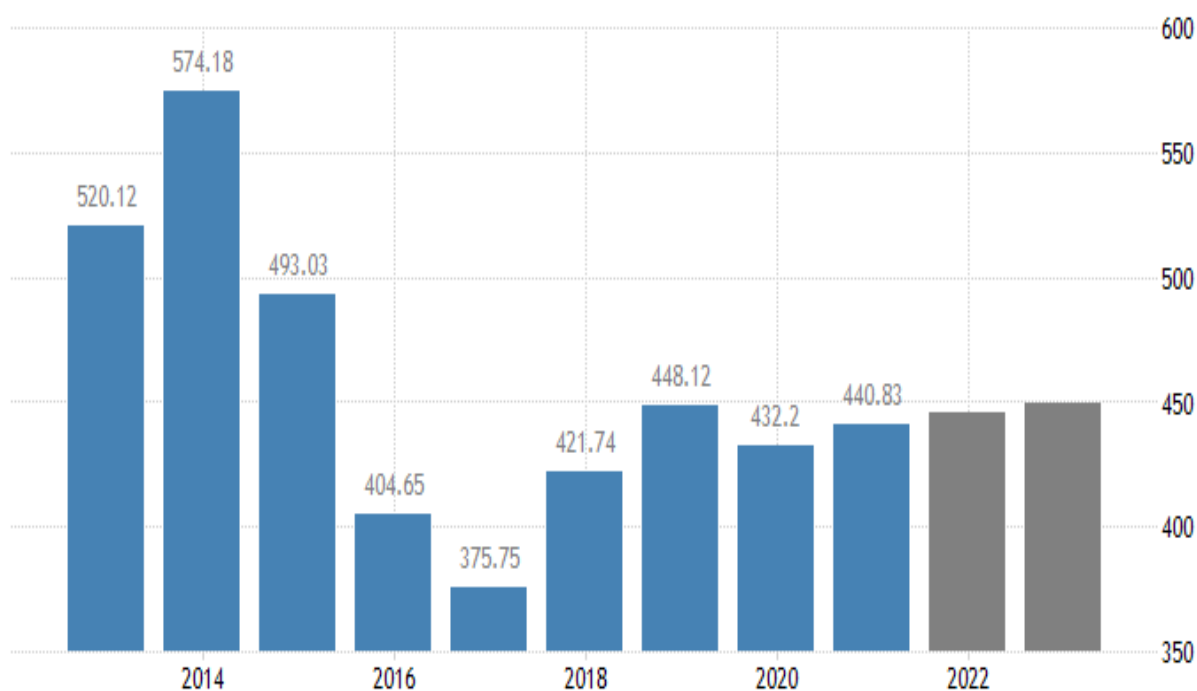


Figure 2.3: Overview of Nigeria for the period 2013-2023

Source: Trading Economics (September 2021)

The ten (10) year span from 2014 has seen great fluctuation in economic activity and growth in Nigeria, with 2017 the hardest hit year, seeing a low of 375.75 billion USD. Although the economy has picked back up since then, it has however not been able to return to its former growth trajectory as seen earlier in the decade. Nigeria also saw a decline in 2020; however, this was not as bad as the dip in 2017. It is commendable how the economy has managed to stay afloat amidst a global pandemic that sterilised all economic activity in the majority of the world's economy. The economy of Nigeria remains very dynamic in structure and that is how it propels growth and stability.

2.2.1.3 Ethiopia

In the view of Trading Economics (2022), the official data provided by the World Bank placed Ethiopia's gross domestic product at the value of 111.27 billion US dollars in the year 2021. Ethiopia's GDP is also valued at 0.05 per cent of the world's economy. Figure 2.4 below is an overview of Ethiopia's GDP for the period 2013-2023.

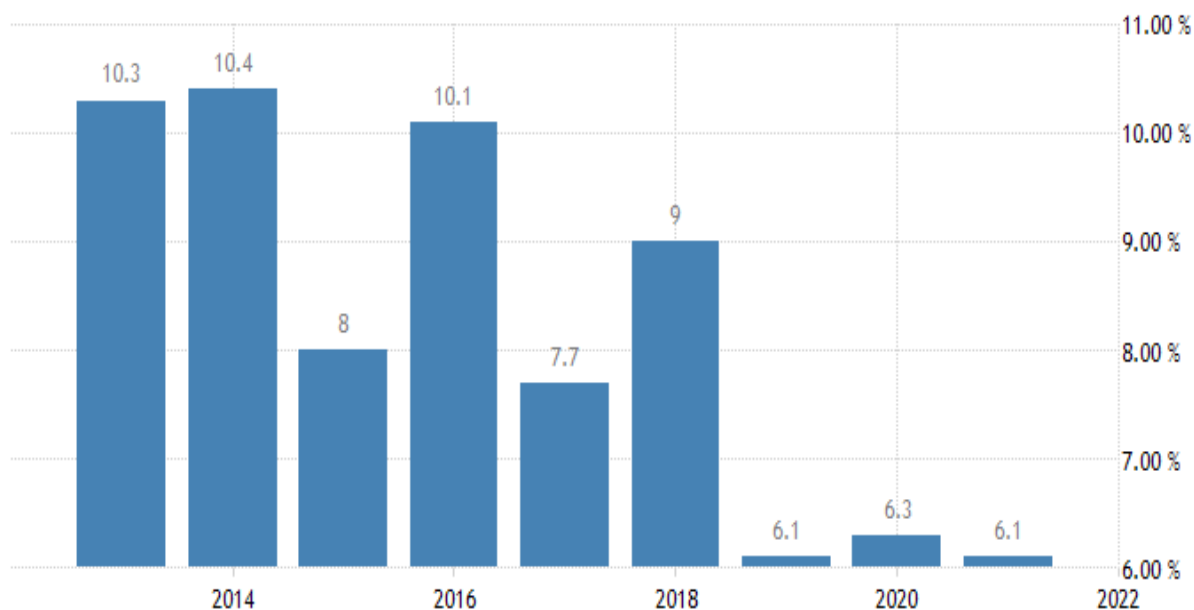


Figure 2.4: Overview of Ethiopia for the period 2013-2022

Source: Trading Economics (September 2022)

Figure 2.4 above shows that Ethiopia has had a steady growth over the years. The sustained economic growth over the past decade has led to favourable trends in reducing poverty in urban and rural areas alike. This growth however, hit rapid changes in 2019, reaching as low as 6.1 percent from a previous 9 percent in the previous year. This shift, according to Trading Economics (2019), was attributed to the global COVID-19 pandemic which affected sectors like agriculture that employ the majority of the country's population. Although consistent, the Ethiopian economy is yet to recover. The World Bank (2022) notes that the Ethiopian economy has great potential for growth and suitability.

The Ethiopian economy is poorly active. While other countries' growth ranges in the hundreds, Ethiopia's ranges in the early tens and single digits. In addition, Ethiopia is currently operating with absolute bare minimum growth. The only positive outlook on that is that there is an element of stability.

2.2.1.4 South Africa

In the year 2021, South Africa's gross domestic product was valued at 419.02 billion US dollars, which accounts for 0.19 per cent of the world's economy (Trading Economics, 2022). Figure 2.5 below is an overview of South Africa's GDP for the period 2013-2023.

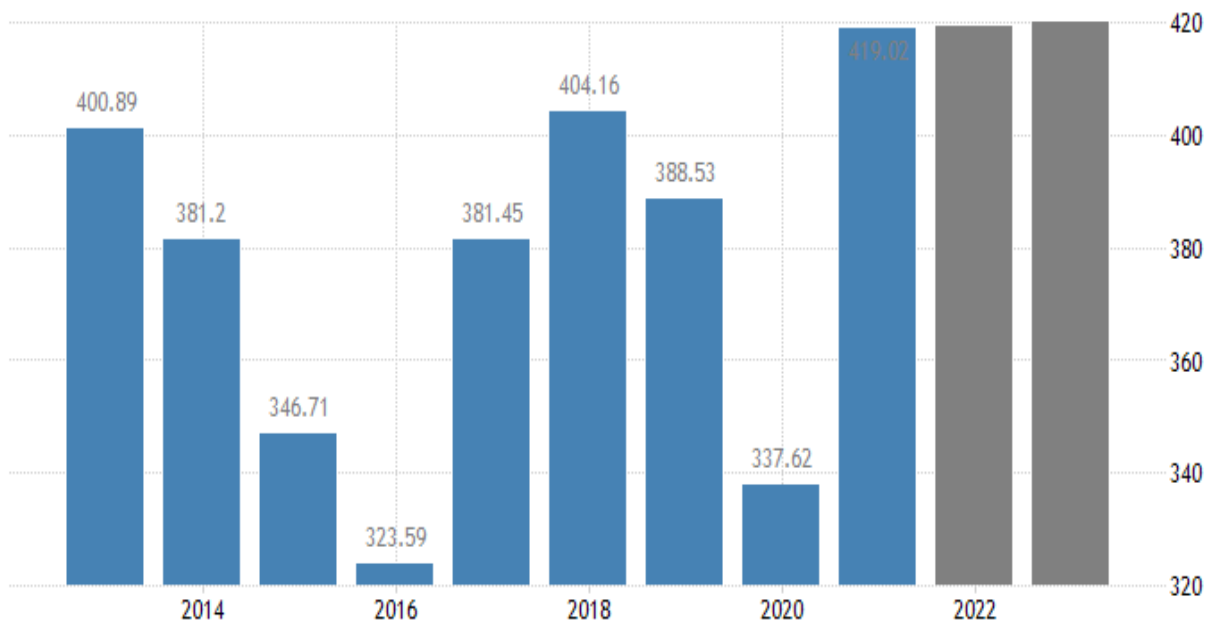


Figure 2.5: Overview of South Africa for the period 2013-2023

Source: Trading Economics (September 2022)

South Africa performs in the early hundreds of billion US dollars. Also, in the 10 years, it had some major dips like in 2016 and 2020. Both these are down to several reasons, including the global pandemic and grave government criminality. The greater part of the 10 years has, however, been somewhat a smooth sail for the economy of South Africa, with the forecast of growth performing steeply.

2.2.1.5 Angola

The GDP in Angola, according to Trading Economics (2022), was worth 67.40 billion in 2021. This is according to official data provided by the World Bank. Angola's GDP accounts for 0.03 per cent of the world's economy.

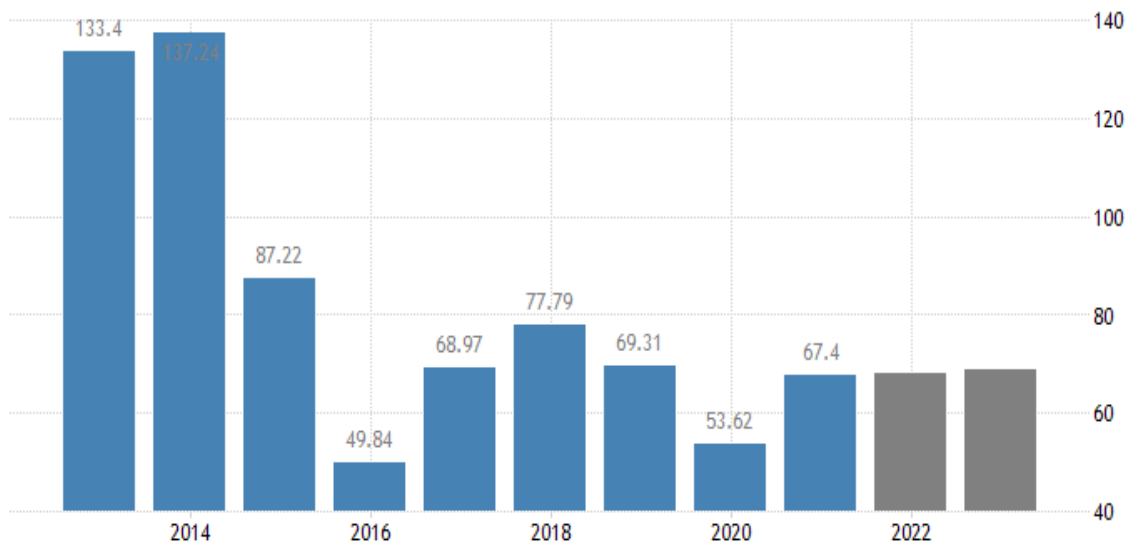


Figure 2.6: Overview of Angola for the period 2013-2023

Source: Trading Economics (September 2022)

In the early years of the decade under evaluation, Angola had about two good years. However, after 2015, the country and its economy have since proceeded to decline. It has taken two major dips, which are 2016 and 2020 respectively. Angola also has quite a dynamic economy, much like that of Nigeria, but they have been unable to return fully to the old economy. A great part of the contributing factor to this lack of growth is slow adaptability towards government spending on infrastructure development.

There are two global shocks that have been identified by the World Bank (2022). One is the slowing of global economic credibility, which influences lower demand for exports from the sub-Saharan African region. Second is inflation. Because of inflation, central banks within the region have seen a sharp increase in borrowing costs within the region. This affects and hampers the elasticity of the spending on important development factors. Below, Figure 2.7 shows selected countries' average wealth.

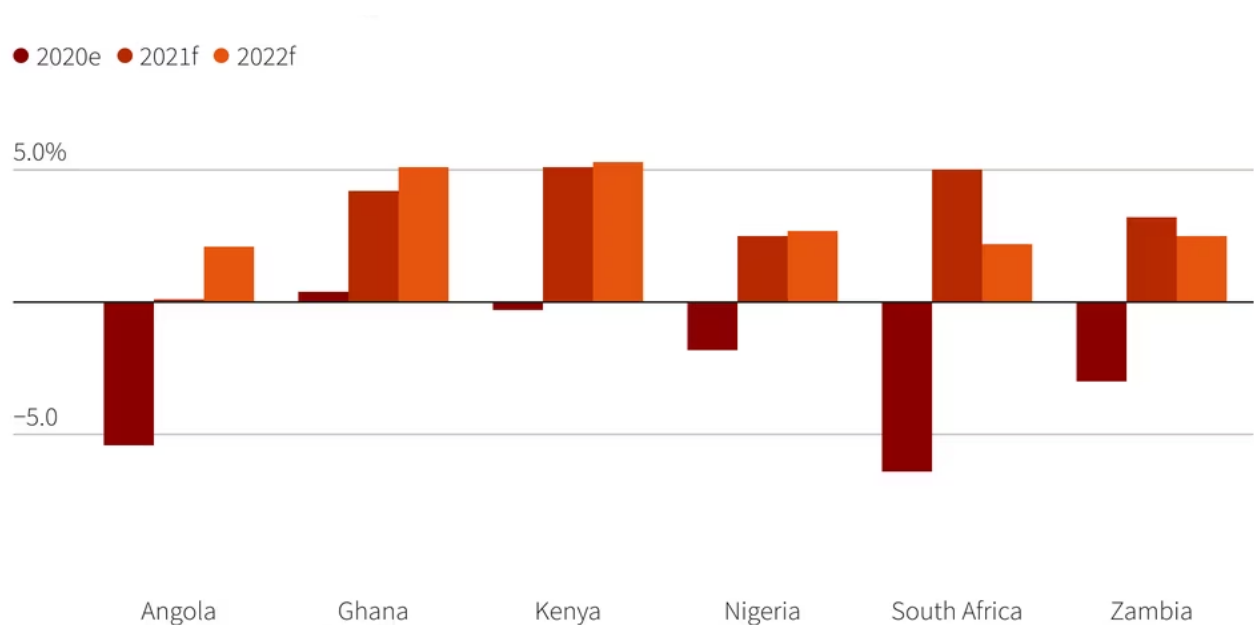


Figure 2.7: Selected countries with average wealth

Source: IMF and Reuters

Some countries like Nigeria, South Africa, Angola, and Kenya may have an average wealth as far as their income bracket is concerned. Abdulqadir and Asongu (2022) indicate that in certain instances, some countries that may have average wealth may also have low GDP aggregate, which may be attributed to the density of the population of these various countries. Furthermore, according to Agbloyor, Gyeke-dako, Kuipo, and Abor (2016), comparisons of national wealth between individual countries are conducted frequently, looking at the purchasing power parity to account for the differences in the cost of living in different countries. In addition to that view, Agbloyor *et al.* (2016) further posit that the PPP resolves the exchange rate issue but carries its own limitations. It falls short in capturing the full value of the economic output that international trade has and requires more extensive estimation compared to the nominal GDP. Holistically, the PPP per capita figures show a narrower distribution than the nominal GDP per capita.

2.2.2 Sub-Saharan African region's economic growth challenges

The sub-Saharan region economy is concerned with a variety of issues. A survey was done in nine (9) SSA countries, namely Ghana, Senegal, Tanzania, Uganda, Burkina Faso, Nigeria, South Africa, Kenya, and Ethiopia on the challenges that affect the possibility of economic growth and development in this region. Unemployment, health care, and quality education

ranked top 3 of the biggest challenges affecting how these economies grow. These are shown in Table 2.2 below.

Table 2.2: Sub-Saharan African region economic growth challenges

	Lack of employment opportunities	Poor health care	Poor quality schools	Gov't corruption	Crime	Lack of clean drinking water	Energy shortages	Poor infrastructure	Food shortages	Lack of access to clean toilets	Pollution	Too few citizens participating in politics
Ghana	92	90	87	88	84	76	94	78	60	65	64	41
Senegal	92	89	87	71	87	90	67	66	85	62	62	39
Tanzania	92	88	87	92	80	77	72	73	64	65	61	52
Uganda	89	82	81	82	69	77	70	65	63	62	44	34
Burkina Faso	88	89	77	70	86	90	64	65	88	46	50	32
Nigeria	83	81	87	86	83	69	77	72	69	57	65	54
South Africa	79	57	61	78	79	55	72	57	56	54	55	50
Kenya	75	51	63	74	71	45	33	46	53	33	36	25
Ethiopia	66	54	49	-	59	65	31	48	50	31	40	37

Source: Pew Research Centre (September 2022)

Table 2.2 above shows that the quality of health care in the sub-Saharan region is currently one of the biggest challenges, with a median of 82%. Particularly, countries like Ghana, Senegal, Burkina Faso, Tanzania, and Uganda have been hit hard by the effects of poor health care. The lack of quality education also stands out in the region, and without good and quality education, the growth of the economy would be unavoidably stagnant. Corruption in government, with a median of 80% across eight (8) countries, is equally key, and is a fighting contender in Tanzania, Nigeria, Uganda, South Africa, and Kenya. Government corruption and crime lead the pack in Kenya, Nigeria, and South Africa. What seems to be slow is the development of infrastructure in SSA, which in turn hampers the development of sanitation (drinking water, clean sanitation, and adequate energy supply).

The IMF (2021) names six (6) main challenges that are seen to affect growth south of the Sahara. The first challenge is said to be the ever-increasing income gap between sub-Saharan African countries and the rest of the world based on real GDP. This is further propelled by how human capital is cheap regardless of the education bestowed onto an individual. The second challenge that was noted by the IMF is the lack of space afforded to taxpayers to support the growth or recovery of fiscal sustainability. Unlike other regions, the limited financial support provided in 2020 will need to be unwound to put debt back on a sustainable footing. The rest of the challenges

are basically as Reuters (2021) has denoted in the graph above. Apparently, lack of adequate health care, affordable education, and lack of development of infrastructure (which feeds into proper sanitation) are major challenges for the region. The issue of criminality also has a huge impact on the stagnation of development of the economy of the region, even though the continent of Africa is rich in mineral resources.

2.3 Credit rating agencies and their effect on economies

According to Bheenick (2005), when a sovereign credit rating agency is going to give a country a rating, that agency assesses a country's capacity and willingness to repay its current and future debt in the stipulated period. This is done considering diverse factors that include, but are not limited to, economic and social factors. Bheenick (2005) further suggests that sovereign credit ratings can offer insights into potential sovereign distress. Meanwhile, Bozic *et al.* (2013) point out that if a sovereign defaults, there is a probability of facing reputation costs, asset losses overseas, restricted access to capital and international markets, and a restriction on international trade. The recent downgrades of sovereign ratings for some of the European countries by major credit rating agencies has highlighted the importance of doing a critical analysis of the effect of changes in sovereign credit ratings.

Authors such as Chen *et al.* (2016), Sangaiorgri and Spatt (2014), and Sangiorgi and Spat (2017), who have written on the nexus of credit rating and economic performance, share a common view that there is a direct correlation between the credit rating a country receives and the number of investments that country attracts. As in the view of White (2010), a central concern of a lender or investor is whether the potential or actual debtor is most likely to repay the debt. This is to say that rating agencies alleviate asymmetric information between users and investors. Credit rating agencies are a subject counter into a vetting process which assists both investors and issuers. As a result, credit rating agencies play a vital role in financial agreements between lenders and borrowers.

Table 2.3 below portrays the credit rating outlook for the 5 best-performing economies in the sub-Saharan region. These are Ethiopia, Ghana, Kenya, Nigeria and South Africa.

Table 2.3: Credit rating outlook

		ETHIOPIA	GHANA	KENYA	NIGERIA	SOUTH AFRICA
2022	RATING		Caa2			BB-

	OUTLOOK		UNDER REVIEW			POSITIVE
2021	RATING	CCC	B	B	B2	BB-
	OUTLOOK	NEGATIVE	NEGATIVE	STABLE	STABLE	STABLE
2020	RATING	B2	B-	B+	B	Ba2
	OUTLOOK	NEGATIVE	STABLE	NEGATIVE	STABLE	NEGATIVE
2019	RATING	B			B+	Baa3
	OUTLOOK	NEGATIVE			NEGATIVE	NEGATIVE
2018	RATING		B	B2	B+	Baa3
	OUTLOOK		STABLE	STABLE	STABLE	STABLE
2017	RATING		B	B1	B2	BB
	OUTLOOK		STABLE	UNDER REVIEW	STABLE	STABLE
2016	RATING		B3	B+	B	Baa2
	OUTLOOK		STABLE	STABLE	STABLE	NEGATIVE
2015	RATING		B3	B+	BB-	BBB-
	OUTLOOK		NEGATIVE	NEGATIVE	NEGATIVE	NEGATIVE
2014	RATING	B	B-		BB-	Baa2
	OUTLOOK	STABLE	STABLE		NEGATIVE	NEGATIVE
2013	RATING		B			BBB
	OUTLOOK		NEGATIVE			STABLE
2012	RATING		B1	B1	Ba3	BBB
	OUTLOOK		STABLE	STABLE	STABLE	NEGATIVE
2011	RATING		B		B+	A3

	OUTLOOK		STABLE		POSITIVE	NEGATIVE
2010	RATING		B+		BB-	
	OUTLOOK		STABLE		NEGATIVE	
2009	RATING		B+	B+	B+	A3
	OUTLOOK		NEGATIVE	STABLE	STABLE	NEGATIVE
2008	RATING		B+	B		BBB+
	OUTLOOK		STABLE	POSITIVE		NEGATIVE
2007	RATING			B+		BBB+
	OUTLOOK			STABLE		POSITIVE
2006	RATING		B+	B+	BB-	
	OUTLOOK		POSITIVE	STABLE	STABLE	
2005	RATING		B+			BBB+
	OUTLOOK		STABLE			STABLE
2004	RATING					BBB
	OUTLOOK					POSITIVE
2003	RATING		B			BBB
	OUTLOOK		POSITIVE			STABLE
2002	RATING					BBB-
	OUTLOOK					POSITIVE

Source: Credit Rating Outlook - [Organization \(worldbank.org\)](http://www.worldbank.org)

According to the Bridgespan Group (2021), the table above depicts the top five (5) best-performing economies in the sub-Saharan African region. It shows the rating and outlook of these various countries. Of the above five countries, and according to the World Bank (2022),

the best economy is Nigeria. This is because the Nigerian financial industry is at a rapid growth rate which expanded from 1 per cent GDP IN 2001 to 10 per cent GDP in 2018 and is one of the world leaders in exports of oil. On second position is South Africa. When compared to other countries in the region, South Africa is found to be the most industrialised and most technologically advanced and a diverse economy.

SSA's economic growth was on a rapid decline between the years 2013 and 2016. This downward trajectory was brought on by corruption within the most active economies in the region. These economies include those of South Africa, Angola, and Zimbabwe. In 2018 however, the SSA growth was predicted to pick up from 2.8 per cent to 3.4 per cent (IMF, 2018). Furthermore, the IMF (2018) was of the view that this trajectory change would be influenced by stronger global growth, higher commodity prices, and favourable finance conditions. An estimated 2 out of 3 countries in the SSA region have higher growth prospects. Economies such as Cote d'Ivoire, Ethiopia, Senegal, and Ghana grew rapidly at an average rate of 6%. However, these were countries that experienced a decline in per capita income and hence it is still difficult to reduce poverty and make borrowings meaningful as opposed to accumulating large public debt when unemployment remains rife, and infrastructure is still underdeveloped (IMF, 2018).

Providing sovereign credit rating (SCR) is a vital aspect of financial monitoring and information for investment decisions. SCR involves conducting an assessment on a government's capacity and willingness to meet all its debt obligations in the prescribed period. A rating can be defined as an alpha-numerical result that is given by a credit rating agency while looking at long-term foreign currency. Over the past decade, emerging markets and developing countries have seen varied trends in their SCR. In contrast to other developing countries, South Africa has encountered difficulties in keeping its sovereign credit rating at investment grade levels since the 2007/2008 global financial crises. According to the annual report from Investec (2019), this downgrade pattern has persisted, with Standard & Poor and Fitch confirming South Africa's "junk investment" status. However, one of the agencies, Moody's downgraded South Africa to sub-investment in March 2020, this following a short-lived stable outlook.

Cantor and Packer (1996) highlight that undesirable variations in credit ratings typically result in substantial advances in sovereign bond yields. Gande and Parsley (2005) and Dittmar and Yuan (2008) emphasise the role of sovereign bonds as "benchmark securities", where their yields are used as a benchmark for interest rates in borrowing countries. Moreover, Longstaff (2011) elaborates on how shifts in the sovereign credit risk could prompt a re-evaluation of global debt

portfolios, thus, impacting the capital cost and flow across nations. Consequently, Becker and Milbourn (2011) note that institutional investors like pension funds and money market funds are restricted from investing in non-investment-grade securities. Kaminsky and Schmukler (2002) also observe the detrimental impact of sovereign rating downgrades on stock markets. In addition, Ismailescu and Kazemi (2010) found that positive sovereign rating announcements are linked to an immediate reduction in sovereign credit default swap spreads. They further established that sovereign rating downgrades contribute to increased stock and bond market volatilities, with negative sovereign rating events having significant snowball effects on yield spreads of sovereign bonds and stock market returns.

2.3.1 Credit rating trends for sub-Saharan countries

Adams (2009) views and describes sovereign credit rating according to what it aims to assess. Adams further states that ‘a sovereign’s willingness to meet its financial obligations fully and timeously is the true essence of what sovereign credit rating is’. Therefore, credit ratings influence issuers as they are a determining factor which lays down the conditions under which governments can assess debt markets. Therefore, the availability of credit information is said to be attributed to the growing activity of the Eurobond. In 2022, Trading Economics conducted a measure on a number of African countries that were evaluated by the three recognised agencies. The number increased to 31 in 2021 from the 10 which were recorded in 2003. In the same breath, the average number of annual credit ratings on African countries rose from seven (7) between 1994 and 2007 to thirty-seven (37) between 2008 and 2020. Factors that influence credit rating in Africa, according to Bheenick (2005), include potential conflicts of interest, unreliable methodologies, corrupt officials in government, and a general lack of understanding of the African economy.

A variety of economic, political, and social factors determines SCR. Bheenick (2005) identifies eight significant variables in assessing sovereign ratings, which are frequently cited by the three international credit rating agencies. These variables, in no particular order, include GDP, default history, external balance, per capita income, fiscal balance, external debt, inflation, and economic development. According to Chen *et al.* (2016), an unfavourable variation in factors that determine changes in the evaluated ratings impacts a country’s borrowing costs in international capital markets. Therefore, countries worldwide prioritise maintaining and enhancing their sovereign credit rating. The figure below gives further details on credit ratings in the SSA region.

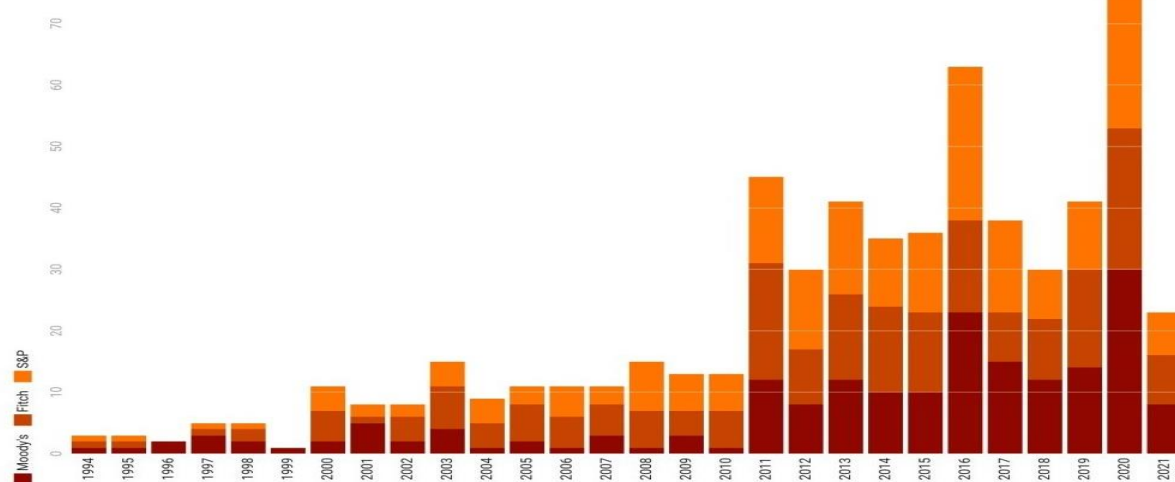


Figure 2.8: Credit ratings calculations based on data collected from trading economics.com (September 2021)

Source: Trading economics (September 2021)

About 32 African countries were under the radar of the three major rating agencies by September 2001, with countries like Tanzania and Togo getting a total of two ratings. Mhlanga (2021) emphasises the weight that South Africa and Egypt have on the overall outlook on Africa. South Africa and Egypt, two countries that are fondly known as Eurobond heavyweights, received 57 and 64 ratings respectively. Of the 49 African countries that have been selected for this study, 20 received a positive credit rating from all three major credit rating agencies. It is worth noting that most African countries, particularly those that issued Eurobonds, have seen their credit rating worsen.

2.3.2 Rating definitions

Credit rating agencies assign letters to indicate ratings for the entities. The letters range from AAA to D, and these letters are categorised into investment and the speculative grade. Investment grade is the rating between AAA/Aaa and BBB/Baa. A debt instrument rated below BB is considered speculative grade, indicating a higher likelihood of loan default. It is therefore distinguishable that speculative credit risk denotes a high degree of credit risk, while investment grade credit risk is associated with lower levels. The credit rating agencies (CRAs) use these descriptions as guidelines to produce their own rating criteria. Tables 2.4 below depicts descriptions of what each rating used by CRAs means. It also shows the long-term issuer ratings,

which range from AAA/Aaa, which is the highest ranking, to C and D. D is the worst rating and is usually assigned in the short term. CRAs assigns both short and long-term ratings to various countries and individual firms.

A short-term credit rating reflects the probability of a borrower defaulting within the financial year, whereas a long-term rating predicts the likelihood of defaulting at any given time in the distant future. Table 2.4 below shows the different ratings that are assigned in the short term.

Table 2.4: Different ratings assigned in the short term

S&P and Fitch/ Mood y's	Description
Investment Grade	
AAA/ Aaa	The best credit quality, remarkable ability to pay bills on time, and highest likelihood of not being impacted by any anticipated hardship. Exceptionally sound financial standing and favourable non-financial aspects.
AA/A a	Exceptionally good credit quality and a powerful ability to pay debts on time. Long-term repayment issues are unlikely, and in the short and medium terms, there are no doubts. Unfavourable modifications to the business, financial, and economic environments are unlikely to have a substantial impact on the organisation.
A/A	Strong ability to meet financial obligations on time and excellent credit quality. Despite having several positive credit traits, this entity could be somewhat susceptible to unfavourable developments in the financial, business, and economic environments.
BBB/Baa	There are good credit quality and enough capacity for ultimate fulfilment of all financial obligations. There are good credit attributes, even though there is some vulnerability to adverse changes in business, economic, and some financial conditions. This is the lowest investment grade category with medium grade credit characteristics.

Speculative Grade	
BB/Ba	The ability to meet financial obligations and maintain credit quality is subject to potential adverse changes influenced by both internal and external circumstances. External or internal financial and non-financial factors provide inadequate safeguards, thus posing an imminent risk to potential investments.
B/B	Significant credit risk and the ability to pay bills on time are extremely susceptible to unfavourable changes in internal or external conditions. Weak protection is provided by financial and/or non-financial sources; there is a significant likelihood of investment risk.
C	A substantial credit risk is evident, with a high possibility of defaulting. This rating implies a huge uncertainty with regards to the capability of repaying debt on time. The rating is a poor standing and offers little to no protection for both financial and non-financial factors.
CCC/Caa	Currently operating under a vulnerable state and only depends on om favourable economic, financial, and business conditions to honour financial commitments.

CC/Ca	Vulnerability is extremely high.
C/C	In the event of a filed bankruptcy petition or similar legal action, financial obligations are still met.
RS	In the case of regulatory supervision (applicable to financial institutions only), the obligor is subject to regulatory oversight owing to its precarious financial position. The likelihood of default is extremely high without ongoing external support.
SD	Selective Default: This occurs when the obligor fails to service one or more financial obligations. However, it is believed that the default will be limited in scope, and the obligor will continue to meet other financial commitments timeously.
D/-	The debtor has defaulted in almost all its financial obligations.

Investment Grade	
A1	Excellent creditworthiness The greatest ability to repay short term financial obligations as promptly as possible with low risk of being impacted by unforeseen challenges.
	Institutions demonstrating exceptional credit profiles are marked with a + alongside their ratings.
A2	Highly robust ability to repay on time with a potential minor impact from unforeseen challenges
A3	Robust ability to repay on time, with potential vulnerability to unexpected adversities.
Speculative Grade	
B	Sufficient ability to repay on schedule, and susceptible to significant impact from unforeseen adversities
C	Limited ability to repay on time in the short term if unexpected adversities arise
RS	Regulatory supervision (applies to financial institutions only) The entity is being monitored by regulatory authorities owing to its precarious financial state. Default is highly probable without ongoing external assistance.
SD	Defaulting on some obligations Even though the obligor missed one or more financial obligations, the CI still expects the defaulting to be limited in impact and anticipates the obligor will continue to fulfil other financial obligations promptly.
D	The obligor has defaulted on a majority of its financial obligations.

Standard & Poor's Ratings Services (2011)

2.3.3 Rating outlook

In addition to the sovereign credit ratings, credit rating agencies are perceived as playing a key role in predicting sovereign credit outlooks (Masciandaro, 2013). A rating outlook is an instrument that indicates the direction in which the rating is likely to move over a one-to-two-year period. Credit rating outlook watch focuses on identifiable events that cause ratings to be placed under special surveillance. There is a longer time horizon for a rating outlook of a country, namely 12-24 months. Rating outlooks are categorised as follows:

Table 2.5: Credit rating categories

Outlook	Meaning
Positive	An increase in the rating is expected.
Negative	There is an expectation of a decrease in rating.
Stable	There is an unlikely change in rating.

Source: Standard & Poor's Ratings Services (2011)

2.3.4 Moody's, Fitch, and Standard & Poor Rating Agencies

The credit rating agencies employ diverse scales and rationale for their ratings. Moody's ratings function as predictions of expected loss, derived from the dual factors of default probability and the anticipated monetary loss incurred by the defaulting party (Poon, Firth, & Fung, 1999; Bhatia, 2002). Conversely, Fitch's assessments focus solely on the pre-default probability of default and further differentiate their evaluations based on the recovery of the principal (Fitch Rating Agency, 1999; Bhatia, 2002). Notably, the ratings issued by S&P reflect only the probability of default and do not encompass its magnitude, the duration of the government's default, the terms of potential renegotiations, or the anticipated amount involved in recovery of principal (Bhatia, 2002).

Table 2.6: Rating agencies

Standard & Poor	Moody's	Fitch
The ratings serve to represent the likelihood of default (d) rather than the severity of default and do not assess the expected time in default, mode of default resolution, or recovery values.	They primarily centre on the expected loss Le , which is contingent upon the probability of default and the expected recovery rate, re , following default, articulated as $Le = (d) \cdot (1 - re)$.	These ratings are of a hybrid nature that exclusively focuses on the probability of default until default materialises and discriminate based on anticipated recovery rates post-default.

Source: Big three credit rating agencies (Bhatia,2002)

Table 2.6 above explains the methods that are utilised by the three different credit rating agencies. This information gives a clear guide to investors in asymmetric markets. Despite the various rating methods, the main aim for these agencies is to provide a rating outlook on all the debt obligations and debt instruments.

2.3.5 Codes used by the credit rating agencies

Sovereign credit ratings that are given by the three major credit rating agencies are presented on an ordinal scale; therefore, the ratings are transformed into a numeric scale to carry out the regressions. Alsakka, Gwilym, and Vu (2013), Williams, Alsakka, and Gwilym (2013), and Ntswane (2014) have transformed the sovereign credit rating data to a 20-point numerical scale, and this study adopted the same scale. Table 2.7 below presents the numeric scale and the credit rating codes of the three main credit rating agencies.

Table 2.7: Numeric scale and the credit rating codes of the three main credit rating agencies.

S & P	MOODY'S	FITCH	NUMERIC VALUE	
A-	A3	A-	14	
BBB+	Baa1	BBB+	13	
BBB	Baa2	BBB	12	
BBB-	Baa3	BBB-	11	Investment Grade
BB+	Ba1	BB+	10	
BB	Ba2	BB	9	
BB-	Ba3	BB-	8	
B+	B1	B+	7	
B	B2	B	6	
B-	B3	B-	5	
CCC+	Caa1	CCC+	4	
CCC	Caa2	CCC	3	
CCC-	Caa3	CCC-	2	
CC	Ca	CC	1	
C	C	SD	0	
DDD		D	0	
DD				
D				Speculative Grade

Source: Fitch (2010), Moody's (2007), and S & P (2007)

Higher ratings are associated with higher numerical values on the scale, with AAA/Aaa being the highest attainable rating, corresponding to a maximal score of 20 on the numeric scale, while the lowest rating, DDD/C, denotes zero on the numeric scale.

2.3.6 The descending value of the sovereign credit rating by Moody Agency

An argument can be made from the available evidence that the sovereign credit rating outlook of countries trading in Eurobonds is consistently deteriorating, leading to a worse outlook than the initial one. This is a common phenomenon that has been observed in all such countries. These countries include South Africa, Nigeria, Kenya, Namibia, and Egypt. Below is the table that depicts these historical ratings up until the last credit rating before 2021.

2.3.6.1 Egypt historical ratings

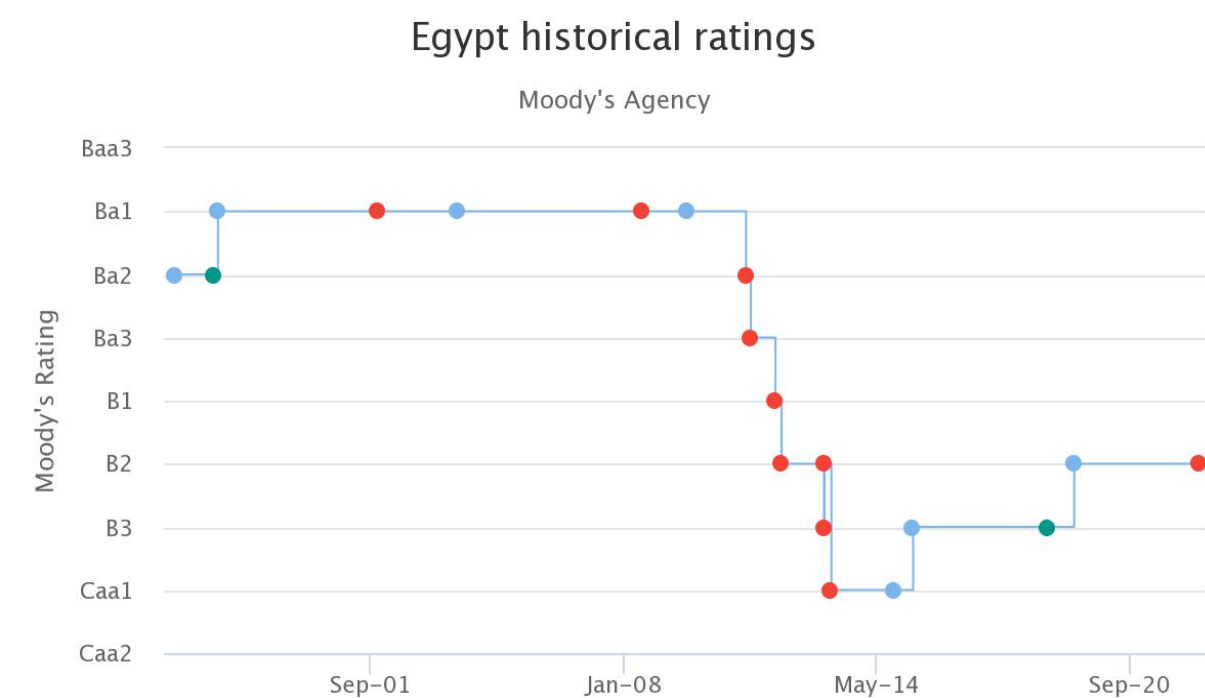


Figure 2.9: Egypt historical ratings

Source - Economy and Society (December 2021)

For the benefit of comparison between SSA countries and other African countries, Egypt was included in this depiction of SCR performance. Most SSA countries are still developing economies and thus struggle to maintain or achieve a positive rating.

Egypt's last rating to date was September 2020, with a negative outlook as depicted by the red dot. However, Egypt had maintained four (4) positive ratings prior to that, stretching back to May of 2014. In addition, when Moody’s first gave an outlook for Egypt, they had started at a

rating of Ba2 early in 2001, as depicted in the graph. The illustration further depicts a downward trajectory and can be attributed to the 2008 global financial crisis. Since then, Egypt has never quite been able to recover to the same investor confidence as that of 2008.

2.3.6.2 Kenya historical ratings

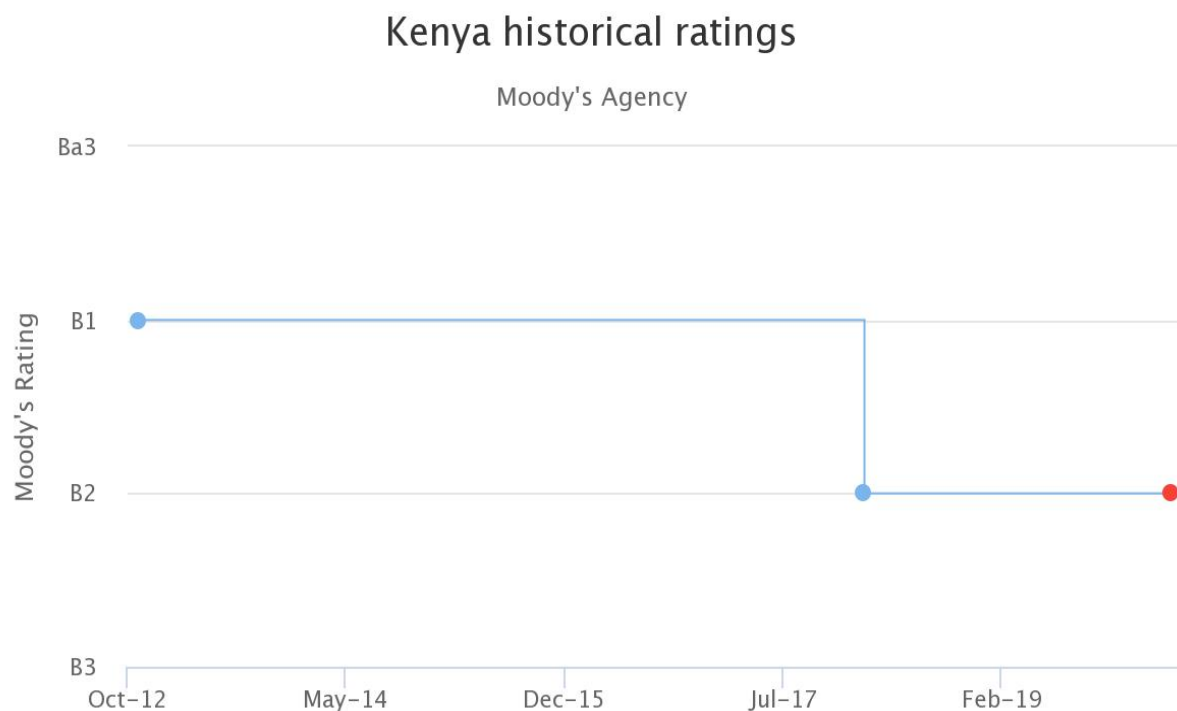


Figure 2.10: Kenya historical ratings

Source: *Economy and Society* (December 2021)

Figure 2.10 illustrates the historical ratings for Kenya. The last credit rating by Moody's in Kenya was in late 2019 as the graph shows and it was a negative rating which is indicated by the red dot. Furthermore, Moody's has only evaluated the Kenya three (3) since 2012. The economy of Kenya has been steady in terms of its outlook since 2012; however, since 2017 it has been slumped and as has remained consistent in rating since then. The red dot indicates a negative outlook for Kenya even though the rating remained at B3.

2.3.6.3 Namibia historical ratings

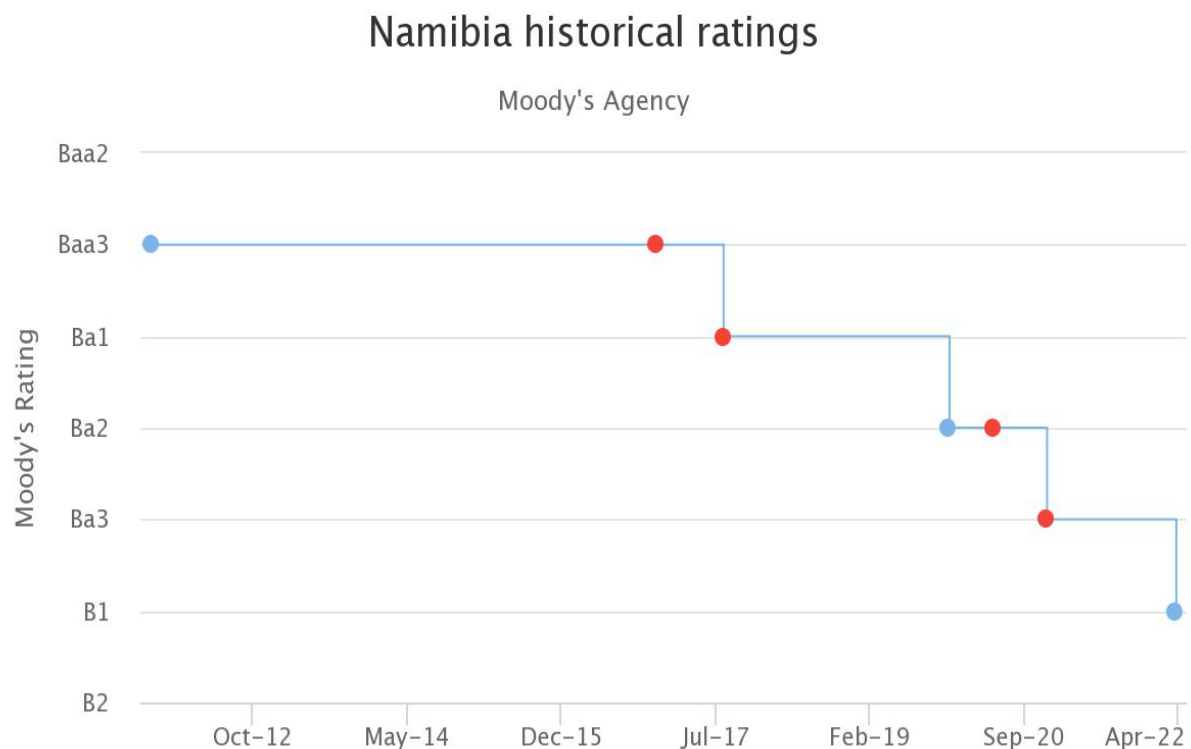


Figure 2.11: Namibia historical ratings

Source: Economy and Society (December 2021)

According to Figure 2.11 above, Namibia has had four (4) negative outlooks as measured by Moody's since 2012. The graph shows that from 2012 until July 2017, the credit rating remained consistent even though in 2016 there was a negative outlook. In 2020 the outlook was negative again owing to the COVID-19 global pandemic. The rating has not been able to recover from what it used to be. However, as of April 2022, the outlook improved to reach a positive outlook.

2.3.6.4 Nigeria historical ratings

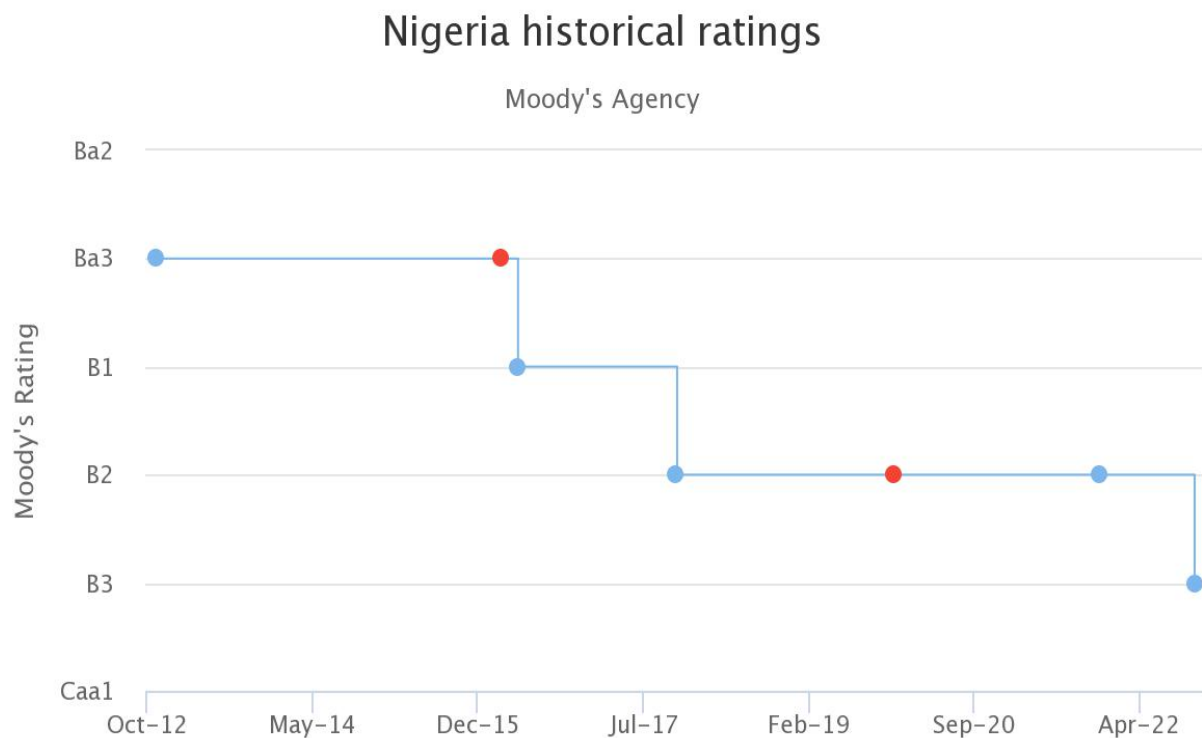


Figure 2.12: Nigeria historical ratings

Source: Economy and Society (December 2021)

The historical ratings for Nigeria are shown on Figure 2.12 above. The figure shows a positive outlook overview. Nigeria has had two (2) negative outlooks from Moody's in the 10-year period between 2012 and 2022. Although the rating has since declined, the outlook has remained rather positive.

2.3.6.5 South Africa historical ratings

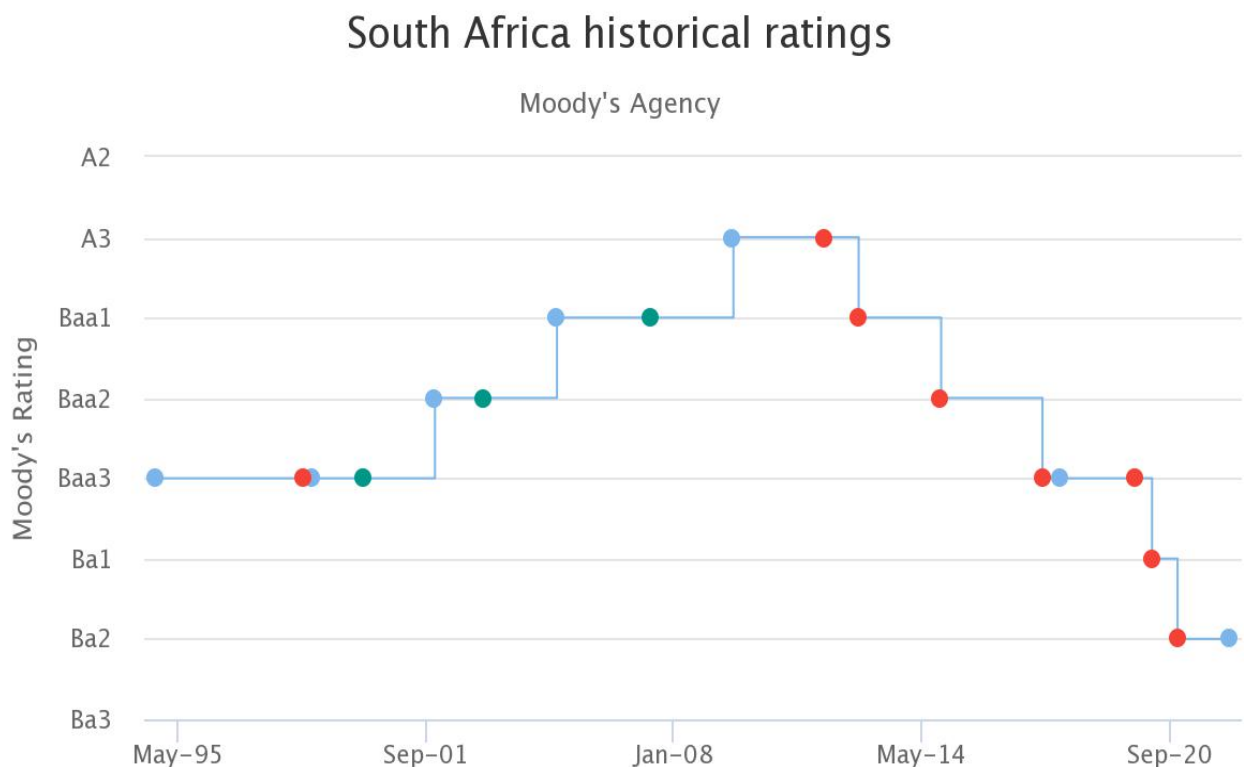


Figure 2.13: South Africa historical ratings

Source: Economy and Society (December 2021)

South Africa's historical ratings run over a span of 25 years, and over that time, they have had about 18 ratings, eight (8) of which have been negative. The last recorded outlook was in 2020 during the COVID-19 global pandemic. Although the outlook was positive, the rating had remained that of junk status. South Africa was downgraded to junk status in 2019 with a Ba1 rating.

In essence, when a rating declines (reflecting heightened risk to a country), investors tend to redirect investments from countries with a high risk, marked by political instability, financial turbulence, or volatile economic conditions towards less risky markets elsewhere. Negative revisions in sovereign ratings are expected to correlate with increased interest rates and net capital outflows. Credit constraints are likely to impede real economic activity, ultimately resulting in reduced subsequent economic output. Conversely, positive sovereign rating revisions yield opposite outcomes (Sani, 2014).

The major issue is the low credit rating that persists in the SSA as noted by scholars like Sani (2014). This issue is what authors like Agbloyor *et al.* (2016) argue limit access to finance. Countries in the current global economy, particularly those in the SSA that are commodity trading countries, need access to foreign direct investment to grow their economies. The concern arises from there; could it be that countries in the SSA are struggling with economic growth or to find stability in the GDP owing to this limited financing?

2.4 Comparison of credit rating agency methodology

According to Mellios and Paget-Blanc Payet (2006), rating agencies such as Moody's and Fitch Ratings consider four aspects of the economy to determine the rating of a country. For all three major rating agencies, economic performance is the common aspect of the economy that they consider determining the indicative rating level of the country. Mellios and Paget-Blanc Payet (2006) further explain that Fitch Ratings also considers structural features such as public finance and external finance. The rating methodologies employed by the major credit rating agencies can be categorised into five main factors, namely:

- a) management quality and strength of subnational institutions;
- b) sovereign factors, intergovernmental relationships, and fiscal arrangements;
- c) economic conditions;
- d) fiscal performance, and
- e) financial and debt position.

The procedures used to rate subnational entities closely resemble the standard rating process. In the view of Kagan (2020), the rating process used by independent credit rating agencies to evaluate the creditworthiness of subnational entities are akin to the broader rating process. However, Kagan (2020) also states that the difference here is that in the case of subnational in developing countries, the three agencies place greater emphasis on qualitative aspects, since they may provide information which is not necessarily disclosed in the public domain. Verster, Fourie, and Styger (2013) express that the methodologies employed by the three agencies differ based on the relative weighting of different rating variables, variations in the relative weights associated with the variables over time, and the significance attributed to these variables. Furthermore, Vester *et al.* (2013) submit that despite credit rating agencies employing similar rating variables and factors, the relative weights assigned to these variables vary based on the agency's interpretation of their importance.

2.5 Sovereign credit rating and economic growth

IMF (2022) pose that the economy of the region has experienced high levels of economic growth, averaging 4.2% between 1999 and 2002. This increase is attributed by the World Bank (2017) to have been the result of stronger trade agreements and it was also around this time where the credit rating agencies had begun to notice sub-Saharan countries. However, the growth has been criticised by writers like Adams (2009), as unemployment and inequality continue to rise, thus not benefiting the general population. This should thus be a petition for governments to encourage all economies in this region to observe a degree of foreign direct investment. Furthermore, Adams (2009) explains that the relationship between investment and economic growth has great advantages for the growth of this region's economy. Thus, the findings of an existence of a relationship between sovereign credit rating and economic growth suggest that an investment indeed plays an integral role in the suitability and growth of this region's economy.

However, there are contrary opinions to this nexus like those of Agbloyor *et al.* (2016), that advance the view that an economy can perform moderately well and still receive a near negative outlook and bad credit rating. Take the Indian economy for instance. As viewed by World Bank (2021), the economy is fast growing even though the credit rating is very low. This has been apparent in India for the past five (5) years and is worrying economic analysts. This is very similar to the financial crises that hit the globe in 2008. In these years preceding the crises, the three (3) rating agencies failed to see the economic dent that was being caused by the American financial policies. The cautioning of economists such as Hatzius (2007), who predicted the global financial crisis, went unnoticed as this scheme seemed to be making a lot of high-end individuals rich. Therefore, credit rating agencies came under a lot of criticism. Hatzius (2007) further explains that rating upgrades translate to diminished interest rates and heightened capital inflows, thus stimulating growth in the economy. Therefore, downgrades in rating lead to increased interest rates and capital outflows, culminating in poor economic performance.

Trends in recent years have further shown that there have been some difficult years for the sub-Saharan African region. This is emphasised by the funding squeeze experienced by the majority of the countries in this region. Global interest rates, as depicted in an IMF (2021) report, have increased and the US dollar has stretched, which has ultimately raised the cost of debt servicing and lessened access to capital market for certain countries. Moreover, Trading Economics (2021) states that this adverse economic environment is exacerbating the already stringent economic conditions. Therefore, the inflation rate is not assisting with the economic conditions

as the standard of living in the region has further dropped. Because of this, growth in the region was forecasted to slow further as it was 3.9% in 2022 and was to further decline to 3.6 in the year following (Trading Economics, 2021). Unfortunately, this emphasises difficulty in the external environment, the external environment being how investors outside perceive the outlook in the region. Nevertheless, African countries are far from powerless and there are many reforms that may be implemented to improve the resilience of economies. These reforms include the mobilisation of domestic revenue and reforms to engender high growth.

As has been alluded to above, – the sub-Saharan African region is far from powerless. In the view of IMF (2021), there are three fundamental ideas that would propel the growth of the region. These are detailed below:

- The first such idea as suggested by the IMF (2021) is that governments may want to implement is in finding aids to contain inflation. The raised cost of living, exponentially hampers the development of these economies as it aggravates the barriers to entry for small businesses. Without thriving business, an economy is always at the brink of collapse.
- The second observation emphasised by the IMF (2021) alludes to the flexibility of exchange rates. It is paramount that the countries should allow the adjustment of exchange rates all the time, mitigating the adverse effects of the economy. Exchange rates are a large contributing factor to the trade between two countries. This region is rich in commodity and should, in effect, be thriving as a result. This is unfortunately not true for several factors. Once exchange rates are standardised and monitored, this should work as a catalyst for foreign direct trade. Trade changes investor outlook for the region as it gives investors an idea of what they are investing in.
- Another recommendation made by the IMF (2021) is the consideration of the impacts of climate change. Climate change dictates how natural resources are harvested as the region's main economic catalyst. Policymakers thus have an obligation to try and mitigate policy that will regulate the effect of these changes. The difficulty in this might be that countries would still need to ensure that basic needs like education and health are met regardless of what the outcome of changes in the climate and the policies that mitigate these changes are.

On the premise of economic growth, governments may further consider how the region has to adapt and further acclimatise itself. These suggestions should assist in the short run to ensure that the overall outlook on the region may change. It is important that governments are cognisant of the virility of the region's economy as the region depends hugely on trade with other regions for food and resources. The IMF (2022) suggests as follows:

- These governments in the sub-Saharan African region, as proposed in a report by the IMF (2021), must acclimatise themselves to low-income households. This will shield them from rising fuel prices that in effect change the price of stable goods and energy prices. Governments may shield these household through implementing targeted transfers or subsidies without debt vulnerabilities excessively.
- The second concept that governments further need to give attention to is inflation. Governments need to contain inflation without undermining the recovery and growth trajectory. For the benefit of the overall outlook on the region, central banks of countries in the region need to raise interest rates when the necessity arises and hence maintain a credible policy framework.
- The last suggestion is enshrined in how countries need to manage the exchange rate adjustments. These adjustments in exchange rate may be brought on by the raising interest rates in advanced economies especially around the COVID-19 Pandemic and the Ukraine war. The exchange rates affect directly the price of all goods and services in the region as about 37 countries in the region import oil from Russia. The behaviour of trade within the region has an impact on the outlook of the region. Although credit rating depends on a multitude of factors, it is important to guard the region's interaction with the external economic climate.

Although the region has not been able to recover at an acceptable pace from the recent geopolitical tensions and the pandemic, strong, inclusive, and sustainable growth will require crucial economic reforms. Broadly, according to the IMF (2022), the three areas of such reforms include, but are not limited to, enhancing diversification; maximising the potential of the private sectors through strengthening trade integration, private fund mobilisations and digital innovation, and addressing the changes that have been brought on by the changes in the climate by investing in adaptation and seizing the opportunities offered by the transition to new energy sources.

The shock that all these challenges have imposed on the economy of the region has caused an imbalance in the overall growth of the region. The outlook has thus changed for external investors which in effect makes the investment appetite decrease. It is unclear however, if this region would be able to recover completely from these drastic, random changes caused by global pandemics. Thus, the IMF (2021) advises that governments within the region should therefore consider more sustainable policies for this region. Furthermore, IMF (2021) recommends that both monetary and fiscal policies should be given a relook and that governments in the region should perhaps figure out ways to work together. For governments to work with cohesion in the region, they should ensure that they distillate for better investment policies. The interventions should not be limited to macro-economic objectives, but also consider a single household income in the micro-economic perspective. It might not seem feasible as the growth stands, but sovereign credit rating outlook will serve the region and investment will hence benefit the growth of the economy through factors like job creation and strong currencies.

Potentially, the region could do much better as it has vast natural resources. In addition, though the sub-Saharan African region comprises very underdeveloped countries, this region needs to come together politically to try and elevate the region's overall economy. Sub-Saharan Africa is rich in resources like oil and has dynamic industrial firms. This is very beneficial for this region and may be utilised to its advantage. The cleaning of the politics in this region may promote healthier investor behaviour, sovereign credit rating and outlook increase, thus growing the region's economy.

2.6 Conclusion

The chapter provides a review of the state of growth of the sub-Saharan African economy together with trends in the sovereign credit rating. The chapter indicates that sub-Saharan Africa has fluctuated between the years 1995s and current period. This has been attributed to the reality that many of the countries in this region are underdeveloped economies. This makes it increasingly difficult for these economies to sustain themselves when global pandemics and crises occur. In addition, before the start of the period provided in this paper, there were not many countries in the SSA region that would have had an existing credit rating. Although countries such as Nigeria, Ethiopia and South Africa can stand their ground as termed developing countries, these economies still get knocked hard when the external factors are relentless. The next chapter provides a review of the literature on economic growth and investment to highlight the relationship between the two attributes.

CHAPTER 3

LITERATURE AND EMPIRICAL REVIEW

3.1 Introduction

This chapter covers the theoretical and empirical literature. The section reviews literature that underpins the impact that sovereign credit ratings have on economic growth. Two sub-sections are used for the literature review, and these are economic growth theories and investment or financial theories. The empirical review also include two subsections, economic growth and sovereign credit rating. These sub-sections speak to what propels an economy to move from strength to strength and the second is the investment theories that should give an insight as to how investment, which is expected to be instigated by a positive rating and outlook, should encourage and stimulate economic growth.

3.2 Literature review

The literature comprises theories that attempt to clarify some essential issues around the level of independence between credit rating outlook and economic growth. A review of the literature covers Keynes' Theory of Investment, which is a large contributing factor to measuring economic growth. This chapter also investigates the degree of influence that credit rating has on economic growth through. This is done by investigating the linkage that the Harrold Domer Model and the degree of investment required to boost economic activity. The Tobinz Q ratio is also investigated as to how it encourages investment within an economy and how it is measured. Furthermore, this chapter also gives insight on Solow's growth model, which further explains the degree of growth needed to support a fluid and healthy economy. In addition, the Supply and Demand leading hypothesis explains how the relationship of a healthy functioning financial system encourages investment which is inevitably the core of what the rating that is granted is. Furthermore, this chapter explores the diamond intergenerational growth model to introduce the aspect of debt into the study. To consider the role of sovereign credit rating, the interest rate channel will be explored. Lastly, this chapter discusses how individual financial behaviour influences the performance of an economy in the usage of the life-cycle hypothesis, considering the inclusion of asymmetric information in the investment market as individuals are not always aware of just what or how the government uses its funds.

3.2.1 Theoretical Literature

This sub-section includes theories or models that aid the understanding of economic growth. It also includes four theories, namely Keynes's theory, Harrod-Domer's model, Solow's growth model, and the Endogenous growth model.

3.2.1.1 Keynes theory of economic growth

According to Haavelmo (1960), John Keynes's work was most prominent during the great depression. It assumed that classical models were not doing enough to assist the economic situation during the great depression. Haavelmo (1960) further explains that John Maynard Keynes developed this theory in the 1930s to comprehend the systematic impact of the great depression. In essence, the Keynes theory advocates that increased government spending and lower taxes should stimulate demand and hence gravitate the global economy out of a depression.

In addition, the classical theory of Keynes assumes that a fluctuation in investment would result in a change in the level of output. This change in output suggests that a change in foreign direct investment, which is influenced by credit rating, would result in a shift in the growth of the economy. According to Leijonhufvud (1967), the Keynes theory of investment puts an emphasis on three determinants of investment, namely cost, return, and expectations. The theory further assumes that a combination of money supply, savings, and investment would determine the growth of the economy.

Other economists such as Hickman (1950) and Cameron (2021) share the view that during a time of economic downfall, there will be a low investment probability, which means there are limited prospects of economic improvement. The Keynesian theory, however, rejected this view and instead argues that at the dawn of economic decline, anxiety and panic stimulate businesses, and investors tend to be more self-fulfilling. Consequently, this may lead to a prolonged period of depression in economic activities, further contributing to increased unemployment. In response to this, Keynes proposed a countercyclical fiscal policy. This policy accommodates periods of economic distress in which governments should assume deficit spending to try and restore stability to aggregate demand.

According to Butos (2020), Keynes' theory suggests that the decision whether to invest is based on the comparison between the Marginal efficiency of Capital (MEC) or (r) which is the rate. The MEC is defined by Tsoulfidis (2008) as the discount rate that equals the present value of a series of cash flows generated from income producing assets over its useful life. Furthermore,

in the view of Tsoulfidis (2008), generally, the essence of how this theory operates is depicted by MEC as being greater than r , implying that new investment opportunities may be explored.

In an economy, a situation may be created where components of its GDP may be arranged in descending order of their MEC. Assuming all components remain constant, investors are prone to favour those with a higher Marginal Efficiency of Capital (MEC) than r and dismiss those with an MEC lower than r . The MEC denotes the rate of return profits on an extra unit of investment. As the amount of investment increases, the marginal efficiency of capital diminishes, owing to the initial investment being concentrated on prime opportunities that yield higher returns, with subsequently diminishing productivity and returns. The volume of investment accumulation hinges on both expected returns and the cost of capital. Moreover, investment becomes viable only up to the point at which the marginal efficiency of capital (MEC) equals the cost of capital, as illuminated earlier (Tsoulfidis, 2008).

3.2.2 The Harrod-Domar model

The Harrod - Domar model is an infusion of two economists, Roy Harrod and EC Domar (Mauro, 2015). Mauro (2015) tells a story that the two were from separate walls of the world but had found that their work had similar characteristics in concept. Mauro (2015) further submits that the main objective of these economies was to achieve a steady growth rate. The Harrod - Domar model of growth gives us insight into the dynamics of growth that speak to how growth arises over time. According to Van den Berg (2013), this model suggests that economic growth depends on the trajectory of savings and the productivity of investments. This view is also apparent from Sato (1964), who also referred to what this model suggests as the capital-output ratio. The Harrod - Domar model is significant in this study as it explains growth in terms of the savings ratio. Therefore, expanding investment levels through fixed capital and human capital is key to achieving economic growth. As indicated in the Theories and Basics (2018), to achieve this, policies that promote savings and produce technological advancements that allow entities to produce more output with less capital should be prioritised and encouraged. This can be achieved by decreasing the capital-output ratio.

According to Mauro (2015), the Harrod - Domar model measures the efficiency of the investment and productivity of human capital. Hence, credit rating agencies look at a lot of different aspects, and one such is the consideration of the development of a country. If a country's human capital is employed fully, it creates a feasible or better outlook on the economy because of the valiant production of goods and services. This positive outlook on

economic growth in turn encourages FDI as investors will be keen because of the economic outlook. The Harrod - Domar model emphasises investment, savings, and technology as the main agents of economic growth. These aspects are some of what investors consider when looking to invest in an economy. Economic growth fosters a positive outlook for the country, which would encourage investment to increase. This will in turn encourage a positive outlook from rating agencies.

3.2.3 Solow – Swan growth model (Exogenous growth model)

The Solow - Swan Growth Model is an exogenous growth model that was brought forward by a Nobel Prize-winning economist by the name of Robert (Bob) Solow. According to Dorwick (2002), the Solows - Swan model demonstrates how unattractive the Harrod - Domer model is as an economic growth theory and considers, at its core, the neoclassical production function. Nevertheless, scholars such as Bucci and Guerrini (2009) consider this model an extension of the Harrod - Domer model. The model was brought forward in the year 1956 and is a rather simple growth model and hence is common in usage. It is a simple-to-understand model in the explanation of economic growth. Therefore, the Solow - Swan model emphasises that total productivity can lead to infinite growth in the economy.

The Solow growth model is described by Dimand and Spencer (2009) as an economic model that depicts a country's net output and compares the narrative to the country's input. This comparison is inclusive of population growth, investment, savings, capital, depreciation, and technological advancements. The Solow growth model measures a nation's economic growth rate over time to indicate the direction of its economy. At its core, the model predicts the long run. Dimand and Spencer (2009) further explain how the shift in both savings and population growth would affect the equilibrium of the model in the long run. Moreover, Dinmand and Spencer suggest that the model carries three main assumptions, including production technology with constant returns to scale, the savings as a constant fraction of output, and the substitutability between labour and capital. This means fixed coefficient production has been dropped; in the production function, labour and capital can be substituted continuously with each other. There, it can be deduced that the model established that there will be no growth in per capita output in the long run.

The very essence of the endogenous growth model is to emphasise that in the long run, economic growth is not dependent on the savings rate. It further suggests that it is technological progress that brings a change in per capita output. Bleaney, Gemmell, and Kneller (2003) also

confirm the gradual increase in the gross domestic product through economic adjustments owing to technological progress. Technological advancements are an imperative component of a country's input. This can be justified by noting that advancements propel production and efficiency of the labour force. The purpose of Solow's growth model is to measure the growth of the economy of a country quarterly per annum. If the Solow growth model formula shows a positive growth rate, it is good for the country, but if it shows a genitive growth rate for two consecutive quarters, it can be deduced that the country is in a recession.

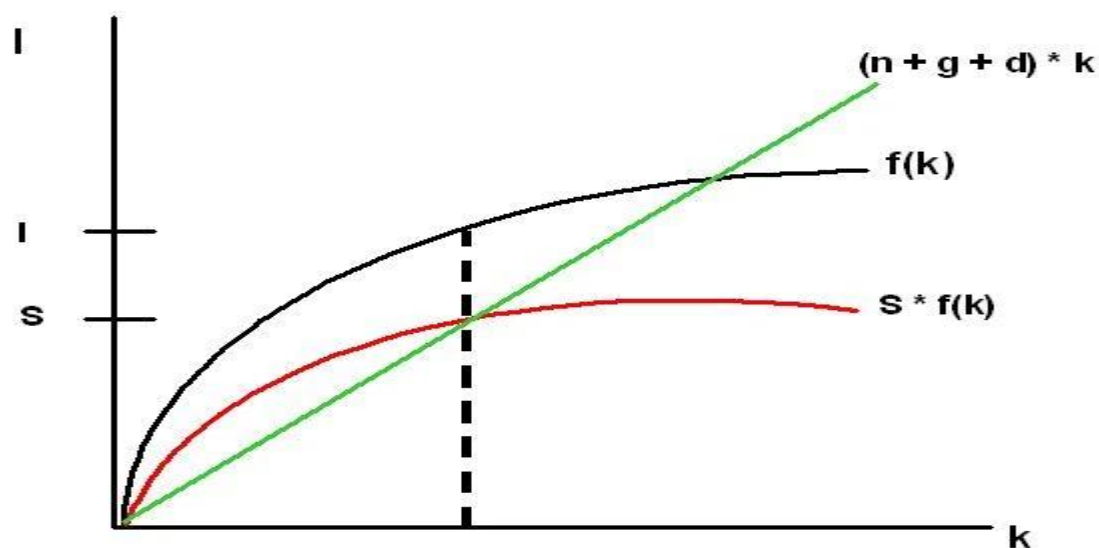


Figure 3.1: Solow Growth model

Source: Indeed

The figure above depicts the Solow- San growth model as depicted by Acemoglu (2008). It is represented such that:

I – represents equilibrium income;

S – represents equilibrium savings;

C – represents consumption;

N – represents growth, and

G – is technological advancements and is depreciation.

Acemoglu (2008) further explains that this model has three (3) main assumptions, namely production technology with constant returns to scale; savings as a constant fraction of output, and the substitutability between labour and capital. With these assumptions, the model

establishes that investments and savings are vital components for economic growth. Increased investment and saving culminate in a bigger capital stock, thus fostering amplified full-employment national income and production. Thus, this speaks to the influence that investment has on a country's economy. In a country's economy, the better the outlook, or rather the more positive the outlook and greater the grading, the more the probability of FDI and savings. Once investment has increased and the economic performance of the country is positive, there is more likelihood that the five (5) macro-economic objectives will be met as the conditions will allow. Hence then, as Acemoglu (2008) affirms, in the Solow-Swan Model of growth and its assumptions, investment is imperative to the growth of an economy.

3.2.4 New growth theory (Endogenous growth model)

The New growth theory is a broad twist on classical economics, with a distinct focus on supply and demand as the primary factors that constitute economic growth. Before the New growth theory was suggested, the dominant theory of growth was the neoclassical growth theory. The New growth theory was introduced by a Nobel-Prize-winning economist from America by the name of Paul Romoer in 1956. According to Ruttan (1998), this theory illustrates a phenomenon in which economic growth is dependent on supply and demand and hence the pursuit of profits. Ruttan (1998) further argues that real GDP, when measured individually, will perpetually increase because people pursue profits.

Solow (1994) further states that the endogenous growth theory primarily suggests that economic growth is heavily dependent on internal factors. This emphasises the point that this theory excludes, entirely, the possibility of external factors when considering economic growth. Moreover, according to Solow (1988), making significant investments in intellectual capacity, human capital, and innovation plays a crucial role in contributing to economic growth. This theory also highlights the positive externalities and spill-over effects of a knowledge-based economy, which will ultimately promote economic growth. The fundamental rationale is that people's desires and requirements influence their purchasing and investment decisions, consequently driving economic growth. Furthermore, what the new growth theory suggests is contrary to the view that a healthy economic growth rate is inflicted holistically by external forces, which cannot be controlled.

In trying to decipher what this theory does, Martin and Sunley (1998) express that this theory places emphasis on technology, knowledge, and entrepreneurship as heavy role players in the growth of an economy. According to Ruttan (1998), the first aspect, which is technology in

this regard, serves as a means for individuals to access the economy and allow effective and efficient trade, which collectively impact the growth of the economy. The second aspect is explained thoroughly by Palley (1996) who states that knowledge is viewed as a commodity that facilitates one's ability to acquire all the required information to drive an economy forward, hence impacting the economy's ability to grow. The final aspect, as indicated by Martin and Sunley (1998), is entrepreneurship. Entrepreneurship is defined by Palley (1996) to encourage individuals to accept the responsibility that each person must influence the growth of an economy. Individuals are expected to invest in ways that enable them to satisfy demand and supply, which allows a generation of profit.

What is important to deduce from this theory is the importance of human capital. New growth theory suggests that human capital is the most valuable resource in an economy. Thus, it is upon governments and firms to endeavour to achieve maximised economic growth and prosperity. If governments and firms focus their efforts on creating avenues for individuals to engage in research, exploration, development, and entrepreneurial behaviours, they will see not only growth but also a healthy and sustainable economy. Sustainable economies encourage a more positive economic outlook, which shifts focus of external investors, encouraging them to further invest in the said economy because it is fully functional and stable.

3.2.5 Diamond Intergenerational Growth Model

The overlapping generations' model, of which the diamond intergenerational growth model is a type, was developed by Peter Diamond. According to Heer (2019), the model essentially addresses the question of demographic, debt, family economics, and pensions. Unlike models like the Solow growth model which assumed saving as a portion of income, Heer (2019) expresses that this model takes savings as a primary function of the interest rate, where people have finite life in the diamond intergenerational model. It assumed that all life is gathered and explained into separate, yet interrelated terms. These terms are commonly used by scholars like Heer and in the examples of Peter (1965) as young and old. Heer (2019) further explains that in the first term (young), an individual is working and assumed to be accumulating savings, and in the subsequent term (old), the individual is assumed to be retired and spending of the savings the accumulated over the period that they worked.

The diamond intergenerational growth model is a type of overlapping generations' model. In essence, this model expresses turnover in the population as other OLG models do, but in this version, the OLG has a unique feature, namely the possible dynamic inefficiency. The diamond

intergenerational growth model further captures the notion of differing stages in life of consumers and their economic significance. Hence, this model insinuates that, in the first part of someone's life, their income should be enough for them to save. These savings are then spent over an individual's pension years. Without adequate income, people cannot save. Unfortunately, without savings then people realistically have no money to spend during their retirement years and will depend on the government. This would strain the economy.

3.3 Investment theories

These theories show a perspective of the SCR element by covering the understanding that a positive credit rating and outlook do in turn ensure that investors see prospects for investing in that particular economy. Therefore, credit rating and investment relationships affect the overall economic perspective.

3.3.1 Tobinz Q ratio

The Tobinz Q theory was popularised by James Tobin. Tobin was an American economist who received a Nobel Prize in 1981 for his work on the Tobiz Q ratio. Tobinz Q has, over the years, played a prominent role in investment opportunities as far as finance literature is concerned. This literature is attributed to by authors like Singhal, Fu and Parker (2016) who review the ratio and firm performance. These studies have managed to solidify the Tobinz Q ratio in terms of investment prospects for firms. The very essence of the ratio is the explanation that is brought on by the formula of the ratio: the market value of a firm divided by the replacement cost of a firm's assets. The association between Tobinz Q and future cash flow is influenced by a positive relation since the denominator of the ratio is the replacement cost of assets and is expected in prevent value terms (Eklund, 2013).

According to Eklund (2013), this theory suggests that firms may decide to use funds for their investment through the sale of shares, which explains the relationship between the share market and investment. Another way to look at the ratio is considering that a single number may inform that a firm's market share is overvalued or undervalued and when a firm should consider buying or selling shares. Hence, q in this theory is calculated as follows:

$$q = \frac{\text{market value of installed capital}}{\text{replacement cost of installed capital}} \dots \dots \dots 3.1$$

According to Blundell, Bond, Devereux, and Schiantarelli (1990), the market value of a firm's installed capital is influenced by the price of its shares in the stock market. Thus, an increase in the share price results in a higher market value for the installed capital. Parkash, Singhal, and Fu (2016) further explain that the replacement cost of installed capital refers to the expense of replacing an existing asset based on the current market price. Hence, Bolton, Chen, and Wang (2012) describe the relationship thus: if the value of q is greater than 1, then the market value of installed capital is bigger than the replacement cost of installed capital: if this is the case, then it means it would be more profitable for a country to increase investment in physical capital. Therefore, Blundell *et al.* (1990) shares the view that the driving factor behind investment, because of this value, is stock valuation. This paper explores Tobin's Q theory because it expert that government spending, investment and debt accumulation are influences of investors' perspectives on a country's economy.

However, Bolton *et al.* (2012) expresses that the irony is that economies seldom react to $q > 1$ or $q < 1$, delaying opportunities for economies to expand or retract, despite the macroeconomic impact that the q ratio holds. What is evident, moreover, is that economies do not base investment decisions solely on fixed investment in the stock price. They would rather evaluate the current value of the expanded profits and future rates. Parkash, Singhal, and Fu (2016) describe the Q ratio as measuring two variables. In addition to these variables, Parkash *et al.* (2016) further express that speculation, market hype, and intellectual capital are variables that would also influence the q ratio. The former relates to q in terms of the prospects or views that investors may have on a particular economy whilst the former evaluates q in terms of variables that are unaccounted for within the boundaries of an economy. These variables include technological advancements, goodwill, knowledge, and skill. The variables are not part of the GDP calculation, which is the sole measure of economic growth, but are quantifying factors in investment probabilities. Therefore, there is an overwhelming view that q is influenced by intangible assets and market hype.

3.3.2 The Life-cycle hypothesis

Deaton (2005) explains that the Life Cycle Hypothesis was conceived by Franco Modigliani in the 1950s. This theory looks at the time series and macroeconomic implications. Furthermore, Deaton (2005) submits that the theory assumes that an increase in the lifetime resources of an individual leads to a proportionate increase in all periods of their life. Hence, Deaton (2005) says the theory related to the life cycle, with consumer seeking to smooth consumption over a

lifetime period by saving when income is high and borrowing when income is low. An increase in personal savings or individual savings in turn increases the attractiveness of the overall economy. The more individuals save, the heavier the pocket of the country.

According to Tobin (1965), when the current income of households, in relation to their average lifetime income, is low, households tend to borrow money to finance their consumption. When this occurs, it lessens the availability of money in the fiscal. If no savings are considered, the fiscal suffers and hence the probability that households will borrow money to sustain their consumption. When their income rises again at a later period, they then pay off their debts. This is based on the theory that households will see an increased income during their life cycle. Modigliani (1995) reveals that the hypothesis is based on the art of using savings to transfer purchasing power from one to another time in the course of life. Modigliani suggests that labour income is usually low in the early years of labour, in comparison to the middle years as income usually rises as people continue to labour and declines during their retirement years (Parker, 2010).

The life cycle theory shows that there is a trade-off between current and future savings, resulting from the fact that income is relatively low during early labour years and becomes higher over the later years. This, therefore, means that the younger age group of households will be highly indebted when compared to the older generation because the younger generation is facing high consumption demands with a low income. These individuals use borrowing to finance this consumption, which is what hurts the overall fiscal. Resnick & Wolff (1981) state that there is another model developed by Tobin in 1967 which assumes a level stream of lifetime consumption and zero net worth when a person dies. This suggests that it is possible for a family to incur debt to purchase the goods needed to establish a household. In addition, the model also suggests that a positive rate of return on assets is another factor that influences household wealth accumulation.

Contrary to the idea brought by the life-cycle theory, which suggests that country wealth is measured by age, there are other four factors that are known to account for household wealth. The factors that influence wealth distribution include variations in lifetime earnings and how they are distributed over time in different countries, discrepancies in saving rates, differences in rates of return on assets, and capital gains, also varying over time and among diverse countries. Furthermore, there are differences in wealth transfers, inheritances, and gifts

obtained by households as stated by Resnick & Wolff (1981). The Life-Cycle hypothesis (LCH) is illustrated as follows:

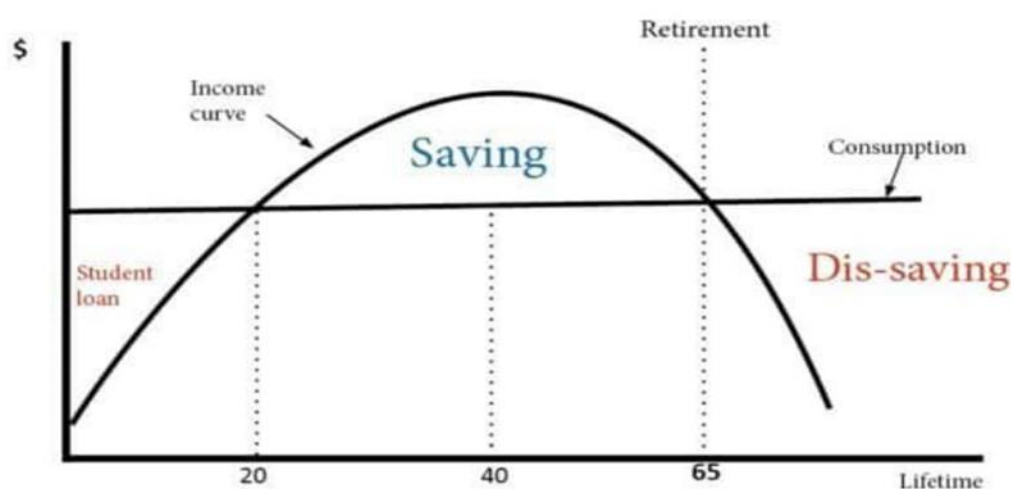


Figure 3.2: Life cycle hypothesis

Source: Mabitle (2020)

The graph above illustrates how consumption increases over the lifetime of an individual country. It shows that the income of an individual fluctuates over their lifetime according to their age. When individuals are still students, i.e. up to the age of twenty years, their income is below their consumption. This means that their consumption is financed through borrowing. Moreover, as they grow, they may get a job and earn more income from which they can save. However, at some point, they will have to retire, which therefore means that their income will decrease, and they will be faced with a situation where their consumption is greater than their income. Now this is where the option of borrowing comes into the picture again. Another way to have this illustrated is through the stripped-down version of the LCH.

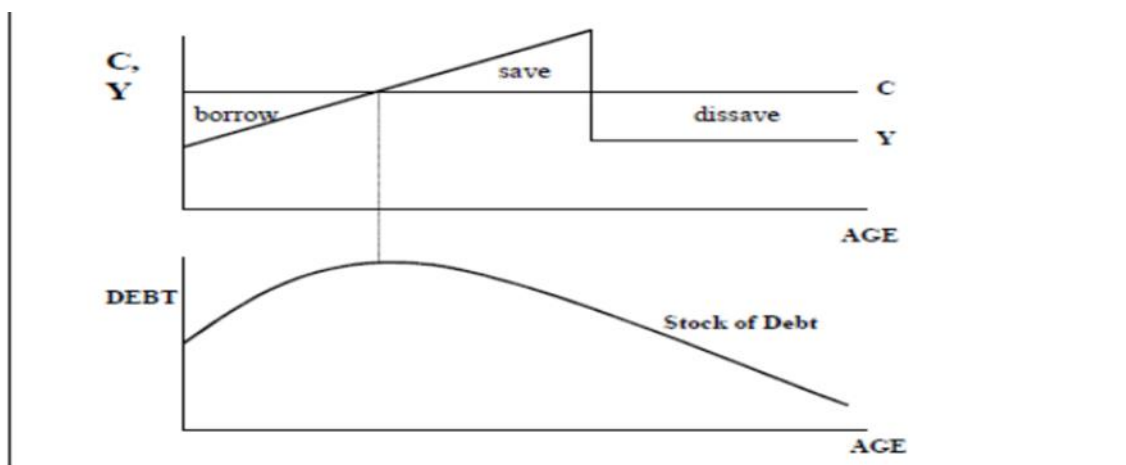


Figure 3.3: Stripped-down version of the LCH

Source: Mabitle (2020)

According to the stripped-down version, consumption levels are constant throughout the lifetime of an individual. This graph measures the consumption and income of individuals against their age. Similar to Figure 3.3, the stripped-down version shows that individuals will borrow during their early years to finance their consumption and only save later in their life when their income has grown. This will then decline after retirement.

Existing studies on sovereign debt ratings, relevant to this paper's analysis, can be broadly categorised into two areas, however, this paper will focus on one. The focused factor states that there are studies that seek to understand the determinants of sovereign debt rating notations; frequently, these techniques involve the use of ordered response models and linear estimation methods.

3.3.3 The Theory of Asymmetric information

The theory of asymmetric information is one of the greatest challenges faced in the investment market. As it is self-descriptive, it is about the non-mutual information between the active parties concluding a financial agreement in the market, i.e. lenders and borrowers. One economist, Akerlof (1970), did great justice in trying to explain the problem of asymmetric information in the market by using the example of good and bad cars. This is referred to as the lemons problem. The problem here is that sellers have more information about the products they provide to the market than the buyers, which means that they could use it to their advantage

over the buyers. The same problem applies to the investment market, where the investor has less information about the economy within which they are interested to invest.

The problem of asymmetric information is better understood for the credit rating sphere in the operation of investment. A greater challenge has been identified in that sector in relation to the imperfect information. The introduction of the concept of riskiness comes into place, as asymmetric information makes it risky for investors to invest their earnings since they cannot really determine how credit-worthy the investees are. Stigilitz & Weiss (1981) noticed the concern on the side of the banks as the providers of credit regarding the interest rates and the riskiness of the loans. According to Stigilitz and Weiss, interest rates charged by banks have the power to influence the pool of loans by sorting potential borrowers or affecting the actions of borrowers. This then introduces us to the concept of adverse selection which derives directly from asymmetric information. Adverse selection occurs when risky borrowers drive out the less risky borrowers in the market. The fact that banks cannot determine how risky it is to lend to certain borrowers means that banks should invest in thorough screening of the potential borrowers, and this involves the use of interest rates. The banks may want to increase interest rates to control borrowing by high-risk borrowers. However, this may become a challenge as it also affects low-risk borrowers, and the banks may therefore end up losing the low-risk borrowers because of the high interest rates. Stigilitz & Weiss (1981) state that the profitability of the banks will then be affected negatively.

The analysis of this theory is very important to this study as it helps to reveal the situation faced by the credit market. It is because of these challenges that the South African government established the NCA to regulate the effects and disadvantages of the asymmetric information between buyers and sellers or lenders and borrowers. This problem of mistrust between these contracting parties has the potential to diminish the credit market altogether because the risks faced by the lenders may result in them making a loss.

3.3.4 The Supply-leading versus the Demand-Leading hypotheses

According to Kairmo & Ogbonna (2017), the first hypothesis, namely the supply-leading hypothesis talks to whether the deepening of a financial system leads to positive economic performance, whereas the second hypothesis, namely the demand-leading hypothesis focuses on a hypothesis that economic growth causes a financial system deepening. A study by Karimo & Ogbonna (2017) is employed to explore these two hypotheses further for a better

understanding of the nature of the relationship or correlation between politics, economic performance, and stock markets. According to Karimo & Ogbonna (2017), the first (supply-leading hypothesis) of the two hypotheses supports that financial development positively impacts the performance and development of the economies, while the demand-leading hypothesis supports those changes in the real sector influence changes in the financial market and system. Therefore, these hypotheses will be useful in studying the link between sovereign credit rating and economic growth in sub-Saharan Africa.

3.3.4.1 Supply leading hypothesis

As per Hurlin and Venet (2008), they believe that the supply-leading hypothesis is one of the main theories that give an understanding of the relationship between sovereign credit rating and economic growth. This assumes that a functioning financial sector is what attracts investors to invest in a country. Hurlin and Venet (2008) state that the optimal allocation of resources is because of how well the financial sector operates and that the supply-leading hypothesis states that there's a one-way relationship between credit outlook and economic growth and it runs from finance to economic growth with no feedback response at all from economic growth.

Advocates of the finance-led growth hypothesis, such as Levine (1997), argue that a well-developed financial market in any country significantly contributes to economic growth. In addition, McKinnon and Shaw (1973) support this view, emphasising that a well-developed financial sector reduces costs, minimises asymmetric information, and improves financial intermediation, thus reducing investment risk and attracting investors, promoting technological innovation and public benefits, and fostering development. The existence of a well-developed financial sector improves the risk associated with investment in a country and attracts investors as it encourages technological innovation resulting in benefiting the public and development.

3.3.4.2 Demand Leading hypothesis

According to Said and Hammam (2002), the Demand Leading Hypothesis posits that international trade plays a significant role in fostering the development of the financial market. As economic growth increases, there is a heightened demand for investment, ultimately leading to the development of the financial system.

3.3.4.3 Feedback hypothesis

Hurlin and Venet (2008) argue that the feedback hypothesis illustrates a two-way causal relationship between credit rating and economic growth through technological changes, suggesting a positive effect of financial sector development on economic growth. This effect generally runs from financial development to economic growth, though occasionally it may run from economic growth to financial development. It is underpinned by enhanced efficiency of capital accumulation and increased savings and investment.

A reciprocal relationship between the development of the financial market and the growth of international trade is postulated, with proponents of this theory arguing that trade openness enhances the competitiveness of production processes and that an efficient financial system fosters international commerce. In the initial stages of international trade development, financial markets are typically underdeveloped and of limited magnitude. It is imperative to achieve sustained trade growth for financial markets to function more effectively (Rahman, 2009).

3.3.5 The International trade and investment theory

The International Trade and Investment Theory was developed by Hirsch (1976). This theory is mainly used by Investors who prefer to invest in a foreign market to maximise their profit. Foreign Direct investors may opt to export or offer their services and funds to local manufacturers. Hirsch asserts that industrial organisation and location theory models are relevant in analysing the FDI framework. As Desta and Hirsch (2012) suggest, this theory assumes imperfect markets, transportation costs, factor mobility, International non-identical production function, and non-constant return to scale.

3.3.6 The Accelerator theory

According to Baddeley (2003), the accelerator theory is the brainchild of Thomas Nixon Carver and Albert Aftalion as the two main economists even though there were many collaborations. This theory's inception was even before the Keynesian economic theory in the early twentieth century. However, it was during the existence and knowledge of the Keynesian theory that the accelerator theory found expression. Kumar (2015) explains that at the very core of the accelerator theory is the suggestion that whenever there is excess demand, firms should choose

to decrease demand by increasing prices or raising the level of investment to meet the level of demand. Hence, this theory is viewed by Kumar (2015) as an economic hypothesis where investment expenditure increases when either demand or income increases. At the heart of the theory, Baddeley's (2003) views are that it assumes that firms will choose to increase production, which would in turn increase profits that assist in the firm's objective to meet the fixed capital-to-output ratio.

The accelerator model exerts what is commonly known as the accelerator effect (Kumar, 2015). The effect of the accelerator simply relates investment and GDP in that when investment increases, then there is a likelihood that there will be a consequential change in GDP. Hence, an increasing rate of economic growth will cause an increase in the investment level, which certifies that a fall in the rate of investment will result in a downward shift in the level of growth. Therefore, as stated by Todorova and Kutrolli (2019), the lineage of the accelerator effect stipulates that, if there is an increase in demand, the firms are likely to adjust production to meet the looming demand after realising that there is a new capacity that needs to be adjusted for.

Furthermore, Jorgenson (1967) portrays a contrary view, which is that the acceleration principle describes an effect that is opposite to the multiplier. According to this principle, an increase in income, followed by a rise in consumption, leads to an increase in investment. As the income and consumption of people rise, the demand for goods increases, requiring more capital for production if the existing capital stock is fully employed. This type of investment, induced by changes in income or consumption, is termed induced investment. Todorova *et al.* (2019) agrees that the accelerator represents the magnitude of the relationship between the increases in investment owing to an increase in income. With an increase of national income, the induced investment will be positive. However, it may decline such that it reaches a zero-point, provided national income remains constant. The production of a specific output level requires a certain amount of capital. To illustrate this relationship, Kumar (2019) explains that if Y_t output is required to be produced and v is the capital output ratio, the required amount of capital to produce Y_t output will be given by the following equation:

$$K_t = vY_t \dots \dots \dots 3.2$$

Where K_t stands for the stock of capital, Y_t for the level of output or income.

K divided by Y yields the output ratio. The capital output ratio is represented by v in the equation stipulated above. According to the accelerator theory, this ratio can be assumed to be constant. It is therefore applicable to assume that the capital output ratio a fluctuation in output is caused by fluctuations is the stock of capital. Hence, Kumar (2019) explains the formula as it is stated above.

Therefore, to best explain this, Kumar (2019) reiterates the breakdown of this equation as follows: when income has reached Y_t , the $K_t = vY_t$ is the stock of capital that is recorded. In addition, income will at times be equal to Y_{t-1} ; when this occurs, one can assume that the stock of capital that is required is $K_{t-1} = vY_{t-1}$. From this, we can deduce that if period $t-1$ may increase to Y_t , income will rise from the Y_{t-1} ; then the stock of capital will increase K_{t-1} from to K_t . As seen above, K_{t-1} is equal to vY_{t-1} , and K_t is equal to vY_t as explained by Kumar (2019).

3.4 Empirical Literature Review.

Pineau, Le, and Estran (2022) investigate the influence of environmental, social, and governance factors in sovereign credit rating. They used a bi-methodical approach to data collection by macro-financial inclusion of both ESG and non-ESG factors. They collected these data over a sixteen-year period, from 2002 to 2018. The finding is that the adaptation of the ESG factors is dependent on economic development. They also noted, however, that this varies between emerging markets and developing economic and advanced economies. They note that for advanced economies, the most imperative factor influencing credit rating on economic development is governance. However, for emerging markets and developing economies, it is all three ESG factors that essentially drive the creditworthiness of the economy.

Cantor and Parker (1996) investigated the determinants of sovereign credit rating, and they were amongst the first scholars to find GDP as the determinant. These results are further supported by Bheenick (2005), adding per capita income, GDP growth, inflation, external debt, level of economic development and default history as other determinants of sovereign credit ratings. Alfonso (2002) also agrees with the previous findings and finds GDP per capita, external debt, real growth, and inflation rate to be significant in explaining a country's credit rating. Alfonso adds the level of economic development, and default history as significant determinants of sovereign credit rating.

When the COVID-19 pandemic hit, it forced authors like Canto, Fanneell, and Serrano (2021) to probe the adjusting of credit rating during this global pandemic. Their research covers a period that begins in the early months of 2020 until the end of 2021 when the pandemic was at its peak. These authors investigated this in the areas covering Europe, which was a substantial area, but also included non-EU countries. The data used in their article were extracted from ESM's extensive RADAR database of credit rating activity. Their results show that the pandemic resulted in a steep decline in credit rating, although they cite other factors including, but not limited to, declining economic activity and business sector inactivity. Lastly, Canto, Fanneell, and Serrano (2021) note the resilience the financial market seemed to have been from the surge in 2020. Furthermore, Tran, Vu, Klusak, Kraemer, and Hoang (2021) also agree with the view that there was a rapid decline in economic growth following the COVID-19 pandemic. It is their view that the health crises caused a lot of inactivity, which caused a train in the relativeness between growth and credit rating.

Moreover, it is an arguable point that the stated macroeconomic variables also represent the state of the country's economy and thus can be shown to also represent the influence of economic performance on stock market performance. For example, Mishal (2011) assessed the relationship between the financial sector development and the economic performance or development in the case of Jordan. This was done using a multivariate vector error correction model which showed the existence of a stable long-term equilibrium relationship between the financial markets' expansion and economic growth. In addition, Mishal (2011) indicates that the causal relationship runs from economic growth to the stock market growth and not the other way round. Moreover, Levine and Zervos (1996, 1998) and Singh (2012) found a direct link between stock market expansion and future economic development, arguing that there a significant positive relationship between stock market liquidity and long-run economic expansion. Furthermore, Shula (2017) shows that macroeconomic variables such as GDP, inflation, real interest rates, and exchange rate accounted for 97.5% of the variation in stock prices for the case of Zambia in their study.

Furthermore, Tandelilin (2010) argues that investors observe macroeconomic indicators such as the GDP, interest rates, inflation, and exchange rates to predict what will happen in stock markets and consequently make investment decisions based on such predictions. Moreover, according to Thobarry (2009), macroeconomic variables such as GDP, interest rates, exchange rates, and inflation impact the demand and supply of products by a particular firm; therefore, the development of a company's activity affects the observable return for investors.

Shah and Afridi (2015) allude to the fact that political stability and regulatory quality have a significant and positive effect on inward FDI, whereas corruption discourages multinationals to invest in SSA countries. Caccia, Baleix, and Paniagua (2018) echo the same sentiment that compliance with the rule of law, lack of corruption, political stability, and democracy have the potential to boost new FDI. In addition, Noor and Abdalla (2014) state that government policies encourage FDI positively though different policies are required for each sector.

Erdem and Varl (2014) expanded on the work done previously by focusing on more emerging economies than just one country and found that the reserves to GDP, governance indicators, GDP per capita, and balance to GDP ratio were pivotal considerations for SCR. The study conducted by Chee, Fah, and Nassir (2015) analysed the credit ratings from 2020 January to 2011 December, encompassing qualitative variables such as economic freedom and development, default history, and a vast array of macroeconomic variables. Their conclusions showed that the macroeconomic variables used were consistent with historical data obtained and emphasised that the economic freedom variable has been overlooked in past studies although they have a great bearing in defining sovereign credit ratings.

Moreover, a study carried by Phakedi (2014) by employing granger causality test in the SADC countries for the period 1990-2012 support the above findings of Barbosa and Faria, (2011) that the development of equity markets facilitates technological innovation. Alex Bara (2017) also discovered that equity markets are good for economic growth because equity markets make it easier to observe the feedback effect of market security prices. In line with this, Alex Bara (2017) discovered that innovative projects somehow seem so difficult to evaluate owing to information asymmetry; however, with the development of equity markets it is much easier to share and distribute information and as a result this contributes positively to innovative activities.

Rousseau (2005) did a study that investigated how credit rating agencies would become more accountable for the work that they do. They did this by examining the disclosure method. The finding of this study showed that having regulators could be amongst the most important methods that could assist with the question of how to enhance the credibility of credit rating agencies.

Syan, Hisen, Chou, and Li (2016) have written on the nexus between sovereign credit rating and economic growth. They based their study on a period of analysis between 1982 and 2012 where they investigated the relations between sovereign credit rating and economic growth.

Their finding emphasises a proportional relationship between the two variables. Most prominently, their view is that the fluctuations in the rating imposed on a country directly impact the economy through interest rates and capital flow channels. They authors collected their data from S & P series of upgrades and downgrades.

Studies about sovereign credit rating on the African continent include studies that sought to find the extent of the relationship between sovereign credit rating and cash flows. One such is by Takawira and Motseta (2021a, 2021b) who looked at into the South African context and analysed the effects of sovereign credit rating on financial development.

As indicated by Simplice (2012), the impact of trade openness differs in African countries based on their income levels; it has positive effects in higher-income countries and negative effects in lower-income ones. In addition, Arezki and Gylfason's (2011) analysis of a dataset covering 158 countries from 1970 to 2007 indicates that trade openness has a positive and statistically significant impact on non-resource GDP growth. However, Shah and Afridi (2015) carried out a study on the significance of good governance for FDI inflow in SAARC countries for the period 2006-2014 using the Random Effect Panel estimation technique. Results show that openness and human capital of the host country are essential but insignificant on FDI inflows.

Mutize and McBride (2020) conducted a comparative analysis to examine the impact of economic growth on sovereign credit ratings in 30 countries across Africa, Europe, Asia, and Latin America from 2010 to 2018. Using panel estimation techniques, the study found that the economic coefficients for African countries were notably smaller compared to other developing countries. The study's findings suggest that an increase in economic growth in Africa does not significantly elevate the likelihood of an upgrade in sovereign credit ratings.

3.5 Assessment of Literature

Theoretical literature has shown that a bad sovereign credit rating impedes a country's ability to access international funding. Literature further reports that a change in foreign direct investment that is influenced by credit rating would result in a shift in the growth of the economy. The theories discussed above provide a better understanding of the impact that sovereign credit rating has on economic growth. Specifically, the studies that show this relationship in Africa. However, there has not been much that has been written on this nexus in sub-Saharan Africa. Most of the studies that give a clear reflection of these variables prove the determinants of sovereign credit rating. The theories are broken into two sets of theories,

namely growth theories and investment theories. This helps extensively show the relationship between sovereign credit rating and economic growth. The focus is on the influence that sovereign credit rating has on the strength of investment as well as the position that the strength of investment carries for the growth of the economy.

Growth theories give a background of an economy's growth and the elements that are needed to play an integral part of that growth. These economic growth theories include Keynes' economic growth theory, the Harrod Domer model, Solow's swan theory, and the new growth theory. These theories are very interrelated, and they focus on what elements propel economic growth in a country or firm. These growth theories give a clear description of what an economy requires to stay afloat, listing elements such as spending and investment. These elements are described by literature to hold the economy together and assist its growth. From these theories, we find a relationship between sovereign credit rating and economic growth. What is prevalent among these theories is that economic growth is essential and that, as an influence, investment is essential for the advancement of an economy.

In addition, there are investment theories that give a description of how an impact in investment will affect the growth of an economy. This speaks directly to the heart of this paper in that sovereign credit rating is, in essence, what investors assess when looking at investing into a country. These theories include Tobin's Q, supply leading, and demand leading hypothesis, the feedback hypothesis, the accelerator theory, and the international trade and investment theory. What these theories agree on is that indeed, investment plays an integral role in the growth and advancement of an economy. These theories suggest that when credit rating and credit outlook are positive and AAA respectively, then the likelihood that investors will invest is high.

The empirical literature gives little evidence of the existence in the SSA region of a nexus between the nexus between credit rating and economic growth. It is however important to consider that the sub-Saharan region was only rated by these credit rating agencies until the early 2000s. There is limited literature on this topic especially studies that focus on Africa. Most studies that identified the link between economic growth and sovereign credit rating, investigated this by analysing the determinants of sovereign credit rating.

3.6 Conclusion

The chapter focused on reviewing the available theoretical and empirical studies which have examined the link between sovereign credit rating and economic growth. From the review it is evident that developing a strong investment growth pattern will prove to be beneficial for the

suitability of a country's economy. However, there are many factors to consider such as macroeconomic stability, and demographic factors and the consideration that the region itself has not been rated by rating agencies for as long as other regions in the globe have. In addition, these factors determine the investment rate and hence the growth of the region's economy. It was also shown that there are five countries in the region whose economies perform far better than the rest. The top five are assisted by what the growth theories cover and explain on the performance of economies. The review further brought to light that a positive rating may result in an increase in FDI, which propels the economy to grow. The better the credit rating the better the likelihood of investors seeing how lucrative it is to invest in that country.

CHAPTER 4

METHODOLOGY

4.1 Introduction

The literature review in the previous chapter and the analysis of the relationship between credit rating and economic growth in Chapter 2 hashed some light on the nature of the nexus of credit rating and economic growth. This chapter sets out the methodology used in this study. This chapter is made up of six sections. First off, Section 4.2 presents the model specification, while Section 4.3 presents the definition and expected a priori, and Section 4.4 shows descriptive statistics. Furthermore, Section 4.5 shows the correlation matrix, whilst Section 4.6 provides a review on the estimation techniques for the study, and Section 4.7 concludes the chapter.

4.2 Model specification

The study was conceptualised from the Keynesian theory of investment. With the classical theory of Keynes, we can deduce that a fluctuation in investment can result in a shift in output. Therefore, a change in forging direct investment that is predisposed by credit rating would result in economic growth. In examining the impact of sovereign credit rating on economic growth, the study adopts and makes modifications to the study by Chen *et al.* (2016). In their analysis, Chen *et al.* (2016) employed the dynamic panel data approach. Their approach assists in mitigating the bias caused by the omitted variables and the discrepancies caused by endogeneity. The model is as follows:

$$GDP_{it} = \beta_0 + \beta_1 SCR_{it} + \beta_2 LIR_{it} + \beta_3 GFCF_{it} + \beta_4 GVE_{it} + \varepsilon_{it} \dots 4.1$$

The equation is written in log form as shown below:

$$LGDP_{it} = \beta_0 + \beta_1 SCR_{it} + \beta_2 LIR_{it} + \beta_3 LGFCF_{it} + \beta_4 LGVE_{it} + \varepsilon_{it} \dots 4.2$$

Where GDP is Gross Domestic Product, SCR is a sovereign credit rating, LIR is lending interest rates, GFCF is Gross Fixed Capital Formation, and GVE is Government Expenditure. β_0 is the constant, and β_1 to β_4 are coefficients of explanatory variables.

4.3 Definition of variables and expected a-priori

Growth is measured in terms of GDP. Sovereign credit ratings are measured largely by the indicators that quantify this sector, and financial intermediaries are measured mainly by how they make their profits, which are per capita income and bank credit.

GDP: this is the total value of goods and services that are produced within the borders of a country for a particular period, usually a year. Thus, in the view of Van Wyk, Botha, & Goodspeed (2018), it is thus the proxy for the total economic activity in a country in a year and because the total production in an economy is, in an accounting sense, equally identical to total income and total expenditure, GDP can be estimated from the production, income, and expenditure sides. Thus, for the purposes of this study, GDP is measured in USD.

SCR: Sovereign credit rating is an independent assessment of a country's credit worthiness. In the view of Vir Bhatia (2002), the essence of SCR is to give investors an idea of the level of risk associated with investing in the debt of a particular country. The credit rating of a country encapsulates mainly two factors, namely the political and the economic environment. According to Vir Bhatia (2002), countries need to further encourage or attract foreign direct investment to issue bonds in external debt markets when they need to foster a higher credit rating. Hence, a positive relationship is expected between sovereign credit rating and economic growth.

LGFCF: The rate of gross fixed capital formation of a country in each period may be defined as the ratio of the relevant gross fixed capital formation to the GDP in that time frame (Kong, Nketia, Antwi, & Musah, 2020). It is further calculated by the sum of a producer's total. It is measured by the total value of a producer's acquisitions, minus the value of fixed assets to be disposed of in that accounting period and adding specific additions to the values of non-produced assets. Gross fixed capital formation denotes net investment and constitutes a crucial component of the Expenditure method utilised for GDP calculation. As informed by Gibescu (2010), a positive relationship is expected between gross fixed capital formation and economic growth.

LIR: In the work by Khatkhate (1988), interest rate is defined as the proportional amount due per period in relation to the amount lent, deposited, or borrowed. The total interest on a principal sum depends on the interest rate, the compounding frequency, and the duration of the borrowing, deposit, or lending. This interest rate is exclusive of inflation as compounded over the various years. Thus, as explained by Damilola (2021), it can be expected that a negative relationship exists between interest rates and economic growth.

LGVE: Government expenditures are expenses that are incurred by the government which include, but are not limited to, all government consumption and investment. This definition, as reflected by Devarajan, Swaroop, and Zou (1996), however excludes transfer payments.

Government expenditure can also be used as a ratio of GDP. This is how GDP will be considered as a means of a control variable to determine the net effects of financial structure on economic growth. Therefore, a positive relationship is expected between government spending and economic growth.

4.3 Data Source

The data utilised in the study were obtained from the World Bank and International Monetary Fund websites. It covers sub-Saharan African countries for the period 2002 to 2022. The data was considered from credit rating agencies, specifically Moody's, Standard & Poor, and Fitch. This period was sourced particularly because before 2002, the three (3) credit rating agencies that are considered in this study had not yet had their radar on sub-Saharan African countries.

The approach undertaken in this study is a quantitative approach, which was used to uncover the broad analysis of the model that has been specified. Paramount is the analysis of the impact that sovereign credit rating has on the growth of the economy. In the sub-Saharan African region, stability and growth of economies is very limited and this affects how the region grows and what the view of the investor towards the region is. Secondary data are used for this quantitative approach as there is a valiant need to discover what the relationship between credit rating and economic growth has been over the years 2002 to 2022, when most of the region's countries were given a rating by the three (3) top credit rating agencies. All the tests generated in this study are run using Eviews 13.

4.4 Descriptive Statistics

Descriptive statistics are defined by Gill and Jonker (2010) as a brief analysis of the character of a set of data or set of variables in a data set. Descriptive statistics give character to a data set by summarising the descriptive coefficients of a particular set of data. Gill and Jonker further explain descriptive statistics to be measured by three elements, namely dispersion, normality, and central tendencies. This paper explores all the data measures on the given data set. Central tendency is measured by statistical mean, median, and mode, while dispersion is measured by range, standard deviation, and set variance, and normality is measured by skewness and kurtosis. These are detailed in the table below.

Table 4.1: Measures of dispersion

Measure	Definition
Range	The difference between what is the lowest value and largest value
Standard Deviation	Value that is used to measure the amount of variation of all data values
Variation	A measure of the differences between variables

Source: Gill and Jonker (2010)

Table 4.2: Measures of normality

Measure	Definition
Kurtosis	Measures the peak and trough of a statistical distribution
Skewness	Measures how asymmetric the data set is

Source: Gill and Jonker (2010)

Table 4.3: Measures of Central Dispersion

Measure	Definition
Mean	The average of all the values in the data set
Median	In a set of data that has been arranged accordingly, it is the number in the middle of the data set. Should this number be a pair of numbers, both are to be considered and averaged to get the true median.
Mode	The number that occurs the most in each data set

Source: Gill and Jonker (2010)

4.5 Correlation Matrix

Correlation is a tool to gain a better understanding of the relationship between variables. Correlation is defined by Senthilnathan (2019) as a statistical technique used to determine the degree to which variables are related, and the value of correlation always lies between +1 and -1. In addition, according to Senthilnathan (2019), there are two types of the correlation - negative and positive correlation. Senthilnathan (2019) further explains that positive correlation occurs when two variables are in a directly proportional relationship with each other. This means when one variable increases, the other variable also increases. The negative relationship is also referred to by Senthilnathan (2019) as an inverse relationship between variables. Thus, if one variable increases, the other variable will decrease.

According to Vinod (2014), correlation matrix is defined as multivariate descriptive statistics between two or more variables which is free from units of measurement. Thus, correlation matrix is an array of correlation coefficients on a table for different variables. The composition of a matrix is made up of correlation coefficients of each pair of variables in a particular data set. The purpose of correlation analysis is to determine whether the independent variables have

any linear association. It becomes challenging to distinguish the distinct effects of each variable on the dependent variable when two variables are collinear, which is the rationale for the presumption of no multicollinearity. Checking for multicollinearity is essential to prevent misleading findings caused by multicollinearity of variables

4.6 Estimation techniques

According to Biorn (2017), panel data is a two-dimensional concept that includes the analysis of cross-sectional and time-series data methods. It is used in this study as this study includes variables that are observed repeatedly over different periods. Biorn (2017) further explains that panel data has two types of observations, namely balanced and unbalanced panel. Balanced panel is a set that considers a full set of data for every variable and every individual. Unbalanced is a set that is missing data for the time periods of some of the cross-sectional units. The formal unit root tests employed are Im-Pesaran-Shin test and Fisher ADF and Philips-Perron (PP) tests. Furthermore, the Hausman test is used to choose the appropriate model between random and fixed effect model.

4.6.1 Im-Pesaran-Shin test

The Im-Pesaran-Shin test is a testing method commonly used for panel unit root testing. According to Barbieri (2005), there are two generational tests, and the Im-Pesaran-Shin test is just one of them. The main assumption of this test is that there is cross-sectional independence across units. In the view of Barbieri (2005), these second-generation tests tend to reject the cross-sectional independence hypothesis. Barbieri further expresses that the main aim of these tests is to overcome the shortcomings of cross-sectional dependence that exists in the first generation of tests. This means that these tests assume that there is a unit root in the data. In addition, according to Baum and Bornhorst (2001), this test estimates the t-test for unit roots in heterogenous panels developed by Im-Pesaran-Shin tests. Baum and Bornhorst further explain that the test allows for individual effects, time trends, and common time effects. In effect, the null hypothesis of the IPS test thus assumes, according to Baum and Bornhorst (2001), that all series are non stationary and that lags of the dependent variable are effected to account for serial correlation in the error term.

4.6.2 ADF and PP tests

According to Sjosten (2022), the ADF test is an improvement of the Dickey-Fuller test (DF) which was contrived by Dickey and Fuller in 1979 and 1981. Sjosten (2022) further suggests that the improved ADF test gives preferable outcomes over the DF test since it includes extra

lagged terms of the dependent variable for the request to wipe out autocorrelation. In addition, Sjosten (2022) submits that the test continues by testing the importance of the coefficient of Y_{t-1} . Thus, in essence, the augmenting is done to evacuate conceivable autocorrelation among error terms. If the calculated qualities are more than the critical values, we reject the null and express that the variable is stationary. Sjosten (2022) further suggests, likewise, that the ADF test may likewise incorrectly demonstrate that the arrangement contains a unit root when there is a basic break in the series. Moreover, it is generally accepted that the ADF test does not think about the instances of heteroscedasticity and non-normality much of the time uncovered in raw data of economic time series variables.

The Philips-Perron (PP) test was conjointly administered to examine whether the results are according to the ADF test as Sjosten (2022) suggests. The model permits fairly gentle assumptions regarding the distribution of errors. Furthermore, Sjosten (2022) adds that one of the benefits of the PP test is that it rectifies for higher-order serial correlation by including lagged differenced terms. This gets obvious for our situation given that the time series extend over a more drawn-out period.

4.6.3 Pooled OLS, fixed and random effects

Biorn (2017) argues that there exist various methods for panel data estimation, such as Pooled OLS, fixed effects, and random effects. Pooled OLS, also referred to as the common constant method, assumes no differences between the estimated cross sections and is suitable under the premise of homogeneity in the data. The fixed effects method treats the constant as a group, allowing for a distinct constant for each group or section. According to Biorn, the methodology presumes that the slope and intercept coefficients of the regression fluctuate across countries or firms over time, and that the error terms exhibit correlation. In addition, Hsiao (2022) explains that the random effect method is an alternative method of estimating a model as the random effect model is built under the assumption that the fixed effects are uncorrelated with the explanatory variables. In essence, Biorn states that the difference between what is fixed and random effects is that fixed effects assume that each country has its own unique intercept, whereas the random effects assumes that each country differs in the error term.

4.6.3.1 Pooled Ordinary Least squares (OLS) model

Raffalovich and Chung (2014) suggest that Pooled OLS model occurs when there are time series and cross sections but the observations in each cross section may not necessarily refer to the same unit. In panel data, this model can be used to derive unbiased and consistent estimates

of parameters even when time constant attributes are present. Furthermore, Raffalovich and Chung (2014) give insight of the essence of pooled OLS which states that pooled OLS is most appropriate when the observed units in more than one time period, but individual units are not repeated across periods. Moreover, Raffalovich and Chung add that, under this sampling scheme, the observations from different time periods are pooled together and OLS is conducted on the sample that is pooled. It is, however, different from a pooled sample when the observed units are repeated.

There is a restriction to the pooled OLS; the sample should be observed and be specific. Should this model not be utilised for observed data, this could lead to omitted variable bias and thus produce biased results. This study used this model to and alleviate the bias of the observations. According to Raffalovich and Chung (2014) this model is effective in treating panel data as cross sectional, as it successfully ignores all entity specific effects and is hence the simplest model to estimate and intercept.

4.6.3.2 Fixed effects method

Fixed effects basically consider the model and endeavours to account for most of the variables that should be considered in this model but are not. This method considers and treats the constant as a group to account for variables that are not considered. This effect considers certain variables that should be controlled for, yet one cannot measure and control for it even though you have data on a braider scale of this particular variable (Sheytanova, 2014). The model in this study considered countries in the sub-Saharan African region, allowing estimation of a constant variable for each country. This means that the estimator, which is the Least Squares Dummy Variable, accounts for each country a dummy variable in the model.

In this study, fixed effects consider individual countries. Thus, the model specified in effect considers all that the variables that are not necessarily specified but are unique to individual countries in the region and that do not change for each individual country over time.

4.6.3.3 Random effects method

At the core, the difference between random and fixed effects is in the analysis of the between variation and the within variation. According to Sheytanova (2014), random effects try and elevate the between variation effect. This way, it improves the regression results on the specified model. Random effects, however, offer another method of an estimating model. This model insinuates that each intercept for cross sectional unit is derived from a common intercept that is constant over a period for all cross-sectional units. Sheytanova (2014) suggests that the

random effects are tested through 3 main assumptions, the Hausman test, likelihood ratio-tests, and the Wald Test.

With the Hausman test, the idea is to run different estimators with the same data so we could have a null and an alternative assumption:

- Null: to accept the random effects assumption
- Alternative: to reject that random effects assumption

and then compare if the estimates are similar enough that we may conclude that the estimator is more efficient, which could drive the assumption that the random test is more consistent.

Royle and Dorazio (2009) further suggest that in the likelihood ratio test, we estimate a model and run two test estimators. The first model includes the cluster means and the second model is without the cluster means. In doing this, the aim is to decipher whether the cluster means in the data set really explains, to any margin, the data that it represents. If the test is not significant, it would be safe to conclude that the cluster means explain the data in the model, which would imply that there is no contextual effect in the model.

Sheytanova (2014) emphasises the third such test to be the Wald test or F test. With this estimator, one is expected to run a single model with their predictors and cluster means and the test simultaneously if the coefficients of those cluster means are equal to zero.

Thus, the random effect is important in that, should the estimate fail, it insinuates that estimates are inconsistent or biased. It can be understood in three different ways. The first is that the unobserved cluster effect is uncorrelated with predictors; the second can be understood to say the within and between effects are equal, and the last is to say that there is no contextual effect in the estimator.

4.6.3.4 Hausman test

This test is one of the most commonly used tests to distinguish the specified model effect. According to Sheytanova (2014), the logic behind the Hausman test is the comparison between fixed effects and the random effects and comparing those differences. The fixed effect estimator is assumed to be consistent while the random effects estimator is assumed to be efficient as it considers the variation of the between and the within effects. As depicted by Sheytanova (2014), the above can be explained by the following equation:

$$(x)^n = (b_{fe} - b_{re})^2 / (Var(b_{fe}) - Var(b_{re})) \dots \dots \dots 4.3$$

Where: fe is the fixed effects;

Re is the random effects, and

var is the variation/standard deviation

As Sheytanova (2014) suggests, the estimator guarantees that the difference between the fixed effects and the random effects will eventually converge, given that the sample size is large enough. However, in true form, Sheytanova (2014) notes, there will be an undeniable difference between these 2 effects, and so the formula takes that difference into account. That difference is then compared to the differences between the standard errors of these two specific estimates. The logic here is that this difference quantifies exactly how much different the estimates are, where the random effects are more efficient than the fixed effects. Hence, the denominator quantifies the efficiency difference. Moreover, Sheytanova (2014) says that the Hausman test in essence expresses that the differences between fixed effects and random effects should be justified by the differences between the standard error of these two differences. If the latter is not true, then it should be concluded either that the random effects are not efficient, or that the fixed effects are not consistent.

4.6 Cross sectional dependence

Cross sectional data are data that measure the characteristics of a data set, measuring at a point in time. According to Henningsen and Henningsen (2019) cross sectional data is defined by looking at multiple subjects over a specific period of time. This means, with cross sectional data, the expectation is to emphasise the variance between two variables in a particular time.

4.7 Conclusion

This chapter discussed the methodology. The theoretical view underpinning the study and the model specification were shown. Variables were also defined and their a priori expectations were indicated. Since the study uses unbalanced panel, the Im-Pesaran-Shin test, and Fisher ADF and PP were also discussed. These are employed for unit root testing. The panel data technique, thus Pooled OLS, fixed effect, and random effect models were also discussed as they are best suited for this study. In addition, the Hausman test is used to choose the appropriate model between fixed effect and random effect model. Lastly, cross sectional

dependence was discussed and is used to check whether the countries are highly interconnected or to check if units in the same cross section are correlated.

CHAPTER 5

ESTIMATION AND INTERPREATION OF RESULTS

5.1 Introduction

This chapter focuses on the interpretation of the results that emanated from the data as they were run and generated on EViews. The structure of Chapter 5 follows this chronological order: introduction, descriptive statistics, correlation matrix, unit root test, Pooled OLS, random effect and fixed effect models, Hausman test, detailed explanation of fixed effect model, cross sectional dependence, and conclusion.

5.2 Descriptive Statistics

Table 5.1 below illustrates the descriptive statistics for the set of variables in the data set. Starting with LGDP (economic growth), the mean value, which is also the average, is 28.44. This means that for the given period, the average level of economic growth in South Africa is 28.44. In addition, the maximum value indicates that during the given period, economic growth reached its maximum at 32.44. The lowest number, which is minimum economic growth recorded in South Africa, is 23.17. The middle value, also known as the median, is 29.15. The standard deviation is 2.62, which means that there is moderate variability in economic growth. When it comes to the skewness, economic growth is negatively skewed, and this is shown by the value which is negative, namely 0.60. This evaluation depicts that the right-handed tail is smaller in size than the left-handed tail. Furthermore, the kurtosis value is 2.27, which implies that the distribution is not extremely peaked. The Jarque-Bera probability is 0.000, which is less than the 5% significance level; hence, the distribution is not normal. Therefore, so we clearly reject the null hypothesis of normal distribution.

Furthermore, when it comes to independent variables, LGFCF (gross fixed capital formation), LGVE (government expenditure) has negative skewness values, thus a long-left tail. On the contrary, SCR (sovereign credit rating) and LIR (lending interest rate) have positive skewness. This skewness gives an implication of a long right tail variable. In terms of kurtosis, a value of 3 indicates that the distribution is normal, thus mesokurtic; a value greater than 3 means leptokurtic and a value less than 3 means platykurtic. LGDP, LGFCF, and LGVE have kurtosis values less than 3, which imply that they are platykurtic, whilst SCR and LIR have kurtosis values greater than 3, meaning they are leptokurtic. In terms of the Jarque-Bera, all independent variables are not normally distributed because their probability values are less than the 5%

significant level. On that note, we clearly reject the null hypothesis of normal distribution on the independent variables (SCR, LGFCF, LGVE, LIR).

Table 5.1: Descriptive Statistics

	LGDP	SCR	LGFCF	LGVE	LIR
Mean	28.43817	12.14986	26.88606	26.51735	14.61946
Median	29.15362	11.00000	27.40835	27.19929	12.24125
Maximum	32.43922	20.00000	31.50416	30.02459	65.41750
Minimum	23.16987	0.000000	21.64035	21.97415	4.736667
Std. Dev.	2.617429	2.888056	2.616833	2.229077	11.07527
Skewness	-0.604061	0.944660	-0.481599	-0.624789	2.329145
Kurtosis	2.267988	5.493725	2.172265	2.282202	9.155012
Jarque-Bera	30.51296	149.6778	24.66384	31.75591	911.1361
Probability	0.000000	0.000000	0.000004	0.000000	0.000000
Sum	10436.81	4459.000	9867.183	9731.868	5365.342
Sum Sq. Dev.	2507.443	3052.757	2506.300	1818.575	44894.19
Observations	367	367	367	367	367

Source: Author's own

5.3 Correlation matrix

The purpose of correlation analysis is to determine whether the independent variables have any linear association. It becomes challenging to distinguish the distinct effects of each variable on the dependent variable when two variables are collinear, which is the rationale for the presumption of no multicollinearity. Checking for multicollinearity is essential to prevent misleading findings caused by multicollinearity of variables.

Table 5.2: Correlation Matrix

Correlation	LGDP	SCR	LGFCF	LGVE	LIR
LGDP	1.000000				
SCR	-0.229686	1.000000			
LGFCF	0.992108	-0.249337	1.000000		
LGVE	0.990016	-0.214316	0.984106	1.000000	
LIR	0.231976	-0.188919	0.256723	0.217324	1.000000

Source: Author's own

Mlambo, Maredza, and Sibanda (2013) argue that the rule of thumb is that if the correlation between the two variables is greater than 80%, multicollinearity may be severe and pose a serious problem. All things being equal, an independent variable that is very highly correlated with one or more other independent variables will have a relatively large standard error. The results of the correlation matrix in Table 5.2 indicate that the correlation between independent variables is only highly correlated between LGVE and LGFCF, which is 0.98. However, other independent variables have weak correlations with each other; thus, the correlations between independent variables are below 80% or are 0.8.

5.4 Panel unit root test

Mufika (2022) argues that one of the fundamental assumptions of a classical linear regression model is that variables should have constant mean, variance, and the covariance between the values of two time periods should be zero. Violation of this assumption leads to spurious regression. For this study, Im-Pesaran-Shin, Fisher ADF, and Fisher PP tests were used since they best fit unbalanced panel data.

Table 5.3: Level series panel unit root test

	Im Pesaran and Shin		Fisher ADF		Fisher PP	
Variable	Intercept	Intercept and Trend	Intercept	Intercept and Trend	Intercept	Intercept and Trend
LGDP	0.74993	0.92710	75.7153**	66.5631	110.606***	57.1631
SCR	2.23569	-0.52506	44.1031	59.8405*	43.9374	71.2353***
LGFCF	1.05579	0.53363	57.5533	52.3453	146.253***	87.3304***
LGVE	2.00101	-0.01284	66.6819	71.0579*	89.5201***	67.5548
LIR	-2.61352***	-1.87548**	79.5849***	65.2075**	172.190***	173.096***

Note: ***denotes significance at 1%; ** significance at 5% and * significance at 10%

Table 5.3 shows that LGDP is not stationary in Im-Pesaran-Shin test at both intercept and intercept and trend. However, LGDP is stationary in Fisher ADF and PP tests at intercept but this is not the case at intercept and trend in both Fisher ADF and PP tests. In addition, SCR, LGFCF, LGVE are not stationary in Im-Pesaran-Shin test at both intercept and intercept and trend. SCR and LGVE are not stationary at Fisher ADF but are stationary at intercept and trend

whilst LGFCF is not stationary in Fisher ADF both at intercept and intercept and trend. Furthermore, SCR is only stationary at intercept and trend in Fisher PP test but not stationary at intercept, whereas LGVE is only stationary at intercept in Fisher PP test but not stationary at intercept and trend. LGFCF is stationary in Fisher PP test at both intercept and trend and intercept. Lastly, LIR is stationary in both Im-Pesaran-Shin and Fisher ADF and PP tests.

Table 5.4: First difference panel unit root test

	Im Pesaran and Shin		Fisher ADF		Fisher PP	
Variable	Intercept	Intercept and Trend	Intercept	Intercept and Trend	Intercept	Intercept and Trend
LGDP	-6.81453***	-6.82718***	152.247***	146.342***	330.403***	296.078***
SCR	-10.9996***	-9.66614***	206.708***	175.387***	673.534***	349.319***
LGFCF	-8.54520***	-7.82421***	181.602***	173.208***	360.915***	394.990***
LGVE	-7.37947***	-5.46281***	167.356***	136.867***	455.988***	299.012***
LIR	-10.8991***	-8.58040***	194.490***	150.321***	291.366***	261.900***

Note: ***denotes significance at 1%; ** significance at 5% and * significance at 10%

First differencing was carried out as shown by Table 5.4 above to have better outcome. All variables (LGDP, SCR, LGFCF, LGVE, LIR) are stationary at first difference at 1% significance level.

5.5 Presentation of results

Table 5.5: Pooled Ordinary Least Squares (OLS) Model

Dependent Variable: LGDP				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
SCR	0.003500	0.004954	0.706449	0.4804
LGFCF	0.580876	0.030689	18.92809	0.0000
LGVE	0.494400	0.035448	13.94712	0.0000
LIR	-0.001864	0.001301	-1.432815	0.1528
C	-0.304733	0.208680	-1.460286	0.1451

R-squared	0.990285	
Adjusted R-squared	0.990178	

Source: Author's own

Table 5.5 indicates that SCR (sovereign credit rating) has a positive relationship with LGDP (economic growth). This means that sovereign credit rating positively impacts economic growth. However, this relationship is statistically insignificant. Furthermore, this result is consistent with the study by Chen, Chen, Chang, and Yang (2016), who found positive relationship between sovereign credit rating and economic growth. LGFCF (gross fixed capital formation) and LGVE (government expenditure) have positive relationships with economic growth, and the relationships are statistically significant at 1%. This entails that gross fixed capital formation and government expenditure positively impact economic growth. These findings align with Pasaran and Garidzirai (2020) and Atteh, Akanyonge, and Asapeo (2023). However, LIR (lending rates) has negative relationship with economic growth, and the result is not statistically significant. This means that lending interest rate has negative impact on economic growth. This is consistent with the findings of Mutinda (2014). In addition, the R-squared is equal to 0.990, while the adjusted R-squared is equal to 0.990, indicating that the model is a good fit and performs well.

Table 5.6: Random Effects Model

Dependent Variable: LGDP				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
SCR	-0.000494	0.004166	-0.118539	0.9057
LGFCF	0.421259	0.013873	30.36438	0.0000
LGVE	0.346694	0.017312	20.02594	0.0000
LIR	0.002528	0.000931	2.716581	0.0069
C	7.932592	0.326171	24.32034	0.0000
R-squared	0.876432			
Adjusted R-squared	0.875066			

Source: Author's own

As shown by Table 5.6 above, the coefficient of SCR indicates a negative impact of sovereign credit rating on economic growth, and the relationship is not significant. This outcome does not agree with the findings of Chen et al. (2016) and Gumata and Ndou (2019). However, the

coefficients of LGFCF and LGVE show a positive impact of gross fixed capital formation and government expenditure on economic growth, concurring with the findings of the study by Egbetunde and Fadeyibi (2015) and Rahman (2023). Moreover, these relationships are statistically significant at 1%. Furthermore, the coefficient of LIR indicates a positive impact of lending rate on economic growth. This result is statistically significant at 1%. However, this is not line with the findings of Shaukat, Zhu, and Khan (2019). In addition, the R-squared is equal to 0.876, while the adjusted R-squared is equal to 0.875, indicating that the model is a good fit and strong.

Table 5.7: Fixed Effects Model

Dependent Variable: LGDP				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
SCR	-0.002823	0.004283	-0.659129	0.5103
LGFCF	0.370321	0.014177	26.12045	0.0000
LGVE	0.251379	0.018108	13.88254	0.0000
LIR	4.13E-05	0.000959	0.043027	0.9657
C	11.84949	0.384461	30.82104	0.0000
R-squared	0.998963			
Adjusted R-squared	0.998890			

Source: Author's own

The coefficient of SCR shows that sovereign credit rating negatively impacts economic growth, and the result is statistically insignificant. However, this result contradicts with the findings of Chen et al. (2016). The coefficients of LGFCF and LGVE, though, show a positive impact of gross fixed capital formation and government expenditure on economic growth. These relationships are statistically significant at 1%. This is in line with Egbetunde and Fadeyibi (2015) and Rahman (2023). Moreover, as indicated by Table 5.7, the coefficient of LIR indicates a positive impact of lending rate on economic growth. This result is not statistically significant. This contradicts the findings of the study by Shaukat et al. (2019). Furthermore, the R-squared is equal to 0.998, while the adjusted R-squared is equal to 0.998, indicating that the model is a good fit and performs well.

5.6 The Hausman test

The Hausman test is a measuring tool that aids in finding which, between fixed and random effects, the most appropriate estimation method. The null hypothesis of the Hausman test is that random effects model is more appropriate than the fixed effects model. If the probability

value is greater than 0.05, the null hypothesis is accepted, but if the probability value is less than 0.05, the null hypothesis is rejected. For this study, the Hausman test has a probability value of 0.0000, which is significant at 1%. This means that we reject the null hypothesis that the random effects model is suitable in favour of the alternative hypothesis that the fixed effects model is appropriate. Furthermore, the model has a Chi-squared test statistic of 366.383501, with a probability which is significant at 1%. These findings show that the fixed effects model is appropriate. The results of the fixed effects model are interpreted below.

Table 5.8: Hausman Test

Correlated Random Effects - Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	366.383501	4	0.0000

Source: Author's own

5.7 Detailed interpretation of fixed effects model results (Table 5.7)

Table 5.7 shows the results of the fixed effect model. There is a negative relationship between sovereign credit rating and economic growth. This is because a one unit increase in sovereign credit rating leads to 0.002823 decrease in economic growth. Hence, sovereign credit rating negatively impacts economic growth. This relationship is statistically insignificant as shown by the probability value 0.6591, which is above all significant levels (10%; 5%; 1%). This result contradicts the findings of Chen et al. (2016) who argue that changes in a nation's rating will impact output growth via two mechanisms, namely interest rates and capital flows. In other words, when ratings are upgraded, it leads to lower interest rates and more capital inflows, which in turn boost economic growth. On the contrary, the current study shows that when ratings are downgraded, higher interest rates and the outflow of capital follow, which subsequently leads to a decline in economic performance.

As indicated by Table 5.7, gross fixed capital formation (investment) positively impacts economic growth; hence, a one unit increase in gross fixed capital formation causes a 0.370321 increase in economic growth. Essentially, what can be deduced is the apparent relationship that exists between gross fixed capital formation and economic growth. In addition, this relationship is statistically significant at 1% as indicated by the probability value 0.0000. This is consistent with *a priori* expectations as well as the findings of Pasara and Garidzirai (2020) who assert that gross fixed capital formation has a positive impact on economic growth. The amount of capital that is accessible to an economy is a significant factor in determining the level of

productivity that it achieves, and investment contributes to the stock of capital. In this way, investment promotes the expansion of the economy as well as economic growth.

A one unit increase in government expenditure yields a 0.251379 increase in economic growth. This entails that government expenditure impacts economic growth positively. This relationship is statistically significant at 1% as indicated by the probability value which is 0.0000. This positive relationship agrees with *a priori* expectations as well as literature as indicated by the studies of Atteh et al. (2023) and Rahman (2023) who ascertained that government expenditure has a strong positive impact on economic growth. Investing in social infrastructure, such as education and healthcare, results in higher worker productivity, which in turn leads to increased output.

Lastly, the relationship between lending interest rate and economic growth is positive. This is because a one unit increase in lending rate leads to 4.13 decrease in economic growth. This entails that lending rate impacts economic growth positively. This relationship is not statistically significant as indicated by the probability value 0.9657. This negative relationship does not concur with *a priori* expectations and literature as shown by Mutinda (2014), who concludes that an inverse relationship exists between lending rate and economic growth. When lending rate increases, it becomes expensive for firms to borrow from banks, and this might discourage growth of firms and investments in an economy, hence affecting aggregate output.

5.8 Residual diagnostic test

Table 5.9: Residual diagnostic test

Null hypothesis: No cross-section dependence (correlation) in residuals			
Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	754.9185	210	0.0000
Pesaran scaled LM	26.58930		0.0000
Pesaran CD	1.417958		0.1562

Source: Author's own

One of the most important diagnostic tests is cross-sectional dependence. Qin, Xu, Luo, and Skare (2023) assert that a shock that happens in one of the nations included in the panel data analysis may also influence other nations, and the presence of such a situation demonstrates cross-sectional dependence. The existence of cross-section dependence between the series will result in biased and incorrect empirical findings. As shown by Table 5.8, the probability values of Breusch and Pagan's (1980) LM test and Pesaran's (2004) scaled LM test are significant at

1%. However, the probability of Pesaran's (2004) CD test is 0.1562, which is insignificant. Considering that the time period for this study is 20 years ($T=20$), which is less than the number of cross sections (countries) ($N=28$), the study concludes that there is no cross-sectional dependence on the residuals by applying Pesaran's (2004) CD test since it is more reliable when $T < N$. To this end, the study fails to reject the null hypothesis of no cross-section dependence in the residuals.

5.9 Conclusion

The chapter provided empirical results of the study done using the methodology discussed in Chapter 4. The analysis started with descriptive statistics which indicated the maximum and minimum levels as well as the skewness and kurtosis values of variables involved. In addition, correlation matrix was presented and showed that most relationships between independent variables are not highly correlated. Since unbalanced panel data were utilised, the study employed the Im, Pesaran and ADF Fisher Chi-square and the PP - Fisher Chi-square. These unit root tests were also performed to determine the time-series characteristics of the data used and all the variables are stationary at first difference. Pooled OLS and random effects and fixed effects models were then assessed through the Hausman test. The findings of the Hausman test showed that the fixed effects model is appropriate, and the results of the fixed effects model were analysed. Thus, sovereign credit rating has negative impact on economic growth, and the impact is not significant. However, gross fixed capital formation and government expenditure positively impact economic growth, and the relationships are statistically significant. Even though lending interest rates positively impact economic growth, the impact is not significant. In addition, the study concludes that there is no cross-sectional dependence on the residuals by applying Pesaran's (2004) CD test since it is more reliable when $T < N$. To this end, the study fails to reject the null hypothesis of no cross-section dependence in the residuals.

CHAPTER 6

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary and conclusion

The aim of the study was to examine the impact of sovereign credit rating on economic growth in selected sub-Saharan countries. Chapter 1 was the introduction and background of the study. In the process of fulfilling the aim of the study, three specific objectives were pursued, and these were to provide an overview of sovereign credit and economic growth; to econometrically investigate the impact of sovereign credit rating on economic growth, and to make policy recommendations based on the results.

Chapter 2 indicated the trends that occurred between 2002 and 2022 for the study's variables, namely economic growth and sovereign credit rating. These trends indicated the relations that these two variables have. Over the studied period, it is shown in the chapter that economic growth in the region has been slow and rigid for most countries. The chapter also depicted that the sovereign credit rating in the region or the outlook on the region has been dreary. The region has about five countries that are outliers in the region as they are mostly industrial and the outlook in these countries is better. Overall, however, the chapter draws a dull picture of the general discourse of the nexus between sovereign credit rating and economic growth in the region.

In Chapter 3, literature showed that a bad sovereign credit rating impedes a country's ability to access international funding. Literature further reports that a change in foreign direct investment that is influenced by credit rating would result in a shift in the growth of the economy. Economic growth theories emphasised that if a country's human capital is employed fully, it creates a feasible or better outlook on the economy because of the valiant production of goods and services. This positive outlook on economic growth in turn encourages FDI as investors will be keen because of the economic outlook. Whilst investment theories emphasised that the existence of a well-developed financial sector improves the risk associated with investment in a country and attracts investors as it eliminates the lemons problem, attracting FDI through technological advancements encourages saving and investment growth overtime. The empirical literature gives little evidence of the existence of this nexus in this region.

Chapter 4 indicated the theoretical view underpinning the study. The model specification was explained and variables were also defined and their a priori expectations were indicated. Since the study utilised unbalanced panel, Im-Pesaran-Shin test and Fisher ADF and PP were also discussed and were employed for unit root testing. The panel data technique thus Pooled OLS, fixed effect and random effect models were also discussed as they are best suited for this study. In addition, the Hausman test was used to choose the appropriate model between fixed effects and random effects model. Lastly, cross sectional dependence was discussed and was also used in Chapter 5 to check whether units in the same cross section were correlated.

Chapter 5 presented the results and the analysis started with descriptive statistics, which indicated the maximum and minimum levels as well as the skewness and kurtosis values of variables involved. In addition, correlation matrix was presented and it showed that most relationships between independent variables are not highly correlated. Since unbalanced panel data were utilised, the study employed the Im, Pesaran and ADF Fisher Chi-square and the PP - Fisher Chi-square. These unit root tests were also performed to determine the time-series characteristics of the data used. All the variables are stationary at first difference. Pooled OLS and random effects and fixed effects models were then assessed through the Hausman test. The findings of the Hausman test showed that the fixed effects model is appropriate. The chapter showed that sovereign credit rating has negative impact on economic growth, and the impact is not significant. However, gross fixed capital formation and government expenditure positively impact economic growth, and the relationships are statistically significant. Even though lending interest rate positively impact economic growth, the impact is not significant. Furthermore, the study concludes that there is no cross-sectional dependence on the residuals by applying Pesaran's (2004) CD test since it is more reliable when $T < N$. To this end, the study fails to reject the null hypothesis of no cross-section dependence in the residuals

6.2 Policy Recommendations

The empirical results suggest that sovereign credit rating negatively impacts economic growth, though the impact is insignificant. The policy recommendation is that the policy makers should improve economic elements such as fiscal discipline and debt management to lessen vulnerability to rating downgrades. However, even though this study found an insignificant relationship between sovereign credit rating and economic growth, strong elements such as improvement of fiscal discipline may improve credit ratings and borrowing costs hence indirectly increasing economic growth.

The results also indicated that gross fixed capital formation has positive impact on economic growth; thus, an increase in investment leads to more output. The policy recommendation is for governments in the sub-Saharan African region should create a conducive environment to attract investors, particularly foreign direct investment. The ability for the region to attract foreign direct investment could influence job creation, which ultimately assists the region in reaching the macro-economic objectives. Attracting investors like Mercedes Benz and China as car manufactures to create car manufacturing plans within the region would create jobs within the region, which helps the economy of the region grow and improve.

Lastly, government expenditure positively impacts economic growth, and the impact is statistically significant. The policy recommendation is that public finance should be considered. This consolidation of public finances may also be accompanied by the consideration of strengthening of public management. Governments in the region are considerably volatile. This is brought on by differing political ideologies. It hence comes imperative that the countries in the region find a political balance to propel the strengthening of public finances and able to consolidate public finances. By strengthening the region's public finance, this propels the region to foster trade with other regions, which ultimately encourages economic growth within the region. The proportional relationship between government expenditure and economic growth means that the consideration of how the region's finances are made and spent means a great deal for the level of economic growth in the region.

6.3 Limitations of the study and areas for further research

The data used in this study span from 2002. This has the potential to limit the results of the study because in comparison to other regions, the period for sub-Saharan African region was slow to kick-start. Other regions in comparison, like Asia, have been considered by the rating agencies for longer periods. Comparatively, therefore, the regressions would give a more accurate result as the span of time being considered is longer.

Another limiting factor to this study is that within the SSA region that is being probed, a percentage of the countries are not being rated yet by the three major credit rating agencies. The fixed effect model implemented over time in this study could have been more accurate had all the variables been present in the cross section.

Another limiting factor is the overall economic outlook of the region. The region is slow developing, with several outlier developing countries. Countries like Nigeria and South Africa are developing rapidly and can keep up with other regions' economic norms and social standards. However, there are countries that still struggle to navigate economic growth and stability. Other countries like Lesotho do not have a stable outlook and have been struggling to maintain the usage of a single currency. These outliers have been pulling the growth and stability of the region from different ends and essentially depict how the countries are unable to advise and grow together for the benefit of the region's entirety. One area for further research could be a study on whether sovereign credit rating impacts the financial and or banking sector. This will help with the understanding of whether the rating granted by these credit rating agencies are all related to the value of the financial sector. Another area of further research could be a probe into what role the sovereign credit rating plays in a particular economy.

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APPENDIX

Descriptive statistics

	LGDP	SCR	LGFCF	LGVE	LIR
Mean	28.43817	12.14986	26.88606	26.51735	14.61946
Median	29.15362	11.00000	27.40835	27.19929	12.24125
Maximum	32.43922	20.00000	31.50416	30.02459	65.41750
Minimum	23.16987	0.000000	21.64035	21.97415	4.736667
Std. Dev.	2.617429	2.888056	2.616833	2.229077	11.07527
Skewness	-0.604061	0.944660	-0.481599	-0.624789	2.329145
Kurtosis	2.267988	5.493725	2.172265	2.282202	9.155012
Jarque-Bera	30.51296	149.6778	24.66384	31.75591	911.1361
Probability	0.000000	0.000000	0.000004	0.000000	0.000000
Sum	10436.81	4459.000	9867.183	9731.868	5365.342
Sum Sq. Dev.	2507.443	3052.757	2506.300	1818.575	44894.19
Observations	367	367	367	367	367

Correlation Matrix

Covariance Analysis: Ordinary

Date: 11/16/24 Time: 11:02

Sample: 2002 2018

Included observations: 367

Balanced sample (listwise missing value deletion)

Correlation	LGDP	SCR	LGFCF	LGVE	LIR
LGDP	1.000000				
SCR	-0.229686	1.000000			
LGFCF	0.992108	-0.249337	1.000000		
LGVE	0.990016	-0.214316	0.984106	1.000000	
LIR	0.231976	-0.188919	0.256723	0.217324	1.000000

Pooled OLS

Dependent Variable: LGDP

Method: Panel Least Squares

Date: 11/16/24 Time: 11:27

Sample: 2002 2022
Periods included: 21
Cross-sections included: 21
Total panel (unbalanced) observations: 367

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SCR	0.003500	0.004954	0.706449	0.4804
LGFCF	0.580876	0.030689	18.92809	0.0000
LGVE	0.494400	0.035448	13.94712	0.0000
LIR	-0.001864	0.001301	-1.432815	0.1528
C	-0.304733	0.208680	-1.460286	0.1451
R-squared	0.990285	Mean dependent var	28.43817	
Adjusted R-squared	0.990178	S.D. dependent var	2.617429	
S.E. of regression	0.259407	Akaike info criterion	0.152692	
Sum squared resid	24.35967	Schwarz criterion	0.205899	
Log likelihood	-23.01899	Hannan-Quinn criter.	0.173833	
F-statistic	9225.043	Durbin-Watson stat	0.135173	
Prob(F-statistic)	0.000000			

Random effects

Dependent Variable: LGDP
Method: Panel EGLS (Cross-section random effects)
Date: 11/16/24 Time: 11:35
Sample: 2002 2022
Periods included: 21
Cross-sections included: 21
Total panel (unbalanced) observations: 367
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SCR	-0.000494	0.004166	-0.118539	0.9057
LGFCF	0.421259	0.013873	30.36438	0.0000
LGVE	0.346694	0.017312	20.02594	0.0000
LIR	0.002528	0.000931	2.716581	0.0069
C	7.932592	0.326171	24.32034	0.0000

Effects Specification

	S.D.	Rho
Cross-section random	0.205890	0.8479
Idiosyncratic random	0.087189	0.1521

Weighted Statistics

R-squared	0.876432	Mean dependent var	2.858498
Adjusted R-squared	0.875066	S.D. dependent var	0.498557

S.E. of regression	0.123241	Sum squared resid	5.498148
F-statistic	641.8878	Durbin-Watson stat	0.286152
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.911924	Mean dependent var	28.43817
Sum squared resid	220.8446	Durbin-Watson stat	0.007124

Fixed effects model

Dependent Variable: LGDP

Method: Panel Least Squares

Date: 11/16/24 Time: 11:48

Sample: 2002 2022

Periods included: 21

Cross-sections included: 21

Total panel (unbalanced) observations: 367

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SCR	-0.002823	0.004283	-0.659129	0.5103
LGFCF	0.370321	0.014177	26.12045	0.0000
LGVE	0.251379	0.018108	13.88254	0.0000
LIR	4.13E-05	0.000959	0.043027	0.9657
C	11.84949	0.384461	30.82104	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.998963	Mean dependent var	28.43817
Adjusted R-squared	0.998890	S.D. dependent var	2.617429
S.E. of regression	0.087189	Akaike info criterion	-1.975794
Sum squared resid	2.599844	Schwarz criterion	-1.709761
Log likelihood	387.5581	Hannan-Quinn criter.	-1.870091
F-statistic	13729.29	Durbin-Watson stat	0.396177
Prob(F-statistic)	0.000000		

Hausman test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
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Cross-section random	366.383501	4	0.0000
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Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
SCR	-0.002823	-0.000494	0.000001	0.0189
LGFCF	0.370321	0.421259	0.000009	0.0000
LGVE	0.251379	0.346694	0.000028	0.0000
LIR	0.000041	0.002528	0.000000	0.0000

Cross-section random effects test equation:

Dependent Variable: LGDP

Method: Panel Least Squares

Date: 11/16/24 Time: 11:57

Sample: 2002 2022

Periods included: 21

Cross-sections included: 21

Total panel (unbalanced) observations: 367

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.84949	0.384461	30.82104	0.0000
SCR	-0.002823	0.004283	-0.659129	0.5103
LGFCF	0.370321	0.014177	26.12045	0.0000
LGVE	0.251379	0.018108	13.88254	0.0000
LIR	4.13E-05	0.000959	0.043027	0.9657

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.998963	Mean dependent var	28.43817
Adjusted R-squared	0.998890	S.D. dependent var	2.617429
S.E. of regression	0.087189	Akaike info criterion	-1.975794
Sum squared resid	2.599844	Schwarz criterion	-1.709761
Log likelihood	387.5581	Hannan-Quinn criter.	-1.870091
F-statistic	13729.29	Durbin-Watson stat	0.396177
Prob(F-statistic)	0.000000		

Cross sectional dependence

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in residuals

Equation: Untitled

Periods included: 21

Cross-sections included: 21

Total panel (unbalanced) observations: 367

Note: non-zero cross-section means detected in data

Test employs centered correlations computed from pairwise samples

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	754.9185	210	0.0000
Pesaran scaled LM	26.58930		0.0000
Pesaran CD	1.417958		0.1562

		ETHIOPIA	GHANA	KENYA	NIGERIA	SOUTH AFRICA
2022	RATING		Caa2			BB-
	OUTLOOK		UNDER REVIEW			POSITIVE
2021	RATING	CCC	B	B	B2	BB-
	OUTLOOK	NEGATIVE	NEGATIVE	STABLE	STABLE	STABLE
2020	RATING	B2	B-	B+	B	Ba2
	OUTLOOK	NEGATIVE	STABLE	NEGATIVE	STABLE	NEGATIVE
2019	RATING	B			B+	Baa3
	OUTLOOK	NEGATIVE			NEGATIVE	NEGATIVE
2018	RATING		B	B2	B+	Baa3
	OUTLOOK		STABLE	STABLE	STABLE	STABLE
2017	RATING		B	B1	B2	BB
	OUTLOOK		STABLE	UNDER REVIEW	STABLE	STABLE
2016	RATING		B3	B+	B	Baa2
	OUTLOOK		STABLE	STABLE	STABLE	NEGATIVE
2015	RATING		B3	B+	BB-	BBB-
	OUTLOOK		NEGATIVE	NEGATIVE	NEGATIVE	NEGATIVE

2014	RATING	B	B-		BB-	Baa2
	OUTLOOK	STABLE	STABLE		NEGATIVE	NEGATIVE
2013	RATING		B			BBB
	OUTLOOK		NEGATIVE			STABLE
2012	RATING		B1	B1	Ba3	BBB
	OUTLOOK		STABLE	STABLE	STABLE	NEGATIVE
2011	RATING		B		B+	A3
	OUTLOOK		STABLE		POSITIVE	NEGATIVE
2010	RATING		B+		BB-	
	OUTLOOK		STABLE		NEGATIVE	
2009	RATING		B+	B+	B+	A3
	OUTLOOK		NEGATIVE	STABLE	STABLE	NEGATIVE
2008	RATING		B+	B		BBB+
	OUTLOOK		STABLE	POSITIVE		NEGATIVE
2007	RATING			B+		BBB+
	OUTLOOK			STABLE		POSITIVE
2006	RATING		B+	B+	BB-	
	OUTLOOK		POSITIVE	STABLE	STABLE	
2005	RATING		B+			BBB+
	OUTLOOK		STABLE			STABLE
2004	RATING					BBB
	OUTLOOK					POSITIVE
2003	RATING		B			BBB
	OUTLOOK		POSITIVE			STABLE
2002	RATING					BBB-
	OUTLOOK					POSITIVE