



Addis Ababa University

College of Business and Economics

Master of Business Administration

**“Determinants of Inflation and Management Strategies: An Empirical
Evidence from Ethiopia”**

**A Thesis Submitted to Addis Ababa University in Partial Fulfillment of the
Requirements for the Award of Master’s Degree in Business Administration.**

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DECLARATION

I, the undersigned, hereby certify that the thesis entitled “Determinants of Inflation and Effective Management Strategies: An Empirical Evidence from Ethiopia” is prepared under the supervision of Asres Abitie (PhD). All sources were noted, referenced, and included in the list of references. I declare that this thesis is my original work and was not submitted in part or in whole to any other higher-learning institution for the purpose of earning a degree.

Winta Ekubay

A square image showing a handwritten signature in black ink. The signature is stylized and appears to be 'Winta E.' with a large, loopy flourish above it.

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This is to certify that the thesis entitled “Determinants of Inflation and Management Strategies: A Case Study of Ethiopia”, carried out by Winta Ekubay, submitted in partial fulfillment of the requirements for the Degree of Master of Business Administration. It complies with the regulations of the university and meets the accepted standards with respect to originality quality.

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Abstract

This research investigates the multifaceted nature of inflation in Ethiopia, aiming to propose effective management strategies. It examines the influence of economic factors such as money supply, exchange rates, and government spending on inflation, while also exploring the potential impact of internal conflicts. Leveraging the ordinary least squares method facilitated by EViews 9 software, the study analyzes data from the Ministry of Finance, including variables such as the Consumer Price Index (CPI), broad money supply (M2), and indicators of internal conflict. Through descriptive and diagnostic analyses, the study establishes correlations between these factors and inflation. The findings highlight significant relationships between inflation and variables like money supply, exchange rates, and GDP, as well as a connection between internal conflicts and inflationary pressures. Consequently, the study recommends targeted policy interventions focused on regulating money supply, stabilizing exchange rates, and controlling government spending to effectively manage inflation in Ethiopia. These insights offer valuable guidance for policymakers aiming to foster economic stability and growth in the country.

Keywords: *inflation, consumer price index, macroeconomic variables, broad money supply, internal conflict, management strategies, Ethiopia*

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LIST OF ACRONYMS

CPI: Consumer Price Index

IR: Interest Rate

GNS: Gross National Saving

RGDP: Real Gross Domestic Products

M2: Money supply

UR: Unemployment Rate

EXR: Exchange Rate

IC: Internal Conflicts

Ln: Natural logarithm

MoFED: Ministry of finance and Economic Development

IMF: International Monetary Fund

Sig: significant

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Inflation poses a significant economic challenge for various countries worldwide, including Ethiopia, as it impacts consumer purchasing power and overall economic stability and growth. Numerous studies have been conducted to comprehend the drivers of inflation in Ethiopia and assess the government's effectiveness in managing it.

Different hypotheses exist regarding the causes of inflation. Structuralists attribute inflation to the economic structure of developing countries, while monetarists emphasize the expansion of money supply surpassing real output growth as a primary inflationary factor (Teamrat, 2017). Generally, inflation may occur when demand surpasses supply, leading to price increases and a decrease in the purchasing power of money.

In the past, inflation in Ethiopia remained low for several reasons. The government-controlled prices and rationed goods at fixed rates, contributing to lower inflation rates. Additionally, maintaining a lower and fixed exchange rate helped mitigate the impact of international price hikes and made imports more affordable (Sisay, 2008).

However, in recent years, inflation in Ethiopia has significantly increased due to several factors. These include the growth of money supply, depreciation of the Ethiopian Birr, high levels of public expenditure, increased demand for imported goods, and recent internal conflicts. The internal conflicts have disrupted economic activities, such as trade and transportation, resulting in shortages of essential goods and services. Furthermore, the conflicts have created a humanitarian crisis, diverting resources from economic development to humanitarian aid. This diversion of resources has intensified pressure on the economy, leading to higher inflation rates.

To manage these factors, the government has implemented various policies, including monetary measures such as increasing reserve requirements, issuing treasury bills and bonds, and implementing exchange rate controls. However, the effectiveness of these policies in controlling inflation in Ethiopia remains subject to debate. Therefore, the purpose of this study is to identify

the factors influencing inflation in Ethiopia and propose effective policy measures for the government to manage inflation.

1.2. Statement of the problem

Inflation, a crucial macroeconomic phenomenon, significantly impacts an economy's stability, investment climate, and citizens' overall welfare (Rasche, 1987). In the context of Ethiopia, understanding the determinants of inflation and implementing effective management strategies are vital for fostering sustainable economic growth and mitigating adverse effects on key economic indicators. The pronounced volatility of inflation in Ethiopia presents a serious challenge, stemming from uncertain output production, price levels, and the inertia effects of inflation volatility, compounded by fiscal and monetary policy flexibility. High inflation breeds uncertainty about future economic conditions, discouraging investment and hindering economic activity (Abeba, 2014). Moreover, inflation leads to a reduction in exports due to increased domestic input costs, exacerbating income inequality by redistributing income from wage earners and fixed income groups to profit recipients and debtors (Jhingan, 1997). The current inflationary climate in Ethiopia, exacerbated by political instability, supply-demand imbalances, rapid population growth, delayed public projects, and inefficiencies in resource utilization, poses significant challenges, particularly for low-income earners (Wasyhun, 2019).

Numerous international and local studies have conducted extensive research on the factors that shape inflation in Ethiopia. These studies have explored various determinants such as fiscal factors, money supply, exchange rates, GDP, and other relevant variables. However, the influence of recent conflicts on inflation dynamics within the Ethiopian context remains relatively unexplored. Understanding the specific impact of conflicts on inflation is crucial for policymakers to devise effective strategies.

Thus, this study aims to bridge this research gap by conducting a comprehensive analysis that encompasses multiple factors influencing inflation in Ethiopia, drawing insights from both international and local studies. The research will assess the significance of fiscal factors, including money supply and exchange rates, in shaping inflation dynamics. Additionally, it will consider other vital variables such as Gross Domestic Products (GDP), Gross National Savings, lending

rate, unemployment rate, and internal conflicts to obtain a comprehensive understanding of the determinants of inflation.

Furthermore, this research seeks to contribute to the existing literature on inflation in Ethiopia and propose effective government policies to manage inflation within the Ethiopian economy based on the study's findings. By analyzing the relationships between various macroeconomic and political variables and inflation, the study will provide valuable insights into effective policy measures and offer evidence-based recommendations for tailored policy interventions in the Ethiopian context.

1.3. Objectives of the Study

1.3.1. General Objectives

The general objective of the study is to examine the determinants of inflation in Ethiopia and propose effective management strategies.

1.3.2. Specific Objective

- To analyze the impact of macroeconomic variables such as money supply, exchange rate, and government spending on inflation in Ethiopia.
- To assess the impact of internal conflict on inflation of Ethiopia.
- To propose effective management strategies to control inflation in Ethiopia, based on the analysis of the factors affecting inflation.

1.4. Research Questions

1. What is the relationship between macroeconomic variables (broad money supply, lending rate, exchange rate, external debt, GDP, gross national savings, unemployment rate, and government spending) and inflation in Ethiopia?
2. How does internal conflict impact inflation in Ethiopia?
3. What are the effective management strategies for controlling inflation in Ethiopia, considering the analysis of the factors affecting inflation?

1.5 Significance of the Study

The findings of the study can provide important insights into the factors that contribute to inflation in Ethiopia and the effectiveness of government policies in managing inflation. Understanding the determinants of inflation is crucial for policymakers to formulate effective monetary and fiscal policies. The study can also help policymakers in Ethiopia to design effective policies and strategies to control inflation and promote economic stability.

In addition, high inflation can have a negative impact on the welfare of the population by increasing the cost of living and reducing access to basic goods and services. The study can provide insights into effective management strategies that can improve the welfare of the population by controlling inflation. Furthermore, the study can contribute to the existing literature on the determinants of inflation and the effectiveness of management strategies, providing a basis for further research in this area.

Overall, the study can have significant implications for policymakers, the economy, academia, and social welfare in Ethiopia, as well as international relations by affecting business and investment.

1.6 Delimitation of the Study

The study is based on 31 years of annual time series data from 1992 to 2022, which allows for a detailed analysis of inflation over longer periods of time.

The study considers macroeconomic indicators including money supply, interest rates, gross domestic product (GDP), gross domestic product (GNS), exchange rate and unemployment rate and a political indicator internal conflict that can influence inflation in Ethiopia.

The dependent variable in this study is inflation, which is measured by the Consumer Price Index (CPI). The CPI is widely accepted and used as an indicator of changes in the general price range. By using the CPI as the dependent variable, the study seeks to assess the impact of the analyzed macroeconomic and political variables on inflation in Ethiopia.

1.8. Organization of the Paper

The research study consisted of five chapters that were organized as follows. Chapter one provided an introduction to the paper, setting the context and objectives of the study. Chapter two comprised a comprehensive review of theoretical and empirical literature on inflation, highlighting the existing knowledge and research gaps in the field. Moving on to Chapter three, the methodology and data sources utilized in the study were described, outlining the approach taken to analyze the research problem. In Chapter four, the descriptive and econometric analysis was presented, including model estimation and the interpretation of results. Finally, the last chapter contains the study's conclusions and recommendations, summarizing the key findings and proposing actionable insights based on the research outcomes.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1. Introduction

This chapter conducts a comprehensive review of inflation in Ethiopia, encompassing both theoretical frameworks and empirical studies. The objective is to offer a comprehensive understanding of the factors influencing inflation in this unique economic context.

Theoretical perspectives serve as the foundational pillar, encompassing traditional monetarist views to structuralist theories, which guide our examination of inflation in Ethiopia. This theoretical groundwork is complemented by empirical insights gathered from various international and local studies conducted in Ethiopia.

Towards the conclusion of the chapter, a conceptual framework is developed. This framework serves as a roadmap, directing the subsequent analysis of inflation determinants in Ethiopia. It seamlessly integrates theoretical constructs with empirical evidence, contributing to a more holistic comprehension of the intricate dynamics at play.

2.2. Theoretical Literature Review

2.2.1. Definition, Effect and measures of inflation

Inflation is a highly controversial term which has undergone modification since it was first defined by the neo-classical economists. Neo-classical defined inflation as a galloping rise in prices caused by excessive increase in the quantity of money. For Keynesians true inflation happens when money supply increases beyond full employment level (Jhingan, 1997). Though various economists define inflation in different ways there is an agreement that inflation is a sustained increase in the general price level

Inflation, defined by Merriam Webster as a sustained increase in the general price level typically attributed to a rise in the volume of money and credit relative to available goods and services, holds significant implications for economies worldwide (Merriam Webster). This widespread escalation in prices engenders a plethora of repercussions. Firstly, it erodes the purchasing power of individuals, leading to a decline in real income, lower living standards, and reduced savings.

Moreover, inflation tends to exacerbate itself as increased spending and investment in response to rising prices perpetuate the cycle, potentially creating a detrimental feedback loop. Additionally, in efforts to curb inflation through monetary policy, central banks often opt to raise interest rates, thereby increasing the cost of borrowing. Furthermore, inflation can stifle employment and economic growth, weaken the currency, deter foreign direct investment due to escalating material costs, curtail production due to increased costs and price uncertainty, and impede exports as elevated domestic input prices render domestically produced goods less competitive globally. Conversely, it can stimulate imports as higher prices for domestic products drive up demand for imports (Mishkin, 2020). Consequently, the multifaceted ramifications of inflation underscore the imperative of implementing effective monetary and fiscal policies to manage and mitigate its adverse impacts on the economy and society as a whole, ensuring sustainable economic growth and stability.

A. Measures of Inflation

There are various price indexes which are used to measure inflation. The following are the major ones stated by Diulio, (1998)

1. Consumer Price Index (CPI)

It is a measure mostly used to measure inflation. The CPI measures the cost of buying a fixed basket of goods and services representative of the purchase of consumers. Inflation is measured by measuring the percentage change in the prices of a given basket goods over time as compared to the price in the base year: In Ethiopia the central Statistical Authority computes the CPI. The authority makes household expenditure survey every five years.

2. GDP Deflator

It is the ratio of nominal GDP in a given year to real GDP of that year. It includes all the goods produced in a country but excludes imports. The deflator measures the change in prices that has occurred between the base year and the current year.

3. Producer Price Index (PPI)

It is a measure of the cost of given basket of goods; however, it differs from the CPI partly in its coverage, which includes raw materials and semi-finished goods. In addition, PPI measures

prices at an early stage of the distribution system, whereas the CPI measures prices when households do their spending

B. Inflation Classification

Inflation, as a critical macroeconomic phenomenon, manifests in various forms, each characterized by distinct rates of price increases. Classifications based on the magnitude of inflation rates serve as crucial tools for understanding its impact on economies. Creeping inflation, identified when prices increase by less than 3 percent annually, is often viewed favorably within economic circles. Such modest inflation rates are deemed conducive to economic growth and stability (Sisay, 2008). Contrarily, walking inflation denotes a situation where prices rise at a rate exceeding 3 percent but remain below 10 percent per annum. This phase of inflation serves as a cautionary signal for policymakers, urging them to implement measures to curb inflation before it escalates into more severe forms (Sisay, 2008). Following walking inflation, running inflation emerges, characterized by annual price increases ranging from 10 to 20 percent. This phase poses significant challenges to economic stability and requires prompt intervention to prevent further escalation and economic disarray (Sisay, 2008). Finally, hyperinflation represents the most extreme form of inflation, characterized by inflation rates exceeding 20 percent. Mishkin (2020) emphasizes the catastrophic consequences of hyperinflation, which include rapid erosion of purchasing power, economic instability, and social unrest. Understanding these classifications is essential for policymakers to formulate appropriate monetary policies tailored to the prevailing inflationary conditions, thereby promoting economic stability and sustainable growth.

2.2.2. Major Factors Affecting Inflation

A. Money Supply

The money supply is the entire stock of currency and other liquid instruments circulating in a country's economy as of a particular time. The money supply can include cash, coins and balances held in checking and savings accounts. (Handa, 2000)

Increasing the money supply faster than the growth in real output will cause inflation. The reason is that there is more money chasing the same number of goods. Therefore, the increase in monetary demand causes firms to put up prices. In other words, if the money supply grows at

the same rate as real out-put we maintain the same price level. The theory most discussed when looking at the link between inflation and money supply is the quantity theory of money (QTM), but there are other theories that challenge it. (Schwartz, 1987.)

B. Interest Rate

The interest rate is the amount a lender charges for the use of assets expressed as a percentage of the principal. The interest rate is typically noted on an annual basis known as the annual percentage rate (APR). The assets borrowed could include cash, consumer goods, or large assets such as a vehicle or building. (Jha, 2011)

Inflation and interest rates are in close relation to each other, and frequently referenced together in economics. Inflation refers to the rate at which prices for goods and services rise. Interest rate means the amount of interest paid by a borrower to a lender, and is set by central banks. (D.atwater. 2013)

In general, as interest rates are lowered, more people are able to borrow more money. The result is that consumers have more money to spend, causing the economy to grow and inflation to increase. The opposite holds true for rising interest rates. As interest rates are increased, consumers tend to have less money to spend. With less spending, the economy slows and inflation decreases. In Ethiopia, interest rates decisions are taken by Monetary Committee of the National Bank of Ethiopia. The official rate is the bank's savings rate.

C. Gross Domestic Product

Gross Domestic Product (GDP) is a broad measurement of a nation's overall economic activity. GDP is the monetary value of all the finished goods and services produced within a country's borders in a specific time period.

Higher production leads to a lower unemployment rate, further fueling demand. Increased wages lead to higher demand as consumers spend more freely. This leads to higher GDP combined with inflation. These increases are due to reduced supply of key commodities and consumer expectations, rather than higher demand. (Diane coyle 2015)

D. Gross National Saving

Gross national saving is derived by deducting final consumption expenditure from Gross national disposable income, and consists of personal saving, plus business saving, plus government saving, but excludes foreign saving. (world bank)

Gross Domestic Saving consists of savings of household sector, private corporate sector and public sector. The more concerning issue is the perceptible shift of investors' preference towards physical assets as compared to financial assets. This can be attributable to a rise in inflationary pressures.

E. Unemployment Rate

Unemployment or joblessness is a situation in which able-bodied people who are looking for a job cannot find a job. The causes of unemployment are heavily debated. And unemployment rate is the share of the labor force that is jobless, expressed as a percentage. It is a lagging indicator, meaning that it generally rises or falls in the wake of changing economic conditions, rather than anticipating them. (Duilio, 1998)

The Phillips Curve implied that there is an inverse correlation between inflation and unemployment. However, Monetarist Rebuttal argued that inflation has no impact on the unemployment rate in the long term, because the economy reverts to the natural rate of unemployment and it adjusts to any rate of inflation.

F. Exchange rate

Exchange rate is the value of one nation's currency versus the currency of another nation or economic zone. Although some exchange rates are fixed by agreement, most fluctuate or float from day to day.

The ultimate determination of the value and exchange rate of a nation's currency is the perceived desirability of holding that nation's currency. That perception is influenced by a host of economic factors, such as the stability of a nation's government and economy. Investors' first consideration in regard to currency, before whatever profits they may realize, is the safety of holding cash assets in the currency. If a country is perceived as politically or economically unstable or if there is any significant possibility of a sudden devaluation or other change in the value of the country's currency, investors tend to shy away from the currency and are reluctant to hold it for significant periods or in large amounts.

G. Internal Conflicts

Conflicts whether internal or external, have significant implications for various economic factors, including inflation. One perspective suggests that conflict disrupts economic activities, supply chains, and infrastructure, leading to a decrease in production and an increase in production costs. These disruptions can cause a shortage of goods and services, resulting in inflationary pressures as demand surpasses supply. Additionally, conflict-induced uncertainty and instability can lead to hoarding, panic buying, and speculative behavior, further fueling inflation.

Conflicts can also affect a country's monetary and fiscal policies. Governments may resort to increased borrowing or money creation to finance conflicts, which can contribute to inflation. Moreover, conflicts can disrupt the functioning of monetary institutions and undermine the credibility of central banks, exacerbating inflationary tendencies.

Conflicts can also create an atmosphere of fear, uncertainty, and pessimism, influencing consumer and investor behavior. Negative expectations about the future can drive up prices and contribute to inflation as people increase their demand for goods and services.

Furthermore, conflicts have distributional consequences, affecting different sectors and groups within the economy. These distributional effects can impact inflation, as certain sectors experience cost increases or supply disruptions, leading to price hikes for specific goods or services.

2.2.3. Theories of inflation

The study of causes of inflation has probably given rise to one of the most controversial debates which differ in their hypotheses. Though various economists define inflation in different ways, a common general agreement is that inflation is a sustained increase in the general price level. It is specifically difficult to identify the reasons for or factors that contribute to inflation. In literature various schools of thought suggested different factors as the prime sources of inflation. (O.P kotwal 1987)

A. Demand Pull Theory

Demand pull inflation or excess demand inflation is the traditional and most common type of inflation. (Jhingan,1997). It occurs when aggregated demand exceeds aggregate supply. This excess demand may occur due to increase in one or all components of aggregate demand which

includes consumption, investment, government expenditure and net exports. The excess demand creates disequilibrium and pulls up prices until equilibrium is restored. This is because the increase in aggregate demand causes shortage of goods and services at old prices.

As a result consumers, business, and government bid against one another for a fixed quantity of available goods and services. This in turn leads to price increases until equilibrium is restored. (Campbell R and L. Stanley, 1986) According to this theory it is believed that inflation is caused by an expansion in the money supply of a given economy which is not supported by an increase in output levels of an economy

B. Structuralism (Cost Push Theory)

According to this view inflation arise in developing countries due to structural rigidities of their economy. The advocates of structural inflation say that the agricultural sector is irresponsive to price increases in developing countries due to defective system of land tenure, lack of irrigation, lack of storage and marketing facilities, bad harvest and the depends of agriculture on rain. (Jhingan, 1997) To prevent the price rise of food products, through imports is not possible due to foreign exchange constraints. Moreover, the price of imported products is relatively higher than their domestic prices.

Another cause of structural inflation is that the rate of export growth in a developing country is slow and unstable (Jhingan, 1997). The sluggish growth rate of exports and the foreign exchange constraints lead to the adoption of the policy of industrialization based on import substitution. Such a policy leads to inflation due to the rise in price of industrial products, income increases in the non-agricultural sectors and the relative inefficiency of the new industries during the “learning” period. The secular deterioration in the terms of primary products of developing countries further limits the growth of income from exports leading to exchange rate devaluation.

One of the proponents of cost push theories is James S. (1767) in his ‘Inquiry into the principles of Political Economy,’ argues that “real forces derive individual and aggregate prices alike” Inflation is determined by forces that determine the prices of individual goods. The forces governing the prices of specific goods are competition and cost. Competition lowers prices as do falling costs.

According to (Jhingan, 1997) the first cause of cost push inflation is an increase in the price of domestically produced or imported raw materials. The increase in raw material prices increases production cost of firms. This in turn results in higher prices because firms pass the cost increase to consumers. The other cause of cost push inflation is the rise in money wages more rapidly than of the productivity of labor.

Jhingan,(1997) summarized it as follows “Thus structural inflation may result from supply inelasticity leading to rise in agricultural prices, costs of import substitutes deterioration of the terms of trade and exchange rate depreciation”.

C. Mark up Theory

The theory is based on the assumption that both prices and wages are “administered” and are settled by workers and business firms. Firms fix administrative prices for their goods by adding to their direct materials and labor costs and some standard markup which covers profit. Labor also seeks wages on the basis of a fixed mark up over its cost of living. (Jhingan,1997).

If one firm rises in order to maintain its desired markup, the costs of other firms are raised which, in turn, raise their prices and this process of chains will lead to rise in the general price level in the final. According to the theory, the mark up can be based on either historical experience or expectations of future costs and prices. Jhingan (1997) summarized the ideas as follows

“The sizes of the markup depend on the degree of excess demand felt in the economy. When demand is moderate, the markups may be applied to historically experienced costs and prices and hence price rise may be slow. But, when demand is intense, the markups are based on anticipations of future costs and price rapidly. Thus there can be no inflation without some change in the size of markup”.

Mark up theories are related to cost push models if prices rise due to the expectations of firms and workers that their markups are lower than the required costs and prices regardless of the state of aggregated demand. The theory may also be related to demand Pull models if firms and workers raise their markups due to increase in demand.

D. Quantity Theory of Money (QTM) (Monetarism)

This theory was put forward by Cagan (1956) who viewed inflation as being caused by monetary growth and focused on the demand for money during hyperinflation and asserted that expectations of future inflation rates depended on past inflation rates. The theory on monetarism was brought forward by Friedman (1982) and in his theory he looks at the quantity theory of money and linked spending to the total amount of money in the economy.

His theory asserts that inflation was as a result of an increase in the supply of money in the economy. He concludes that inflation occurs if the growth of money supply in the economy supersedes the economic growth. The monetarist theory explains demand pull inflation as being caused by excess demand for goods and services which causes a positive output gap, whereby businesses respond by raising prices to increase their profit margin. This is attributed to increases in the money supply in the economy, depreciation of the exchange rate and reduction in the tax rates in an economy.

Monetarism maintains the view that inflation is as a result of higher rate of growth of money supply from the rate of growth in the economy, aimed at regulating the quantity, cost and allocation of money and credit in the whole economy. Moreover, it aims at achieving a set of objectives to maintain growth and stability in the economy. Therefore, any monetary policy seeks to stabilize both the exchange rates and prices, raise the level of employment, stable economic growth and interest rate smoothing.

E. Keynesian Theory

J.A. Keynes (1940) is known as the father of modern economics in his theory of inflation he argues that an increase in general price levels or inflation is created by an increase in the aggregate demand which is over and above the increase in aggregate supply. If a given economy is at its full employment output level, an increase in government expenditure (G), an increase in private consumption (C) and an increase in private investment (I) will create an increase in aggregate demand; Leading towards an increase in general price levels.

Such an inflationary situation is created due to the fact that at optimum or full employment of output (maximum utilization of scarce resources) in a given economy is unable to increase its output or aggregate supply in response to an increase in aggregate demand. According to Keynes, unexpected increase in aggregate demand creates “inflationary gap” and leads to inflation under

full employment conditions. This in turn creates unanticipated profits for firms while nominal wages remain temporarily constant.

The rising profit creates excess demand in the goods market. The rise in profit compels firms to expand their production there by creating excess demand in the labor market. The competition for fully employed labor among firms pushes nominal wages until real wage is restored at its initial level. The increase in real wage in turn produces excess demand in the goods market and hence inflationary pressure. The interaction of the labor and goods market produces wage-price spiral that can only be reversed by checks to aggregate demand (Kibritçioğlu, 2002).

F. The Phillips Curve

A.W. Phillips was one of the first economists to present compelling evidence of the inverse relationship between unemployment and wage inflation. Phillips studied the relationship between unemployment and the rate of change of wages in the United Kingdom over a period of almost a full century (1861-1957), and hypothesized that when demands for labor is high and there are few unemployed workers, employers can be expected to bid wages up quite rapidly.

However, when demand for labor is low, and unemployment is high, workers are reluctant to accept lower wages than the prevailing rate, and as a result, wage rates fall very slowly. Consequently, since wages and salaries are a major input cost for companies, rising wages should lead to higher prices for products and services in an economy, ultimately pushing the overall inflation rate higher. As a result, Phillips graphed the relationship between general price inflation and unemployment, rather than wage inflation. The graph is known today as the Phillips Curve.

G. Monetarist Rebuttal

In the late 1960s, a group of economists who were staunch monetarists, led by Milton Friedman and Edmund Phelps argued that the Phillips Curve does not apply over the long term. They contended that over the long run, the economy tends to revert to the natural rate of unemployment as it adjusts to any rate of inflation. The natural rate is the long-term unemployment rate that is observed once the effect of short-term cyclical factors has dissipated and wages have adjusted to a level where supply and demand in the labor market are balanced.

If workers expect prices to rise, they will demand higher wages so that their real (inflation-adjusted) wages are constant. And in a scenario wherein monetary or fiscal policies are adopted to lower unemployment below the natural rate, the resultant increase in demand will encourage firms and producers to raise prices even faster. They claimed that as inflation accelerates, workers may supply labor in the short term because of higher wages – leading to a decline in the unemployment rate.

However, over the long-term, when workers are fully aware of the loss of their purchasing power in an inflationary environment, their willingness to supply labor diminishes and the unemployment rate rises to the natural rate. However, wage inflation and general price inflation continue to rise. Therefore, over the long-term, higher inflation would not benefit the economy through a lower rate of unemployment. By the same token, a lower rate of inflation should not inflict a cost on the economy through a higher rate of unemployment. Since inflation has no impact on the unemployment rate in the long term, the long-run Phillips curve morphs into a vertical line at the natural rate of unemployment. (Elvis P.,2019)

H. Purchasing Power Parity Theory

PPP is based on the idea that an equivalent of a perfectly competitive world market for each of the different goods exists, so that there is a single price for each good throughout the world. (Jackman, et al, 1981) According to PPP, exchange rates equate the purchasing power of the different currencies, or equivalently the ratio of the price levels in two countries will equal the reciprocal of the exchange rate between their currencies. The form the price equalization will take place depends on the kind of the exchange system used. In a fixed exchange rate, prices adjust to equate the fixed exchange rates.

This implies that inflation rates should be equalized across countries. Under flexible exchange rates, PPP implies a convergence of exchange rates to offset differential price movements between different countries. This implies that a country's inflation rate is completely insulated from the world inflation rate and depends only on domestic factors. (Jackman, *et al*,1981).

But in the short-run PPP does not hold and the inflation rate of a country with flexible exchange rate is not completely insulated from the world inflation. (Jackman, *et al*,1981). Jackman, *et al*. opine that expansionary monetary policy within a country would tend to lower interest rates and hence

encourage an outward flow of capital there by lowering the exchange rate. This would lead to a fall in the exchange rate, which would in turn raise the price (interims of domestic currency) of foreign goods.

By contrast a fiscal expansion would raise interest rates, and thus lead to an appreciation of the exchange rate and hence a fall in the domestic currency price of foreign goods". On the contrary, Jackman, *et al*(1981) state that expansionary monetary policies in the rest of the impact of expansionary policies in rest of the world will lower the inflation of a country by encouraging inflow of capital. But the effect of fiscal expansion in the world in a country's inflation is indeterminate. In short PPP theory states that inflation of a country with fixed exchange rate is determined by the world inflation rate in the long run while that of flexible exchange rate is completely insulated from international price developments.

I. Expectations Hypothesis

This new development in inflation theory is the argument that expectations play a crucial role in the inflationary process. (Jackman *et al.*, 1981). There are two views on how expectations affect the inflationary process. According to the traditional view, adaptive expectations approach, people correct their expectation of the inflation rate gradually. This is because people base their expectation of inflation on past inflation. This view tells us that in the short run before people adjust their expectations policies of the government have the power to influence unemployment and output. But in the long run people adjust their expectations and it is impossible for the government to use policies because actual and expected inflations are equal.

According to the recent view, rational expectations, economics agents use all the available information to make rational expectations. Due to this actual and expected inflations always equal. As a result, any expansionary policy adopted by the government both in the short run and long run will generate only inflationary pressures. (Campbell R,2016)

2.2.4. Inflation Management

Inflation management constitutes a critical aspect of macroeconomic policy, necessitating careful consideration and implementation of various strategies to mitigate its adverse effects on economic stability and growth. Mishkin (2020) underscores the importance of proactive inflation

management, highlighting the detrimental consequences of unchecked inflation, such as eroding purchasing power, distorting resource allocation, and exacerbating income inequality. Effective inflation management involves a combination of monetary and fiscal policies aimed at controlling the money supply, managing aggregate demand, and promoting price stability. Central banks play a pivotal role in this process through the use of interest rate adjustments, open market operations, and reserve requirements to influence the money supply and curb inflationary pressures (Mishkin, 2020). Additionally, fiscal policy measures, including taxation, government spending, and debt management, are employed to complement monetary policy efforts and address structural imbalances contributing to inflationary pressures (Mishkin, 2020). Furthermore, Mishkin (2020) emphasizes the importance of adopting forward-looking inflation targeting frameworks, which provide transparency, credibility, and accountability in monetary policy implementation, thereby anchoring inflation expectations and promoting long-term price stability. Mishkin's insights underscore the multifaceted nature of inflation management and the need for coordinated policy responses to effectively address inflationary challenges and promote sustainable economic growth.

Monetary Inflation management is a multifaceted endeavor crucial for maintaining economic stability and fostering sustainable growth. Mishkin (2020) underscores the importance of proactive inflation management, emphasizing the adverse consequences of unchecked inflation such as eroding purchasing power and exacerbating income inequality. Effective inflation management entails a holistic approach that incorporates monetary and fiscal policies, supply-side reforms, exchange rate policies, and credible commitments to maintaining price stability. Monetary policy, as a key tool in inflation management, involves the use of various instruments by central banks to influence the money supply, interest rates, and aggregate demand (Friedman, 1968). These policies are classified as either expansionary or contractionary, depending on the prevailing economic conditions, and aim to stabilize prices and promote economic growth (Blanchard, 2003).

Furthermore, fiscal policy plays a crucial role in inflation management by influencing aggregate demand through government spending and taxation (Barro & Redlick, 2011). Expansionary fiscal policies involve increasing government spending or reducing taxes to stimulate economic activity during recessions, while contractionary fiscal policies involve reducing government spending or increasing taxes to cool down the economy and combat inflation (Blanchard, 2003). Additionally,

income policies, which focus on controlling the rate of growth of money incomes, can help moderate inflationary pressures by preventing excessive wage increases (Jencks, 1976).

Moreover, supply-side management strategies, including structural reforms and investment in infrastructure, can alleviate supply-side constraints and reduce inflationary pressures (Wonnacott & Wonnacott, 1990). Structural reforms aimed at enhancing market efficiency, promoting competition, and reducing regulatory burdens can increase productivity and reduce production costs, thereby contributing to inflation management (Romer, 1994). Investment in infrastructure, such as transportation networks and energy facilities, can also increase production capacity and supply, alleviating bottlenecks and reducing inflationary pressures (Hulten, 1996).

Additionally, exchange rate policies play a crucial role in inflation management by influencing the competitiveness of domestic goods and services and the cost of imported goods (Obstfeld & Rogoff, 1995). Fixed exchange rate regimes, where the domestic currency is pegged to a stable foreign currency, can help stabilize prices and manage inflation by reducing exchange rate volatility (Frankel, 1999). On the other hand, floating exchange rate regimes allow exchange rates to fluctuate freely, serving as an automatic adjustment mechanism to dampen inflationary pressures arising from external factors (Mundell, 1963).

Furthermore, expectations and credibility play a crucial role in inflation management by shaping individuals' behavior and influencing market outcomes (Friedman, 1977). Rational expectations theory suggests that individuals form their expectations about the future based on all available information, highlighting the importance of credible policy commitments and transparent communication in anchoring inflation expectations and promoting price stability (Sargent & Wallace, 1975). Moreover, the efficient markets hypothesis posits that asset prices in financial markets reflect all available information, underscoring the role of information efficiency in shaping market outcomes and inflation expectations (Fama, 1970). Credible commitments by central banks and governments to maintaining price stability can enhance confidence in the economy and anchor inflation expectations, thereby promoting long-term price stability and sustainable economic growth (Bernanke et al., 1999).

Moreover, coordination of policies, both within and across countries, is crucial for effective inflation management (Rogoff, 1985). Coordinating monetary and fiscal policies to align their

objectives and actions can enhance the effectiveness of inflation management efforts and contribute to macroeconomic stability (Blinder, 1982). Establishing institutional frameworks that promote policy coordination and cooperation among relevant stakeholders, including central banks, finance ministries, and other government agencies, can also contribute to better inflation management outcomes (Alesina & Summers, 1993).

In conclusion, effective inflation management requires a comprehensive approach that incorporates monetary and fiscal policies, supply-side reforms, exchange rate policies, and credible commitments to maintaining price stability. By adopting a holistic approach that addresses the root causes of inflation and promotes macroeconomic stability, policymakers can enhance the effectiveness of inflation management efforts and promote sustainable economic growth and development. Mishkin's insights underscore the importance of proactive inflation management and the need for coordinated policy responses to effectively address inflationary challenges and foster economic stability and prosperity.

2.3. Empirical Literature Review

2.3.1. Foreign Empirical Review

Exploring the determinants of inflation extends beyond national borders, and insights from foreign empirical studies provide a richer understanding of these dynamics across diverse economic contexts. This study synthesizes the findings from various international studies, identifying recurring themes and nuanced insights into the complex factors influencing inflation.

The review focuses primarily on developing countries to ensure the relevance and applicability of findings within the context of inflation dynamics in these nations. This selective approach allows for a more focused and comparative analysis tailored to the specific challenges faced by developing economies. Additionally, it addresses resource constraints and aims to provide policymakers with insights directly relevant to their policy decisions in developing countries

Fiscal Policy and Exchange Rates: Prakash and Philip's (2001) study on developing countries underscores the role of fiscal policy and exchange rate movements as primary drivers of inflation. This observation aligns with Winfred's (2014) findings in Kenya, where central bank rates, influenced by fiscal policies, significantly contributed to inflation dynamics. Similarly, Mogsin

and Schimmelpfennig (2006) in Pakistan emphasized the importance of monetary factors, particularly exchange rates, in short-term inflation dynamics.

External Shocks and Globalization: The impact of external factors, such as oil price fluctuations, is a common thread in these studies. Both Prakash and Philip (2001) and Maliszewski's research in Georgia (2003) highlight how global forces, including changes in oil prices, can have a substantial impact on domestic inflation. This emphasizes the interconnectedness of economies in a globalized world and the need for inflation management strategies that consider international market dynamics.

Monetary Variables: The significance of monetary variables is a recurring theme. Prakash and Philip (2001) emphasize the role of money supply in driving inflation in developing countries. Winfred (2014) identifies money supply as a critical factor affecting inflation in Kenya. Mogsin and Schimmelpfennig (2006) also underscore the dominance of monetary variables, particularly private sector credit, in explaining inflation trends in Pakistan. These consistent findings underscore the central role of monetary policy in shaping inflation outcomes.

Exchange Rates and Trade: Exchange rate movements and trade dynamics emerge as important factors. Prakash and Philip (2001) point to the influence of exchange rate changes on inflation. Winfred (2014) establishes a positive relationship between exchange rates and inflation in Kenya. Maliszewski's study (2003) emphasizes the impact of exchange rate variations on inflation in Georgia. These findings highlight the significance of international trade and currency movements in shaping domestic inflation rates.

Output and Economic Growth: While Prakash and Philip's study (2001) suggests a limited role for cost shocks and the output gap in explaining inflation, Winfred (2014) identifies GDP growth rate as a factor negatively correlated with inflation in Kenya. Similarly, Maliszewski (2003) finds that output plays a role in influencing inflation in Georgia. These findings indicate that domestic economic conditions and growth prospects can affect inflation trends.

Political Stability and Corruption: Winfred's (2014) study in Kenya explores the impact of political instability and corruption perception on inflation. Although no direct link to inflation is established, the study underscores the importance of political stability in maintaining economic equilibrium and indirectly influencing inflation dynamics.

Conclusion and Policy Implications: The synthesis of these foreign empirical studies reveals a complex interplay of factors influencing inflation across diverse contexts. Fiscal policies, exchange rates, external shocks, monetary variables, and political stability emerge as pivotal drivers. While the relative importance of these factors may vary, these insights collectively enhance our understanding of global inflation dynamics. Policymakers and researchers can draw on these findings to craft tailored strategies for inflation management. Furthermore, recognizing the influence of global economic forces and external shocks underscores the importance of international cooperation and vigilant monitoring of global economic trends in managing inflation effectively.

2.3.2. Local Empirical Review

In the context of Ethiopia, a nation with its unique economic challenges and opportunities, understanding the factors that drive inflation is crucial for policymakers aiming to foster economic stability and growth. This local empirical literature review aims to synthesize and triangulate findings from studies conducted within Ethiopia over the years to provide a comprehensive overview of the determinants of inflation within the nation.

Role of Monetary Policy:

A consistent theme that emerges from this local empirical literature is the central role of monetary policy in shaping inflation dynamics within Ethiopia. Specifically, the management of money supply growth is identified as a critical determinant of inflation in both the short and long run. Effective monetary policy measures, such as controlling the rate of money supply growth, are repeatedly emphasized as essential for maintaining price stability and curbing inflationary pressures within the Ethiopian context (Kahssay Hagos, 2020; Tekeber N. et al., 2019; Fitsum S. et al., 2016; T.T. Biresaw, 2013; Menji S., 2008; Ayele, G. E., & Zerayehu, H. H., 2017).

Exchange Rate and External Factors:

Local empirical studies also underscore the influence of the nominal exchange rate and external economic factors on inflation within Ethiopia. These factors, including world oil prices, external debt, and foreign aid, are consistently identified as contributors to inflation dynamics. Policymakers are advised to carefully manage exchange rate policies to prevent excessive currency

devaluation, which can contribute to long-term inflation. Moreover, monitoring external conditions, particularly global commodity prices like oil, is highlighted as crucial for domestic inflation management within Ethiopia's unique economic context (Kahssay Hagos, 2020; Tekeber N. et al., 2019; T.T. Biresaw, 2013; Ayele, G. E., & Zerayehu, H. H., 2017).

Inflation as a Monetary Phenomenon:

A core finding from the local empirical literature is the assertion that inflation is fundamentally a monetary phenomenon within Ethiopia. Effective management of money supply growth is consistently emphasized as pivotal in containing inflation. This underscores the importance of sound monetary policy, tailored to Ethiopia's economic landscape, in the nation's efforts to control inflation. It implies that policies aimed at controlling money supply expansion should be central to Ethiopia's inflation management strategy (Kahssay Hagos, 2020; Tekeber N. et al., 2019; Fitsum S. et al., 2016; T.T. Biresaw, 2013; Menji S., 2008; Ayele, G. E., & Zerayehu, H. H., 2017).

Negative Correlation with Economic Growth:

Another consistent observation from local empirical studies is the negative correlation between inflation and real Gross Domestic Product (GDP) within Ethiopia. It is repeatedly found that higher economic growth, as represented by real GDP growth, is associated with lower inflation rates. This underscores the importance of policies that promote economic growth and increase output supply as effective tools for controlling price levels within the specific context of Ethiopia. Policymakers are encouraged to prioritize strategies that stimulate economic growth to mitigate inflationary pressures unique to the Ethiopian economy (Kahssay Hagos, 2020; Tekeber N. et al., 2019; Fitsum S. et al., 2016; Menji S., 2008; Ayele, G. E., & Zerayehu, H. H., 2017).

Political Stability:

In some local empirical studies, political stability emerges as a significant factor that can influence inflation dynamics within Ethiopia. Stable political environments are recognized as conducive to mitigating inflationary pressures, indicating the importance of political stability in achieving economic stability. Fostering political stability and promoting democratic discussions among political parties are highlighted as instrumental in managing inflation within the Ethiopian context (Kahssay Hagos, 2020; T.T. Biresaw, 2013; Ayele, G. E., & Zerayehu, H. H., 2017).

Conclusion:

This local empirical literature review triangulates findings from studies conducted within Ethiopia to provide policymakers with an enhanced understanding of the determinants of inflation in the country. The synthesis of these studies collectively contributes to a well-rounded framework for addressing inflationary pressures unique to Ethiopia.

Effective monetary policy, exchange rate management, consideration of external factors, promotion of economic growth, and the maintenance of political stability emerge as key policy considerations tailored to Ethiopia's economic landscape. Policymakers must navigate these factors within the specific context of Ethiopia to ensure that inflation remains within manageable bounds, fostering sustainable economic growth and prosperity for the nation. The findings collectively underscore the complexity of inflation within Ethiopia and the need for locally tailored policy approaches to achieve macroeconomic stability.

2.4 Conceptual Framework

In the context of this research, a simplified conceptual framework that offers a clear overview of the central variables and their relationships is presented, helping us comprehend the complex dynamics influencing inflation in Ethiopia. Our independent variables encompass a range of macroeconomic factors, including money supply, interest rates, exchange rates, GDP growth rate, government spending, unemployment rate, and a significant political factor—internal conflict. These variables are hypothesized to exert a substantial influence on the dependent variable, inflation, within the Ethiopian context. This framework serves as our intellectual map, guiding our research journey and aiding in the systematic analysis of these critical factors in understanding inflation in Ethiopia.



SOURCE: Researchers own compilation

Figure 1 Conceptual Framework

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1. Research Design

The explanatory research design was chosen for this study to investigate the causal relationships between various macroeconomic variables and inflation in Ethiopia. By employing this design, the researcher seeks to explain why changes in these variables impact the inflation rate in the country. Research design in this study implements explanatory to identify the major cause of inflation in Ethiopia because Explanatory research is conducted in order to identify the extent and nature of cause-and-effect relationships (Malawi & Thornhill (2012)).

3.2. Population and Sampling Techniques

The research focuses on analyzing the annual records of the Consumer Price Index (CPI) in Ethiopia. The dataset spans 31 years, covering the period from 1992 to 2022. The chosen timeframe of 31 years enables a thorough examination of inflation dynamics, encompassing long-term trends. This selection facilitates robust statistical analysis while maintaining a balance between data accessibility and research practicality.

3.3. Data Type and Source

This study utilizes quantitative time series secondary data spanning from 1992 to 2022 to investigate the factors influencing inflation and its management. The data for all variables, including CPI, GDP, GNS, money supply, lending rate, exchange rate, unemployment rate, and government spending, were obtained from the Ministry of Finance (MoF), with the exception of internal conflict, which is represented as a dummy variable. Internal conflict pertains to recent armed conflicts and tensions that have emerged in different regions of Ethiopia. Notably, the inclusion of a dummy variable for internal conflict reflects recent armed conflicts and tensions within Ethiopia, specifically representing significant events such as the Ethio-Eritrea civil war and the recent civil war. Additionally, interviews were conducted with the Economist and Policy

Advisor from MoF to propose effective strategies for managing inflation based on the study's findings.

3.4. Method of data Analysis and presentation

In this research, a linear regression model was employed to assess the association between the dependent variable, inflation measured by the Consumer Price Index (CPI), and several independent variables. The chosen independent variables include money supply, interest rate, exchange rate, GDP, GNS, unemployment rate, government spending, and a dummy variable for conflict. Notably, a singular measurement method, the CPI, was utilized to gauge inflation in this study.

This specific measurement was selected due to its distinct advantages over alternatives like the GDP deflator. The CPI accounts for imported goods and services, making it a more comprehensive metric for inflation in the Ethiopian context. The regression model utilized to inspect the factors influencing inflation is expressed as follows.

$$\text{CPI} = f(\text{M2}, \text{IR}, \text{GDP}, \text{GNS}, \text{UR}, \text{DIC}, \text{EXR})$$

$\ln \text{CPI} = \beta_0 + \beta_1 \ln \text{M2} + \beta_2 \ln \text{IR} + \beta_3 \ln \text{GDP} + \beta_4 \ln \text{GNS} + \beta_5 \ln \text{UR} + \beta_6 \ln \text{EXR} + \beta_7 \text{DIC} + U_t$
--

Where:

M2= Broad Money Supply

IR= Interest rate

GDP= Gross Domestic Products

GNS= Gross National Savings

UR= Unemployment Rate

EXR= Exchange Rate

DIC= Dummy for Internal Conflict

The subscript term t = time

U_t = error term at time t.

$\ln$ = the natural logarithm, the coefficients 0, 1... 7 are the parameters of the respective variables.

Using the logarithm of variables in regression helps address nonlinearity, stabilize variance

(heteroscedasticity), and allows for interpreting coefficients as percentage changes (Cameron & Trivedi, 2009; Greene, 2003; Wooldridge, 2015).

To validate the conformity of the data to the fundamental assumptions of the classical linear regression model, a diagnostic analysis was conducted. This analysis encompassed tests to assess the presence of serial correlation, normality, heteroscedasticity, multicollinearity, unit roots, and cointegration. The software employed for data analysis was Eviews9 (Econometric views), a statistical package specifically designed for time series-oriented econometric analysis on Windows. The findings from the analysis were presented in the form of tables, graphs, and figures to facilitate comprehensive visualization and understanding.

Variable	Explanation	Measurement	Expected result
Dependent variable	Inflation is the general rise in prices, leading to a decrease in the purchasing power of money.	Natural Log of customer price index (CPI)	Sig & +ve
Inflation			
Independent variable	The total amount of money in existence in a country.	Natural Log of M2(Broad Money Supply)	Sig& +ve
Money supply			
Interest rate	The amount a lender charges for the use of asset expressed as a percentage of the principal.	Natural Log of Nominal simple average lending rate.	Sig& +ve
GDP	Monetary measure of the market value of all final goods & services produced in a period of time, often annually.	Natural Logarithm of Real GDP	Sig & -ve
GNS	final consumption expenditure minus gross national disposal income & consist of personal saving, plus business saving, plus government saving, but excludes foreign saving.	Natural Log of GNS	Sig & -ve
Unemployment rate	The number or proportion of unemployed people.	The percentage of share of jobless labor force from the overall labor force	Sig & -ve
Exchange rate	The value of one nation's currency versus the currency of another nation or economic zone.	The natural log of value of Ethiopian birr against US dollar	Sig & +ve
Conflict	Refers to the civil war that happened in Ethiopia, it takes the Ethio-Eritrea war and tensions that have recently arisen in various regions of Ethiopia.	It is a dummy variable and have a value of 1 if there is conflict at a given year from the sample period and 0 otherwise.	Sig & +ve

Table 1: variables and their expected result

Source: researchers own compilation

CHAPTER FOUR

4. DATA ANALYSIS AND INTERPRETATION

In this chapter, various analytical techniques was conducted to examine the data and draw meaningful conclusions. These techniques include descriptive analysis, diagnostic analysis, and regression analysis. The findings will be presented using tables, graphs, and figures, allowing for a clear and visual representation of the data. Furthermore, we will provide interpretations of the analyzed data, offering valuable insights into the relationships and patterns observed

4.1. Descriptive Analysis

This section shows the results of the descriptive analysis for the primary variables incorporated in the regression model. Essential statistical measures such as mean, median, standard deviation, minimum, and maximum values have been presented. This presentation aims to provide a comprehensive overview of the data utilized in the model and serves as a tool for data screening to identify any implausible figures.

Table 2: descriptive statistics of dependent and independent variables

Source: Eviews

	CPI	EX RATE	GDP	GNS	ICONFLICT	LENDING RATE	M2	UR
Mean	73.17569	14.73755	974866.6	263846.7	0.129032	0.123502	278644.4	0.488394
Median	39.02218	8.794000	245836.0	57103.29	0.000000	0.120000	56651.91	0.032200
Maximum	293.0223	48.56734	6157538.	1311141.	1.000000	0.155000	1715310.	2.500000
Minimum	20.38626	4.270000	22077.90	1457.500	0.000000	0.068000	9010.900	0.022900
Std. Dev.	65.90688	10.72520	1457425.	363373.7	0.340777	0.018157	434573.2	0.949488
Skewness	1.629955	1.507281	2.047428	1.434684	2.213176	-0.571747	1.936993	1.557764
Kurtosis	5.510579	4.815019	6.912627	4.059473	5.898148	4.076744	5.952793	3.437491
Jarque-Bera	21.86794	15.99326	41.43213	12.08452	36.15615	3.186483	30.64707	12.78480
Probability	0.000018	0.000337	0.000000	0.002376	0.000000	0.203266	0.000000	0.001674
Sum	2268.446	456.8640	30220863	8179246.	4.000000	3.828550	8637977.	15.14020
Sum Sq. Dev.	130311.5	3450.895	6.37E+13	3.96E+12	3.483871	0.009890	5.67E+12	27.04582

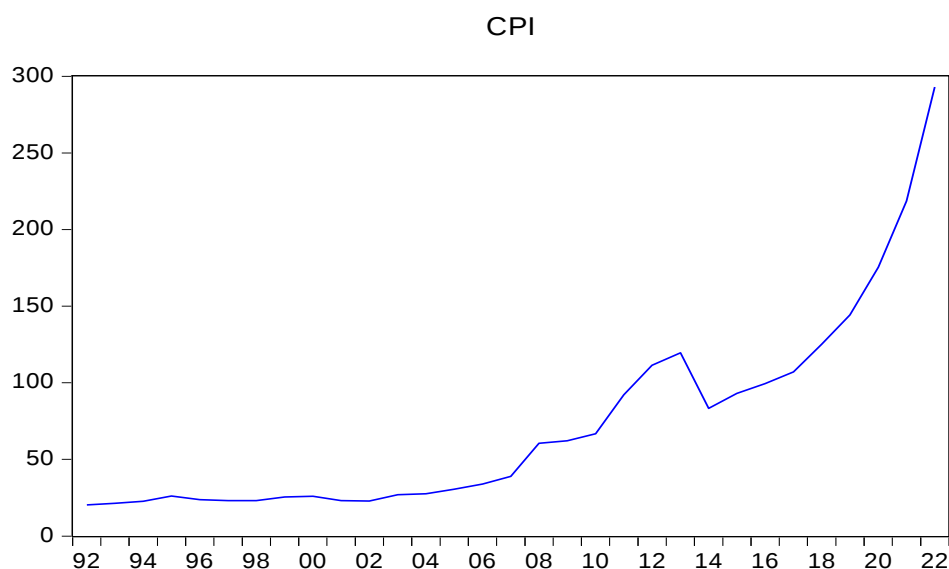
Observations	31	31	31	31	31	31	31
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The presented table displays descriptive statistics, including mean, maximum, and minimum values, for variables such as CPI (Consumer Price Index), GNS (growth rate of gross national savings in Ethiopia), IR (annual lending rate of commercial banks), M2 (growth rate of total annual broad money supply in Ethiopia), RGDP (growth rate of Real GDP), UR (annual unemployment rate), IC (dummy variable representing internal conflict), and ER (exchange rate), spanning the years 1992-2022. Particularly, the Consumer Price Index (CPI) is calculated using the Laspeyres formula.

Descriptive Trend Analysis of CPI

As indicated in Table 2.0, the CPI (Consumer Price Index) reflecting inflation in Ethiopia over the 31 observations averages a value of 73.17569 for the study period (1992-2022). The maximum CPI value is observed at Br 293 in 2022, while the minimum value stands at 20.4 in 1992. This range illustrates the fluctuations in the cost for the average consumer to obtain a basket of goods and services during the specified period.

Figure 2 Trend of CPI



The trend of CPI shows that from 1992 until 2004 it shows more or less stable trend with a slight ups and downs, but after 2005 it started increasing until 2013 and showed a decrease in 2014. It then started increasing in an increasing rate until 2022 as its shown in the above graph fig1.

Descriptive Trend Analysis of Broad Money Supply (M2)

Broad money supply (M2) is a metric used to assess the growth of the money stock in a country over a specific period, typically a year. It encompasses various components, including currency outside banks, non-government demand deposits, resident sectors' time and savings deposits, foreign currency deposits, bank, and traveler's checks, as well as other securities like certificates of deposit and commercial paper. In the case of Ethiopia, the value of broad money supply has exhibited a consistent upward trend over the past three decades.

By the end of the 2021/22 fiscal year, all components of money supply experienced notable growth. Narrow money supply, comprising demand deposits and currency held outside banks, increased by 26% from 438 billion to 588 billion birr. This expansion can be attributed to the overall growth in economic activities and improvements in the demand for money for transactional purposes.

Moreover, the domestic liquidity, as indicated by broad money supply (M2), reached a significant milestone of 1.715 trillion birr, representing a substantial 21% growth compared to the preceding year. This growth in broad money supply indicates an increased availability of liquid assets within the economy, reflecting the expansion of financial transactions and overall economic activities in Ethiopia.

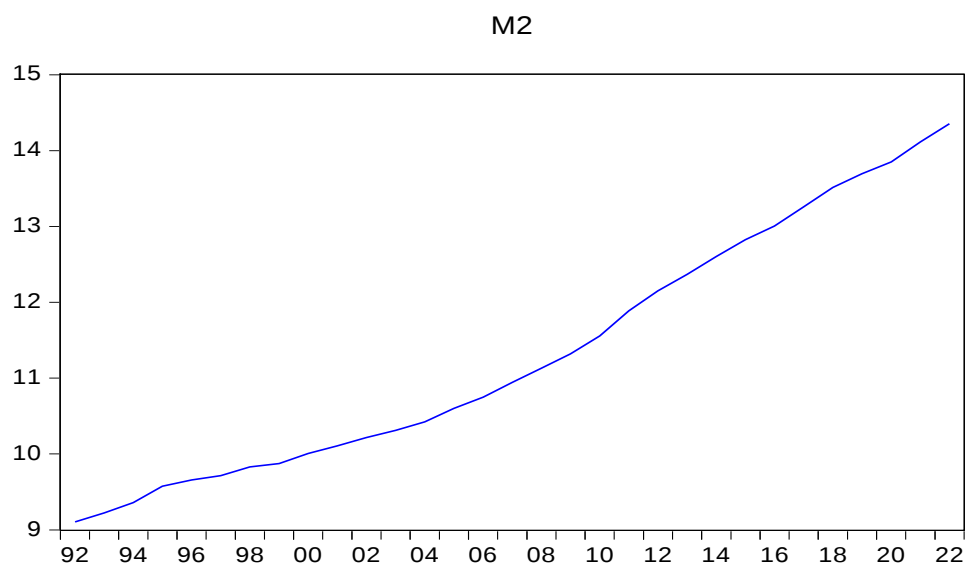


Figure 3 trend of broad money supply

Descriptive Trend Analysis of Lending Rate (IR)

The lending interest rate refers to the rate at which financial institutions charge borrowers for the funds they lend. It is an essential component of the overall interest rate environment and plays a crucial role in shaping borrowing costs for individuals and businesses. The lending interest rate reflects the cost of borrowing money and serves as a measure of the risk associated with lending activities.

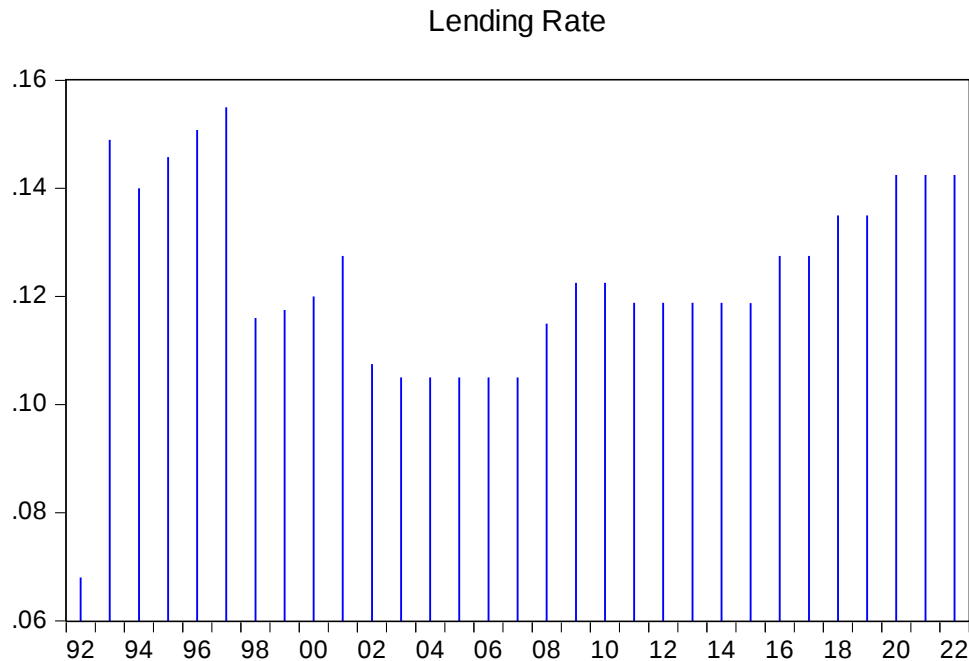


Figure 4 trend of LR

From the graph above, it can be observed that the interest rate fluctuates over the years. Initially, from 1992 to around 1997, the interest rate remains relatively stable around 10-12%. Around 1997, there is a slight increase in the interest rate, followed by a period of fluctuation until approximately 2005.

From 2005 to around 2013, there is a general increasing trend in the interest rate, with some minor fluctuations along the way. After 2013, the interest rate stabilizes at a higher level, ranging from 11.5% to 15.5%. (this shows that for every Br.1 of liability from commercial banks in these years, there was Br. 0.105 annual interest), while maximum IR is 15.5 in 1997 (this shows that for every Br.1 of liability from commercial banks in 1997, there was Br. 0.155 annual interest). Mean of IR is 12.21, which means the nominal simple average lending rate of commercial banks from 1992-2022 in Ethiopia was 12.21

Descriptive Trend Analysis of GNS

Gross National Savings (GNS) refers to the total amount of savings generated by individuals, businesses, and the government within a country over a specific period. It represents the portion of income that is not consumed but rather set aside for future use or investment. GNS includes savings in various forms, such as personal savings, corporate savings, and government savings.

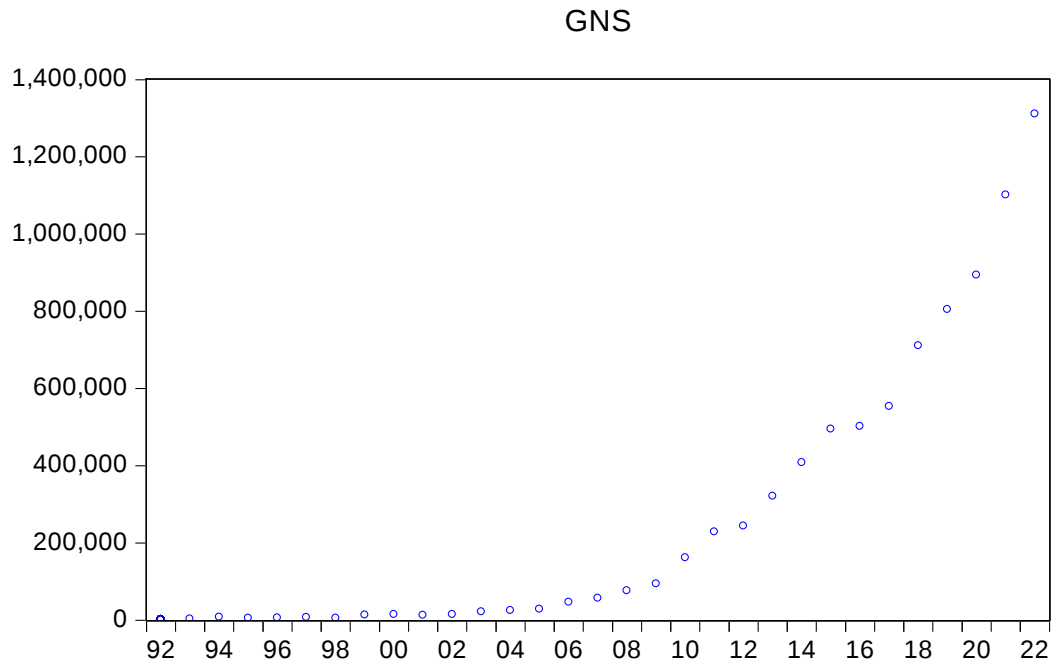


Figure 5 Trend of GNS

As shown in Graph fig 5 The trend of GNS in Ethiopia shows a general upward trend from 1992 to 2022. The values increase over time with occasional fluctuations. However, there are several periods of more substantial growth in gross national savings. Notable periods include the late 1990s, early 2000s, mid-2000s, and from 2011 to 2022. During these periods, the growth rate appears to be higher than in other years.

And while the overall trend is upward, there are instances of fluctuations and temporary plateaus in the growth of gross national savings. These can be seen in certain years where the values remain relatively stable or experience slight declines before resuming their upward trajectory.

Descriptive Trend Analysis of RGDP

Gross Domestic Product (GDP) is a widely used economic indicator that measures the total value of all goods and services produced within a country's borders over a specific period. It serves as a key measure of a nation's economic performance and provides insights into the overall health and growth of an economy

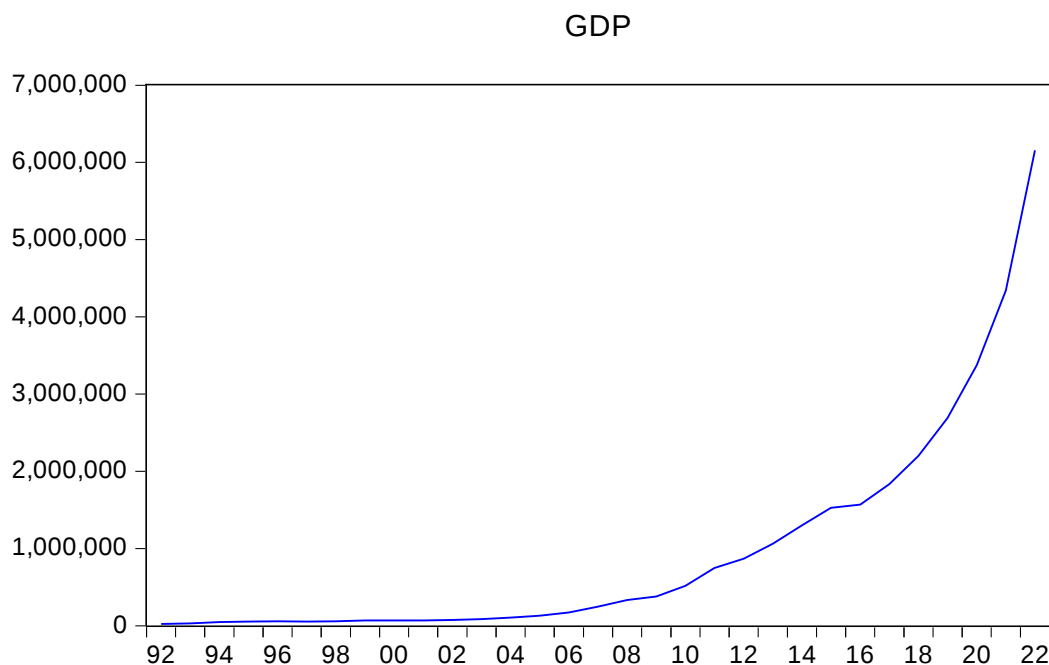


Figure 6 Trend of GDP and CPI

The GDP data for Ethiopia from 1992 to 2022 shows a general increasing trend over the years. In the early years (1992-2000), the GDP values remained relatively stable, ranging from 15,542.61 to 22,077.90. However, from the early 2000s onwards, there was a significant upward trend in GDP. The values started to rise more rapidly, reaching 289,69.40 in 2006 and further increasing to 6,159,538 by 2022.

There are noticeable fluctuations in the growth rate of GDP over the years. From 2006 to 2013, the GDP growth rate experienced a significant surge, with values exceeding 500,000. However, from 2013 to 2016, there was a slight decline in growth rate, followed by a substantial increase again, reaching a peak of 6,150,538 in 2022.

Note: All figures are in millions of Ethiopian Birr

Descriptive Trend Analysis of Unemployment Rate

The Unemployment Rate (UR) is a metric that gauges the percentage of the labor force without employment from the total labor force. Notably, UR demonstrates a minimum value of 3.1% in 1994, indicating that only 3.1% of the labor force was unemployed during that year. Conversely, it reaches its maximum level at 26.4% from 1999 to 2003, denoting that the annual unemployed labor force constituted 26.4% of the total labor force during that period. The mean UR value is 19.71, signifying that, on average, the jobless labor force comprises 19.71% of the total labor force in the sampled years.

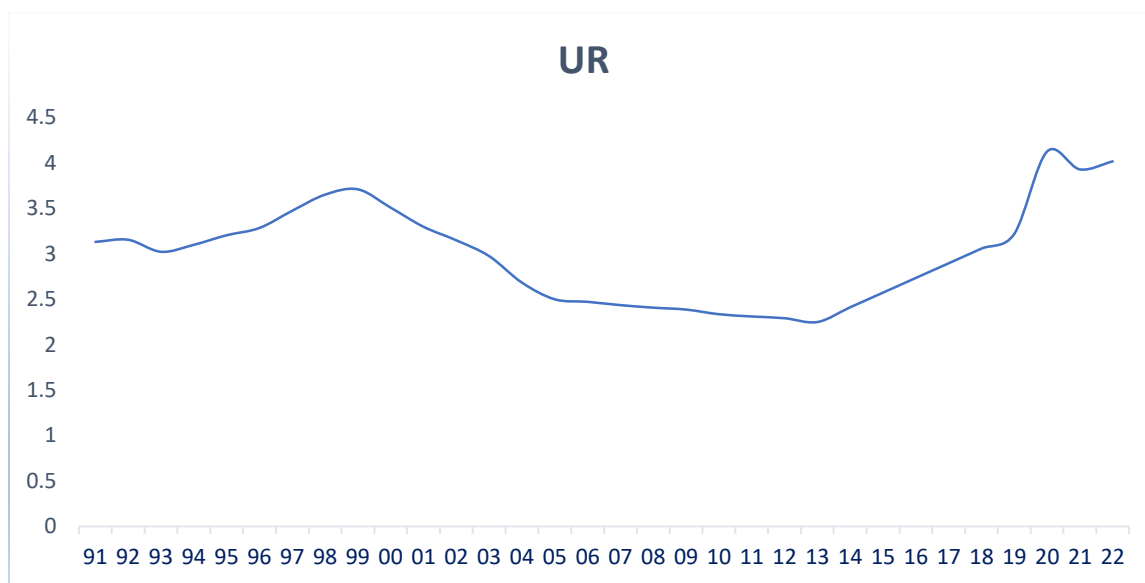


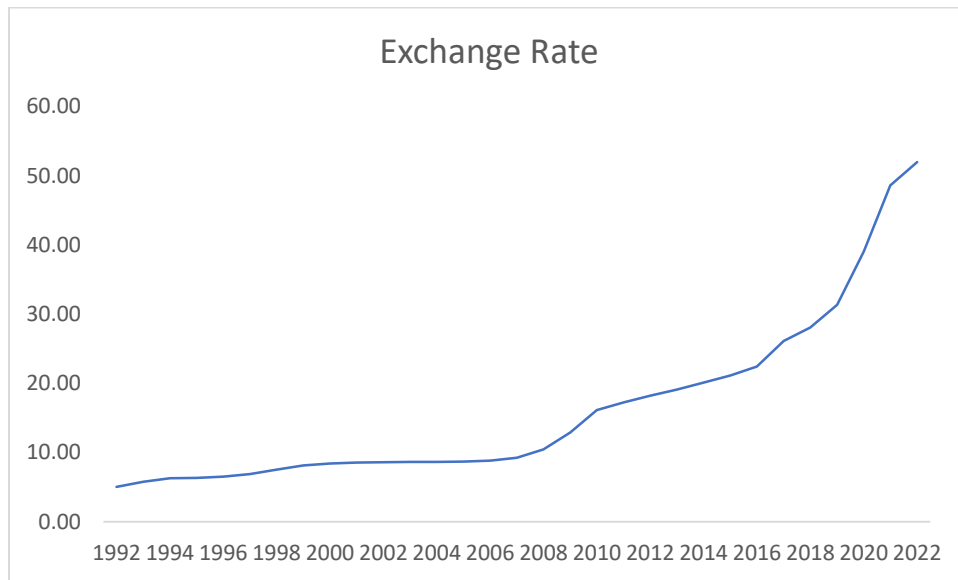
Figure 7 Trend of UR and CPI

As illustrated in Figure 6, the Unemployment Rate (UR) exhibits an initial increase in 1995 followed by a gradual fluctuation throughout the remaining period. Notably, from 1996 onwards, there is an observable overlapping trend between the Consumer Price Index (CPI) and UR until 2004. Subsequently, as CPI begins to rise, unemployment shows a declining trend. This observed pattern suggests a potential negative relationship between UR and CPI, indicating that an increase in the Consumer Price Index may be associated with a decrease in the Unemployment Rate.

Descriptive Trend Analysis of Exchange Rate

The exchange rate is a fundamental economic indicator that reflects the value of birr in relation to dollar. It plays a crucial role in international trade, investment, and financial transactions. It provides insights into the country's currency valuation and its competitiveness in the global market.

Figure 8 Trend of ER



The exchange rate for the Ethiopian Birr shows a relatively stable trend from 1992 to 1996, remaining constant at 2.1 units. However, starting from 1997, it begins to experience fluctuations. By 2001, it increases to 4.3 units, indicating a depreciation of the Ethiopian currency. From 2002 to 2010, it continues to rise steadily, reaching a peak of 8.8 units in 2010. This period is characterized by increasing volatility in the exchange rate. Subsequently, from 2011 to 2014, the exchange rate remains relatively stable within the range of 8.5 to 8.7 units. From 2015 onwards, there is a gradual appreciation of the Ethiopian currency, with the exchange rate increasing to 51.9 units in 2022.

4.2. Diagnostic Analysis

To assess the consistency of the sample with certain assumptions, diagnostic checking was employed. The aim is to verify if the following conditions hold:

- The data sets are stationary, meaning they do not exhibit unit roots.

- There is no presence of a relationship between independent variables, indicating the absence of multicollinearity.
- There is no correlation between the error term at time period 't' and the error term at the previous time period, indicating no autocorrelation issue.
- The error term remains constant across the observations, signifying homoscedasticity.
- The error term follows a normal distribution, ensuring normality.

If none of the above assumptions are violated, the regression analysis will proceed as planned, providing accurate and reliable estimates. By adhering to these conditions, any concerns of plagiarism are mitigated.

Stationarity (unit root test)

According to time series econometrics, a given regression can explain the long-run relationship among the variables either if all the variables are stationary at level, i.e. $I(0)$, or if they are co integrated. Regression based on non-stationary time series explains the relationship during the study period only. This means that it is impossible to infer about the long run relationship of the variables and leads to spurious regression, very high R square but with no meaningful relationship among the variables.

Decision Rule: variables are stationary if their p-value is less than significance level or if T statistics is less than 5% critical values.

Variable	P value at level	P Value at 1 st difference	P value at 2 nd difference
CPI	1.0000	0.0294	Not needed
IR	0.0701	0.7106	0.0003
M2	0.9549	0.0608	0.0001
RGDP	0.1229	0.1237	0.0007
UR	0.7543	0.0000	Not needed
GNS	0.0052	Not needed	Not needed

Exc R	0.8591	0.3630	0.0061
DIC	0.6307	0.0173	Not needed

Table 3 unit root test (stationarity)

Co integration test

The significance of a regression based on unit roots (non-stationary) is contingent upon the existence of cointegration, implying a long-run relationship between variables. Given the unit root test results indicating that M2, IR, and CPI possess a unit root, we proceed to assess the presence of a long-run relationship among all variables.

According to time series econometrics, if the residuals from a regression of unit roots are stationary then the variables are said to be co integrated. This is because even if the variables are individually nonstationary their linear combination is stationary which is depicted by the stationarity of the residuals. (Greene, 2017)

Decision rule: accept if the p value of co integration is less than 0.05 on at least 1 co integrating equation.

Unrestricted Cointegration Rank Test (Trace)

Hypothesized	Trace	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.977286	315.3103	159.5297	0.0000
At most 1 *	0.894255	205.5525	125.6154	0.0000
At most 2 *	0.863542	140.3973	95.75366	0.0000
At most 3 *	0.611986	82.63699	69.81889	0.0034
At most 4 *	0.560106	55.18228	47.85613	0.0088
At most 5 *	0.487181	31.36688	29.79707	0.0327
At most 6	0.333228	11.99972	15.49471	0.1569
At most 7	0.008440	0.245805	3.841466	0.6200

Trace test indicates 6 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Table 4: Cointegration test between Variables

The outcome of our Johansen co-integration analysis suggests the potential existence of six co-integrating equations within the overall system. This leads us to a robust conclusion that the Ethiopian inflation scenario can be elucidated by considering the independent variables. The graphical representation of this test is depicted in the figure below.

Multi co-linearity

An implicit assumption inherent in the application of the panel LS estimation method is the non-correlation among explanatory variables (independent variables). In the absence of any relationship between these explanatory variables, they are considered orthogonal. Orthogonality implies that altering the inclusion or exclusion of a variable in a regression equation would not lead to changes in the coefficients of other variables (Brooks, 2008).

As noted by Chris (2008), multicollinearity arises when some or all independent variables exhibit high correlations. In the presence of multicollinearity, the regression model struggles to discern which independent variables truly influence the dependent variable. Consequently, the model becomes less effective in identifying the individual contributions of each independent variable to the dependent variable.

Decision rule: According to Gujarati, (2004) multi co-linearity could only be a problem if the pair-wise correlation coefficient among variables is above 0.90 (Hailer et al, 2006)

	CPI	RGDP	M2	ICONFLICT	IR	ERATE	GNS	URATE
CPI	1.000000	0.889617	-0.085007	0.468562	0.340127	0.337233	0.865895	-0.056132
RGDP	0.889617	1.000000	0.036101	0.267162	0.277483	0.235194	0.888122	0.039313
M2	-0.085007	0.036101	1.000000	-0.261059	-0.264074	-0.305118	-0.187691	0.896206
ICONFLICT	0.468562	0.267162	-0.261059	1.000000	0.224072	0.222403	0.495879	-0.208343
IR	0.340127	0.277483	-0.264074	0.224072	1.000000	0.889313	0.363200	-0.229573
ERATE	0.337233	0.235194	-0.305118	0.222403	0.889313	1.000000	0.366351	-0.266326
GNS	0.865895	0.888122	-0.187691	0.495879	0.363200	0.366351	1.000000	-0.158767
URATE	-0.056132	0.039313	0.896206	-0.208343	-0.229573	-0.266326	-0.158767	1.000000

Table 5 correlations- multi co-linearity test

In this case, this study chooses to use high pair-wise correlation coefficients method because it can see the correlation of independent variables between each other one by one. And no multi co-linearity problem was found.

Autocorrelation (serial correlation)

Serial correlation arises when there exists a relationship between a variable and its lagged value, meaning the error for a given period (y) is correlated with the error for the preceding period (x). For ordinary least squares to provide accurate results, it is essential that there is no serial correlation, implying that the current error term should not be correlated with the previous error term.

In cases where serial correlation is present, the estimated parameters can still be unbiased and consistent, but they become inefficient. The issue lies in the invalidation of tests such as T-test, F-test, or confidence intervals due to the underestimation or overestimation of the variances of estimators. This can result in misleading conclusions regarding the significance of parameters within the model, as the hypothesis testing becomes compromised. (Shumway & Stoffer, 2017)

Decision Rule: Accept if p-value is greater than 5% significance level.

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	3.557870	Prob. F(2,21)	0.0510
Obs*R-squared	7.845710	Prob. Chi-Square(2)	0.1978

Table 6: Autocorrelation test

The study used The Lagrange multiplier (LM test) for higher order serial correlation. To identify determinants of inflation in Ethiopia 1 (7*31) observations were used in the model. To test this the student researcher used Breusch-Godfrey Serial Correlation LM Test. As shown in the table below there is no serial correlation because the p value is 0.1978 which is greater than the significant level (>0.05).

Heteroskedasticity

One of the critical assumptions in Classical Linear Regression Models (CLRM) is the assumption of homoscedasticity, which states that the variance of the errors remains constant. As noted by Brooks (2008), when the errors exhibit a constant variance, this assumption holds. On the contrary, if the errors do not have a constant variance, the situation is termed heteroscedasticity.

Chris (2008) further emphasizes that in the presence of heteroscedasticity, where the error terms lack a constant variance, the estimators of the ordinary least square method become inefficient. Additionally, hypothesis testing loses reliability and validity, as the variances and standard errors are underestimated under these conditions. Proper consideration of homoscedasticity is crucial for ensuring the accuracy and robustness of regression analysis results. Enders (2014)

Decision Rule: Accept if p-value greater than 5% significance level.

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.316146	Prob. F(7,23)	0.2872
Obs*R-squared	8.866094	Prob. Chi-Square(7)	0.2624
Scaled explained SS	6.734863	Prob. Chi-Square(7)	0.4570

Table 7 Heteroskedasticity test

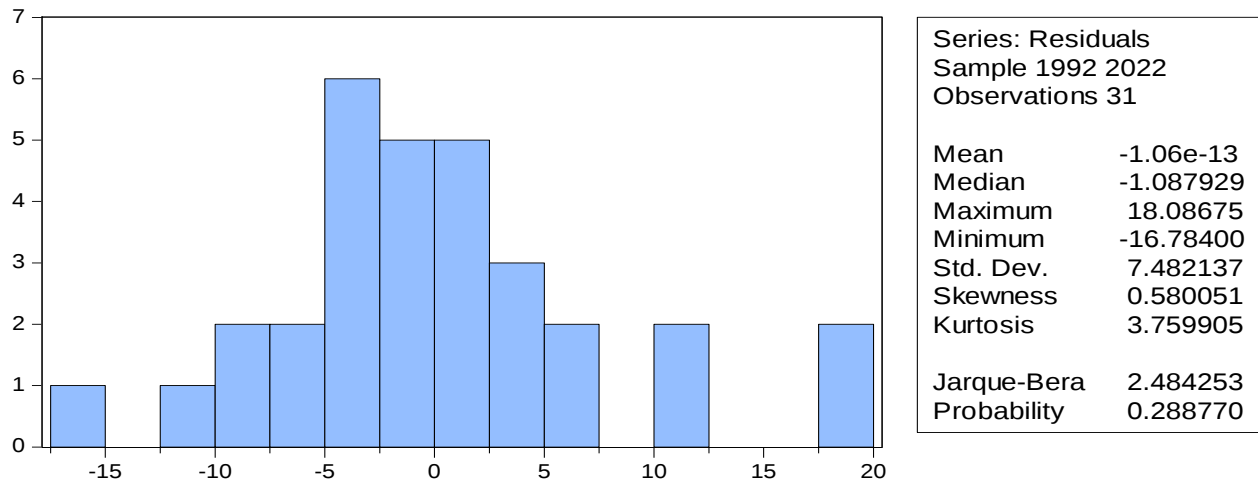
The White test has been employed in this study to identify the presence of heteroscedasticity. The results, as presented in the table, indicate that both the F-statistic and Chi-Square versions of the test statistic led to the same conclusion: there is no substantial evidence supporting the existence of heteroscedasticity. This determination is drawn from the p-values, which exceed the threshold of 0.05, suggesting that the null hypothesis of homoscedasticity cannot be rejected. 0.05.

Normality

The examination of normality through statistical tests is essential to ascertain the appropriateness of modeling a dataset with a normal distribution. When residuals adhere to a normal distribution, the corresponding histogram typically exhibits a bell-shaped pattern, and the Bera-Jarque statistics can be employed for verification. The adherence to the normality assumption holds significance, as it simplifies and validates the derivation of ordinary least square estimation (Tsay, 2005)

Decision Rule: Accept if p-value of JB test is greater than significance level.

Figure 9 Histogram-Normality



This research employed the Jarque-Bera Test (JB test) to assess the normal distribution of the error term. Illustrated in the figure is a kurtosis coefficient of 3.76. Additionally, the Bera-Jarque statistic yielded a P-value of 0.288. This outcome suggests that the p-value for the Jarque-Bera test exceeds the 0.05 threshold, indicating conformity to a normal distribution for the errors in the models. (Tsay,2005)

4.3. Regression analysis

Table 8: Linear Regression of Variables

Dependent Variable: LNCPI

Method: Least Squares

Date: 09/01/23 Time: 22:51

Sample (adjusted): 1992 2022

Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGDP	0.700528	0.190684	3.673764	0.0013
LNER	0.017155	0.006548	2.619820	0.0153
LNIR	-0.999652	0.691195	1.6783464	0.0938
LNМ2	0.434534	0.140172	-3.100008	0.0050
LNGNS	-0.042942	0.096600	-0.444530	0.6608
DIC	0.040038	0.077111	-0.519225	0.0286
UR	0.307403	0.153529	2.002246	0.0572
C	-0.939970	0.687079	-1.368067	0.1845
R-squared	0.986733	Mean dependent var	3.986882	
Adjusted R-squared	0.983272	S.D. dependent var	0.811810	
S.E. of regression	0.104997	Akaike info criterion	-1.468811	
Sum squared resid	0.253559	Schwarz criterion	-1.141865	
Log likelihood	29.03216	Hannan-Quinn criter.	-1.364218	
F-statistic	285.1040	Durbin-Watson stat	1.959054	
Prob(F-statistic)	0.000000			

4.3.1. Discussion of the Result

From the above table, the regression equation is given as

$$\text{CPI} = -44.76 + 49.1 \text{ M2} + 6.69 \text{ EXR} + 58.45 \text{ RGDP} + 7.05 \text{ IC}$$

The regression findings displayed in the table reveal an R-squared value of 0.9867, signifying that 98.7% of the overall variation in the inflation level can be ascribed to alterations in the independent variables incorporated in this model. This implies that the variables considered in the model elucidate solely 98.7% of the fluctuations in inflation in Ethiopia. The residual 0.0133 underscores the presence of other variables influencing inflation that were not encompassed in the study model, accounting for 1.33%. The Prob (F-statistic) value, recorded at 0.000, underscores a high level of statistical significance, reinforcing the reliability and validity of the model. Each variable is meticulously elaborated upon in subsequent sections for a comprehensive understanding.

A. BROAD MONEY SUPPLY (M2)

The regression analysis reveals a substantial and positive correlation between the Broad Money Supply (M2) and the inflation rate. The estimated coefficient for M2 is 0.434534, suggesting that a 1% increase in the money supply is associated with a corresponding 0.43% rise in the Consumer Price Index (CPI), assuming all other factors remain constant. This positive relationship between M2 and inflation is statistically significant at both the 5% and 1% levels, as indicated by the p-value of 0.0050 ($p < 0.05, 0.01$).

These findings are in line with existing literature on inflation, reinforcing the well-established positive and highly significant association between Broad Money Supply (M2) and inflation. Numerous studies conducted in Ethiopia and other countries have consistently presented empirical evidence supporting this relationship. For instance, Prakash L. and Philip S. (2001) observed similar outcomes in their study on developing countries. Moreover, research by Winfred, Rabiul, Ahmad, Emil, Narmatha, and Sisay (2008), Teamrat (2017), Ayele, G. E., & Zerayehu, H. H. (2017), and Biresaw (2013) in Ethiopia provides additional backing for the positive link between M2 and inflation.

B. EXCHANGE RATE

The regression analysis reveals a noteworthy association between the Exchange Rate and inflation, as indicated by the positive coefficient of 0.017155. This signifies that, while holding other variables constant, a 1% increase in the exchange rate corresponds to an expected increase of 0.017% in the Consumer Price Index (CPI). The statistical analysis further supports this relationship, as evidenced by the p-value of 0.0153 ($p > 0.05$), suggesting that the coefficient is statistically significant.

The findings of this research align with the existing literature, highlighting the importance of considering the impact of exchange rate movements on inflation dynamics. Several empirical studies conducted by Egwaikhide (2006), (Schimmelpfennig, 2006), Kirrimi (2014), Rabiul (2017) and Ayele, G. E., & Zerayehu, H. H., 2017 also provide support for this positive relationship between the exchange rate and inflation. These studies have demonstrated that fluctuations in the exchange rate can exert a significant influence on inflationary pressures.

C. REAL GROSS DOMESTIC PRODUCTS (RGDP)

The regression analysis reveals a positive relationship between the Real Gross Domestic Product (RGDP) and the inflation rate. The coefficient of RGDP is estimated to be 0.700528, indicating that a 1% increase in RGDP will result in an expected increase of 0.7 % in the Consumer Price Index (CPI), holding other variables constant. The positive relationship between RGDP and inflation is statistically significant at the 5% level, as indicated by the p-value of 0.0013 ($p < 0.05$).

The findings of this study regarding the positive relationship between RGDP and inflation are consistent with previous research conducted by Sisay (2008), and Winfred (2014). These studies have also identified a similar association between RGDP and inflation. However, it is important to note that the results of this study differ from the findings of Teamrat (2017), Ayele, G. E., & Zerayehu, H. H., (2017) and Biresaw (2013), which reported contrasting results in their investigations of the relationship between RGDP and inflation.

D. INTERNAL CONFLICT

The analysis reveals that internal conflict has a positive relationship with inflation in Ethiopia, as indicated by the coefficient of 0.040038. on average, when there is a conflict, compared to when

there is no conflict, the dependent variable "inflation" is expected to increase by 0.04 units, all else being equal. The p-value 0.0286 suggests that the effect is statistically significant at the 0.05 level.

The finding is aligned with expectations, indicating that internal conflict has a significant impact on inflation in Ethiopia. This result is consistent with previous studies that have highlighted the relationship between socio-political instability and economic indicators, including inflation. It implies that periods of internal conflict, characterized by disruptions to economic activities, supply chain disruptions, and uncertainty, tend to contribute to inflationary pressures in the country.

4.4. Targeted Policy Interventions for Effective Inflation Management

Drawing from the comprehensive findings of this study and additional scholarly insights, a range of policy interventions can be recommended to effectively manage inflation in Ethiopia and foster sustainable economic growth. These interventions are informed by the intricate relationships uncovered through rigorous analysis of macroeconomic variables such as broad money supply, lending rates, exchange rates, GDP, gross national savings and unemployment rates.

- A. **Monetary Policy and Money Supply Control:** Monetary policy plays a crucial role in controlling inflation by influencing the money supply in the economy (Blanchard, 2003). Policymakers can utilize tools such as adjusting interest rates, open market operations (OMO), and reserve requirements to regulate the availability of money (Mishkin, 2020). For instance, if inflationary pressures are rising, the central bank can increase interest rates to reduce borrowing and spending, thereby dampening aggregate demand and curbing inflation. Similarly, conducting OMOs involves buying or selling government securities to adjust the money supply. By selling securities, the central bank reduces the money supply, putting upward pressure on interest rates and dampening inflationary pressures. Adjusting reserve requirements affects the amount of funds banks must hold in reserve, impacting their ability to lend. Increasing reserve requirements reduces the availability of credit, which can help control inflation by moderating spending.
- B. **Exchange Rate Management:** Exchange rate stability is vital for controlling inflation, especially in economies with high import dependencies (Blanchard, 2003). A stable exchange rate fosters price stability by reducing uncertainty in international trade and limiting the pass-through of exchange rate fluctuations to domestic prices. Policymakers

can intervene in foreign exchange markets to maintain exchange rate stability, either by direct intervention or through indirect measures such as monetary policy adjustments. Additionally, adopting a managed float or pegging the currency to a stable foreign currency can help stabilize exchange rates and mitigate inflationary pressures arising from currency depreciation.

- C. **Promoting Economic Growth and Development:** Sustainable economic growth can alleviate inflationary pressures by increasing the economy's capacity to produce goods and services (Romer, 1994). Policymakers can implement measures to enhance productivity, such as investing in infrastructure, technology, and human capital development. Infrastructure projects, such as roads, bridges, and energy facilities, not only boost economic activity but also improve supply chain efficiency, reducing production costs and prices. Furthermore, policies that promote investment and innovation can stimulate long-term economic growth, fostering a more stable price environment.
- D. **Conflict Resolution and Stability:** Internal conflicts and political instability can exacerbate inflationary pressures by disrupting economic activities, reducing investor confidence, and undermining governance (Sachs & Warner, 1995). Resolving conflicts through peaceful means and promoting political stability are essential for creating a conducive environment for economic growth and price stability. Policymakers can invest in conflict resolution mechanisms, strengthen institutions, and promote social cohesion to mitigate the adverse effects of internal conflicts on inflation. Additionally, fostering inclusive governance and addressing grievances can help build resilience against future conflicts, contributing to long-term stability.
- E. **Employment and Labor Market Policies:** Unemployment, while not directly linked to inflation in this study, remains a critical economic indicator that policymakers must address (Blanchard, 2003). Implementing labor market policies to promote job creation, skill development, and labor market flexibility can contribute to economic stability and inflation management. Job creation initiatives, such as infrastructure projects and incentives for small and medium-sized enterprises (SMEs), can stimulate aggregate demand and reduce unemployment. Furthermore, investing in education and training programs can enhance the employability of the workforce, reducing structural unemployment and fostering sustainable economic growth.

F. Fiscal Discipline and Public Finance Management: Fiscal discipline is essential for maintaining macroeconomic stability and controlling inflation (Blanchard, 2003). Policymakers should prioritize efficient public finance management to ensure sustainable fiscal policies. This involves prudent budget allocation, transparent financial governance, and responsible debt management. By avoiding excessive government spending and borrowing, policymakers can prevent fiscal imbalances that could fuel inflationary pressures. Moreover, enhancing revenue mobilization through tax reforms and combating corruption can increase fiscal space for essential public investments while maintaining price stability.

These interventions collectively address the multifaceted nature of inflation and provide a holistic framework for policymakers. However, policymakers should approach policymaking comprehensively, considering the broader economic context, to effectively manage inflation and foster sustainable economic growth in Ethiopia.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

In this chapter, a synthesis of the primary findings will be presented, along with the conclusions drawn from the analysis and interpretation of the collected data. Recommendations tailored for government policymakers and fellow researchers will be provided, grounded in the presented research outcomes.

5.1. Summary

- Diagnostic tests, including unit root, co-integration, multi-co-linearity, heteroskedasticity, auto correlation, and normality tests, were conducted to ensure the reliability of the study's results, and no issues were found.
- The regression model exhibited strong explanatory power, as evidenced by a high R-squared value of 0.9867. This indicates that the selected variables within the model account for approximately 98.7% of the observed variations in inflation in Ethiopia.
- The highest inflation during the study period was recorded in 2022, while the lowest was observed in 1992.
- A robust positive and significant relationship at 5% level exists between the growth of Broad Money Supply (M2) and the inflation rate. A 1% increase in money supply (M2) is associated with an expected increase of 0.43% in the Consumer Price Index (CPI).
- The analysis shows a noteworthy association between the Exchange Rate and inflation.
- The positive coefficient of 0.017155 suggests that a 1% increase in the exchange rate corresponds to an expected increase of 0.017% in the CPI and this relationship is statistically significant at 5% level.
- This finding is in line with previous research, emphasizing the importance of considering exchange rate movements in inflation analysis. This relationship is also supported by previous research.
- Real GDP (RGDP) has a positive statistically significant relationship between the with the inflation rate at 5% level.
- The coefficient of RGDP is estimated at 0.700528, indicating that a 1% increase in RGDP growth rate leads to an expected increase of 0.700528% in the inflation.
- These findings are consistent with some previous studies but differ from others, highlighting the complexity of the RGDP-inflation relationship.

- Internal Conflict is found to have a positive association with inflation in Ethiopia that is significant at 5% level ($p=0.0286$).
- The coefficient of 0.040038 suggests that, on average, when there is a conflict compared to when there is no conflict, inflation is expected to increase by 0.04 units, all else being equal.
- The result aligns with expectations and previous studies, indicating that internal conflict contributes to inflationary pressures due to disruptions in economic activities and increased uncertainty.
- Overall, these findings emphasize the intricate and diverse nature of the factors influencing inflation in Ethiopia, with certain variables displaying significant relationships while others lack statistical significance.
- The study recommends the following measures to manage inflation in response to recent inflationary pressures:
 - Implement effective monetary policies to control and regulate the growth of broad money supply.
 - Prioritize measures to manage exchange rate fluctuations and promote exchange rate stability.
 - Focus on policies that stimulate and sustain Gross Domestic Product (GDP) growth.
 - Consider the potential impact of Gross National Savings (GNS) on inflation management, although the relationship was found to be statistically insignificant.
 - Acknowledge the influence of internal conflict on inflation and take appropriate measures to mitigate its impact.

5.2. Conclusion

This research aimed to investigate the determinants of inflation in Ethiopia and propose effective management strategies for its control. The study primarily focused on scrutinizing the relationships between various macroeconomic variables, including broad money supply, lending rate, exchange rate, GDP, gross national savings, and unemployment rate, alongside internal conflict, and their collective impact on inflation.

To achieve these objectives, secondary time series annual data were sourced from the Ministry of Finance (MoF). The study's dependent variable was inflation, measured through the consumer price index (CPI), while the independent variables encompassed broad money supply (M2),

exchange rate, gross national savings (GNS), real gross domestic product (RGDP), commercial bank lending rate (IR), unemployment rate (UR), and internal conflict.

All variables, with the exception of Internal Conflict and Unemployment Rate, underwent natural logarithm lagging to address nonlinearity, stabilize variance, and facilitate percentage interpretation. Descriptive analysis, including minimum, maximum, and average values, provided insights into the data, and trend analysis revealed temporal patterns and changes in the variables. Diagnostic analysis was implemented to ensure the reliability of the results.

The research hypothesis was tested using a linear regression model, chosen as the most suitable approach for explaining the relationships between dependent and independent variables. The findings uncovered significant associations between specific variables and inflation. Notably, broad money supply growth, exchange rate, and real gross domestic product exhibited positive relationships with inflation, while the commercial bank lending rate and internal conflict demonstrated negative relationships.

Based on these research findings, several effective management strategies for controlling inflation in Ethiopia can be recommended. These strategies include implementing monetary policies that target controlling broad money supply growth to manage inflationary pressures effectively, monitoring and managing exchange rate fluctuations to mitigate the impact on inflation, focusing on policies and measures to stimulate economic growth and enhance productivity to control inflation, emphasizing the importance of stable and favorable lending rates to promote investment and manage inflation, and addressing social and political factors, such as internal conflict, through effective governance and peace-building initiatives to minimize their impact on inflation.

These recommendations, informed by rigorous analysis and supported by relevant literature, provide a comprehensive framework for policymakers to address the multifaceted challenges associated with inflation management in Ethiopia.

5.3. Recommendations

Based on the findings of this study and the analysis of the determinants of inflation in Ethiopia, the following recommendations are proposed for policymakers and relevant stakeholders:

Monetary Policy and Money Supply Control: Given the significant positive relationship between broad money supply growth and inflation, policymakers should prioritize implementing prudent monetary policies to regulate the growth of money supply. This may include adjusting interest rates, conducting open market operations, and setting appropriate reserve requirements to manage inflationary pressures effectively (Mishkin, 2020).

Exchange Rate Management: To mitigate the impact of exchange rate fluctuations on inflation, policymakers should consider adopting measures to stabilize and manage the exchange rate. This may involve interventions in foreign exchange markets, monetary policy adjustments, and adopting exchange rate regimes that promote stability and reduce uncertainty (Blanchard, 2003).

Promoting Economic Growth and Development: Enhancing economic growth and development is crucial for controlling inflation in the long term. Policymakers should prioritize policies and initiatives aimed at improving productivity, fostering investment, and enhancing competitiveness to stimulate sustainable economic growth and reduce inflationary pressures (Romer, 1994).

Conflict Resolution and Political Stability: Addressing internal conflicts and promoting political stability are essential for creating a conducive environment for economic growth and price stability. Policymakers should invest in conflict resolution mechanisms, strengthen institutions, and promote social cohesion to mitigate the adverse effects of internal conflicts on inflation (Sachs & Warner, 1995).

Employment and Labor Market Policies: While the relationship between unemployment and inflation may not be statistically significant in this study, policymakers should still prioritize employment policies to ensure overall economic stability. Implementing measures to promote job creation, skill development, and labor market flexibility can contribute to reduced unemployment and aid in long-term inflation management (Blanchard, 2003).

Fiscal Discipline and Public Finance Management: Maintaining fiscal discipline and effective public finance management is essential for controlling inflation and ensuring macroeconomic stability. Policymakers should emphasize responsible fiscal policies, prudent budget allocation, and transparent financial governance to prevent fiscal imbalances that could fuel inflationary pressures (Blanchard, 2003).

These recommendations, informed by the empirical findings of this study and supported by relevant literature, provide a comprehensive framework for policymakers to address the multifaceted challenges associated with inflation management in Ethiopia. Implementation of these recommendations can contribute to fostering sustainable economic growth and price stability in the country.

5.4. Limitation and Future Study Direction

The study relied on secondary annual data, limiting its ability to capture short-term fluctuations and dynamic changes. Future research should explore the use of more frequent and granular data for a comprehensive analysis.

To gain a holistic understanding of inflation dynamics in Ethiopia, future research could broaden the analysis to include factors such as fiscal policy measures, external shocks, and structural reforms. Furthermore, Consideration of advanced econometric techniques like panel data analysis can also provide a more in-depth analysis of the relationships between variables and comparative analysis with other countries or regions would offer valuable insights into generalizability and identify unique factors specific to Ethiopia's inflation dynamics. Future research should also explore the interplay between inflation and other macroeconomic objectives, such as poverty reduction, and sustainable economic growth, to develop a comprehensive framework for policymaking.

Addressing these limitations and pursuing further research will deepen our understanding of inflation dynamics in Ethiopia and refine recommended management strategies for more effective outcomes.

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APPENDIX

Unit Root (Stationarity) Test for Variables

Test for CPI

Null Hypothesis: D(CPI) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 7 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.906794	0.0294
Test critical values: 1% level	-4.440739	
5% level	-3.632896	
10% level	-3.254671	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(CPI,2)

Method: Least Squares

Date: 06/09/23 Time: 18:51

Sample (adjusted): 2001 2022

Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CPI(-1))	-5.960901	1.525778	-3.906794	0.0021
D(CPI(-1),2)	4.848667	1.357064	3.572908	0.0038
D(CPI(-2),2)	4.214239	1.176447	3.582175	0.0038
D(CPI(-3),2)	3.943660	1.067926	3.692822	0.0031
D(CPI(-4),2)	3.645829	0.924596	3.943159	0.0020
D(CPI(-5),2)	3.036377	0.735668	4.127374	0.0014
D(CPI(-6),2)	2.069210	0.576273	3.590678	0.0037
D(CPI(-7),2)	1.488701	0.375495	3.964634	0.0019

C	-37.47427	11.00730	-3.404491	0.0052
@TREND("1992")	3.570749	0.830247	4.300829	0.0010
R-squared	0.708865	Mean dependent var	3.359121	
Adjusted R-squared	0.490513	S.D. dependent var	17.67204	
S.E. of regression	12.61401	Akaike info criterion	8.210449	
Sum squared resid	1909.359	Schwarz criterion	8.706377	
Log likelihood	-80.31493	Hannan-Quinn criter.	8.327274	
F-statistic	3.246439	Durbin-Watson stat	2.394701	
Prob(F-statistic)	0.030483			

Test for M2

Null Hypothesis: D(M2,2) has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.296435	0.0000
Test critical values:	1% level	-3.699871	
	5% level	-2.976263	
	10% level	-2.627420	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(M2,3)

Method: Least Squares

Date: 06/10/23 Time: 18:22

Sample (adjusted): 1996 2022

Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(M2(-1),2)	-1.873998	0.297628	-6.296435	0.0000
D(M2(-1),3)	0.416157	0.188851	2.203628	0.0374
C	0.003647	0.009973	0.365669	0.7178
R-squared	0.736374	Mean dependent var	-0.003825	
Adjusted R-squared	0.714405	S.D. dependent var	0.096512	
S.E. of regression	0.051577	Akaike info criterion	-2.987036	

Sum squared resid	0.063845	Schwarz criterion	-2.843054
Log likelihood	43.32498	Hannan-Quinn criter.	-2.944222
F-statistic	33.51904	Durbin-Watson stat	1.677187
Prob(F-statistic)	0.000000		

Test for Exchange Rate

Null Hypothesis: D(EXRATE,2) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.536108	0.0061
Test critical values:		
1% level	-4.323979	
5% level	-3.580623	
10% level	-3.225334	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EXRATE,3)

Method: Least Squares

Date: 06/10/23 Time: 18:23

Sample (adjusted): 1995 2022

Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXRATE(-1),2)	-0.907405	0.200041	-4.536108	0.0001
C	-0.021490	0.024283	-0.884986	0.3846
@TREND("1992")	0.001457	0.001337	1.089927	0.2861
R-squared	0.451682	Mean dependent var		0.000623
Adjusted R-squared	0.407817	S.D. dependent var		0.071511
S.E. of regression	0.055031	Akaike info criterion		-2.860900
Sum squared resid	0.075709	Schwarz criterion		-2.718164
Log likelihood	43.05260	Hannan-Quinn criter.		-2.817264
F-statistic	10.29699	Durbin-Watson stat		1.907564
Prob(F-statistic)	0.000547			

Test for RGDP

Null Hypothesis: D(RGDP,2) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 1 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.515548	0.0007
Test critical values: 1% level	-4.339330	
5% level	-3.587527	
10% level	-3.229230	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(RGDP,3)

Method: Least Squares

Date: 06/10/23 Time: 18:26

Sample (adjusted): 1996 2022

Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGDP(-1),2)	-1.367816	0.247993	-5.515548	0.0000
D(RGDP(-1),3)	0.287105	0.150880	1.902876	0.0696
C	-0.020728	0.045907	-0.451525	0.6558
@TREND("1992")	0.001649	0.002448	0.673675	0.5072
R-squared	0.658087	Mean dependent var		0.017550
Adjusted R-squared	0.613489	S.D. dependent var		0.154252
S.E. of regression	0.095898	Akaike info criterion		-1.715106
Sum squared resid	0.211518	Schwarz criterion		-1.523131
Log likelihood	27.15394	Hannan-Quinn criter.		-1.658022
F-statistic	14.75618	Durbin-Watson stat		2.178636
Prob(F-statistic)	0.000014			

Test for GNS

Null Hypothesis: GROSSNS has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 7 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.727788	0.0052
Test critical values:		
1% level	-4.416345	
5% level	-3.622033	
10% level	-3.248592	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GROSSNS)

Method: Least Squares

Date: 06/10/23 Time: 18:27

Sample (adjusted): 2000 2022

Included observations: 23 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GROSSNS(-1)	-0.802181	0.169674	-4.727788	0.0004
D(GROSSNS(-1))	0.416360	0.163254	2.550387	0.0242
D(GROSSNS(-2))	0.312694	0.144523	2.163624	0.0497
D(GROSSNS(-3))	0.656290	0.131827	4.978422	0.0003
D(GROSSNS(-4))	0.652541	0.119736	5.449849	0.0001
D(GROSSNS(-5))	0.464825	0.134472	3.456662	0.0043
D(GROSSNS(-6))	0.271599	0.110937	2.448219	0.0293
D(GROSSNS(-7))	0.240609	0.089930	2.675524	0.0191
C	5.490423	1.137680	4.825983	0.0003
@TREND("1992")	0.181945	0.039007	4.664427	0.0004
R-squared	0.789669	Mean dependent var		0.199903
Adjusted R-squared	0.644055	S.D. dependent var		0.153226
S.E. of regression	0.091416	Akaike info criterion		-1.647767
Sum squared resid	0.108640	Schwarz criterion		-1.154073
Log likelihood	28.94932	Hannan-Quinn criter.		-1.523604
F-statistic	5.423039	Durbin-Watson stat		2.474485
Prob(F-statistic)	0.003286			

Test for Unemployment Rate

Null Hypothesis: D(URATE) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-13.83252	0.0000
Test critical values:		
1% level	-4.309824	
5% level	-3.574244	
10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(URATE,2)

Method: Least Squares

Date: 06/10/23 Time: 18:31

Sample (adjusted): 1994 2022

Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(URATE(-1))	-1.760762	0.127292	-13.83252	0.0000
C	0.323083	0.662394	0.487750	0.6298
@TREND("1992")	-0.019217	0.036690	-0.523763	0.6049
R-squared	0.880371	Mean dependent var		0.000220
Adjusted R-squared	0.871169	S.D. dependent var		4.602258
S.E. of regression	1.651892	Akaike info criterion		3.939417
Sum squared resid	70.94744	Schwarz criterion		4.080861
Log likelihood	-54.12155	Hannan-Quinn criter.		3.983716
F-statistic	95.66925	Durbin-Watson stat		1.817506
Prob(F-statistic)	0.000000			

Test for Internal Conflict

Null Hypothesis: D(ICONFLICT) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 2 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
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Augmented Dickey-Fuller test statistic	-4.090928	0.0173
Test critical values:	1% level	-4.339330
	5% level	-3.587527
	10% level	-3.229230

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ICONFLICT,2)

Method: Least Squares

Date: 06/10/23 Time: 18:37

Sample (adjusted): 1996 2022

Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ICONFLICT(-1))	-1.449571	0.354338	-4.090928	0.0005
D(ICONFLICT(-1),2)	0.413142	0.285666	1.446243	0.1622
D(ICONFLICT(-2),2)	0.374396	0.198997	1.881417	0.0732
C	-0.064462	0.157771	-0.408582	0.6868
@TREND("1992")	0.006950	0.008593	0.808781	0.4273
R-squared	0.579456	Mean dependent var	0.000000	
Adjusted R-squared	0.502993	S.D. dependent var	0.480384	
S.E. of regression	0.338665	Akaike info criterion	0.837965	
Sum squared resid	2.523266	Schwarz criterion	1.077935	
Log likelihood	-6.312524	Hannan-Quinn criter.	0.909320	
F-statistic	7.578287	Durbin-Watson stat	1.984328	
Prob(F-statistic)	0.000537			

DATA OF DEPENDENT AND INDEPENDENT VARIABLES

DATA From MoFED							
Year	CPI	Money Supply	Lending Rate	Exchange Rate	GNS	UR	GDP
1989	13.1	5,704.4	6.8%	2.1	1780.297	3.690%	16611.6
1990	13.8	6,708.2	6.8%	2.1	1664.494	3.080%	17591

1991	20.0	7,962.3	6.8%	2.1	1075.2	3.100%	20531.32
1992	20.4	9,010.9	6.8%	4.3	1457.5	3.050%	22077.9
1993	21.3	10,136.7	14.9%	5.01	3438.6	3.100%	28969.4
1994	22.7	11,598.7	14.0%	5.77	7608.769	3.210%	47559.74
1995	26.1	14,408.5	14.6%	6.25	4984.194	3.310%	53597.59
1996	23.7	15,654.9	15.1%	6.32	5771.146	3.470%	55520.01
1997	23.1	16,548.8	15.5%	6.50	7577.547	3.620%	53391.29
1998	23.1	18,554.8	11.6%	6.88	5168.182	3.710%	57368.2
1999	25.5	19,399.3	11.8%	7.51	13208.69	3.510%	65986.25
2000	26.0	22,177.8	12.0%	8.14	14980.36	3.300%	67351.03
2001	23.2	24,516.2	12.8%	8.42	12555.41	3.130%	65895.47
2002	22.9	27,321.9	10.8%	8.54	14671.73	2.940%	72702.75
2003	27.0	30,090.1	10.5%	8.58	22062.21	2.98%	85800.06
2004	27.6	33,625.9	10.5%	8.64	25440.95	2.68%	105415.1
2005	30.6	40,211.8	10.5%	8.7	28933.89	2.5	130333.7
2006	33.9	46,596.3	10.5%	8.7	46747.66	2.44	170280.6
2007	39.0	56,651.9	10.5%	8.8	57103.29	2.47	245836
2008	60.6	68,182.1	11.5%	9.2	76376.01	2.41%	332060.3
2009	62.2	82,509.7	12.3%	10.4	93973.24	2.39	379134.5
2010	66.8	104,432.4	12.3%	12.9	161984	2.34%	515079
2011	92.2	145,377.0	11.9%	16.1	228936	2.31	747326
2012	111.4	189,398.7	11.9%	17.3	243795	2.29%	866921
2013	119.6	235,313.6	11.9%	18.2	321169	2.25	1060825
2014	83.3	297,732.0	11.9%	19.1	407884	2.41%	1297961
2015	93.1	371,328.9	11.9%	20.1	494999	2.57%	1528044
2016	99.4	445,266.3	12.8%	21.1	502075.8	2.73%	1568098
2017	107.2	573,384.0	12.8%	22.4	553887.2	2.90%	1832786
2018	125.2	740,572.9	13.5%	26.1	711346.8	3.06%	2200121
2019	144.3	886,752.6	13.5%	28.1	804643.3	3%	2690751
2020	175.5	1,037,646.4	14.3%	31.3	893996.2	4.13%	3374747
2021	218.6	1,348,266.2	14.3%	39.0	1101330	3.93%	4341387
2022	293.0	1,715,310.0	14.3%	48.6	1311141	4.02%	6157538