UNIVERSITY OF GHANA

MONETARY POLICY, TRADE AND UNEMPLOYMENT IN SUB-SAHARAN AFRICA

BY

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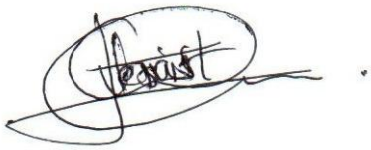
DECLARATION

I, Agnes Boatemaa Appiadu, hereby declare that except for the references which have been duly cited, this thesis is my own work and has not submitted either in whole or in part, to any other university for the purpose of obtaining any degree.



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CERTIFICATION

We hereby certify that this thesis was produced based on the candidate's independent work and was supervised in compliance with the University of Ghana's guidelines on thesis supervision.

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PROF. AGYAPOMAA GYEKE-DAKO (SUPERVISOR) DATE

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PROF. VERA O. FIADOR (SUPERVISOR) DATE

DEDICATION

This thesis is dedicated to God Almighty who makes all things possible; in Him I am able to do all things through Jesus Christ who strengthens me. I also dedicate this work to my mother whose dream has become her children's reality. Additionally, this thesis is dedicated to the girl child whose ambition is to attain academic success. To her I say, "never give up, for the sky is the limit".

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Bless the Lord, O my soul; and all that is within me, bless His holy name.

Bless the Lord, O my soul and forget not all His benefits (Psalm 103:1-2).

My heartfelt gratitude goes to the Almighty God for His unfailing love and favour upon my life, and for His guidance and protection throughout this academic journey. Indeed, His grace and mercies have brought me this far.

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LIST OF ACRONYMS

AfCFTA	African Continental Free Trade Area
CFA	Financial Community of Africa
COVID-19	Coronavirus Disease 2019
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
H-O	Heckscher-Ohlin
IFS	International Financial Statistics
ILO	International Labour Organization
IMF	International Monetary Fund
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
OMO	Open Market Operations
SDG	Sustainable Development Goal
SSA	Sub-Saharan Africa
UNCTAD	United Nations Conference on Trade and Development
VAR	Vector Autoregression
VIF	Variance Inflation Factor
WDI	World Development Indicators
WTO	World Trade Organization

ABSTRACT

The study examined the relationship between monetary policy, trade and unemployment in Sub-Saharan Africa during the period of 2001 to 2022 using a quantitative approach. Employing panel data set from 39 countries in the region, the research assessed how fluctuations in monetary policy rates and trade openness influence unemployment outcomes, while accounting for the effects of key economic variables such as inflation rate, real GDP growth, government expenditure, FDI, and level of institutionalized democracy. The Generalised Methods of Moments (GMM) dynamic panel data estimation technique was used to estimate the study's variables. The GMM was chosen to account for reverse causality problem and deal with the potential problem of endogeneity common with dynamic models. The GMM technique also allowed for the lagged dependant variable to be included as an independent variable.

The results of the study highlight a strong persistence of unemployment in the Sub-Saharan African region over time. The findings indicate an inverse relationship between trade openness and aggregate unemployment rates and a positive relationship between trade openness and youth unemployment rates. Monetary Policy rates were found to have effect on youth unemployment but not on aggregate unemployment rates in Sub-Saharan Africa. The joint effect of monetary policy and trade openness on youth unemployment rates was positive.

Based on the findings, it is recommended that governments of Sub-Sahara African Countries should actively formulate and implement policies that enhance trade, reduces and eliminates barriers to trade, effectively allocate resources to sectors that offer comparative advantage and promote employment in the region. Central banks should also consider the differential impacts of monetary policy frameworks on various demographic groups and design policies that specifically address the needs of the youth on the labour market in Sub-Saharan Africa.

CHAPTER ONE

INTRODUCTION

1.1 Background Information

Throughout the 21st century, as economies have experienced volatile economic cycles, enhancing employment has taken an even stronger position at the centre of development policy discussions (Fox & Gandhi, 2021). In recent times, the focus of countries and many international organizations such as the United Nations, United Nations Conference on Trade and Development (UNCTAD), World Bank Group, World Trade Organization (WTO), International Monetary Fund (IMF) and many other development banks across the globe have been on creating an environment which promotes sustained growth together with decent, full and productive employment for all persons in the world. This is because employment has been highlighted as the area of focus in achieving the United Nations Sustainable Development Goals (SDG); Goal 1 – No Poverty, and Goal 8 – Decent Work and Economic Growth.

In achieving the Sustainable Development Goals, economic policies, including the use of monetary policy and international trade, have received attention in modern literature given the potential benefits of these policies in influencing economic growth, providing sustainable jobs, promoting equality and reducing poverty. Monetary policy has been widely employed by many countries as a means of fostering economic stability and influence economic activity in their economies. Governments across several countries and their monetary authorities use monetary policy to manage demand for goods and services and output, thereby influencing employment (Koshy, 2012). Changes in monetary policy rates through the various monetary policy transmission channels affect consumption, investment spending, demand, output and eventually employment levels in an economy with demand driving production and job creation.

Similarly, world trade volumes have increased greatly over the years, with approximately US$ 30.4 trillion in 2023, a figure that is five times more than trade volumes in 1995 (D'Andrea et al., 2024). With increased trade and growth coinciding with decreased poverty, much research has sought to investigate the impact of trade in economic growth (Edwards, 1998; Frankel & Romer, 1999), development (Rodrik, 2001; Kim, Lin & Suen, 2011), unemployment (Felbermayr et al., 2011; Heid & Larch, 2012) and poverty reduction (Winters, McCulloch & McKay, 2004; Dollar & Kraay, 2004) as well as the role of monetary policy in influencing employment and reducing unemployment (Assemien, Esso & Kanga, 2019; Dallari & Ribba, 2020). According to the United Nations (2023), unemployment forms a huge part of poverty. Hence, by targeting the problem of soaring unemployment levels, poverty can be eradicated.

Over the years, the global economy has experienced a significant rise in unemployment rates. Between the years 1991 and 2022, world unemployment rates have increased tremendously, with the rate of 5.4% in 2022 (United Nations, 2023) as against 5% in 1991, reaching a high of 6.6% in 2020 due to the COVID-19 health pandemic. The topic of unemployment raises a much greater concern especially given the outcomes from the African continent. In the Sub-Saharan African region, unemployment rates have skyrocketed over the last 10 years, with an average of 5.8% in 2014, 6.1% in 2017 and 6.9% in 2021 (World Bank, 2024), trends which indicate higher rates compared to world averages over the years.

In recent times, many countries in Sub-Saharan African region have experienced periods of higher economic growth which have led to renewed optimism about the region's development prospects (Garcia-Verdu, Selassie & Thomas, 2012). And even after the global recession, banking crises and political unrest, countries in the Sub-Saharan African region continue to strive for growth. Amid Russia-Ukraine conflict, climate change effects and the COVID-19 pandemic, the region has been seen to be picking up in growth rate of 3.6% in 2022 as compared to 2.6% in 2019 and -2.1% in 2020 (Africa Economic Outlook Report 2022; World Bank,

2024). Sub-Saharan African trade partners network has widened, and trade volumes have significantly increased with exports value of US$ 523.97 billion and imports of US$ 556.92 billion in 2023 as against US$ 85.57 billion in exports and US$ 84.31 billion in imports in 1991 (World Bank, 2024). Despite these outcomes in growth rates and trade, the Sub–Saharan African region faces the issue of high poverty and low employment rates. Although the world has progressed in reducing poverty levels and unemployment, the Sub-Saharan African region continues to struggle in this area, thwarting global efforts as the greater portion of poor people in the world live in the Sub-Saharan African region (Agyei & Idan, 2022). The contrasting patterns between trade expansion, economic growth, and persistent unemployment in the Sub-Saharan Africa region raise the question: what evidence is there that higher levels of output and trade, along with the implementation of monetary policy, translate into greater job creation and reduced unemployment levels among the population?

1.2 Statement of the Problem

Countries worldwide have experienced a fair share of the development challenges caused by unemployment, from which countries in Africa are not excluded. The Sub-Saharan African region is a diverse region in the African continent, endowed with abundant natural and human resources. This resource base offers the region significant potential to yield inclusive and sustained growth and eliminate poverty. With the region having the world's largest free trade area, that is the African Continental Free Trade Area (AfcFTA) and a 1.2-billion-person market, it is surprising that Sub-Saharan Africa currently records slowed rates of economic growth as a result of declining yet high inflation and high youth unemployment (The World Bank Group, 2023). In 2023, economic growth rate stood at 2.8% compared to 4.1% in 2021 and 6.6% in 2004. Meanwhile, average inflation rate stood at 6.7% in 2023 and 9.4% in the preceding year, with aggregate unemployment rate of 6% of total labour force and youth unemployment at 10.01% of the labour force between the ages of 15 and 24 in 2023, with huge

variations in female and male youth unemployment. Observably, some countries in the region recorded aggregate unemployment rates above 20% and youth unemployment rates above 35%.

Sub-Saharan Africa is the region with the youngest population in the world, with approximately 70% of its population below 30 years (United Nations, 2023). And with the figure rising by the day, high unemployment rates especially among the youth have serious implications for growth and development in the region. For a region that depends on commodity trade (merchandise trade of 42.5% GDP in 2023) for most of its growth in recent times, the existing trends of high unemployment amongst the populace warrants scrutiny. In recent times, countries within the region continue to promote job creation and stimulate employment through the formulation and implementation of fiscal, monetary and trade policies, and given the efforts, it will be expected that outcomes of growth and employment prospects among the populace will be better. However, this has not been the case. This is due to the unclear link between monetary policy, trade openness and unemployment in the Sub-Saharan African context. The relationships between monetary policy and unemployment and trade and unemployment are still a controversial topic with contrasting views from previous studies (Alexius & Holmlund, 2007; Sunde, 2015; Essien et al., 2016; Dutt, Mitra & Ranjan, 2009; Kim, 2011; Demiral, Demiral, Khoich & Maidyrova, 2020). Very few studies, over the years have sought to research the link between these variables. However, there has not been comprehensive research on the workings of monetary policy through trade and its impact on unemployment in Sub-Saharan Africa. While theoretically monetary policy through the transmission channels can influence trade and unemployment, little research has been conducted in exploring the subject matter and the possible relationship they have in Sub-Saharan Africa.

Furthermore, although much research over the years has examined the topic of monetary policy and its effects on inflation; financial sector and economic growth; trade, growth and

unemployment; and exchange rate and trade, little is known about the implications of monetary policy on trade in influencing employment outcomes for countries, especially those in the Sub-Saharan African region. For research that has attempted the topic, the studies have been conducted at country level and looking at various aspects of trade in goods and services with contrasting views, which has made applying the knowledge to this part of the world difficult, given the difference in economic structure and characteristics. Thus, this study investigated the relationship among monetary policy, trade openness and unemployment rates in the Sub-Saharan African region.

1.3 Objectives of the Study

The objective of this study was to empirically investigate the effect of trade on aggregate unemployment and youth unemployment in the Sub-Saharan African region. To achieve the aim of the study, the following objectives were derived:

1. To explore the impact of monetary policy on unemployment rates in the Sub-Saharan African region.
2. To explore the effect of trade openness on unemployment rates in Sub-Saharan Africa.
3. To examine the interactive effect of monetary policy rate and trade openness on unemployment rates in Sub-Saharan Africa.

In all three objectives, both aggregate unemployment and youth unemployment rates are investigated.

1.4 Research Questions

The questions the study sort to answer were:

1. What is the relationship between monetary policy and unemployment rates in Sub-Saharan Africa?

2. What impact does openness to trade have on unemployment rates in the Sub-Saharan African region?
3. What is the interactive effect of monetary policy rates and trade openness on unemployment rates in Sub-Saharan Africa?

1.5 Significance of the Research

This study provides insight into the relationship between monetary policy, trade and unemployment in the Sub-Saharan African region, and is relevant to research, policy and practice in the monetary policy-trade-unemployment nexus. Firstly, it contributes extensively to existing literature on trade, monetary policy and unemployment. With the comprehensive investigation on the subject matter, this study provides insight into the impact of monetary policy and unemployment as well as the effects of trade on unemployment, sheds light on the dynamic relationship between monetary policy, trade and unemployment in Sub-Saharan Africa and provides a foundation for future research in the area.

Furthermore, the findings of this study will help policymakers in Sub-Saharan African countries to formulate and implement policies that target trade policy and monetary policy and create employment opportunities for their people. This research will broaden the understanding of policy makers on the impact of trade and monetary policies in stimulating employment and with the broadened knowledge, policy makers will be well informed in designing effective trade policies and monetary policies that influence employment positively. Similarly, the insights from this study can help policy makers to implement programs of great social and economic benefits geared towards reducing unemployment and promoting job creation in the region.

Additionally, the study provides great significance to practice and industry as it broadens the knowledge of industry players in response to trade and monetary policy as well as programs that influence job creation and employment.

1.6 Delimitations of the Study

This study is limited to countries in the African continent, specifically countries in the Sub-Saharan African region. Countries in the region have characteristics that are structurally similar making it appropriate for them to be studied together as a group. Also, in order for the findings of the study to be more relevant to present situations and reflect current circumstances, the study period is restricted to span from 2001 to 2022. Lastly, the study focuses on trade openness and monetary policy even though other factors and variables have impacts on aggregate unemployment rates and youth unemployment rates.

1.7 Organization of the Study

The study is made up of five chapters organized as follows. This chapter, Chapter One, provides an introduction to the subject area. It focuses on the problem statement, study background, objectives of the study and research questions, as well as the significance of the study. The second chapter, which follows this chapter, provides an overview of existing literature and studies on the topic and a review of relevant theoretical and empirical literature in the subject area. It is then followed by chapter three, which discusses the research methods and variables used in the study. In chapter four, the results from the data analysed from the study are presented and discussed. Finally, the study ends with Chapter Five which summarises the study, provides a conclusion for the entire work and offer some key policy recommendations. The references and appendices then follow.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides a review of works on monetary policy, trade openness and unemployment. It begins with a review of the concepts of monetary policy, trade and unemployment. The chapter further provides an overview of the trends in monetary policy, trade, aggregate unemployment and youth unemployment in the region of focus. Concepts, theories and empirical findings of the relationship among monetary policy, trade openness and unemployment are also reviewed and discussed.

2.2 Conceptual Review

This section discusses the concepts of monetary policy, trade openness and unemployment. It highlights the tools of monetary policy and provides insights on the various types of unemployment.

2.2.1 Concept of Monetary Policy

Government authorities across the globe rely on one or more economic policies in order to shape and influence economic activities in their states. Monetary Policy is an economic policy that consists of a set of actions geared towards regulating the supply of money and achieving economic growth in an economy. This policy is adopted by monetary authorities of countries, be it the central banks, national treasuries or reserves to affect monetary and other financial conditions in their countries of operation, including stabilizing prices, achieving high employment and rapid growth (Friedman, 1968). The practise of monetary policy also seeks to maintain a country's international trade balance and foster increased capital investments in order to enhance economic growth in their nation over time (Friedman, 2000).

Monetary policy could be either contractionary or expansionary. Any actions by central banks and monetary authorities geared towards reducing money supply is contractionary. On the flip side, any actions that increase money supply in an economy is expansionary. Contractionary monetary policy, also known as monetary tightening and expansionary monetary policy, can also be referred to as monetary loosening. Changes in monetary policy influence a number of key macroeconomic variables including inflation, GDP and unemployment.

2.2.2 Monetary Policy Tools

In influencing the supply of money, stabilizing growth and enhancing economic growth, central banks rely on a number of tools to implement monetary policies in their economies. Using these tools, central banks either decrease monetary supply or increase money supply. These tools or instruments include Reserve Requirements Policy, Open Market Operations (OMO) and Discount Rate Policy.

Open Market Operations

Open Market Operation involves the purchase or sale securities belonging to the government in an open market. Open market consists of dealers in government bonds and individual government securities including treasury bills. Whilst open market purchase, aimed at stabilizing general prices in an economy during times of deflation, increases the economy's money supply, open market sales reduce money supply in times of inflation (Dzisah, 2019). Open market operations work by targeting money supply directly by regulating commercial banks' liquidity and creditability and have been proven to be an effective mechanism (Grigolashvili, 2019).

Reserve Requirement Policy

Commercial banks, for prudence purposes, retain a fraction of deposits received in the form of cash or its closest equivalent in order to pay depositor when they need to withdraw their funds. Some part of the deposits is required by the monetary authorities/ central banks to be retained

and kept as reserves. These reserves form the required reserves of banks, and through this reserve requirement policy or reserve ratio, monetary authorities are able to influence the amount of money available to banks to be given out. By controlling the levels of reserves required to be retained by commercial banks, central banks can influence interest rates and credit growth (Organisation for Economic Co-Operation and Development, 2018). Increasing reserve ratio is a contractionary monetary policy move as it causes decrease in money supply as a result of reduced liquidity of banks.

Discount Rate Policy

Central banks are lenders of last resort. When commercial banks in a country are short of reserves, they may fall on their central bank to provide funds. These funds are borrowed from the central banks, which in turn charge interest on the borrowed funds. The interest charged by central banks on funds lent to commercial banks is the discount rate.

Central banks use discount rate of monetary policy to create liquidity and influence investments. By decreasing the discount rate on loans made available to commercial banks, commercial banks decrease the interest rates charged on loans available for lending to the public. Expanding liquidity and boosting investments as loans become more attractive (Dzisah, 2019).

2.2.3 Concept of Trade

Trade influences every aspect of human life. According to Titievskaia and Harte (2019), trade influences economic cycles, impacts labour markets and broadens the spectrum of consumer decisions and choices. Trade is the purchase, sale or exchange of goods and services. Trade happens in varying scales, on local, regional or global levels, between two or more parties in a market system. The sale, purchase or exchange of goods and services across national borders forms the basis of international trade. International trade serves as a central driving force behind

globalisation – promoting integration among countries and people. In the international market, trade could be done by any parties, be it governments or business entities once they have the ability and resources to meet global demand (Samue, 2019).

In the early days of human life, trade involved direct exchange of services and goods for other services and goods, without the presence of money. In modern day trading, trade revolves around the transfer of services or goods between individuals and business entities with money as a medium of exchange. In our world of today, division of labour and specialization have brought about new dynamics in trade and trade implications.

2.2.4 Concept of Unemployment

Over the years, the terms, employment and unemployment, have received a growing attention in macroeconomics literature. This is because one of the macroeconomic objectives of economies is to achieve full employment (Englama, 2001). Despite the serious repercussion unemployment poses to economies, unemployment remains a big challenge for many economies especially economies of developing countries. According to the International Labour Organisation, the problem of unemployment is created when persons in an economy who are seeking jobs and willing to work are unable to find jobs.

The requirement in defining unemployment is that the conditions of not having work, when available for work and searching for work at a point in time must all simultaneously be satisfied to term one as being unemployed. The unemployment rate in an economy, which measures the proportion of the labour force who are unemployed serves as an indicator for understanding conditions of the labour market as well as providing insights into the general performance of the economy (Reserve Bank of Australia, 2023).

2.2.5 Types of Unemployment

Unemployment in an economy may take different forms. These forms of unemployment emanate from different reasons for which people become unemployed. They include frictional unemployment, cyclical unemployment, structural unemployment, voluntary unemployment, seasonal unemployment as well as regional unemployment.

Frictional Unemployment

Participants in the labour market are always seeking change. The change may arise from the quest for higher income or career aspiration purposes. More often than not, people tend to change jobs due to one reason or the other. Frictional unemployment occurs when people move voluntarily from one job to the other in the labour market. The movement of workers in the labour market helps in the achievement of an effective allocation of labour across economies (Reserve Bank of Australia, 2023). However, this movement tends to create a gap as persons seeking jobs may not find the jobs immediately and the businesses seeking to fill their job vacancies may not find the right candidates to fill these vacancies in the shortest possible time. In this instance, a temporary unemployment situation is created resulting from the time it takes for workers and employers or businesses to match up.

Structural Unemployment

Aside from unemployment resulting from the time it takes for workers and employers to find each other, there may be potential mismatches between the skills potential workers possess and the skills employers are looking for which may cause an unemployment problem. Structural unemployment results from the mismatch between the skills required to do available jobs and the lack of the skills jobseekers have. Just as every worker or job seeker is different, the requirements of jobs available in the labour market also vary. In some cases, the qualifications of job seekers do not match those that business entities require and even in situations where the

number of workers that a business seeks to recruit is equal to the number of persons seeking jobs, persons without the required qualifications will find themselves without work.

Technological advancement as a result of globalisation has been named as one of the causes of structural unemployment. Technological changes may cause some skills to be obsolete and this may lead to a mismatch as newer skills are being required. Geographical mismatch of jobs can also cause structural unemployment. Structural unemployment has the tendency to last longer in an economy compared with other forms of unemployment given the time it may take to have workers skillset matching required job skills.

Cyclical Unemployment

Unemployment may emerge because of business cycle fluctuations and changes in economic activity over time. Reduced economic activity resulting from economic recession and associated policy adjustment programs creates cyclical unemployment (Petrakis, Kostis & Kafka, 2014). When the demand of goods and services falls as a result of an economic downturn in an economy, it becomes difficult for persons available to work and seeking jobs to find jobs. This is because during economic recession businesses experience decreased demand for their goods or services and may respond to the weak demand by reducing the number of persons employed either by laying existing workers off or hiring less workers. Hence, jobseekers will also find it harder to become employed. Increase in cyclical unemployment may indicate low performance in economies. Cyclical unemployment could be mitigated using policies that stimulate aggregate demand, such as monetary policy loosening.

Other forms of unemployment include regional unemployment which denotes unemployment affecting certain areas of an economy and seasonal unemployment where unemployment levels vary among certain industries because the production of goods and services is linked to certain times of the year. That is, employment is tied to production periods and in times there is no

production there is a halt in employment and existing workers may have to find other jobs. Industries that tend to experience seasonal unemployment include tourism and agriculture, especially farming. Lastly, underemployment, which involves part-time workers seeking full-time work is sometimes considered as a form of unemployment.

2.3 Trend Analysis

In this section, existing trends of monetary policy, trade openness and unemployment are discussed. This section provides a comprehensive review of how monetary policy, trade and unemployment has developed over time.

2.3.1 Trends in Monetary Policy

There has been a growing usage of monetary policy in influencing economic activities in many countries around the world. Similarly, countries in the Sub-Saharan African region have explored the use of monetary policy to influence activities in their countries. However, some of the socio-economic indicators like unemployment, inflation, trade and the others have not reflected clearly the implications of monetary policy instruments in the region.

Monetary policy in Sub-Saharan Africa has transformed significantly over the years, with the move from a fixed exchange rate regime to a more flexible regime that allows for greater monetary independence (Khan, 2011). During pre-independence times, monetary arrangements in the region were mainly managed by currency boards such as the currency board arrangements with the British Pounds Sterling, French Franc and South African Rand. In the times following independence, whilst arrangements with the Pound were dismantled, some of these boards like the Rand Monetary Area and CFA Franc zone structures remained. The dismantling of board arrangements set the path for the establishment of independent central bank institutions and monetary authorities. In recent times, central banks and monetary authorities' roles have transitioned beyond the traditional role of administering heavily

managed exchanged rates and providing effective nominal anchor for prices (Berg and Portillo, 2018) to actively taking responsibility for financial stability and monetary policy given the growing financial liberalization and financial sector reforms.

Today, countries in the Sub-Saharan African (SSA) area rely on two major monetary policy frameworks: the exchange rate pegs regimes, which allow only limited room for independent monetary policy and the monetary targeting framework (Kasekende and Brownbridge, 2011), with a few adopting inflation-targeting framework (Onaga, Arize and Onwumere, 2023). Twenty-three countries in the SSA area have their monetary policy anchored on exchange rate peg framework, making monetary policy reliant on exchange rate policy with the aim of achieving stability in exchange rate regime. On the other hand, thirteen counties in the region have monetary policy built around quantitative monetary target framework, where the operating target of monetary policy is money reserves and intermediate target is broad money. Three countries in the Sub-Saharan African region, namely Ghana, South Africa and Mauritius, use inflation targeting monetary policy framework whose operating target is short term interest rate with the key guide to monetary policy decisions being inflation forecasts. Here, policy decisions include maintaining, raising or decreasing the monetary policy rate. In the case of Kenya, a mixed monetary policy framework is adopted, where elements of both monetary targeting and inflation targeting frameworks are used. The objective of both monetary targeting frameworks and inflation targeting frameworks seeks to achieve price stability in an economy. Regardless of which framework is used, monetary policy instruments, including Reserve Requirements or Liquid Asset Requirements, Open Market Operations, Discount or Policy Rate as well as Sale of Foreign Exchange Market Operations can be employed.

Trends in monetary policy in the last 8 years have shown monetary policy tightening for some countries in Europe, Asia, Oceania, Americas and Africa while others have decreased monetary policy rates over the years. Generally, a growing trend of increased monetary policy rate has

been observed among countries worldwide. However, in the case of countries in the Sub-Saharan Africa, average monetary policy rates are higher than countries in Europe and Asia (Anarfo, 2018). Increased rates in the area have mostly been a response to inflationary threats, with the attempt to reduce the amount of money in circulation (Sede and Adediyan, 2021). On average, countries in the Sub-Saharan African region have higher monetary policy rates compared to countries from other economic regions. Persisting inflationary threats and tighter monetary policies have resulted in high borrowing costs for countries in the Sub-Saharan African region (International Monetary Fund, 2023); and despite efforts on the part of central banks of countries in the region to use monetary policy to stabilize prices, attain full employment and economic growth, there is still evidently the problem of unemployment in the region.

2.3.2 Trends in International Trade

The Sub-Saharan African region boasts of vast natural resources, creating the opportunity for international trade. Export of goods and produce forms a great source of revenue for countries in Sub-Saharan Africa, as the region is enriched with many primary commodities such as precious metals, oil and varieties of agricultural produce. For the past 50 years, natural resource-based products have been the most goods exported by African countries (Songwe and Winkler, 2011). Over the years, countries in Sub-Saharan African have traded with countries outside the region and in recent times, newer markets and global partners have been engaged, introducing newer approach to trade (Elmorsy, 2016).

Following the adoption of the Structural Adjustment Program in trade and the joining of Trade Organisations during the late 1980s and early 1990s by most Sub-Saharan African countries, trade in the region has increased. Exports and imports in the Sub-Saharan African region have steadily increased as a result of increased trade integration (Mazorodze, 2023), promotion of

free trade areas and trade openness in the African continent despite challenges posed by global financial crisis and health pandemic.

Sub-Saharan Africa's exports and imports of goods and services have increased significantly over the years with exports value of US$ 548.9 billion and imports value of US$ 559.2 billion in 2022 compared to US$ 86.5 billion and US$ 84.3 billion in 1991. Despite the impressive trade volumes recorded by the region, the sub-Saharan Africa's trade is still being marginalised in world trade. Sub-Saharan Africa's share of trade has been relatively constant at about 3% of global imports and exports (World Trade Organization, 2020), despite great efforts made towards international trade by countries in the region. The region's exports currently account for about 70% of all African exports of services and goods, with trade trends being imports exceeding exports over the last 10 years. Most of SSA's exports have been to developed countries and imports also coming from these countries (Kimenyi, Lewis and Routman, 2012). The Sub-Saharan African region currently records higher imports compared to exports with exports of goods and services at 22.93% of GDP and imports of goods and services at 23.82% of GDP in the year 2021 (World Integrated Trade Solutions, 2024). At the same time, trade openness is at 57.04% of GDP (World Bank, 2024).

In recent times, to achieve increased economic growth and drive international trade, several countries in the Sub-Saharan African region have embraced intra-regional and global trade agreements (Oloyede, Osabuohien & Ejemeyovwi, 2021). For countries in the region, signing up to the African Continental Free Trade Area is a great step in achieving regional integration and trade. And even though overall intra-African trade is relatively low across the region, there has been varying outcomes from sub areas in the region – with the Southern and Eastern African regions recording higher levels of intra-regional trade and contributing about 30% of intra-African exports (Kuwornu, 2024). These regions contrast with other parts of the continent, where trade is more externally oriented. With the introduction of the African

Continental Free Trade Area, the future prospects for the Sub-Saharan Africa growth and trade have become immense given the renewed potential and capacity of the region to enhance economic integration and increase trade flows within the African continent coupled with diversification of production beyond the natural resource sector.

2.3.3 Trends in Aggregate Unemployment

Unemployment is highlighted to be one of the critical economic problems affecting all countries in our world of today. Countries around the globe have experienced a fair share of this development challenge, from which countries in Africa are not excluded. In time past, the African economy has enjoyed increased economic growth which has not translated into reduced unemployment rates on the continent (Akinyele, Oloba and Mah, 2022). Even more surprising is the fact that a resource-rich continent like Africa still continues to record high levels of unemployment especially in the Sub-Saharan African region.

The Sub-Saharan African region is diverse – comprising varying income countries that boast of countless natural resources, largest free trade area in the world based on market size and a 1.2-billion-person market (The World Bank Group, 2023). Despite the great potential of the region, if its resources are capitalised on for growth and development, it is a problem that the region still shows inconsistency in attaining reduction in unemployment levels.

Trends in unemployment in major economic regions reveal that Middle East and North Africa have higher unemployment rates at 9.16% as at 2023. The region has maintained an extremely higher unemployment rate over the years. Regions such as Europe, Latin America, Caribbean and Central Asia have also experienced their fair share of high unemployment rates in times past. Generally, East Asia and Pacific has relatively been able to keep unemployment at lower levels compared to the other regions of the world (Appendix 5). Aggregate unemployment rates around the world picked up in 2020 due to the COVID-19 pandemic with its implication

reflecting high rates recorded in the following year. The regions' efforts in tackling unemployment post pandemic have been seen to be paying off as unemployment rates have since slightly lowered.

Aggregate unemployment in the Sub-Saharan African region, however, tells a different story. Sub-Saharan Africa's aggregate unemployment rate averaged 6.4% of total labour force in 1991 and an average of 6.2% of labour force in 2023, with not much significant changes over the years; the lowest being 5.7% recorded in 2013 and the highest, 6.9% in 2021. Although, unemployment rates around the world have taken a downward turn, some countries in the Sub-Saharan African region record high unemployment rates. Some of these countries, such as South Africa, Botswana, Gabon and Eswatini, not only have unemployment rates beyond 20% of their total labour force in 2023 but also an increased unemployment rates compared to 1991. Generally, Niger, Burundi, Chad and Benin recorded lowest unemployment rates in the region, with a handful of Sub-Saharan African countries having reduced unemployment rates in 2023 compared to 1991 (Appendix 6).

2.3.4 Trends in Youth Unemployment

Sub-Saharan Africa is characterised as the world's youngest population given the number of people between the ages of 15 and 25, and about 70% of people aged under 30 in the region. As of 2016, about 30% of the population of Sub-Saharan Africa was made up of young persons in the age group of 15-25 (Fox, Senbet, and Simbanegavi, 2016). The numbers continue rising by the day, and it is estimated that the number of young people in Sub-Saharan Africa will make up 42% of the World's youth population by 2030 (Cousins & Sharma, 2023), with the World Bank estimating a 50% of the population of Sub-Saharan Africa being under the ages of 25 by 2050. With the region's population getting younger by the day, high youth unemployment in the region may cause serious repercussions for the growth and development

of the region. The highest rate of youth unemployment in the region (12.68% of total population between the ages of 15 and 25) was recorded in 2020 mainly due to the health pandemic that saw many losses of jobs around the world (Appendix 7). In the periods following the pandemic, youth unemployment is seen to have declined; however, the rates are still above global average. Significant differences are also recorded among different countries in the Sub-Saharan African region. A number of countries in the region have youth unemployment rates in the ranges of 20% and 50% of total labour force between the ages of 15 and 24. Countries such as Botswana, Cape Verde, Eswatini, Mauritania, South Africa and Sudan recorded youth unemployment rates significantly higher in 2023 compared to 1991, whilst the likes of Angola, Cameroon, Ivory Coast, Gambia and Zambia have been able to reduce youth unemployment in their countries. In 2023, Botswana, Congo and Eswatini recorded youth unemployment rates above 40% of labour force between the ages of 15 and 24, with South Africa towering above all countries in the region with youth unemployment rates above 50% (Appendix 8).

2.4 Theoretical Review

This section discusses theories in monetary policy and unemployment proposed by finance and the economic literature. The theories include monetary policy transmission mechanism, Ricardo's theory of comparative advantage and Heckscher-Ohlin theory of trade.

2.4.1 Monetary Policy Transmission Mechanism

Monetary policy affects economies through various transmission mechanisms or channels. Central Banks through these channels transmit monetary policy stance in their economies. These channels or transmission mechanisms include other asset prices, interest rate, credit and exchange rate channels.

The Interest Rate Channel

The Interest Rate Channel, also known as the Cost of Capital Channel, has been recognised in the economics literature as a monetary policy transmission mechanism for over 50 years (Mishkin, 1995). It is known as the main transmission channel under the Keynesian monetary policy theory through which cash rate affects economic activity and inflation by targeting short-term interest rates and influencing business decisions on consumption and investment. Under the interest rate channel, a monetary policy tightening implemented by increasing the policy rate leads to an increase in interest rate in the short-term. This increment in short-term interest rates impacts real interest rates and further causes an increase in the cost of capital. Increased cost of capital leads to a fall in consumption as consumer and business investment spending falls and eventually causes a decline in aggregate demand, output and prices (Choi, Willems & Seung, 2024).

The Credit Channel

The credit channel as a transmission mechanism came about as a result of some dissatisfaction with the conventional literature on the use of interest rate in explaining the effect of monetary policy in an economy. According to Bernanke and Gertler (1995), credit channel provides a newer perspective on transmission mechanism monetary policy, highlighting the availability of quality credit while emphasizing how agency problems are created in the financial market. Under the credit channel, two sub channels (the bank lending channel and balance sheet channel) are derived.

In the bank lending channel, banks in the financial system play a role of making credit or loans available from the deposits they receive. In this channel, a fall in policy rate decreases bank deposits which has an effect on the amount of loans that can be made available. Reduced loans in turn reduces investment spending and output. On the other hand, the balance sheet channel focuses on the influence of monetary policy on the financial position and the net worth of

businesses in the presence of information asymmetry problems. In this channel, a fall in policy rate causes a fall in equity prices which leads to a decline in the net worth of businesses and reduces businesses' capability to raise external fund, thereby, lowing investments and aggregate demand. Another circumstance also holds where a contractionary monetary policy that causes interest rates to rise reduces cash flow, increases information asymmetry problems, lowers leading and causes a decline in investments and aggregate demand. The balance sheet channel also has a liquidity channel through which consumer spending affects output.

Other Asset Prices

According to Mishkin (2001), fluctuations in the stock markets affects an economy as a result of changes in monetary policy. The effect of monetary policy through other asset price channel is seen through the effect of Stock Market on Investment. Tobin's q-theory of investment explains how the fluctuations in stock prices affect an economy. Tobin's q provides information on the market value of firms compared to the replaceable assets of firms, with a higher q implying that the market price of a firm is higher compared to the replacement cost of capital. It also suggests the new equipment capital is cheap compared to the firm's market value. The resulting effect is that firms can issue equity and receive a higher price for them relative to the cost of equipment that is being purchased, leading to increased investment spending as firms can now invest in more goods using a small issue of stock.

Linking equity prices with investment spending, a monetary policy loosening which causes interest rates to fall makes bonds less attractive relative to stocks leading to the increase in the demand for stocks. Hence, monetary policy tightening leads to increased equity prices raising q, which in turn raises investment and thereby results in increased aggregate demand and output. Aside bonds, businesses finance investment by issuing equities or common stock. A rise in stock prices makes financing of investment cheaper as each issued share produces more

funds. In this instance, a rise in monetary policy rate, increases stock prices, decreases cost of capital and eventually increases investment and output.

Exchange Rate Channel

Globalisation, internalization of economies, coupled with exchange rate systems have brought about the realisation of the exchange rates channel of monetary policy. This consists of interest rate effects in an economy and the effects exchange rate has on exports and output. This is the channel through which monetary policy is mapped unto trade with employment implications. Under the exchange rate channel, a monetary policy tightening which causes real interest rates to rise, brings about an appreciation in the domestic currency relative to other foreign currencies, thereby leading to decreased net exports as exports become expensive and imports become cheaper resulting from foreign products becoming less expensive compared to domestic products. With cheapened imports, domestic sales drop hindering job creation thereby causing increased levels of unemployment. Significant drop in exports also affects aggregate output as domestic sales decline (Mishkin, 1995).

Expectations Channel

In recent literature, there has been the subject of expectations as a monetary policy transmission channel in targeting inflation in an economy. In the expectations channel, the expectation of economic agents influences the effectiveness of monetary policy, with different expectations yielding varying economic outcomes despite identical monetary policy being employed (Güler, 2016). Factors such as the permanency or temporariness of monetary authorities' policy decisions, monetary policy preferences and conditions of change as well as political and corporate influences on monetary authority could shape expectations of economic agents thereby influencing inflation situations in an economy. Market expectations of interest rates in the short term could also influence expectations of changes in interest rates in the medium term and long term alike.

2.4.2 Theories of Trade

Economists over the years have put forward some theories or conditions under which trade takes place. They include Mercantilism, Absolute Advantage, Comparative Advantage and Heckscher-Ohlin (H-O) theories of trade.

Mercantilism

Developed between the 16th and 18th century, the mercantilism system and theory of trade calls for government focus on regulating economic activity and trade in promoting domestic industry as against foreign industries (Pettinger, 2019). The Mercantilism system is characterized by policies that place restrictions on importation, protects domestic industries, promote accumulation of foreign currency reserves as well as increase in gold stocks. This is because the mercantilist goal was to maximize a nation's export surplus by maximising exports that in turn increase output and employment and minimize imports for an economy. In modern economies, mercantilism present itself in the form of policies that undervalue a country's currency, government subsidies of some industries as well as copyright theft. Research by Letiche (2014) found that the mercantile theory of trade was associated with high levels of unemployment. Letiche highlight that this was due to factors such as revolution in agriculture, merchant entrepreneurs and political unrest during the mercantilist era.

Absolute Advantage

In the 18th century, following the criticisms of the Mercantilist view on trade, Adam Smith developed the concept of Absolute Advantage as an international trade theory, in his publication "The Wealth of Nations" in 1776. According to Smith, countries in order to benefit from trade should specialize in the production of commodities that give them absolute advantage. This meant a country producing and exporting commodities that can be produced more cheaply than other countries and importing those that are more expensive to produce (Schumacher, 2012).

Absolute Advantage is associated with specialization, division of labour and low-cost production including cheaper materials, fewer production hours and cheaper labour under free trade conditions. Whilst in a Mercantilism system, a country would prioritize its gains at the expense of other countries, the absolute advantage system took a laissez-faire approach where all countries would benefit from trade. Adam Smith, however, attributes the determinant of employment to prior capital accumulation and technology but not government policies (Rashid, 2020).

Comparative Advantage

In 1817, following the work of Adam Smith, David Ricardo, in his publication "Principles of Political economy and Taxation", introduced the concept of Comparative Advantage in Trade. The theory of comparative advantage considers the use of opportunity cost in analysing different options for production. According to the theory, a country has a comparative advantage if it produces goods at a lower opportunity cost compared with other countries. It suggests that countries when trading with one another should produce and export goods with a higher comparative advantage and import those that have a relatively less comparative cost advantage. While other factors of production are considered in Adam Smith's theory of absolute advantaged, in the theory of comparative advantage labour is the only productive factor. Studies such as Carrère, Fugazza, Olarreaga and Robert-Nicoud (2014) and Widyawati (2018) found that changes in trade openness impacted unemployment levels in countries with comparative advantage with the latter's findings supporting the Ricardian theory.

Heckscher-Ohlin Theory of Trade

The Heckscher-Ohlin Theory of Trade, also the H-O theory, combines the work of Eli Heckscher in 1919 and that of Bertil Ohlin in 1933. According to the H-O theory, countries that have abundant factor of production should export them and those with less abundant factor of production should import them. In the H-O model, it is assumed that relative abundance of

any two countries' factors of production reflects the differences in the countries, given that some countries are capital endowed, and others are labour endowed. The argument under the H-O theory is that a country's comparative advantage depends on relative differences in the quantity of the factors of production, that is capital and labour.

An extension of Heckscher-Ohlin theory is the Heckscher-Ohlin-Samuelson model developed by Paul Samuelson in 1949 which suggests that developed countries should prioritize and produce capital-intensive goods for exportation while developing countries specialise and produce labour-intensive goods (Siddiqui, 2018). Other trade theories such as the New Trade Theory which recognizes the effect of network and economies of scale on trading has also been developed.

2.5 Theoretical Framework

This section discusses the theories and models under monetary policy and trade and how they impact unemployment. It highlights the underlying assumptions and theoretical framework underpinning this study.

2.5.1 Monetary Policy Transmission Mechanism

The Monetary Policy Transmission Mechanism provides the theoretical underpinning for this study, explaining how changes in monetary policy impact economic variables such as output, inflation, employment and exchange rates. In Sub-Saharan Africa, this theory is particularly applicable in understanding how monetary easing or tightening can influence job creation and reduce unemployment levels.

Firstly, the interest rate channel of monetary policy influences cost of borrowing through the adjustment of monetary policy rate. The lowering of interest rates by central banks decreases borrowing costs, leading to increased investment and consumption (Mishkin, 1996). This

stimulates demand for goods and services, potentially leading to reduction in unemployment as businesses respond to increased production needs by increasing employment.

Also, monetary policy through the credit channel influences job creation as changes in monetary policy affect changes in the availability of credit in an economy. Higher interest rates as a results of monetary policy tightening reduce the availability of credit causing a decrease in investment and consumption (Özşuca, 2012), and eventually a decrease in employment in an economy. The flipside then holds that lower interest rates can increase the amount of credit available, allowing businesses to expand and households to increase consumption. Increased credit availability encourages investment, innovation, and employment growth.

The exchange rate channel of monetary policy influences trade and employment as changes in interest rates affect exchange rates. The exchange rate channel of monetary policy provides a theoretical foundation and insights into the dynamic relationship among monetary policy and trade in influencing unemployment. Monetary policy through the exchange rate channel affects trade, that is, imports and exports, and subsequently influences unemployment levels. A decrease in interest rates typically leads to currency depreciation, which makes exports cheaper and imports more expensive (Grimwade, 2000). This can stimulate demand for services and goods produced locally, boosting output and employment in export-oriented sectors. Sub-Saharan Africa is a region with a significant reliance on trade, particularly exporting commodities. A depreciation of the currency as a result of changes in exchange rate can be beneficial for export sectors by making products more competitive in global markets. This could result in higher demand for exports which can reduce unemployment in these countries. The dynamics, however, may vary from country to country as different countries have different economic structure and makeup.

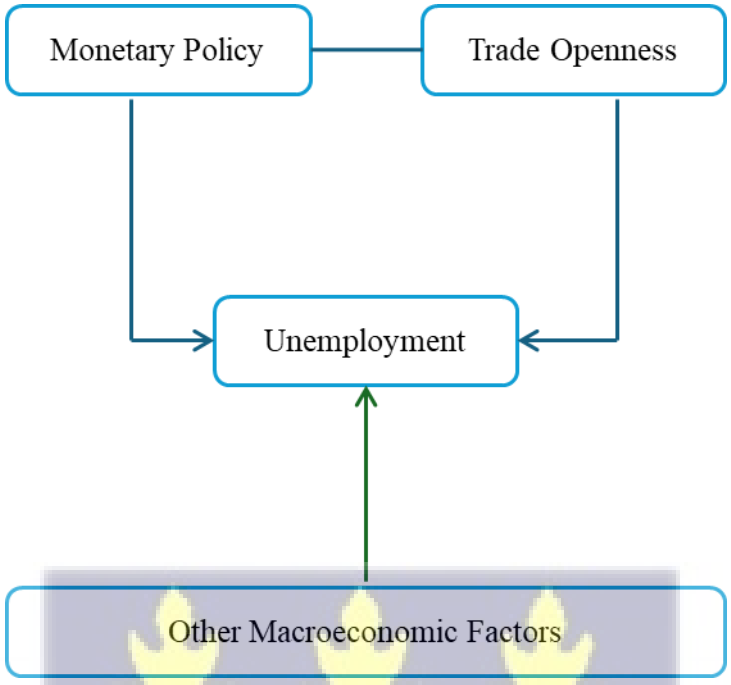
2.5.2 Heckscher-Ohlin Theory of Trade

The Heckscher-Ohlin Theory of international trade propounded by Heckscher and Ohlin is one of the theories that underpins this study as it provides useful insights into the relationship between trade and unemployment highlighting the trade patterns in developed and developing countries. While other trade theories exist as discussed in section 2.6, the H-O theory better explains the linkage between trade and unemployment. The H-O theory, also referred to as the factor endowment theory, focuses on how different factor endowments, that is, labour and capital, determine a country's comparative advantage in the production of goods. According to the theory, countries export goods that utilize their abundant factors intensively and import goods which use their scarce factors intensively. according to this theory, trade openness allows countries to specialize in sectors where they have a comparative advantage, hence boosting employment in those sectors. In the context of Sub-Saharan Africa, where labour is abundant, the H-O theory suggests that countries in the region are more likely to export labour intensive goods which could lead to the growth of export sectors that create jobs and boost employment.

2.6 Conceptual Framework

The study hypothesizes that there is a relationship between monetary policy, trade and unemployment. Figure 2.1 highlights the possible relationships with the arrows showing the casual relationships following the review of theories. There are other macrolevel factors that have been highlighted by existing literature that could affect unemployment. Such factors may include real GDP growth, urban population share, foreign direct investment, inflation, domestic investment, government expenditure, credit to private sector, level of institutionalized democracy and GDP per capita. Figure 2.1 shows a graphical conceptualization of the relationships between monetary policy, trade openness, other macrolevel factors and unemployment.

Figure 2.1 Conceptual Framework of the relationship between Monetary Policy, Trade Openness and Unemployment



Source: Author's Construction (2025)

The exchange rate channel of monetary policy suggests a possible relationship between monetary policy and trade. Monetary policy expansion which is conducted by lowering interest rates could weaken domestic currency, making exports cheaper, thus boosting exports and reducing unemployment. Based on the dynamic relationship, an interactive term of monetary policy and trade is introduced with its impact on unemployment assessed in this study.

2.7 Empirical Review

Over the years, the topics of trade, unemployment and monetary policy have taken the forefront of most economic discussions. While many studies have focused on establishing the relationship between trade and economic growth and that between monetary policy and growth, less attention has been given to the issue of trade and monetary policy, and their impact on unemployment. For the literature available, the focus has been on any two of the variables, either trade and unemployment, monetary policy and unemployment or trade and monetary

policy with the majority being on a country level as against a regional level analysis. And given the difference in the measure of trade, location of study and in some cases differences in econometric models used, findings from previous research remain mixed and inconclusive. Also, most studies on the topic have been conducted in more developed countries with little research on the subject in developing countries which are equally faced with the issue of high unemployment amid great efforts in trade.

The following sections of this chapter review existing literature on the relationship between monetary policy and unemployment, trade and unemployment and between monetary policy and trade.

2.7.1 Monetary Policy and Unemployment

Over the years, some scholars have attempted to explore different aspects of the relationship between monetary policy and unemployment. Most of the studies conducted have been at the country-level, with varying methods being used. Some studies examining the effect of monetary policy on unemployment are as follows.

In 2007, Alexius and Holmlund assessed the link between monetary policy and changes in unemployment in Sweden. The study used data that spanned from 1980 to 2005 and the vector autoregressive (VAR) technique in analysing the link between the two variables. The study revealed that monetary policy shocks led to fluctuations in unemployment and that monetary policy shocks in the country accounted for approximately 30 percent of Sweden's unemployment fluctuations, suggesting that output gap increases while unemployment declines as a result of monetary policy loosening.

Chicheke (2009) also explored the relationship among inflation, monetary policy and unemployment in South Africa. The research utilized the Vector Error Correction Model and data from the year 1980 to 2008. The results indicated that a cointegrating relationship exists

among monetary policy, inflation and unemployment in South Africa. Chicheke further observed that the effects of monetary policy on the other variables were long lasting. The effect was, however, felt more on inflation than on unemployment in the South African economy.

In 2015, Sunde examined the relationship between monetary policy and unemployment in Namibia using the structural VAR estimation technique and data covering 1980 to 2013. The findings revealed that in the short run, unemployment levels were impacted by monetary policy decisions in Namibia, though this was not effective in the long run.

In the case of Nigeria, Essien et al. (2016) examined the impact of monetary policy on unemployment in Nigeria from 1983 to 2014 using a vector autoregressive (VAR) estimation technique. The finding revealed a dynamic relationship between monetary policy and unemployment in the country of study, with monetary policy tightening causing a rise in unemployment rates and all the regressors in the model jointly caused unemployment in Nigeria. Ibekwe (2018) examined the impact of monetary policy variables including monetary policy rate, money supply, exchange rate and treasury bill rate on unemployment in Nigeria and found a negative impact of the variables on unemployment levels in Nigeria.

Furthermore, Benazić and Rami (2016) used the bounds testing Autoregressive Distributed Lag approach for cointegration estimation technique in analysing the effect of monetary policy on unemployment in Croatia and found that stable cointegration relationship existed between monetary policy and levels of unemployment in Croatia. Monetary Policy, however, played a limited role in the reduction of unemployment levels in Croatia.

In a panel data study by Assemien, Esso and Kanga (2019), the effect of shocks in monetary policy on employment in West Africa was examined. The study used the Dynamic Stochastic General Equilibrium technique and data sourced from West African Economic and Monetary Union member countries covering from the period of 1993 to 2014 for the estimation. The

results of the study indicated that the impact of monetary policy on employment levels depended on the characteristics of the labour. Also, it was found that monetary policy loosening increased investment, employment and job finding probabilities. The findings were further verified using structural panel VAR. From the structural panel VAR analysis, it was confirmed that an expansionary monetary policy shock increased not only investments but also household consumption.

Dallari and Ribba (2020), using the structural near-VAR approach, investigated the effects of monetary policy and government spending on unemployment across European peripheral countries from 1999 to 2016. The findings showed that monetary policy jointly with other macroeconomic shocks impacted unemployment outcomes in the countries sampled. They observed that monetary policy tightening shocks drove national economies into a state of recession. In Serbia, Veselinović (2020) examined the impact of monetary policy on unemployment rates using time-series data spanning 2009 to 2019 and the vector error correction model. The findings showed that monetary policy rate did not significantly impact unemployment in Serbia.

In 2021, Mahadika and Wibowo explored the impact of monetary policy on Indonesia's unemployment rates. They found that, monetary policy variables, real interest rate, and real exchange rate negatively and significantly affected unemployment rates in Indonesia. The effect of monetary policy was, however, temporary. A time series data from the year 1975 to 2016 and the Autoregressive Distributed Lag method econometric method were used in Mahadika and Wibowo's study.

2.7.2 Trade and Unemployment

Over the years, a number of scholars around the world have sought to explore the link between trade and unemployment in their geographical locations. Whilst some studies focused on

aggregate unemployment, others examined youth unemployment while others explored the differences between genders when it comes to the issue of unemployment. Different econometric models have been used in establishing the relationship over the years making the subject matter and relationship between trade and unemployment inconclusive. Some prominent works are as follows.

In 2003, Goldberg and Pavcnik investigated the relationship between trade liberalization and informality using data from Colombia and Brazil. The study followed a time where both Brazil and Colombia had undergone massive lessening of trade barriers. The finding showed that whilst there was no indication of a relationship between trade and the formal sector in Brazil, the case of Colombia was different; a relationship was found between the two variables in Colombia. The relationship observed, however, was only during periods before major labour market reforms. The reforms were found to cause an increase in the flexibility of the Colombian labour market. The finding highlighted that labour market institutions were significant to access the impact of trade policy on labour markets.

Dutt, Mitra and Ranjan in 2009 employed both ordinary least squares and instrumental-variables approaches to analyse panel data from the year 1985 to 2004 in exploring the impact of international trade on unemployment with a focus on trade resulting from Ricardian Comparative advantage and Heckscher-Ohlin. The study found that in the short run, trade liberalization caused increases in unemployment. However, with time, a steady state is achieved as unemployment starts to reduce. The findings revealed that increased trade openness caused reduction in unemployment under the Ricardian model. On the flip side, a mixed relationship was observed between trade and unemployment in the Heckscher-Ohlin model. Countries that were capital abundant experienced high unemployment levels when trade increased and those that were labour abundant experienced lower levels of unemployment in times of increased trade openness.

In 2011, Felbermayr, Prat and Schmerer explored the link between unemployment rates and trade openness in twenty OECD countries from 1980 to 2003. A cross-sectional analysis was also conducted among an increased number of countries over the same period. They found a negative association between trade and unemployment rates in the long run and short run, with increases in openness to trade causing a decline in unemployment rates. The models used included a GMM panel regression for the OECD sample and two-stage least-squares regression for large cross-section of countries.

Kim's study in 2011 also investigated the possible impact of international trade on unemployment. Similar to Felbermayr et al. (2011), twenty OECD countries over the period between 1961 and 2008 were studied. Kim included labour market institutions in his study and found that unemployment levels increased with higher trade in the presence of rigid labour market. However, in countries where labour markets are more flexible, unemployment was not affected by high trade levels.

In 2012, Heid and Larch employed instrumental variables fixed effects and dynamic panel estimation technique in exploring the impact of migration and trade on unemployment in 24 OECD countries spanning from 1997 to 2007. The findings revealed a positive and significant relationship between international trade and unemployment, with increased trade leading to increased unemployment rates in the countries sampled. The results of the study also showed the existence of high levels of unemployment over time.

Carrère et al. (2014), using a difference-in-difference analysis and a panel data set of 97 countries between 1995 and 2009 explored the effect trade has on unemployment and found that countries with comparative advantage in steady labour market frictions sectors experienced increased levels of unemployment in the presence of trade liberalization as compared to weaker labour market friction countries.

In 2020, Demiral, Demiral, Khoich and Maidyrova, used a panel regression analysis to examine the factors contributing to unemployment in 17 developing countries and 18 developed countries spanning from 2005 to 2016 and found that while trade liberalization enhanced employment in developing countries the story was entirely different in developed countries where liberalization increased unemployment levels.

Liu et al. (2022) explored the relationship among institutional performance, public expenditure, trade openness and unemployment in the Organization of Islamic Cooperation member countries over the period of 1991 to 2018. Using the Dynamic common correlated effects technique, they found in lower-income countries that trade openness had a negative and significant association with unemployment and youth unemployment. And in higher-income countries, trade had a positive relation with unemployment.

In the area of trade-unemployment in Africa, Anyanwu (2014) used data spanning 1980 and 2010 and pooled Ordinary Least Squares with country fixed effects to analyse the link between trade and unemployment amongst the youth in Africa and found that the youth unemployment problem in the Sub-Sahara African region could be reduced using intra-African trade as high levels of trade caused a reduction in youth unemployment. Also, Wahab (2018), using the GMM estimation technique and data from 35 Sub-Sahara African countries over the period of 1991 to 2015, observed that youth unemployment and aggregate unemployment in Sub-Saharan Africa declined with increased trade openness. The effect, however, was less in the reduction of aggregate unemployment as compared to youth unemployment.

Lastly, in 2020, Kpognon, Ondoa and Bah analysed the link among youth unemployment, labour market regulations and trade openness in the Sub-Sahara African region. The study which used 41 countries spanning the years 2002 and 2017 and employed the instrumental variable two-stage least squares and pooled ordinary least squares (OLS) regression estimation

techniques showed that although labour market regulation rigidity and trade openness have a significant and positive effect on youth employment, in economies with massive labour market rigidities, trade openness had an inverse relationship with youth employment.

2.7.3 Monetary Policy-Trade Openness Interaction and Unemployment

While much research has investigated the relationships between trade openness and unemployment and monetary policy and unemployment, little is known about the interaction of monetary policy and trade and its effects on unemployment rates. Existing literature on monetary policy and trade suggests the possible relationship thereof. Studies such as Raifu (2017) and Bhat and Beg (2023) suggest that other macroeconomic policies enhance trade in promoting employment. Some research on monetary policy and trade which provides insights into the relationship between the two variables and its impact on unemployment are highlighted below.

Early research by Işik and Acar (2006) explored the relationship among monetary policy effectiveness in output and trade openness, using pooled data from 42 countries from 1990 to 2000. The results from the study showed that economies with high degree of openness experienced fewer effects on output with changes in money supply. Also, developing open economies experienced lesser output and trade in the presence of monetary loosening compared to that of countries with more developed economies.

Berument, Konac and Senay (2007) also examined the relationship among trade openness in an economy and monetary policy effectiveness on inflation and output growth in 29 countries using quarterly data from 1957 to 2003 and found that the relationship between trade openness and monetary policy effectiveness in output growth varied with country as the relationship depended on other country-specific factors.

In 2010, Cooke used a two-country general equilibrium model to explore how trade integration is affected by aggregate labour productivity and monetary policy shocks. The findings of the study showed that monetary policy tightening increased productivity in domestic export business but reduced output in foreign businesses. On the other hand, Cwik, Muller and Wolters (2011) assessed the role of trade openness in the transmission of monetary policy in the United States of America compared to that of Europe and found that monetary transmission in the United States is significantly altered by trade openness under the new Keynesian model. And that increase in trade openness has monetary policy tightening effect on output and inflation.

Usman and Adejare (2014) used data over the years 1980 to 2011 to explore the effect of monetary policy on industrial growth in the manufacturing sector in Nigeria. Their findings indicated that monetary policy instruments, deposits and rediscount rate, have a significant positive effect on manufacturing output in the Nigerian economy. Furthermore, in a study on monetary shocks and output, Ridhwan, de Groot, Rietveld and Nijkamp (2014) found differences in monetary policy response across the various sectors in Indonesia, with manufacturing firms being more sensitive to monetary policy shocks compared to firms in the agricultural sector. They also observed that changes in monetary policy greatly affected output in developing economies compared to developed economies.

Adler and Buitron (2017), using data covering 1992 to 2016, explored the impact of monetary policy shocks on the trade balance of the United States of America. The results revealed that a significant relationship exists between monetary policy and trade balances. Per the findings, monetary policy loosening strengthened trade balance and monetary tightening weakened the United States' trade balance.

Ahiakpor et al. (2019) and Chiaraah (2019), using data over the period of 2002 to 2017 and 2002 to 2016 respectively, analysed monetary policy effectiveness and how trade policy and

trade openness influence monetary policy in Ghana. Both studies found that at high degree of trade openness, monetary policy is less effective in causing reduction in output gap but more effective in causing reduction in inflation. The results indicated that monetary policy could be used to reduce the negative effect of trade openness on inflation in Ghana. Similarly, Effiong, Ekpo and Johnson (2019) found that at a high degree of trade openness, monetary policy negatively affected inflation but positively affected output growth in Africa, suggesting that monetary policymakers need to consider trade openness levels in making monetary policy decisions.

In 2020, Ashamu examined the link between monetary policy and foreign trade in Nigeria and found a positive relationship among monetary policy and foreign trade within the period of 1981 to 2017. He observed using the Error Correction Model that, when monetary policy rates increased, trade also increased. Also, Cacciatore and Ghironi (2021) in their study on trade, unemployment and monetary policy, found that trade positively impacted on monetary policy amid labour market frictions and other labour market forms.

2.7.4 Other Macroeconomic Factors and Unemployment

Research on unemployment over the years has highlighted some macrolevel factors that affect unemployment rates in an economy. Such factors include real GDP growth, inflation rate, exchange rate, government expenditure, FDI, amongst others.

GDP Growth Rate is a macroeconomic factor which has been identified in the existing literature to influence unemployment levels in an economy. The Okun's Law provides a theoretical framework for the relationship between unemployment and GDP growth. Adamu, Kaliappan, Bani and Nor (2017) observed that the relationship between economic growth and unemployment in Sub-Saharan Africa followed the Okun's law as they found an inverse relationship between the two variables. On the contrary, Abraham and Nosa (2018) using data

from 1991 to 2017 and employing the Panel Least Squares and Ordinary Least Squares estimation techniques found a mixed relationship between growth and unemployment as an inverse relationship was observed between unemployment and GDP growth rate for some countries in Sub-Saharan Africa and a positive relationship in other Sub-Saharan African countries. The observations highlighted a varying relationship between GDP growth and unemployment across countries and the possible existence and non-existence of the Okun's law in countries in the region.

On the topic of **government expenditure**, Fosu (2019) analysed the relationship between government expenditure and unemployment using pooled OLS, fixed and random effect and found a positive relationship between government consumption expenditure and unemployment in the Sub-Sharan African region. Also, Onuoha and Agbede (2019), using GMM technique with panel data from 2000 to 2017, found that government expenditure on health and defense increases unemployment in the Sub-Sahara African region. Government expenditure on education and infrastructure, however, decreases unemployment rates in the region.

Foreign Direct Investment: Studies including Mustafa and Azizun (2020), Atilaw, Sisay and Shiferaw (2022) and Ositaufere and Okafor (2024) examined the relationship between foreign direct investments and unemployment in the Middle East and North Africa, East Africa and Sub-Saharan Africa respectively. The finding of these studies revealed an inverse relationship between Foreign Direct Investment (FDI) and unemployment. Various econometric techniques were employed in these studies ranging from fixed effect model, random effect model and non-linear autoregressive distributed lag. Mustafa and Azizun (2020), additionally, found that whilst a negative relationship exists between the variables in the long run, a positive relationship exists between FDI and unemployment in the short run.

Inflation: Research on inflation and unemployment over the years has highlighted the dynamic relationship between inflation and unemployment. In Sub-Saharan Africa, a study conducted by Ahiadorme (2022) revealed that the Phillips curve hypothesis of inverse relationship between inflation and unemployment was weak in the region. Varying relationships were observed with some countries having a positive relationship and others a negative relationship. The study by Daniel, Israel, Chidubem and Quansah (2021) on the relationship between inflation and unemployment in Nigeria, however, found no significant relationship between the two variables, noting that monetary policies and fiscal policies rather influenced unemployment levels in the country.

Credit to Private Sector: The existing literature indicates that the availability of private credit influences levels of unemployment in an economy. In a study on the relationship between bank credit and unemployment in countries in Europe, Göçer (2013) noted that increase in credit reduced unemployment rates in the European countries. The study by Azolibe, Dimnwobi and Uzochukwu-Obi (2022) highlighted varying effects of bank credit on unemployment rates in South Africa and Nigeria. Whilst an inverse relationship was observed in the case of unemployment in South Africa, a positive and insignificant relationship was observed amongst the variables in Nigeria. Similarly, in ECOWAS countries, Ozili and Oladipo (2024) noted that contraction of private credit increased unemployment; however, expansion of credit had no effect on unemployment in the ECOWAS countries.

Gross Fixed Capital Formation: Studies on the determinants of unemployment have highlighted the relationship between gross fixed capital formation and unemployment levels. Sigurdsson (2013) found that increases in capital formation led to a reduction in unemployment. Similarly, Alrayes and Abu Wadi (2018) found a negative relationship between fixed capital formation and unemployment in Bahrain. In South Africa, Meyer and Sanusi

(2019) found domestic investment had positive effects on employment, suggesting that an increase in domestic investment in the form of capital formation reduces unemployment.

Institutionalized Democracy: On the subject of institutions and unemployment, a study by Ilyas and Khan (2019) revealed that unemployment in times of democratic regimes was high compared to that of dictatorships in Pakistan, highlighting the role of political structure in influencing unemployment in a country. In Sub-Saharan Africa, the study by Wahab (2018) showed that an increase in institutionalised democracy increased aggregate unemployment and youth unemployment.

GDP Per Capita: Studies such as Rahman (2013), Okuom, Obange and Odhiambo (2023) highlight the link between GDP per capita and unemployment. Both studies found a negative relationship between GDP per capita and unemployment. Okuom et al. (2023) observed that high per capital income in Kenya was associated with low youth unemployment in Kenya in the long run. The study of Feng, Lagakos and Rauch (2021), however, found a positive relationship between the variables, with increase in GDP per capita causing an increase in unemployment.

Urban Population: Literature on unemployment also notes a significant relationship between urbanisation and unemployment over the years. Some research on the topic includes

Chen, Huang, Cheng, Tang and Huang (2023) who found that urbanization had negative effects on employment using a sample of 163 countries from 1991 to 2019. They also noted that different income countries reacted to the relationship differently which is similar to the study of Saheed, Adeneye, Ibrahim and Alexander (2018) which found that rural-urban migration increased unemployment in Nigeria.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

In this chapter, the study design, study area and methods employed in the research are discussed. The chapter presents information on the empirical models and econometric methods used in analysing the relationship among trade, monetary policy and unemployment rates in the Sub-Saharan African region. Variables considered in the empirical estimation, the data sources and description of the data are also discussed.

3.2 Research Design, Area and Data Source

A panel design with a quantitative approach was used in exploring the relationship among monetary policy, trade openness and unemployment in this study. In a panel research design, data is collected on a number of observations over an extended period of time, allowing for observation and analysis of changes and trends over time within the group of observations.

The study is conducted in Africa; specifically, the data collected was on Sub-Saharan Africa. 39 countries out of the 48 Sub-Saharan African countries were used. Additionally, a sub-regional analysis was conducted, involving 17 Anglophone Sub-Saharan African countries and 18 Francophone Sub-Saharan African countries. These countries were sampled based on data availability. The data collected span from 2001 to 2022 to reflect trends in the 21st Century.

Data from secondary sources were used in exploring the relationship among the variables in this study. The research used data from the World Development Indicators (WDI) of World Bank database, International Financial Statistics (IFS) of International Monetary Fund database and Centre for Systemic Peace's Polity5 databases. The World Development Indicators is a collection of development indicators, compiled from international sources that are officially recognized. It reflects global development data such as national data and regional estimates,

which are accurate and, in most cases, current. The International Monetary Fund's International Financial Statistics, on the other hand, contains statistical datasets for fund members, with data ranging from exchange rates, monetary statistics, interest rates among others. The Polity5 dataset presents data on all major and independent states in the global system, with data consisting of government regime forms, political competitions, key executive recruitment qualities and limitations on executive authority, as well as any changes in governing authority's institutionalized qualities.

Aside data on monetary policy rate which was collected from the IFS database and data on the Level of Institutionalized Democracy collected from the Polity5 database, all other data were sourced from the WDI. The data used in the study is unbalanced as not all the variables contains the same data points as a result of missing data in some years. Table 3.1 lists the variables used in the study, the variable's description and the database from which data was sourced.

3.3 Model Specification

Following the works of Anyanwu (2014) and Liu et al. (2022), in analysing the relationship among monetary policy, trade openness and aggregate unemployment rates, the model estimated is written as:

$$AUN_{it} = \beta_0 + \beta_1 AUN_{it-1} + \beta_2 \text{TO}_{it} + \beta_3 MPR_{it} + \beta_4 GDPGro_{it-1} + \beta_5 FDI_{it} + \beta_6 INF_{it} + \beta_7 UPS_{it} + \beta_8 DI_{it} + \beta_9 GOV_{it-1} + \beta_{10} CPS_{it-1} + \beta_{11} \ln GDPPC_{it} + \beta_{12} POL5_{it} + \varepsilon_{it} \ldots (1)$$

where AUN_{it}, AUN_{it-1}, TO_{it}, MPR_{it}, $GDPGro_{it-1}$, UPS_{it}, FDI_{it}, INF_{it}, DI_{it}, GOV_{it-1}, CPS_{it-1}, $POL5_{it}$, $\ln GDPPC_{it}$, $\beta_0, \beta_1, \ldots, \beta_{13}$, ε_{it} *denotes* Aggregate Unemployment Rate, Lagged Aggregate Unemployment Rate, Trade Openness, Monetary Policy Rate, Lagged Real GDP Growth, Urban Population Share, Foreign Direct Investment, Inflation, Domestic Investment, Lagged Government Expenditure, Lagged Credit to Private Sector, Level of Institutionalized

Democracy, Natural log of GDP Per Capita, Coefficients to be estimated, Error term respectively. And *i*, *t* denotes country index and time index in years respectively

Following the estimation above, in analysing the link between trade openness, monetary policy and youth unemployment, the model is modified and written as:

$$YUN_{it} = \beta_0 + \beta_1 YUN_{it-1} + \beta_2 \text{TO}_{it} + \beta_3 MPR_{it} + \beta_4 GDPGro_{it-1} + \beta_5 FDI_{it} + \beta_6 INF_{it} + \beta_7 UPS_{it} + \beta_8 DI_{it} + \beta_9 GOV_{it-1} + \beta_{10} CPS_{it-1} + \beta_{11} \ln GDPPC_{it} + \beta_{12} POL5_{it} + \varepsilon_{it} \ldots (2)$$

where YUN_{it}, *and* YUN_{it-1} *denotes Total Youth Unemployment* and *Lag of Total Youth Unemployment respectively. All other notions remain the same as in the case of aggregate unemployment.*

In analysing the interactive effect of trade openness and monetary policy rates on aggregate unemployment, the model is estimated as:

$$AUN_{it} = \beta_0 + \beta_1 AUN_{it-1} + \beta_2 \text{TO}_{it} + \beta_3 MPR_{it} + \beta_4 (TO_{it} * MPR_{it}) + \beta_5 GDPGro_{it-1} + \beta_6 FDI_{it} + \beta_7 INF_{it} + \beta_8 UPS_{it} + \beta_9 DI_{it} + \beta_{10} GOV_{it-1} + \beta_{11} CPS_{it-1} + \beta_{12} \ln GDPPC_{it} + \beta_{13} POL5_{it} + \varepsilon_{it} \ldots (3)$$

Similarly, in analysing the interactive effect of trade openness and monetary policy rates on youth unemployment, the model is estimated as:

$$YUN_{it} = \beta_0 + \beta_1 YUN_{it-1} + \beta_2 \text{TO}_{it} + \beta_3 MPR_{it} + \beta_4 (TO_{it} * MPR_{it}) + \beta_5 GDPGro_{it-1} + \beta_6 FDI_{it} + \beta_7 INF_{it} + \beta_8 UPS_{it} + \beta_9 DI_{it} + \beta_{10} GOV_{it-1} + \beta_{11} CPS_{it-1} + \beta_{12} \ln GDPPC_{it} + \beta_{13} POL5_{it} + \varepsilon_{it} \ldots (4)$$

Where, $TO_{it} * MPR_{it}$ *denotes the interactive effect of Trade Openness and Monetary Policy Rate. All other notions remain the same as in the case of the models without the interactive effect.*

3.4 Definition and Measurement of Variables

The study examined the effect of the independent variables on the dependent variable controlling for some macroeconomic factors in the quest to investigate the relationship between monetary policy, trade and unemployment in Sub-Saharan Africa.

3.4.1 Dependent Variable

Unemployment Rate

Unemployment rate is the study's dependent variable. Unemployment is referred to as the share of labour force who are available to work and are searching for employment but are without work. Data collected on unemployment includes aggregate unemployment and youth unemployment. While aggregate unemployment measures the share of the total labour force who are unemployed expressed in percentage, youth unemployment only takes into consideration those that are within the ages of 15 to 24 (World Bank, 2024). Unemployment rates sourced from WDI are modelled International Labour Organization (ILO) estimates.

Previous year's unemployment rates are likely to influence current unemployment rate. Thus, by following the work of Hjazeen, Seraj and Ozdeser (2021), for each dependent variable estimation, the first lag of the dependent variable is included in the regressors. It is expected that increases in unemployment rate of the previous year will also cause an increase in the current year's unemployment rate.

3.4.2 Independent Variables

Monetary Policy Rate

Monetary Policy Rate forms part of the main independent variables in the study. Monetary Policy involves using interest rates in controlling the overall supply of money in an economy. Stabilizing price levels as well as promoting economic growth is the desired outcomes for which monetary policy is implemented (Friedman, 1968). Different countries have different

names for their monetary policy rates, including names such as bank rates, repurchase rates, rediscount and discount rates (Focus Economics, 2024). In these countries, the central banks use these rates to perform the same function of the monetary policy rate. Monetary policy rate is used in measuring monetary policy stance in this study. The theoretical foundation for monetary policy in the study is the monetary policy transmission mechanism.

Data for monetary policy is sourced from the IFS database of IMF. There is the probable relationship among monetary policy and trade through the monetary policy's exchange rate channel; thus, an interacting effect is also included as an explanatory variable. Monetary Policy rate tends to influence various rates in an economy and thus we expect that a decrease in monetary policy rates will decrease unemployment.

Trade Openness

Trade Openness forms part of the main independent variables in this study. Trade Openness is measured by summing up a country's exports and imports and expressing it as a share of the Gross Domestic Product (GDP) of that country (Fujii, 2017). Trade Openness reflects an economy's actual exposure to international trade. While much research in the past years has used the nominal measure of trade openness (that is, the sum of nominal imports and exports relative to nominal GDP), this research uses a real measure of trade openness proposed by Alcalá and Ciccone (2004). The Heckscher-Ohlin theory of trade provides the theoretical foundation for trade in this study, and it is expected that trade openness will usually lead to trade creation and should have positive outcomes for employment, thereby reducing unemployment.

3.4.3 Control Variables

Level of Institutionalized Democracy

Level of institutionalized democracy is the measure of political freedom, economic freedom as well as the liberties citizens of a particular country enjoy (Center for Systemic Peace, 2024). The theory of institutional economics provides insights into the role of institutions in shaping market outcomes and employment (Cornwall, 1999). It is a moderating variable in the model. According to Anyanwu (2014), the creation of sustainable liberal democracy is beneficial in reducing unemployment rates in countries, especially among the youth. An increase in institutionalized democracy is expected to translate into a reduction in unemployment rates as civil freedom creates opportunity for the populace to start and operate business ventures causing job creation. Data for level of institutionalized democracy is sourced from the Polity5 Dataset of the Centre for Systematic Peace. The polity5 project uses a 21-point scale which lies between +10 and -10 to capture regime authorities. It is further categorized into sub-regimes where +6 to +10 denotes democracies, -10 to -6 denotes autocratic regimes and -5 to +5 denotes regimes that practice anocracy with special values -66, -77 and -88. Under the Polity5 framework, a higher polity score reflects a stronger democratic regime, while a lower score indicates a lower democracy. It is expected that countries with much more freedom experience lower levels of unemployment as there is liberty to effectively implement laws that lead to job creation.

Real GDP Growth

Okun's Law well explains the link that exists between GDP growth and unemployment. It posits that an increase in economic growth in a country would translate into better outcomes for the total population and lead to a fall in unemployment of that country. According to Anyanwu (2014), an improved economy increases the incentives for the population to work or enter the labour market as household unearned income rises thereby reducing unemployment.

Following the work of Marelli, Choudhry and Signorelli (2013), the lagged of real GDP growth is included in the estimation as an independent variable and it is expected that a rise in real GDP growth will reduce unemployment rates.

Foreign Direct Investment

Foreign Direct Investment (FDI) denotes the transfer of capital from one country to the other (Angmosi, 2020). FDI forms part of the control variables in the study. The Foreign Direct Investment data used for the estimation is the net inflows of FDI as a share of GDP expressed as a percentage (World Bank, 2024). Neoclassical growth theory provides insights on the use of FDI in the form of capital and technology in influencing output and employment levels in an economy (McCombie, 1988; Mahembe & Odhiambo, 2014; Mwakabungu & Kauangal, 2023). Trends have shown that FDI inflows to the African continent has increased over the years. While FDI increases create the opportunity for higher output and job creation, issues such as export substitutions abound as local businesses may be displaced hereby causing unemployment to increase. Furthermore, increased FDI does not necessarily translate into increased employment as inflows may not be geared towards job creation. Data on FDI is sourced from the WDI database.

Urban Population Share

The portion of the total population of a country living in places identified as urban at a specific point in time makes up the urban population share (World Bank, 2024). Theories of migration such as the dual labour market theory provides a theoretical background for urbanisation and the impact on demand, growth and employment (Smith & Zenou, 1997; de Groot, 2001). According to Kpognon, Ondoa and Bah (2020), new urban demand causes importation growths, and the use of the right policies and measures could promote local value chains as well as create jobs as urbanization brings about increased consumption. It is expected that when

this is brought into the SSA setting, an increase in urban population share should decrease unemployment.

Domestic Investment

Investment is vital in influencing growth and employment levels in an economy. The balance theory of capital formation, Harrod-Domar theory and Solow-swan model provides insights into the use of investment in capital for productivity, growth and employment (Sigurdsson, 2013; Todaro & Smith, 2015; Pasara & Garidzirai, 2020). Gross Fixed Capital Formation is used in measuring domestic investment in this study with data sourced from WDI. It captures the relevant assets used in producing goods and services in an economy. These assets include machinery, plants and equipment through which revenue is generated. The higher the domestic investment available to the government and the private sector, the more there are resources available to create employment for the population. It is therefore expected that a rise in domestic investment will decrease unemployment.

Inflation Rate

The rise in general price levels of commodities in a country over a period of time is referred to as inflation (Congressional Research Service, 2023). The Philips curve establishes an inverse relationship among unemployment and inflation. There is, however, a situation where employers respond to inflation by reducing employment due to increases in cost of production and demand for higher wages. The effect here therefore is uncertain. Consumer Prices Index is used as the measure for inflation in the study with data sourced from WDI. By including inflation, the effect of macroeconomic variables is also controlled for.

Credit to Private Sector

Financial institutions in countries provide financial resources to private sector institutions in their countries in the form of trade credits, loans and securities. These financial resources go a

long way in job the creation and reduction of unemployment as businesses use them for expansion. The theory of financial development provides a theoretical background to the use of credit to the private sector to influence economic growth and employment (Khan, 1999). When credit is readily available to the private sector, they are empowered to increase production and increased production calls for more labour which is an increase in employment. In this study, credit to the private sector is lagged and it is expected that a rise in credit to the private sector will decrease unemployment.

Real GDP Per Capita

Real GDP per capita of a country is measured by GDP of the country as a share of its population in constant US$ dollar (World Bank, 2024). It is the income growth pace per head of the population and is used as an indication of the standard of living of people in a country (Bergeaud, Cette & Lecat, 2015). Economic growth theories set the theoretical foundation for GDP per capita. While earlier research by Kim (2011) finds a negative relationship between GDP per capita and unemployment rates, Anyanwu in 2014 found a positive relationship among the variables in Africa. Following from past studies, the link between real GDP per capita and unemployment is vague and may either be positive or negative.

Government Consumption Expenditure

Government Consumption Expenditure measures all expenses made by government on goods and services as well as remuneration for public sector workers (World Bank, 2024). Whilst government expenses on natural security and defence are included in the government consumption expenditure, a clear cut is made on government military expenses which is excluded from government consumption expenditure and forms part of government capital formation. The Keynesian theory provides insights into the use of government intervention in influencing economic growth and employment (Keynes, 1936). Increases in government

consumption expenditure is expected to reduce the resources available for the government to use on economic programs that leads to job creation. In this study, government expenditure is lagged following the notion that government spending activity may have a gradual and delayed effect on unemployment as policy intervention may not have immediate effect. We expect then that a positive relationship would exist between government consumption expenditure and unemployment.

Table 3.1 Sources of Data and Description of Variables

Name of Variable	Description of Variable	Data Source
Aggregate Unemployment	% of total labour force	WDI
Youth Unemployment	% of total labour force within the age 15 to 24	WDI
Monetary Policy Rate	Central Bank Policy Rates	IFS
Trade Openness	Sum of exports and imports (% of GDP-PPP)	WDI
Inflation Rate	Inflation, consumer prices (annual %)	WDI
Real GDP Growth	GDP growth (annual %)	WDI
Level of Institutionalized Democracy	Polity5 index	Polity5
Credit to Private Sector	Domestic credit to private sector (% of GDP)	WDI
Foreign Direct Investment	Net FDI Inflows (% of GDP)	WDI
Real GDP Per Capita	GDP per capita (current US$)	WDI
Domestic Investment	Gross Fixed Capital Formation (% of GDP)	WDI
Urban Population Share	Urban population (% of total population)	WDI
Government Consumption Expenditure	General government final consumption expenditure (% of GDP)	WDI

Expected Signs of Explanatory Variables

From the review of literature on the variables used in the study, the following direction of relationships or signs are expected between the explanatory variables and unemployment as shown in Table 3.2 below.

Table 3.2 Expected Signs of Explanatory Variables

Name of Variable	Expectation
Lagged Aggregate Unemployment	Positive
Lagged Youth Unemployment	Positive
Monetary Policy Rate	Positive
Trade Openness	Negative
Lagged Real GDP Growth	Negative
Level of Institutionalized Democracy	Negative
Lagged Credit to Private Sector	Negative
Urban Population Share	Negative
Foreign Direct Investment	Positive
Inflation Rate	Negative / Positive
Natural Log of Real GDP Per Capita	Negative/ Positive
Lagged Government Consumption Expenditure	Positive
Domestic Investment	Negative

3.5 Estimation Technique

This study employs the System Generalized Method of Moments (GMM) panel estimations in estimating the models used in finding the relationship among trade, monetary policy and unemployment. The GMM is a dynamic panel data estimation technique that allows for the

inclusion of a lagged dependent variable as a regressor. The introduction of the lagged unemployment rate (aggregate unemployment and youth unemployment) is justified on both theoretical and empirical grounds. Theoretically, unemployment is a persistent variable where current unemployment levels are often influenced by past unemployment rates due to factors such as labor market rigidity, skill mismatch, and adjustment costs. Empirically, including the lagged unemployment rate captures the dynamic nature of unemployment, improving the model's explanatory power by accounting for inertia or path dependency in unemployment dynamics. However, including the lagged unemployment rate as an independent variable introduces the issue of endogeneity, as it may correlate with the error term due to its dependence on prior shocks. The System GMM addresses this by using lagged differences of the regressors as instruments for the level equation.

The technique also accounts for potential reverse causation between trade openness and unemployment rates and monetary policy and unemployment rates. System GMM, as introduced by Blundell and Bond (1998), combines equations in levels and first differences, utilizing lagged differences as additional instruments for the level equation. This approach yields more robust results compared to the earlier difference GMM method proposed by Arellano and Bond (1991). To mitigate the problem of instrument proliferation, the number of instruments is limited to ensure they do not exceed the number of groups in the panel, as established by Mileva, Bruhn and Weickert (2007).

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

In this chapter, the results and findings of the study are presented and discussed. It starts by providing the results of the descriptive statistics which describes the nature and features of the dataset and the extent to which it can affect the findings of this study. Next, the correlation matrix and the variance inflation factor are also presented to indicate the kind of relationship among the variables and how it is likely to influence the findings. Additionally, findings from the diagnostic tests conducted in the study are presented. The chapter ends with the presentation and discussions of the results.

4.2 Descriptive Statistics

The descriptive statistics provides vital information of the dataset used in the study. It consists of the number of observations, standard deviation, mean, maximum and minimum values for the variables analysed in this study. Essentially, the statistics provides relevant insights into the attributes and characteristics of the dataset with its variability and distribution.

Table 4.1 Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Aggregate Unemployment Rate	858	8.3226	7.1108	0.317	37.852
Trade Openness	846	67.0568	29.1991	2.6988	175.798
Monetary Policy Rate	793	9.398831	10.4560	0.25	150
Government Expenditure	830	14.60695	6.5703	0.9517	44.5445
Real GDP per capita	858	7.053019	1.0168	4.7394	9.8959
Credit to Private Sector	835	20.3087	23.0044	0.0016	142.422
Domestic Investment	828	22.79319	9.2650	1.5251	76.7823
Real Gross Domestic Growth	858	4.137685	5.4157	-36.392	63.3798
Inflation	824	9.285971	30.1409	-16.8597	557.2018
Urban Population Share	858	40.94637	16.3884	8.461	90.735
Foreign Domestic Investment	855	3.836807	5.8340	-17.2921	64.3841
Level of Institutionalized Democracy	699	1.9299	14.0666	-88	10
Total Youth Unemployment	858	15.43611	14.0105	0.468	65.343

Source: Author's Construction using STATA

The descriptive statistics presented in Table 4.1 highlights substantial variability and trends across key macroeconomic and institutional indicators in Sub-Saharan Africa. The aggregate unemployment rate has an average of 8.32%, with a standard deviation of 7.11%, showing considerable variation across countries. Niger recorded the lowest unemployment rate of 0.317% in 2011, while Eswatini registered the highest at 37.852% in 2022. This wide disparity reflects differences in labor market dynamics and structural economic challenges across the region. Youth Unemployment, with an average of 15.44% and a standard deviation of 14.01%, demonstrates a more pronounced issue of youth unemployment. The minimum value of 0.468%, recorded by Niger in 2011, and the maximum value of 65.343% in Eswatini in 2022, further underscores the disproportionate challenges young people face in accessing employment opportunities. These trends align with the existing literature indicating that youth

unemployment is often more severe than aggregate unemployment due to structural barriers and skill mismatches in the labor market.

Trade Openness has a mean value of 67.06%, with a standard deviation of 29.20%, indicating significant differences in trade integration across the region. Sudan's low of 2.6988% in 2022 contrasts sharply with Eswatini's high of 175.798% in 2002, reflecting varying levels of engagement in international trade. Foreign Direct Investment (FDI) averages 3.84%, with a standard deviation of 5.83%. Negative FDI flows, such as -17.2921% in the Republic of Congo in 2020, indicate economic instability, while Equatorial Guinea's high of 64.3841% in 2001 points to resource-driven investment inflows. These statistics highlight the importance of creating a stable and attractive investment climate to maximize FDI's benefits for economic growth and development.

The Monetary Policy Rate exhibits a significant variability, with a mean of 9.40% and a standard deviation of 10.46%. The lowest rate of 0.25%, recorded by Cape Verde in 2020, reflects efforts to stimulate economic activity through accommodative monetary policy, whereas Angola's exceptionally high rate of 150% in 2002 illustrates extreme contractionary measures likely employed to combat hyperinflation or currency instability. This variation demonstrates the diverse monetary policy responses to macroeconomic challenges in the region. Government Expenditure averages 14.61%, with a standard deviation of 6.57%. Nigeria's expenditure ranged from a low of 0.9517% in 2003 to a high of 44.5445% in 2005, reflecting substantial fluctuations in fiscal policy. High government spending may signify developmental priorities or resource revenues, while lower levels may indicate fiscal constraints.

Real GDP Per Capita shows relatively low variability, with a mean of 7.05% and a standard deviation of 1.02%. The minimum value of 4.7394%, recorded by Burundi in 2003, contrasts

with the maximum of 9.8959% by Equatorial Guinea in 2008, reflecting disparities in living standards and economic performance. Credit to the Private Sector has an average of 20.31% but a high standard deviation of 23.00%, indicating uneven access to credit. Sierra Leone's minimum value of 0.0016% in 2001 and the maximum value of 142.422% by South Africa in 2007 demonstrate this disparity. Domestic Investment, with a mean of 22.79% and a standard deviation of 9.27%, also varies significantly, from a low of 1.5251% in Zimbabwe in 2005 to a high of 76.7823% in the Republic of Congo in 2015, underscoring differences in resource allocation and investment climates.

Real GDP Growth averages 4.14%, with a standard deviation of 5.42%. The lowest growth rate of -36.392%, recorded in the Central African Republic in 2013, reflects severe economic contractions, while Equatorial Guinea's highest rate of 63.3798% in 2001 highlights periods of rapid expansion, often linked to resource booms. Inflation rates, with a mean of 9.29% and a standard deviation of 30.14%, reveal extreme volatility. Zimbabwe's hyperinflationary peak of 557.2018% in 2020 contrasts sharply with Lesotho's deflationary rate of -16.8597% in 2009, illustrating the region's vulnerability to price instability and the need for effective inflation management policies.

Urban Population Share has a mean of 40.95%, with a standard deviation of 16.39%. The lowest share of 8.461% recorded in Burundi in 2001 contrasts with Gabon's high of 90.735% in 2022, reflecting varying levels of urbanization and infrastructure development. The Level of Institutionalized Democracy, with a mean of 1.93 and a standard deviation of 14.07, ranges from -88 to 10, indicating diverse political environments across the region. These statistics underscore the critical role of governance and institutional quality in shaping economic and social outcomes in Sub-Saharan Africa.

4.3 Correlation Analysis

The correlation analysis shows the degree to which the variables used in this study are correlated with one another. Specifically, it indicates both the strength of the relationship among the variables and the direction of the association among the variables. The correlation coefficient that reflects correlation among two variables ranges from +1 to –1. A high correlation coefficient usually above +/-0.5 depicts a strong relationship and a lower coefficient usually below +/-0.5) depicts a weak relationship among the variables. The sign +/- depicts the direction of the relationship, be it a positive or negative relationship. While correlation provides the information on the extent to which one variable is related to another, correlation does not necessarily imply causation.

Table 4.2 Correlation Matrix

	AUN	TO	MPR	GOV	GDPPC	CPS	DI	GDPGro	INF	UPS	FDI	POL5	YUN
AUN	1												
TO	0.465*	1											
MPR	0.065	0.033	1										
GOV	0.411*	0.419*	-0.062	1									
GDPPC	0.463*	0.426*	-0.156*	0.199*	1								
CPS	0.359*	0.176*	-0.158*	0.310*	0.471*	1							
DI	0.084*	0.425*	-0.020	0.120*	0.129*	-0.021	1						
GDPGro	-0.123*	0.008	0.068	-0.136*	-0.059	-0.130*	0.149*	1					
INF	0.032	-0.104*	0.382*	-0.092*	-0.065	-0.092*	-0.134*	-0.111*	1				
UPS	0.404*	0.310*	-0.036	0.006	0.575*	0.235*	0.201*	-0.109*	-0.041	1			
FDI	0.009	0.285*	0.102*	0.017	-0.006	-0.065	0.519*	0.252*	0.001	0.080*	1		
POL5	0.063	0.124*	0.019	0.071	0.093*	0.161*	0.167*	0.144*	0.006	0.063	0.055	1	
YUN	0.978*	0.450*	0.069	0.384*	0.518*	0.412*	0.111*	-0.115*	0.028	0.433*	0.02	0.090*	1

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Source: Author's Construction. note: AUN, TO, MPR, GOV, GDPPC, CPS, DI, GDPGro, INF, UPS, FDI, POL5, YUN represent aggregate unemployment rate, trade openness, monetary policy rate, government expenditure, Real GDP per capita, credit to private sector, domestic investment, real gross domestic growth, inflation, urban population share, foreign direct investment, level of institutionalized democracy and youth unemployment respectively.

From Table 4.2 above, the correlation matrix reveals several noteworthy relationships. The aggregate unemployment rate (AUN) shows significant correlations with various variables. Aggregate unemployment rate has positive and significant relationship with trade openness (TO; r = 0.465), government expenditure (GOV; r = 0.411), and youth unemployment (YUN; r = 0.978). The strong correlation with youth unemployment rate (YUN) highlights the interdependence between aggregate unemployment and youth unemployment. The literature supports that youth unemployment often accounts for a significant proportion of national unemployment rates (International Labour Organization, 2020). These relationships suggest that higher unemployment rates are associated with higher youth unemployment and higher GDP per capita, possibly indicating economic conditions where both the overall and youth unemployment rates are elevated despite higher income levels.

Similarly, youth unemployment rate shows a positive relationship with trade openness (TO) which aligns with studies suggesting that increased trade openness can lead to sectoral shifts that may temporarily elevate unemployment, especially in developing economies transitioning to competitive markets (Autor, Dorn & Hanson, 2016). It indicates that economies with higher trade openness may experience higher unemployment rates. Additionally, Trade Openness shows moderate positive correlations with government expenditure and domestic investment, suggesting that more open economies tend to have higher government spending and domestic investment levels. The association with government expenditure suggests that government spending may influence labour market dynamics, possibly through public sector employment programs or indirect economic stimuli.

Trade Openness exhibits significant correlations with variables such as GDP per capita (GDPPC; r = 0.426), government expenditure (GOV; r = 0.419), and domestic investment (DI; r = 0.425). These relationships are consistent with theories emphasizing the importance of trade as a driver of economic activity, influencing capital accumulation and government revenue

through tariffs and trade taxes (Krugman, 1991). The correlation between trade openness and aggregate unemployment further illustrates the complex interaction between trade liberalization and labour markets.

The monetary policy rate shows limited significant correlations, with no strong ties to key variables like aggregate unemployment or real GDP growth. However, its relationship with inflation (INF; r = 0.382) supports macroeconomic theories where central banks adjust policy rates to manage inflationary pressures (Taylor, 1993). This underscores the role of monetary policy in stabilizing economic conditions without directly addressing employment or trade fluctuations.

Government expenditure is positively correlated with aggregate unemployment (r = 0.411) and trade openness (r = 0.419), suggesting that fiscal policies significantly impact both trade and employment. Public spending, particularly in infrastructure and social programs, can stimulate trade by improving market access while potentially affecting unemployment through direct and indirect job creation (Keynes, 1936). Government Expenditure's negative correlation with real gross domestic product growth suggests that increased government spending does not necessarily translate into higher economic growth rates in the region.

Gross domestic product per capita shows moderate positive correlations with aggregate unemployment rate and youth unemployment, suggesting that higher GDP per capita is associated with higher unemployment rates. GDP per capita also has a moderate positive correlation with urban population share and a weak positive correlation with credit to private sector, indicating that wealthier economies have larger urban populations and higher levels of credit to the private sector. Credit to private sector exhibits moderate positive correlations with aggregate unemployment rate and youth unemployment, suggesting that higher credit levels are associated with higher unemployment rates.

Foreign Direct Investment has a notable positive correlation with domestic investment (DI; r = 0.519) and trade openness (TO; r = 0.285), which aligns with the hypothesis that foreign investments foster economic growth by enhancing productive capacity and trade opportunities (Borensztein, De Gregorio & Lee, 1998) and suggests that higher levels of domestic investment and economic growth attract more foreign investment. Interestingly, FDI's weak association with unemployment suggests that its impact on job creation may depend on the absorptive capacity and labour market structure of the host country. The correlation between domestic investment and foreign direct investment suggests that higher levels of domestic investment are associated with higher levels of foreign investment.

Real gross domestic product growth shows a weak positive correlation with foreign direct investment and a weak negative correlation with government expenditure, suggesting that higher growth rates may attract more foreign investment, while higher government spending may not necessarily lead to higher growth rates. Level of institutionalized democracy shows weak positive correlations with youth unemployment and trade openness, indicating that higher levels of democracy are associated with slightly higher trade openness and youth unemployment rates.

Inflation demonstrates a complex relationship, negatively correlated with real GDP growth (-0.123) and domestic investment (-0.134), consistent with studies suggesting inflationary pressures can hinder investment and economic growth. Inflation is positively correlated with monetary policy rate, reflecting the central bank's response to inflationary pressures. Conversely, urban population share (UPS) shows positive associations with trade, capital formation, and government expenditure, highlighting its role as a driver of economic activity through increased demand and labour supply (Todaro & Smith, 2015). Urban population share's strong positive correlations with gross domestic product per capita and aggregate

unemployment rate, indicates that higher urbanization is associated with higher GDP per capita and higher unemployment rates.

Youth unemployment near-perfect correlation with AUN (r = 0.978) indicates that higher youth unemployment is associated with higher overall unemployment rates. It reinforces the critical need to address youth-specific labour market challenges. High correlations of youth unemployment with variables like trade openness and GDP per capita also suggests that broader economic trends directly influence youth labour outcomes.

4.4 Diagnostic Tests

Diagnostic Tests conducted as a result of the use of panel data include test for over-identifying restrictions, test for Heteroscedasticity and Autocorrelation.

4.4.1 Heteroscedasticity

Panel data comprises both cross-sectional and time-series dimensions, making it susceptible to the estimation problem of heteroscedasticity. Heteroscedasticity exists when the variance of the error term is not constant across observations, leading to inefficient parameter estimates and biased standard errors, and can undermine the reliability of statistical inference. The presence of outliers, misspecification of models, inaccurate transformation of data, and skewed distribution of regressors and variables with different units of measurement normally are some of the causes of heteroscedasticity. As highlighted by Wooldridge (2012), one effect of heteroscedasticity is that it produces inefficient estimators and makes hypothesis tests unreliable.

To test for the presence of heteroscedasticity in the empirical models of this study, the Breusch-Pagan/Cook-Weisberg test was employed. This test examines whether the variance of the residuals is constant across observations.

- Null Hypothesis (H_0): The variance of the error term is constant (homoscedasticity exists).
- Alternative Hypothesis (H_1): The variance of the error term is not constant (heteroscedasticity exists).

If the test rejects the null hypothesis, it indicates the presence of heteroscedasticity, necessitating the use of robust standard errors or other corrective measures to ensure efficient and reliable estimates.

Table 4.3 displays the results of the Breusch-Pagan / Cook-Weisberg test. The null hypothesis states that the variance is constant in the residuals. The p-values being less than 0.05 in both scenarios indicates that the null hypothesis can be rejected and conclude that heteroscedasticity is present in the dataset. This problem is addressed in the dynamic estimation technique employed in this study.

Table 4.3 Heteroscedasticity

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity
Ho: Constant variance
Variables: fitted values of UNR
chi2(1) = 58.53
Prob > chi2 = 0.0000

4.4.2 Multicollinearity

Multicollinearity is said to exist in a linear regression model when correlation exists among the explanatory variables. Independent variables that are strongly correlated with each other in an empirical model may produce the same effect. Thus, by including highly correlated variables in the same model may generate biased estimates, inflated standard errors, and difficulties in interpreting the results of the regression analysis accurately, resulting in the regressors having an insignificant impact on the dependent variable. To check for multicollinearity among explanatory variables, the correlation matrix and the variance inflation factor test are

conducted. To assess multicollinearity in a regression model, the null and alternative hypotheses guide the evaluation of the relationships among explanatory variables. The null hypothesis states that there is no multicollinearity among the explanatory variables, implying weak or no linear relationships and variance inflation factor (VIF) values below the acceptable threshold, typically 10. Conversely, the alternative hypothesis posits the existence of multicollinearity, where strong correlations among the explanatory variables are present, reflected in VIF values exceeding 10.

- Null Hypothesis (H_0): Multicollinearity does not exist between independent variables.
- Alternative Hypothesis (H_1): Multicollinearity exists between independent variables.

The rule of thumb is that VIF above 10 indicates multicollinearity. Table 4.3 shows that no issue of multicollinearity exists between the variables used in this study as all the VIF values are less than 10. Also, the regressors can be maintained because their individual VIF and their mean VIF are less than 10.

Table 4.4 Variance Inflation Factor

Variable	VIF	1/VIF
GDPPC	4.08	0.244979
MPR	3.18	0.314141
INF	3.03	0.329629
YUN	2.53	0.39456
TO	2.31	0.432816
UPS	2.20	0.455235
DI	1.87	0.535763
FDI	1.70	0.586736
CPS	1.63	0.614074
GOV	1.60	0.623907
GDPGro	1.17	0.856688
POL5	1.09	0.918031
Mean VIF	2.2	

Source: Author's Construction. note: GDPPC, MPR, INF, YUN, TO, UPS, DI, FDI, CPS, GOV, GDPGro, POL5 denotes Real GDP per capita, monetary policy rate, inflation, youth unemployment, trade openness, urban population share, domestic investment, foreign direct investment, credit to private sector, government expenditure, real gross domestic growth and level of institutionalized democracy respectively.

4.4.3 Test for Over-Identifying Restrictions

The issue of overfitting on the endogenous variables is likely to be present in the system GMM estimation technique employed in this study. Hence, it is necessary that instruments that are endogenous variables are valid so as to yield efficient and consistent estimates. It is expected that these instruments have correlation with the endogenous explanatory variables and the residuals should not correlate with the explanatory variables. The Sargan-Hansen test for over-identifying restriction is then conducted to examing the validity of the instruments. In order to achieve a valid GMM estimation and the segregation constraint for these instruments to be suitable, the Sargan-Hansen test statistics must produce a high p-value.

The null hypothesis of the Sargan-Hansen test posits that the instruments are valid. That is, the variables are uncorrelated with the error term and properly excluded from the estimated equation. In contrast, the alternative hypothesis suggests that the instruments are invalid, indicating a potential correlation with the error term or incorrect exclusion from the model. The outcome of the test is interpreted based on the p-value. A p-value greater than the chosen significance level (commonly 0.05) indicates failure to reject the null hypothesis, providing evidence that the instruments are valid, and the model is well-specified. Conversely, a p-value that is less than the significance level results in the rejection of the null hypothesis, implying that the instruments may be invalid.

- Null Hypothesis (H_0): Instruments are valid (no misspecification).
- Alternative Hypothesis (H_1): Instruments are not valid (model is misspecified).

In this study, the Sargan-Hansen test results, as presented in Table 4.5 and Table 4.6, yield p-values of 0.25, 0.192, 0.207, and 0.134 for models (1), (2), (3), and (4), respectively. In all cases, the p-values exceed the conventional threshold of 0.05, indicating that the null hypothesis cannot be rejected. This suggests that the instruments used in the GMM estimation

are valid, as they are not correlated with the error term. The high p-values further indicate that the model is well-specified, with the instruments accurately capturing the exogenous variation needed to explain the endogenous variables.

The results of the Sargan-Hansen test are consistent with the findings of the Arellano-Bond AR(2) test, which also supports the validity of the instruments by confirming the absence of second-order serial correlation. Together, these diagnostic tests validate the robustness of the GMM framework employed in the analysis, ensuring the reliability of the parameter estimates and the conclusions drawn from the study.

The Sargan-Hansen test results confirm the validity of the instruments used in the GMM estimation. The high p-values provide strong evidence that the instruments are uncorrelated with the error term and correctly excluded from the estimated equations. This validation is essential for the integrity of the analysis, reinforcing confidence in the reliability of the model's estimates and its ability to accurately capture the relationships between trade openness, monetary policy, and unemployment rates in Sub-Saharan Africa.

4.4.4 Autocorrelation

Panel data often includes time-series components, making it susceptible to the issue of autocorrelation also known as serial correlation. Autocorrelation occurs when the error terms are serially correlated across observations over time. This problem can arise due to country-specific or time-specific effects in the empirical model as well as when the model used is not appropriately specified. If autocorrelation is present, it may lead to inefficient parameter estimates and biased standard errors, potentially compromising the reliability of the results.

In this study, autocorrelation could emerge due to the inclusion of the lagged unemployment rate (the dependent variable) as an explanatory variable in the model. Given the use of the System Generalized Method of Moments (GMM), the Arellano-Bond AR test for

autocorrelation is employed to check for first-order AR(1) and second-order AR(2) autocorrelation in the residuals of the differenced equation.

- Null Hypothesis (H_0): There is no autocorrelation in the error terms.
- Alternative Hypothesis (H_1): There is autocorrelation in the error terms.

The AR(1) test examines the presence of first-order serial correlation in the residuals of the first-differenced equation. In dynamic panel data models, first-order serial correlation is typically expected due to the transformation of the data during differencing. The AR(2) test, in contrast, assesses the presence of second-order serial correlation in the residuals of the first-differenced equation. The absence of AR(2) serial correlation is crucial for the validity of the instruments, as the presence of second-order correlation would suggest that the instruments are endogenous, violating the assumptions of the GMM framework. According to Roodman (2009), the null hypothesis of serial correlation test in the second-order is that the errors from the Arellano-Bond test for AR(2) in first difference regression exhibit no second-order autocorrelation. This can be confirmed from the last row of the regression outputs in Table 4.5 and Table 4.6.

Firstly, the AR(1) is significant in all the results and the AR(2) is not significant in all the results. This indicates that the model has been properly specified. For the models presented in Table 4.5 and Table 4.6, the p-values for the AR(1) test are 0.005, 0.052, 0.062, and 0.03 for models (1), (2), (3), and (4), respectively. In most cases, the p-values are below the significance level of 0.05, leading to the rejection of the null hypothesis of no first-order serial correlation. This result is consistent with theoretical expectations for differenced dynamic panel data models and does not indicate any misspecification of the models.

Secondly, the AR(2) test results in this study yield p-values of 0.364, 0.709, 0.092, and 0.312 for models (1), (2), (3), and (4), respectively. All p-values exceed the standard threshold of 0.05, leading to the failure to reject the null hypothesis of no second-order serial correlation.

This confirms the validity of the instruments used in the GMM estimation and reinforces the robustness of the model specification. The outcomes of the AR(1) and AR(2) tests complement the results of the Sargan-Hansen test for over-identifying restrictions, where the p-values for the Sargan-Hansen test are 0.25, 0.192, 0.207, and 0.134 for the respective models. These values further confirm the appropriateness of the instruments and the consistency of the estimates. Together, these diagnostic tests validate the dynamic panel data approach used in the analysis, ensuring the reliability of the findings.

4.5 Regression Results

The study presents the GMM regression results in Table 4.5 and Table 4.6. It presents the coefficients of the study variables and their standard errors which are put in parentheses. Table 4.5 presents the regression results of the main model which examine the impact of monetary policy and trade openness on unemployment.

Table 4.5 The Effect of Trade Openness and Monetary Policy Rate on Unemployment Rate in Sub-Saharan Africa

	(1)	(2)
VARIABLES	**AUN**	**YUN**
L.AUN	0.777***	
	(0.0174)	
L.YUN		0.767***
		(0.0193)
TO	-0.0042***	0.00458*
	(0.0013)	(0.0026)
MPR	0.00159	-0.00026
	(0.0040)	(0.0082)
L.GOV	0.0219***	-0.0294***
	(0.0052)	(0.0108)
InGDPPC	-0.123**	0.265***
	(0.0490)	(0.1010)
L.CPS	-0.00284**	0.00842***
	(0.0013)	(0.0027)
DI	-0.00033	0.000899
	(0.0036)	(0.0074)
L.GDPGro	-0.00283	-0.0137
	(0.0058)	(0.0119)
INF	-0.0114**	0.0101
	(0.0055)	(0.0113)
UPS	0.00468**	-0.0106**
	(0.0022)	(0.0045)
FDI	0.00313	0.0123
	(0.0058)	(0.0120)
POL5	-0.00410**	0.00197
	(0.0019)	(0.0039)
Constant	0.745***	-1.623***
	(0.2780)	(0.5740)
Observations	572	572
Number of countries	39	39
Number of instruments	24	23
Sargan Hansen Prob	0.25	0.192
Prob > AR1	0.005	0.052
Prob > AR2	0.364	0.709

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Source: Author's Construction. note: AUN, L.AUN, TO, MPR, L.GOV, InGDPPC, L.CPS, DI, L.GDPGro, INF, UPS, FDI, POL5, YUN, L.YUN represent aggregate unemployment rate, lag of aggregate unemployment rate, trade openness, monetary policy rate, lag of government expenditure, natural log of Real GDP per capita, lag of credit to private sector, domestic investment, lag of real gross domestic growth, inflation, urban population share, foreign direct

investment, level of institutionalized democracy and youth unemployment and lag of youth unemployment respectively. The GMM results indicate that the estimates are efficient, which is supported by certain conditions being met. These conditions include having a sufficient number of individuals (39) compared to the study period (22 years), which is considered appropriate for adopting the GMM technique. The number of groups should be greater than the number of instruments. Additionally, the high correlation between the dependent variables and their first lags should be between 0.733 to 1.13 (all greater than 0.733) which indicates the stability of economic indicators.

The GMM model requires that the number of instruments in the model should not go beyond the number of groups which was followed in the study. Also, a probability greater than the chi-square shows that the result is robust. It can be concluded that the explanatory variables contribute significantly to the model since the p-value of the results is less than 0.05.

4.6.1 Monetary Policy Rate and Unemployment.

The results of the regression show that past values of unemployment affect the current level of unemployment at a 1% significance level, implying that unemployment rates in the previous year are likely to positively increase unemployment rates in the current year due to the persistence of unemployment over time. This is consistent with findings by Adamu, Kaliappan, Bani and Nor (2018), Wahab (2018), and Fosu (2019) on the persistence of aggregate unemployment in the Sub-Saharan African region as well as the persistence of youth unemployment, consistent with the findings by Anyanwu (2014) and Baidoo (2016) on the high levels of youth unemployment in Sub-Saharan Africa.

In model (1), Monetary Policy Rate (MPR) and aggregate unemployment rates (AUN) have a positive relationship and a coefficient of 0.00159; however, it is not significant. The finding suggests that monetary policy has no significant role in explaining the unemployment problem in the Sub-Saharan African region. It indicates that changes in monetary policy have no effect on unemployment in the region. The findings align with those of Sunde (2015) where unemployment in Namibia is affected by monetary policy in the short run (although ineffective

in the long run) as well as Benazić and Rami (2016) in the case of the monetary policy and unemployment in Croatia. The results, however, differ from the findings of Alexius and Holmlund (2007) and Essien et al. (2016) who found that monetary policy had positive effects on unemployment in Sweden and Nigeria respectively. The lack of a significant relationship between monetary policy rate and aggregate unemployment rate in the models diverges from the traditional Phillips Curve perspective, which posits an inverse relationship between inflation (often controlled by Monetary Policy Rates) and unemployment (Friedman, 1968). This discrepancy may be due to the unique economic contexts or structural rigidities in the labour market of the Sub-Saharan African region. The findings from the sub-regional analysis on the other hand supports the Phillips Curve framework as it revealed negative and significant relationship between monetary policy rate and aggregate unemployment rates at 5% significance level in both Anglophone and Francophone Sub-Saharan Africa at varying levels (Appendix 10).

In the case of the relationship among monetary policy and youth unemployment in Sub-Saharan Africa an inverse relationship was observed. While monetary policy rate had a negative but insignificant relationship in model (2), a significant relationship was observed in model (4) suggesting that monetary policy could play a role in explaining youth unemployment situations in Sub-Saharan Africa. The negative relationship observed between monetary policy and youth unemployment in model (4) does not support the positive relationship between monetary policy and unemployment through the monetary policy transmission mechanisms. The finding, however, suggests that higher monetary policy rates may reduce youth unemployment, possibly by controlling inflation and creating a more stable economic environment for job creation (Bernanke and Gertler, 1995).

4.6.2 Trade Openness and Unemployment

Trade openness (TO) is negatively associated with aggregate unemployment rates in both models (1) and (3), indicating that higher trade openness is linked to lower unemployment rates. Trade has a negative coefficient of 0.0042 and is statistically significant at a level of 1%. This implies that when trade increases by 1%, unemployment decreases by 0.0042%. The findings align with those of the theory proposed by Krugman (1994) suggesting that increased trade openness can lead to economic growth and job creation which decreases unemployment. However, this relationship can vary depending on the structure of the economy and the specific industries affected by trade. The inverse relationship is also in line with the works of Felbermayr et al. (2011), Demiral et al. (2020) and Liu et al. (2022) who found negative effects of trade liberalization on unemployment in OECD countries, developing countries, and OIC countries respectively.

In contrast, Trade Openness has a positive relationship with youth unemployment at a significant level of 10%. This indicates that when trade increases by 1%, youth unemployment increases by 0.00458%. The finding suggests that trade policies might disproportionately affect young workers, potentially due to their lower skill levels or experience (Goldberg and Pavcnik, 2007). Similarly, in the Anglophone and Francophone Sub-Saharan Africa sub-regional analysis positive relationships were observed between trade and aggregate and youth unemployment at varying levels of significance (Appendix 10). It aligns with the findings of Heid and Larch (2012) that a positive and significant effect among international trade on unemployment, where increased trade led to increased unemployment rates in the OECD countries sampled. The positive relationship could be as a result of the rigid labour markets in some countries in the Sub-Saharan African region. In model (4), however, trade openness had no significant effect on youth unemployment. The discrepancy could be because of the varying labour market conditions in different countries in the Sub-Saharan African region. Similar to

some OECD countries where Kim (2011) found that increases in trade led to higher aggregate unemployment in the face of rigid labour market, but in countries where there were average degrees of labour market rigidities, increases in trade had no significant effect on unemployment. This is also, likened to the finding of Carrère et al. (2014) that countries with strong labour market frictions experience high levels of unemployment as a result of trade liberalization compared to those with weak labour market frictions. This may be the case for youth unemployment in Sub-Saharan Africa.

Table 4.6 The Interactive Effect of Trade Openness and Monetary Policy Rate on Unemployment Rate in Sub-Saharan Africa

	(3)	(4)
VARIABLES	**AUN**	**YUN**
L.AUN	0.774***	
	(0.0176)	
L.YUN		0.764***
		(0.0193)
TO	-0.00291*	0.000934
	(0.0016)	(0.0033)
MPR	0.0136	-0.0336*
	(0.0096)	(0.0198)
TO*MPR	-0.00015	0.000411*
	(0.0001)	(0.0002)
L.GOV	0.0237***	-0.0343***
	(0.0053)	(0.0111)
InGDPPC	-0.127***	0.275***
	(0.0490)	(0.1010)
L.CPS	-0.00286**	0.00847***
	(0.0013)	(0.0027)
DI	-0.0004	0.00111
	(0.0036)	(0.0073)
L.GDPGro	-0.00232	-0.015
	(0.0058)	(0.0119)
INF	-0.0102*	0.00654
	(0.0055)	(0.0114)
UPS	0.00508**	-0.0117***
	(0.0022)	(0.0045)
FDI	0.00283	0.013
	(0.0058)	(0.0120)
POL5	-0.00427**	0.00247
	(0.0019)	(0.0039)
Constant	0.628**	-1.294**
	(0.2910)	(0.6000)
Observations	572	572
Number of countries	39	39
Number of instruments	24	23
Sargan Hansen Prob	0.207	0.134
Prob > AR1	0.062	0.03
Prob > AR2	0.092	0.312

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

*Source: Author's Construction. note: AUN, L.AUN, TO, MPR, TO*MPR, L.GOV, InGDPPC, L.CPS, DI, L.GDPGro, INF, UPS, FDI, POL5, YUN, L.YUN represent aggregate unemployment rate, lag of aggregate unemployment rate, trade openness, monetary policy*

rate, interaction of trade openness and monetary policy rate, lag of government expenditure, natural log of Real GDP per capita, lag of credit to private sector, domestic investment, lag of real gross domestic growth, inflation, urban population share, foreign direct investment, level of institutionalized democracy and youth unemployment and lag of youth unemployment respectively. The GMM results indicate that the estimates are efficient, which is supported by certain conditions being met. These conditions include having a sufficient number of individuals (39) compared to the study period (22 years), which is considered appropriate for adopting the GMM technique. The number of groups should be greater than the number of instruments. Additionally, the high correlation between the dependent variables and their first lags should be between 0.733 to 1.13 (all greater than 0.733) which indicates the stability of economic indicators.

4.6.3 Monetary Policy Rate-Trade Openness Interaction and Unemployment

Table 4.6 presents the regression results of the main model with the interaction between monetary policy and trade. Models 3 and 4 show the interactive effect of Monetary Policy Rates and trade openness on unemployment. The lagged aggregate unemployment rate (L.AUN) is highly significant and positively associated with current aggregate unemployment rates in model (3) with a coefficient of 0.774 whereas the lagged youth unemployment rate (L.YUN) is highly significant and positively associated with current youth unemployment rate in models (4), with coefficients 0.764, highlighting the persistence of youth unemployment. Also, the sub-regional analysis revealed that the issue of high unemployment is more pronounced in Anglophone Sub-Saharan African countries compared to Francophone Sub-Saharan African Countries (Appendix 10 & Appendix 11).

The interaction term of trade openness and monetary policy rate (TO*MPR) is negative but not significant for aggregate unemployment rates in model (3) and is positive and significant for youth unemployment in model (4). The interaction of trade openness and monetary policy rate has a coefficient of 0.000411 and is statistically significant at 10%. This coefficient suggests that when trade and monetary policy jointly increases by 1%, there is an increase in the youth unemployment rate by 0.000411%. The sub-regional analysis however revealed a trend of negative relationship between the interactive effective of trade and monetary policy rate and

both aggregate unemployment and youth unemployment at varying significant levels with the interaction being more effective in the context of youth unemployment (Appendix 11). The results suggest that the combined effect of trade openness and monetary policy rate on unemployment is complex. While monetary policy may have implication for trade in influencing employment (Usman & Adejare, 2014; Ashamu, 2020), the reverse may also hold with trade having implications for monetary policy in influencing employment (Cwik, Muller & Wolters, 2010; Effiong, Ekpo & Johnson, 2019; Cacciatore & Ghironi, 2021). The positive and significant interactive effect of monetary policy and trade on youth unemployment somewhat provides insights into the trends of youth unemployment in the Sub-Saharan African region, where despite great efforts on the part of governments to salvage the issue of high youth unemployment in the region, youth unemployment is still on the rise, consistent with the finding of Işik and Acar (2006) that the effect of monetary loosening on output and trade is limited in developing open economies compared to developed economies. It then calls for awareness and critical action on the part of both monetary policymakers and trade policymakers to use the policy tools and options due them to influence the economy in such a way that considers the youth unemployment issue at hand. Monetary policymakers would need to be mindful that their monetary policy decisions have implications for trade in influencing employment in the economy and in reverse trade openness has implications for monetary policy. Likewise, trade policymakers must also consider the effects monetary policy decisions have on trade and the trickle-down effect of the interaction on youth unemployment and general unemployment at large.

The negative and significant coefficient of Monetary Policy Rate in model (4) suggests that monetary policy rates tightening may reduce youth unemployment situation in Sub-Saharan Africa, possibly by targeting inflation.

4.6.4 Other Macroeconomic Factors and Unemployment

The results of the regression also show the effects of the control variables used in the study on unemployment rates. The past values of government expenditure (that is, lagged government expenditure (L.GOV) is positively and significantly associated with aggregate unemployment rates in both models (1) and (3), with coefficients of 0.0219 and 0.0237, respectively. However, it negatively and significantly associated with youth unemployment in both models (2) and (4), indicating that higher government spending in the previous year is linked to lower youth unemployment rates in the current year. Also, lagged government expenditure and aggregate unemployment rates suggests that higher past government spending may be linked to current unemployment levels. This counter-intuitive finding could indicate inefficiencies in government spending or the crowding out of private investment, as discussed by Barro (1991). The negative relationship between lagged government expenditure and youth unemployment rates indicates that government spending can effectively reduce youth unemployment, likely through public sector job creation and social programs targeting young workers (Perugini and Signorelli, 2010).

Gross domestic product per capita (GDPPC) is negatively associated with aggregate unemployment rates and positively associated with youth unemployment rates. The coefficients are significant in all models, indicating that higher GDP per capita is linked to lower aggregate unemployment but higher youth unemployment. The negative relationship between GDP per capita and aggregate unemployment rates supports the notion that higher economic prosperity leads to lower unemployment rates, consistent with Okun's Law (Okun, 1962). The positive relationship with youth unemployment is surprising, as one would expect higher GDP per capita to reduce youth unemployment. This anomaly could be due to the distribution of economic gains or the structural characteristics of the economy (Aghion, Caroli & Garcia-Penalosa, 1999).

Lagged credit to private sector (L.CPS) shows a negative and significant association with aggregate unemployment rates and a positive and significant association with youth unemployment rates, suggesting that increased credit to the private sector reduces overall unemployment but may increase youth unemployment, reflecting the importance of financial sector development in promoting job creation (Levine, 1997). Also, the positive impact of lagged credit to private sector on youth unemployment rates suggests that while increased credit supports the overall economy, it may not sufficiently address the specific challenges faced by young job seekers (Beck, Levine & Loayza, 2000).

Other variables such as domestic investment (DI), lagged real GDP growth (L.GDPGro), inflation (INF), urban population share (UPS), foreign direct investment (FDI), and level of institutionalized democracy (POL5) show varying degrees of significance and effects on aggregate unemployment rates and youth unemployment rates. Lagged real GDP growth and domestic investment both have no significant relationship with youth unemployment and aggregate unemployment in Sub-Saharan Africa. The insignificant relationship between real GDP growth and unemployment in the findings does not support the Okun's Law when it comes to the growth-unemployment nexus in Sub-Saharan Africa.

The negative coefficient of inflation on aggregate unemployment rates, albeit significant only in model (1), suggests that higher inflation may be associated with lower unemployment, confirming the short-run Phillips Curve hypothesis of inverse relationship between inflation and unemployment (Hall & Hart, 2012). There is, however, no relationship between inflation and youth unemployment rate, indicating that the Philips curve hypothesis may not hold in the Sub-Saharan African region for the youth unemployment problem.

Urban Population Share has a positive association with aggregate unemployment rates. The positive relationship between urban population share and aggregate unemployment rates might

reflect urban labour market challenges such as higher competition for jobs and urban poverty (Harris & Todaro, 1970). The findings also correspond with the findings of Wahab (2018) that rapid urbanization increases unemployment in Sub-Saharan Africa. The negative and significant relationship between urban population share and youth unemployment rates underscores the unique challenges of urban labour markets, where higher urbanization could lead to more job opportunities for youth (Glaeser, 2011). The finding is also consistent with that of Anyanwu (2014) that an increase in urbanization aids in reducing the youth unemployment problem in Sub-Saharan Africa.

Lastly, Foreign Direct Investment's non-significant impact on aggregate unemployment rates in the models contrasts with the general expectation that foreign direct investment can promote job creation, as highlighted by Dunning (1993) and Folawewo and Adeboje (2017). This could be due to the nature of foreign direct investment inflows, which may not be labour-intensive in the Sub-Saharan African region. The negative association between level of institutionalized democracy and aggregate unemployment rates indicate that better democratic institutions may help reduce unemployment by fostering a more stable and predictable economic environment (Acemoglu, Johnson & Robinson, 2001).

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This section marks the final chapter of this study. The chapter provides a comprehensive summary of the primary findings of the study, the conclusions drawn from these findings, recommendations for policy and direction for further research. The chapter aims to summarize the essence of the research, emphasizing the implications of the results and suggesting pathways for future inquiries.

5.2 Summary of Findings

The objective of this study was to investigate the effects of trade and monetary policy rate on unemployment rates in Sub-Saharan Africa. In achieving this objective, the study explored the impact of trade openness on youth unemployment rates as well as the effect on aggregate unemployment rates in the Sub-Saharan African region. The effect of monetary policy rates on youth unemployment and aggregate unemployment in the Sub-Saharan African region was also examined. The study further investigated the joint effect of trade openness and monetary policy rate on aggregate unemployment rates and youth unemployment rates in Sub-Saharan Africa.

Using the System Generalized Method of Moments panel data estimation technique on an unbalanced dataset, the study analysed the impact of several macroeconomic variables, including trade openness, monetary policy rate, government expenditure, domestic investment, real GDP per capita, credit to the private sector, inflation, urban population share and foreign direct investment on both aggregate unemployment rates and youth unemployment rates across 39 countries in the Sub-Saharan African region over the period of 2001 and 2022.

The descriptive statistics indicated a significant variability across the dataset used in the study, with aggregate unemployment rates ranging from 0.317% to 37.852%, youth unemployment rates ranging from 0.468% to 65.343% and monetary policy rates from 0.25% to 150%. The results from the correlation analysis revealed several important relationships, notably a strong positive correlation between aggregate unemployment and youth unemployment, and a moderate positive correlation between aggregate unemployment and GDP per capita within the area of study. Trade openness exhibited a moderate positive correlation with both aggregate unemployment and youth unemployment, reflecting high levels of unemployment despite great efforts in promoting trade in the Sub-Saharan African region.

The Variance Inflation Factor (VIF) analysis showed that multicollinearity was not a significant issue among the independent variables used in the study, as all the VIF values were below the threshold of 10. Other diagnostic tests conducted confirmed the presence of heteroscedasticity accounted for in the GMM dynamic panel data model technique used. It also indicated robustness against autocorrelation/ serial correlation. The GMM regression results highlighted that trade openness had a statistically significant negative effect on aggregate unemployment rates in the Sub-Saharan African region, while the monetary policy rate did not show a significant direct impact on aggregate unemployment but did influence youth unemployment in certain specifications. Government expenditure and GDP per capita were also found to significantly affect unemployment rates in the Sub-Saharan African region.

5.3 Conclusions

From the results and findings of the study, the following key conclusions are drawn. Firstly, increased trade openness is associated with lower aggregate unemployment rates in Sub-Saharan Africa, suggesting that policies promoting trade openness could effectively reduce the problem of high levels of unemployment in the region. Secondly, the impact of the monetary

policy rate on unemployment is less straightforward; while it did not significantly affect aggregate unemployment, it had varying effects on youth unemployment, indicating that monetary policy may have differential impacts on specific demographic groups. Thirdly, the interaction between the monetary policy rate and trade openness in shaping unemployment is multifaceted. While monetary policy can influence trade and thereby affect employment outcomes, the reverse is also possible – trade conditions may shape monetary policy decisions, and their combined effect may contribute to rising unemployment levels. Fourthly, higher government expenditure is positively associated with unemployment rates, implying that increased government spending alone may not suffice to reduce unemployment without efficient allocation of resources. Lastly, the study revealed a complex relationship between real GDP per capita and unemployment, where higher GDP per capita was associated with higher unemployment rates, highlighting structural issues within the economies of countries in the region where economic growth does not necessarily translate into job creation in the Sub-Saharan African region.

5.4 Recommendations

Based on the conclusions from the study highlighted above, the following recommendations are proposed. Policymakers should focus on enhancing trade policies to further open up Sub-Saharan African economies, as increased trade openness has been shown to reduce unemployment rates. Countries in the Sub-Saharan African region should actively make efforts to promote trade both amongst themselves and with countries outside the African continent. Trade policies should be aimed at increasing participation in international trade, with a target on increasing exportations rather than importations as well as capitalising on sectors that have comparative advantage in order to increase employment. The reduction and removal of non-tariff and tariff trade barriers should be considered so as to promote trading within the region. Tax incentives could also be employed and given to entities to encourage production, attract

significant investment and increase employment. With the varied response of aggregate unemployment and youth unemployment to trade, policymakers should develop policies tailored to the specific needs of the various groups especially the youth. Policy development should be geared towards equipping the youth with skills and expertise as well as making employment opportunities easily accessible by the youth. Additionally, countries in Sub-Saharan Africa could leverage existing regional and international trade agreements to enhance intra-regional and inter-regional trade, foster economic integration and improve access to global markets. A key instrument in this regard is the African Continental Free Trade Area (AfCFTA), which offers a framework for reducing and eliminating tariff and non-tariff barriers to trade across the continent. By fully implementing AfCFTA provisions, countries can stimulate industrial development, expand export opportunities, and promote inclusive economic growth.

Complementing trade policy, monetary policy authorities such as central banks and treasuries should consider the differential impacts of monetary policy on various demographic groups and design policies that specifically address the needs of the youth labour market. Targeted monetary policies that address structural unemployment, particularly among the youth, should be prioritized. This may include interest rate incentives and credit schemes tailored to youth-led enterprises aimed at stimulating job creation in emerging sectors. To further support inclusive employment outcomes, governments should aim to improve the efficiency of public expenditure, ensuring that spending is directed towards sectors that can generate employment and foster sustainable economic growth. Efforts should also be made to ensure that economic growth is inclusive and leads to job creation, potentially involving investments in education and skills development to better align the workforce with countries' economic needs. Given that monetary policies and fiscal polies have implication for each other in influencing employment outcomes, governments should strengthen monetary policy and fiscal policy

coordination through the establishment of Monetary-Fiscal Coordination Councils to promote policy alignment, foster employment-focused strategies, facilitate policy synergy and prevent contradictory policy actions. Furthermore, regional coordination through institutions such as the African Union and Regional Economic Communities can support harmonized policy frameworks that strategically align with development goals and promote inclusive growth and employment across borders. Additionally, opportunities and avenues for knowledge sharing should be actively explored. To facilitate cross-regional learning, innovation and policy development, knowledge-sharing platforms and policy exchange forums could be established to enable countries to share experience, best practices, lessons and strategies for advancing inclusive growth and employment generation across the Sub-Saharan Africa region.

5.5 Suggestions for Further Research

Future research could expand on this study by exploring several areas. A sectoral analysis could investigate the impact of trade openness and monetary policy on unemployment across different sectors of the economy to identify which sectors are most affected. Longitudinal studies could examine the long-term effects of trade policies and monetary interventions on unemployment rates. Analysing the interactions between different macroeconomic policies and their interactive effects on unemployment could help in developing more comprehensive policy frameworks. In addition to policy interactions, the influence of other macroeconomic and structural factors such as informality, education levels, labour market flexibility and technological adoption on the relationship between monetary policy, trade and unemployment could further be explored. Furthermore, focusing specifically on youth unemployment could identify tailored solutions that address the unique challenges faced by young people in the labour market in our world today.

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APPENDICES

Appendix 1: List of 39 Sub-Saharan African Countries used in the Study

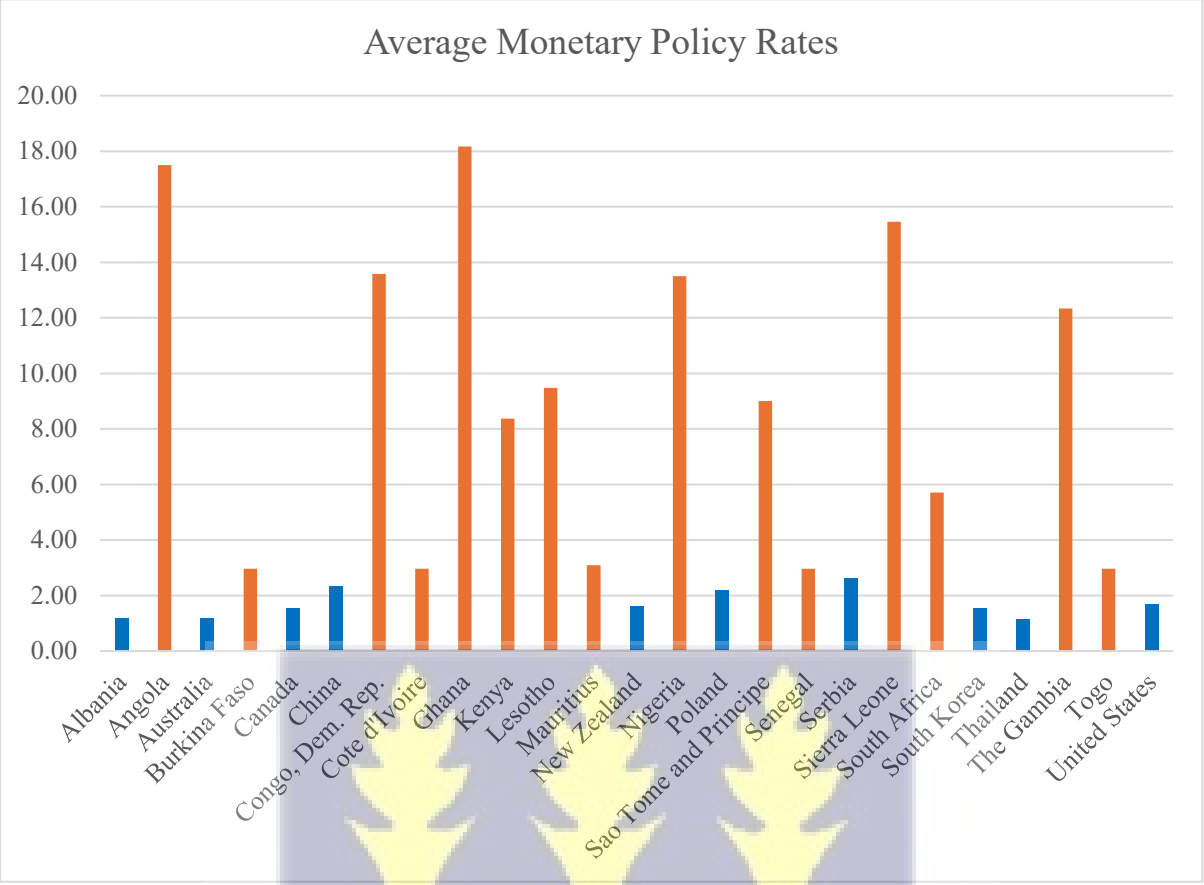
Angola	Eswatini	Namibia
Benin	Gabon	Niger
Botswana	Gambia	Nigeria
Burkina Faso	Ghana	Rwanda
Burundi	Guinea	Senegal
Cabo Verde	Guinea - Bissau	Sierra Leone
Cameroon	Kenya	South Africa
Central Africa Republic	Lesotho	Sudan
Chad	Madagascar	Tanzania
Congo Republic	Mali	Togo
Cote D'Ivoire	Mauritania	Uganda
Democratic Republic of Congo	Mauritius	Zambia
Equatorial Guinea	Mozambique	Zimbabwe

Appendix 2: Monetary Policy Rates from 2017 to 2022

Year	2017	2018	2019	2020	2021	2022	Average
Sub-Saharan Africa Region							
Angola	18	16.5	15.5	15.5	20	19.5	17.50
Burkina Faso	2.5	2.5	2.5	2	4	4.25	2.96
Congo, Dem. Rep.	20	14	14	18.5	7.5	7.5	13.58
Cote d'Ivoire	2.5	2.5	2.5	2	4	4.25	2.96
Ghana	20	17	16	14.5	14.5	27	18.17
Kenya	10	9	8.5	7	7	8.75	8.38
Lesotho	10.27	10.69	10.26	7.20	8.06	10.36	9.47
Mauritius	3.5	3.5	3.35	1.85	1.85	4.5	3.09
Nigeria	14	14	13.5	11.5	11.5	16.5	13.50
Sao Tome and Principe	9	9	9	9	9	9	9.00
Senegal	2.5	2.5	2.5	2	4	4.25	2.96
Sierra Leone	14.5	16.5	16.5	14	14.25	17	15.46
South Africa	6.75	6.75	6.5	3.5	3.75	7	5.71
The Gambia	15	13.5	12.5	10	10	13	12.33
Togo	2.5	2.5	2.5	2	4	4.25	2.96
Other Economic Regions							
Albania	1.25	1	1	0.5	0.5	2.75	1.17
Australia	1.5	1.5	0.75	0.1	0.1	3.1	1.18
Canada	1	1.75	1.75	0.25	0.25	4.25	1.54
China	2.5	2.55	2.5	2.2	2.2	2	2.33
New Zealand	1.75	1.75	1	0.25	0.75	4.25	1.63
Poland	1.5	1.5	1.5	0.1	1.75	6.75	2.18
Serbia	3.5	3	2.25	1	1	5	2.63
South Korea	1.5	1.75	1.25	0.5	1	3.25	1.54
Thailand	1.5	1.75	1.25	0.5	0.5	1.25	1.13
United States	1.38	2.38	1.63	0.13	0.13	4.38	1.67

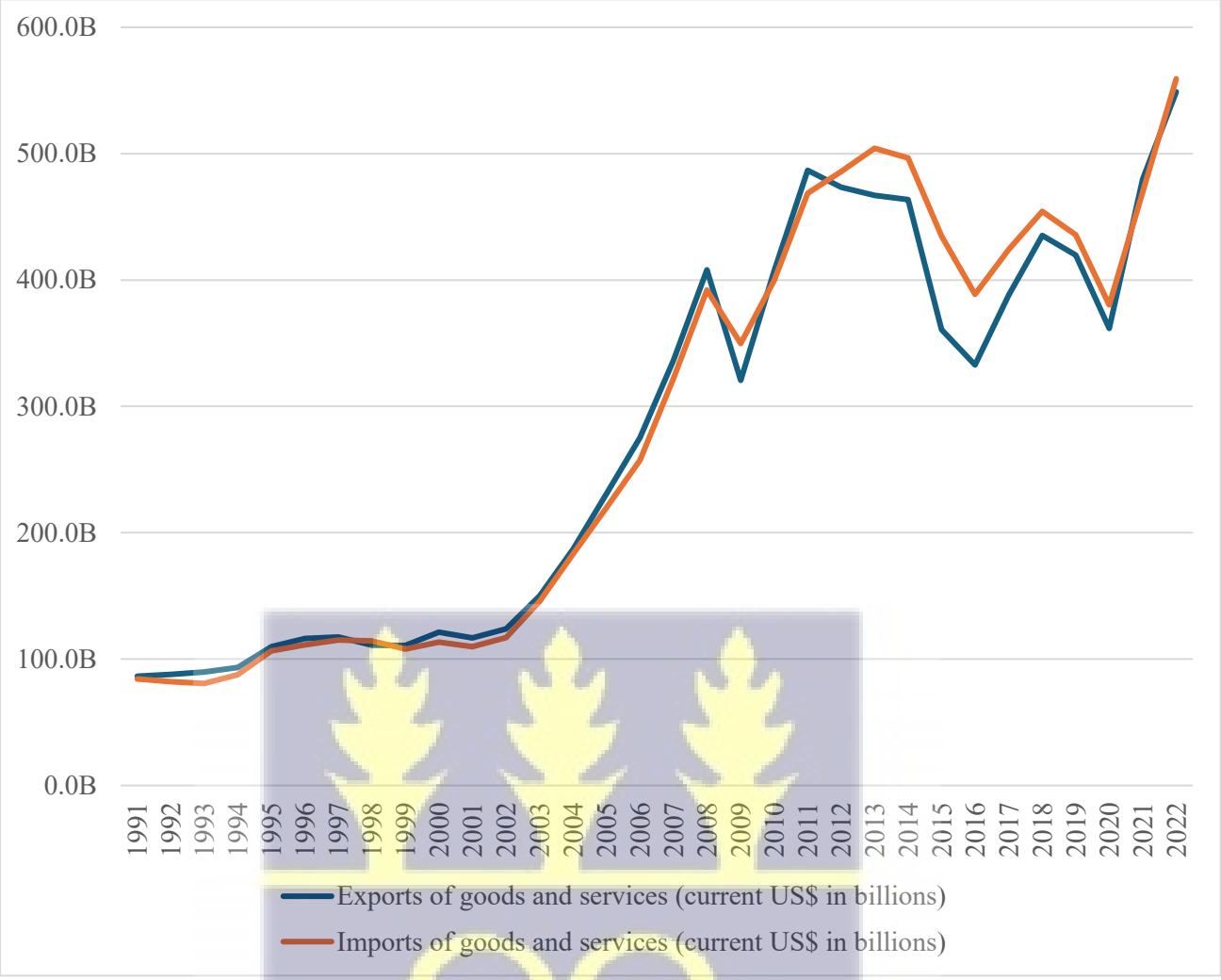
Source: Authors Compilation from IFS

Appendix 3: Average of 2017 to 2022 Monetary Policy Rates



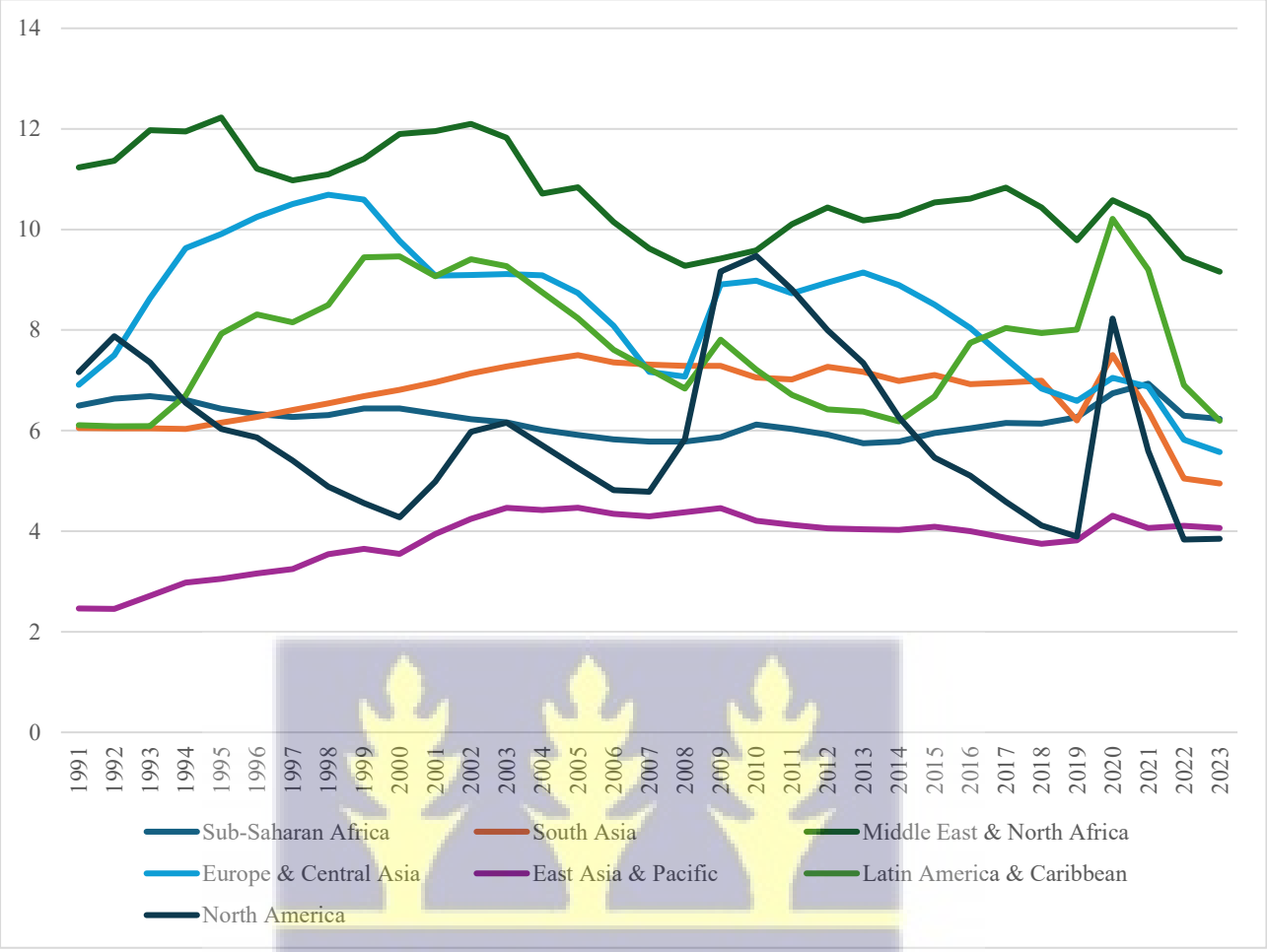
Source: Authors Compilation from IFS

Appendix 4: Trends of Exports and Imports of Goods and Services in SSA



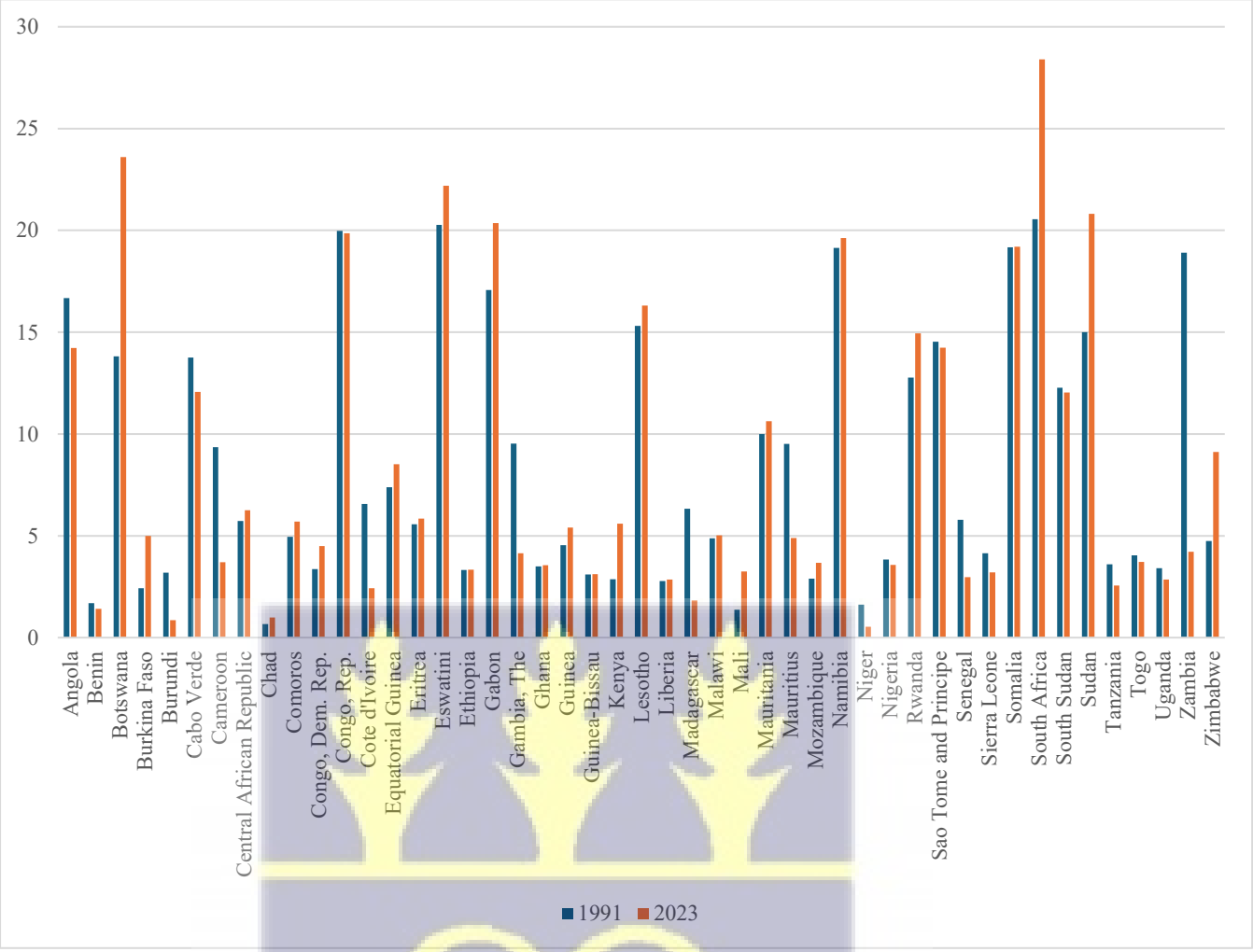
Source: Authors Compilation from WDI

Appendix 5: Trends of Regional Unemployment Rates from 1991 to 2023



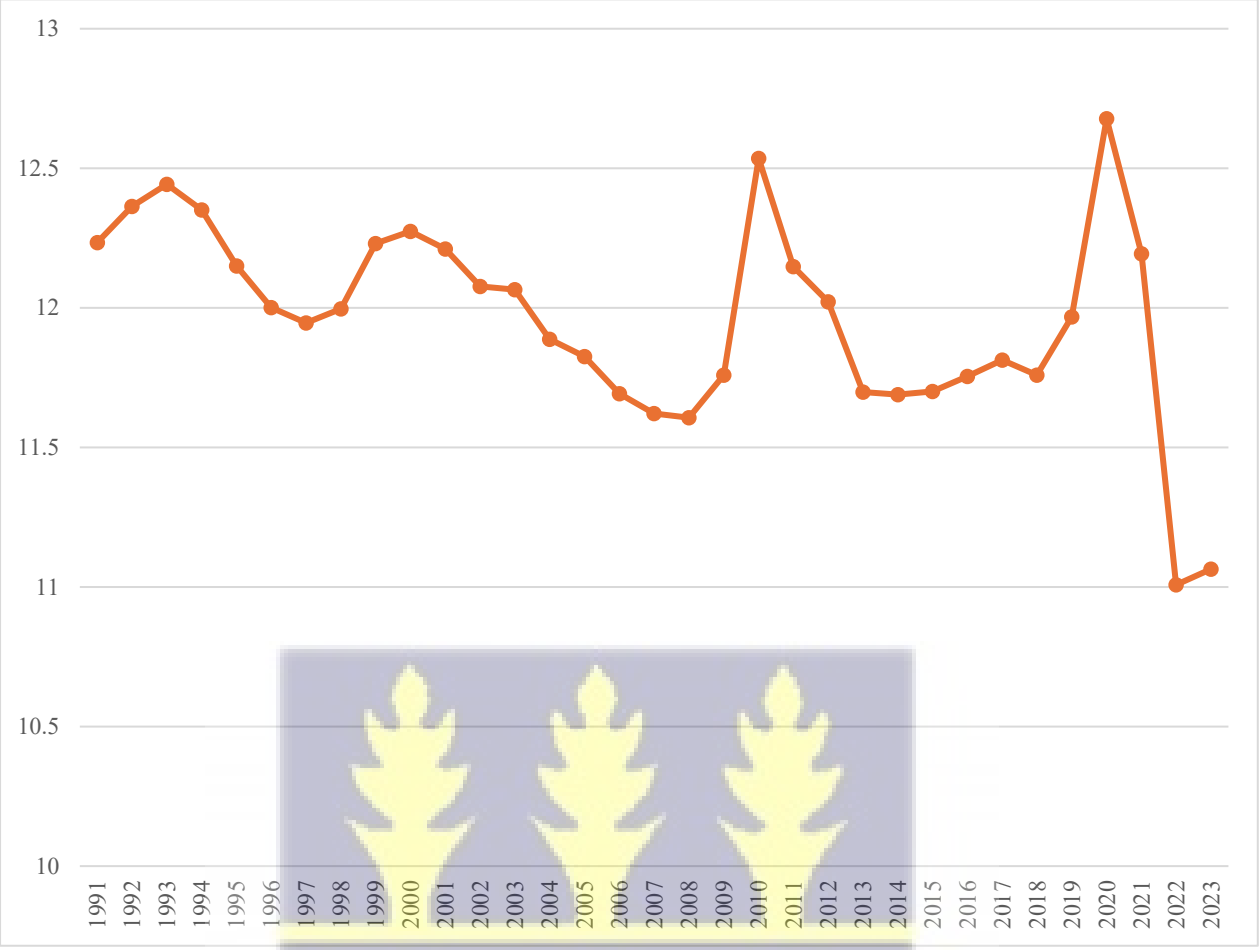
Source: Authors Compilation from WDI – ILO estimates

Appendix 6: Aggregate Unemployment Rates in SSA Countries in 1991 and 2023



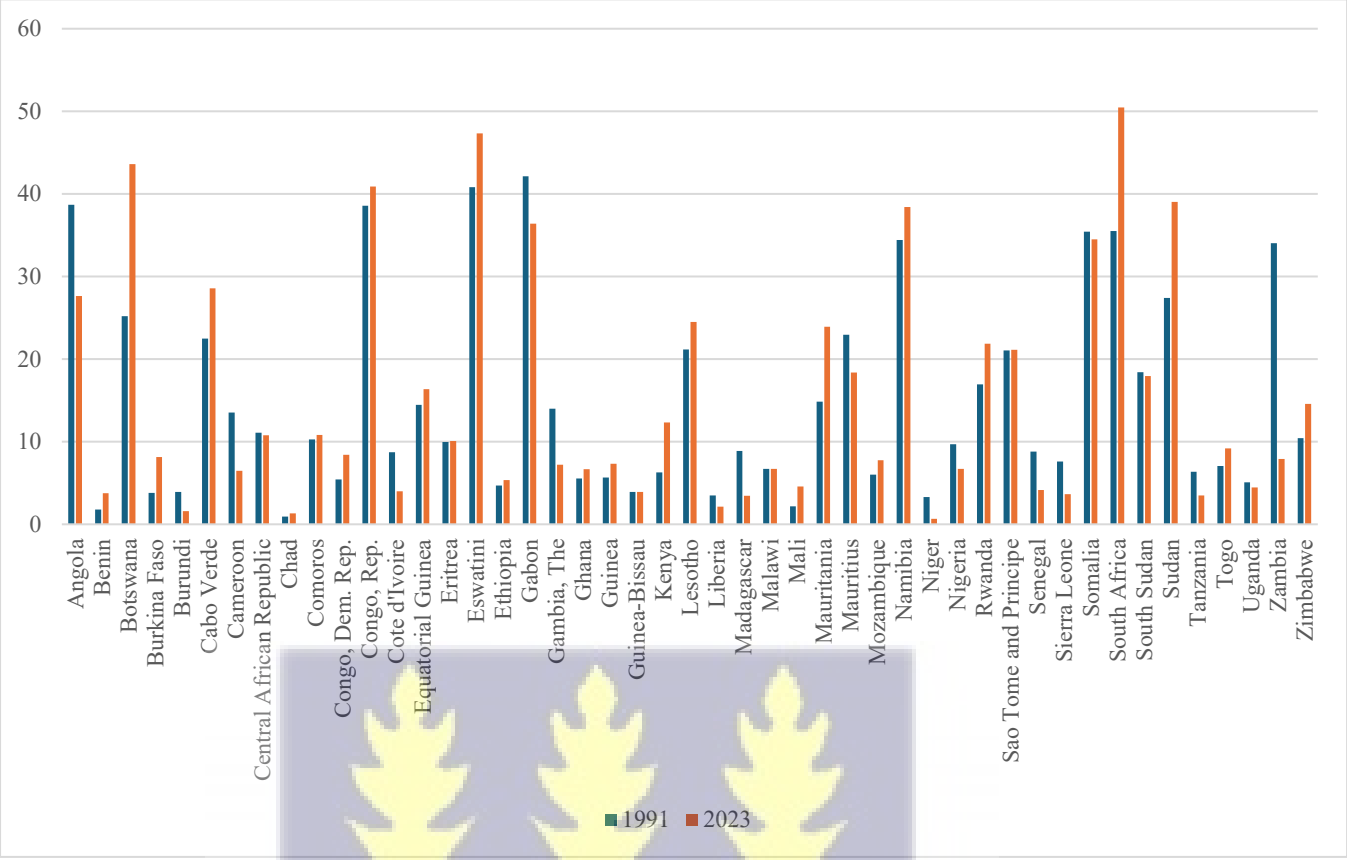
Source: Authors Compilation from WDI

Appendix 7: Trends of Youth Unemployment Rates in SSA from 1991 to 2023



Source: Authors Compilation from WDI

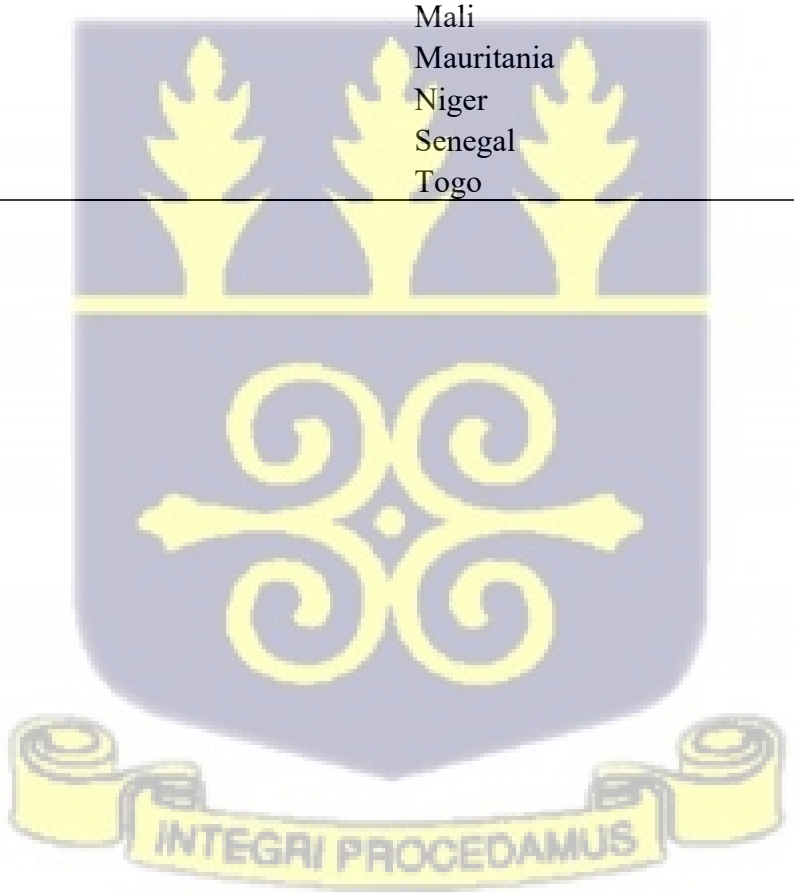
Appendix 8: Youth Unemployment Rates in SSA Countries in 1991 and 2023



Source: Authors Compilation from WDI

Appendix 9: List of Anglophone and Francophone Sub-Saharan African Countries used in Sub-Regional Study

Anglophone	Francophone
Botswana	Benin
Eswatini	Burkina Faso
Gambia	Burundi
Ghana	Cameroon
Kenya	Central African Republic
Lesotho	Chad
Mauritius	Congo
Namibia	Côte D'Ivoire
Nigeria	Democratic Republic of Congo
Rwanda	Equatorial Guinea
Sierra Leone	Gabon
South Africa	Guinea
Sudan	Madagascar
Tanzania	Mali
Uganda	Mauritania
Zambia	Niger
Zimbabwe	Senegal
	Togo



Appendix 10: The Effect of Trade Openness and Monetary Policy Rate on Unemployment Rate in Anglophone and Francophone Sub-Saharan African Countries

	AUN		YUN	
VARIABLES	**ANGLOPHONE**	**FRANCOPHONE**	**ANGLOPHONE**	**FRANCOPHONE**
L.AUN	1.156**	0.541*		
	(0.447)	(0.286)		
L.YUN			0.765**	0.642*
			(0.271)	(0.322)
TO	0.00297***	0.0161**	0.0691**	0.0465*
	(0.113)	(0.016)	(0.191)	(0.042)
MPR	-0.183**	-0.0725**	-0.173	0.0716
	(0.319)	(0.092)	(0.517)	(0.221)
L.GOV	-0.272	-0.00364	-0.136	0.125
	(0.342)	(0.103)	(0.636)	(0.192)
InGDPPC	-4.326*	-0.607	-3.055*	-1.541
	(3.36)	(0.84)	(4.63)	(2.38)
L.CPS	0.162	-0.0737	0.188	-0.181
	(0.308)	(0.072)	(0.391)	(0.233)
DI	0.0745	-0.00335	-0.166	-0.0173
	(0.235)	(0.019)	(0.31)	(0.022)
L.GDPGro	0.0278	-0.0114	0.127	-0.00772
	(0.142)	(0.019)	(0.23)	(0.03)
INF	0.0346	0.0169	-0.0805	0.1
	(0.113)	(0.034)	(0.196)	(0.06)
UPS	0.216*	0.274*	0.0961*	0.602
	(0.493)	(0.14)	(0.608)	(0.422)
FDI	-0.247	-0.0155	0.09	0.00466
	(0.532)	(0.039)	(1.201)	(0.046)
POL5	-0.677	-0.0388	-0.702	-0.0669
	(3.337)	(0.04)	(3.643)	(0.092)
Constant	25.29	-5.023	24.12	-13.66
	(30.75)	(4.81)	(34.55)	(10.61)
Observations	229	289	229	289
Number of countries	17	18	17	18
Number of instruments	16	17	16	16
Sargan Hansen Prob	0.244	0.154	0.458	0.125
Prob > AR1	0.05	0.02	0.03	0.098
Prob > AR2	0.382	0.091	0.212	0.078

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Appendix 11: The Interactive Effect of Trade Openness and Monetary Policy Rate on Unemployment Rate in Anglophone and Francophone Sub-Saharan African Countries

	AUN		YUN	
VARIABLES	**ANGLOPHONE**	**FRANCOPHONE**	**ANGLOPHONE**	**FRANCOPHONE**
L.AUN	1.00808**	0.264		
	(0.314)	(0.372)		
L.YUN			1.225*	0.899*
			(0.607)	(0.482)
TO	0.0703**	0.112*	0.126	0.112*
	(0.169)	(0.057)	(0.097)	(0.149)
MPR	0.427**	0.0505	0.965**	0.654
	(1.159)	(0.165)	(0.361)	(1.059)
TO*MPR	-0.007**	-0.00045**	-0.0190**	-0.012***
	(0.017)	(0.003)	(0.007)	(0.02)
L.GOV	-0.127	-0.133	0.226	0.144
	(0.11)	(0.147)	(0.238)	(0.303)
InGDPPC	-2.071*	-1.655*	-1.582	-1.854
	(1.065)	(0.795)	(2.235)	(1.441)
L.CPS	-0.142	0.191	-0.577	-0.316
	(0.089)	(0.253)	(2.38)	(0.668)
DI	0.0162	-0.0455	-0.0109	-0.0263
	(0.051)	(0.041)	(0.026)	(0.045)
L.GDPGro	-0.0399	0.0458	-0.068	-0.0181
	(0.027)	(0.058)	(0.022)	(0.048)
INF	0.0575	0.116*	0.28	0.153
	(0.139)	(0.056)	(0.192)	(0.191)
UPS	0.395*	0.311***	0.641	0.591
	(0.216)	(0.103)	(0.584)	(0.566)
FDI	0.00507	-0.0488	0.0134	-0.0114
	(0.04)	(0.055)	(0.043)	(0.103)
POL5	-0.0222	-0.0818	-0.00928	-0.0233
	(0.052)	(0.059)	(0.071)	(0.093)
Constant	2.308	-5.132	-20.84*	-15.49
	(8.067)	(5.436)	(10.8)	(20.52)
Observations	289	289	289	289
Number of countries	17	18	17	18
Number of instruments	16	17	16	17
Sargan Hansen Prob	0.25	0.213	0.207	0.278
Prob > AR1	0.052	0.005	0.062	0.004
Prob > AR2	0.364	0.092	0.741	0.652

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1