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Research Article

Drivers of Inflation in Sub-Saharan African Countries: A System Generalized Moment Method

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KEYWORDS: Economic Growth; Panel Data; Inflation; Generalized Moment Method; Sub-Saharan Africa

Abstract

The aim of this research is to establish the causes of inflation in Sub-Saharan African (SSA) countries through the use of the demand-pull theory and the cost push theory of inflation as the theoretical framework and the system generalized method as the analytical framework. Panel data for 36 SSA countries covering 34 years was used. The result of the descriptive analysis indicated that the rate of inflation follows the money supply rate in SSA countries while periods of high economic growth had relatively low levels of inflation rates. On the other hand, the result of the regression analysis indicated that factors like money supply, population growth, and last year's price positively relate to inflation while economic growth, government spending, and exchange rates negatively relate to inflation in SSA countries. These findings provide evidence for both the quantity theory of money and the demand-pull theory of inflation. To curb inflation in SSA countries, it is necessary to promote economic growth. A tight monetary policy helps to manage the levels of short-run inflation by restricting aggregate demand, whereas productive government spending helps to manage the inflation levels in the long run owing to the gains made in productivity. Inflation can thus be managed effectively by adopting a well-balanced strategy.

1 Introduction

Price changes that lead to inflation occur in the majority of economies but represent a problem for emerging agrarian economies (Abderrahim & Laourari, 2022). In contrast to developed economies, where price changes, or inflation, is stable and predictable, inflation in developing agrarian economies is more volatile due to various reasons (Anderl & Caporale, 2023). Thus, a study into the causes of inflation in developing economies would be useful in order to devise monetary, fiscal, and foreign exchange policies to help stabilize these economies.

Inflation in developing countries has been classified into four types namely; structural causes, demand-pull, cost-push, and institutional causes (Ferreira et al., 2024). Demand-pull inflation is characterized by an excessive level of aggregate demand than the productive capacity of the economy. The excess demand in the economy arises as a result of

rapid economic growth, expansionary fiscal policies, and excessive money supply growth (Jackson et al., 2023). On the other hand, cost-push inflation is characterized by rising costs of production such as increases in the price of oil, imports, and currency devaluation in developing nations (Kinlaw et al., 2022). However, structural factors include poor supply chain efficiency, inadequate infrastructure, agriculture dependency, and exporting of raw materials in developing countries. This makes the economies to experience inflation due to supply shortages (Kinlaw et al., 2022). Nonetheless, institutional factors such as corrupt governance and ineffective policymaking will make it difficult for the measures of controlling inflation to be effective.

In addition, the causes of inflation in emerging nations may be broadly classified into external and internal causes. Among these, the external causes are the price of oil and food, changes in exchange rates, tight monetary policy in advanced nations, natural catastrophes, and conflicts, whereas the internal causes are an excess domestic money supply, budget deficit, subsidies, supply side constraints, dependence on agriculture, poor infrastructure, inefficiency and corruption in the government, high population growth rates, and urbanization (Kuma & Gata, 2023). In short, it can be concluded that inflation in developing countries is a multi-dimensional problem, which is affected not only by external but also internal factors. The external factors including the rise in the price of commodities, changes in exchange rates, and geopolitical events tend to make the problem worse at times, whereas internal factors have a great deal of importance in terms of their impacts.

The issue of inflation is not only tied to economic stability but also amplifies socioeconomic issues such as decreased purchasing power, increased income disparities, and ineffective anti-poverty strategies (Kinlaw et al., 2022). Therefore, coping with the inflation problem in developing nations requires a comprehensive understanding of various factors influencing it and customized and multi-dimensional policies (Tolasa et al., 2022). Given the ongoing inflation issue in developing nations and its negative influence on economic stability and social well-being, further analysis of factors and sustainable solutions should be considered. However, the combination of both internal and external forces highlights the necessity for a detailed and context-specific approach towards the management of inflation problems in developing nations. In this research work, an attempt is made to understand the causes behind inflation problems in the SSA nations through the use of panel data and system generalized method of moments as the major method of data analysis. The rest of this paper is structured in the following manner. The second section provides a detailed literature review of the topic; the third one presents the methods used in this study; the fourth section addresses the results and discussion.

2 LITERATURE AND HYPOTHESIS DEVELOPMENT

Some of the theories regarding the factors behind the development of inflation include classical theory, Keynesian theory, Monetarist theory, and Mundell Fleming theory. Classical theory on inflation holds that the factor responsible for causing inflation is too much money in circulation. Conversely, the Keynesians hold that inflation is a result of spending by the government. Likewise, the monetarists argue that monetary expansion is the cause of inflation, whereas according to the Mundell-Fleming theory, depreciation of exchange rates results in imported inflation.

First, classical economics posits that the total production of goods and services within an economy is influenced by the volume of labor, land, and capital. Hence, as the volumes of labor, land, and capital increase, there will be a corresponding increase in production levels. Nevertheless, the classical school posits that inflation is a situation that occurs when the money supply grows faster than production. Second, according to the Keynesians,

the positively sloped aggregate supply curve illustrates the linkage between inflation and economic growth. The positive aggregate supply curve indicates that demand shock influences prices and production levels (Dornbusch et al., 1996). Therefore, the linkage between the aggregate demand and supply curve indicates that there is a positive linkage between inflation and economic growth. Inflation theory by the Keynesians states that excess aggregate demand is the primary factor responsible for inflation at home. Demand-pull inflation happens because of an excess aggregate demand. According to economics, the aggregate demand is defined as the sum of private investments, private consumption, expenditures by the government, and net exports. The demand-pull theory of inflation was introduced by Keynes in 1936, and it suggested that inflation happens due to excess demand. Keynes argued that the solution to rapid price increases would be to adopt measures that reduce aggregate demand.

Thirdly, the quantity theory of monetarism postulates that in the long run, economic output depends on variations in the real variables (Friedman & Schwartz, 1963). According to the quantity theory of monetarism (Milton Friedman, 1969), the relationship between the quantity of money (M), price level (P), transaction (T), and the velocity of money (V) is as below.

$$MV = PT \tag{1}$$

According to equation (1), money flows through the economy smoothly while the labor force is fully employed in the economy. In relation to the theory above, if the government uses the expansionary monetary policy, then in the long term, it will affect the general price level but not the production of goods and services or even the GDP. Therefore, according to the above equation, expanding the money supply in an economy does not influence its output in the long run. According to the theory, inflation will thus have no effect in the long run on an economy since the real GDP remains unchanged. Mundell (1960) argues that a devalued currency of a nation, especially in a poor and a small developing economy that depends highly on imports of various items such as capital goods, consumer goods, fuel and raw materials, may cause budget deficit, increased rate of inflation and imbalance of payments in the economy.

There is a type of inflation called the cost push inflation. Cost push inflation happens due to increases in the cost of production hence leading to price increases for the produced goods. There are two ways through which the depreciation of currency could lead to inflation. First, currency depreciation causes the price of imported products to increase hence increasing prices locally. Second, currency depreciation causes increases in the price of imported products which are used in the production process hence increasing the cost of production. Studies have shown that there are many factors that could cause inflation in agrarian economies which depend on importing and whose supply is low. These factors include monetary supply, growth of the economy, depreciation of currency, and high imports.

Some studies have examined what causes inflation in SSA countries and established that exchange rate and money supply are usually the major causes. Studies conducted by Abderrahim and Laourari (2022) and Anderl and Caporale (2023), for instance, using nonlinear autoregressive distributed lag models have concluded this. Jackson et al. (2023) in examining Sierra Leone identified GDP, money supply, exchange rate, and lending interest rates as the important determinants. According to Kinlaw et al. (2022), another determinant of inflation in emerging countries is government expenditure. In Ethiopia, Kuma and Gata (2023) using a panel model determined that exchange rate, money supply, and population are the important predictors of inflation.

Tolasa et al. (2022) and Maitah et al. (2024) used time series analysis and ARDL to analyze the sources of inflation in Ethiopia, and they observed that the most common sources include exchange rates, money supply, population, GDP, imports, and interest on loans. According to Ujkani and Gara (2023), the primary source of inflation in emerging markets is money supply. In Europe, Erdoğan et al. (2020) found out that currency depreciation and the money supply are some of the major sources of inflation. Similarly, Demeke and Tenaw (2021) applied ARDL to Ethiopia and found out that money supply and GDP are some of the sources of inflation. On the other hand, in Kuwait, Al-Mutairi et al. (2020) used a multiple linear regression model and observed that imports and money supply influence inflation positively.

Furthermore, Okoye et al. (2019) identified that exchange rate, budget deficit, money supply, and economic growth are all considered as the determinants of inflation. According to Kahssay (2017), the determinants of inflation in Ethiopia were analyzed using ordinary least square estimation and it was identified that the major determinants of inflation are money supply and gross domestic product. Likewise, according to Salma (2021) and Wudu (2020), the factors such as money supply, foreign direct investment, and trade balance have a positive impact on inflation. Similarly, it was also found by Olamide et al. (2022) and Islam et al. (2017) that the exchange rate has a negative impact on inflation.

Although many studies have examined inflation dynamics in SSA, the present research contributes significantly to the literature by taking into account an aspect that has been largely overlooked by other researchers. Two main differences are evident between the present analysis and previous literature on inflation in the SSA region. First, whereas previous studies have relied on static panel regressions and/or Ordinary Least Square estimation methods, the present research utilizes System Generalized Method of Moments estimation methods, a method that accounts for both endogeneity and persistence problems common in analyzing inflation dynamics. Second, the current study examines not only monetary indicators but also structural factors.

According to the theoretical and empirical study mentioned above, the following six factors serve as independent variables in this study: the lagged consumer price index, the GDP, money supply (MS), the official exchange rate (EXR), government spending (G) and the total population measured in millions (POP). Money supply represents all the physical cash present in circulation within the economy and all cash stored in both checking and savings accounts. Rapidly growing levels of money supply compared to the actual production of goods and services in an economy may trigger inflation since there will be too much money available relative to the number of goods, leading companies to increase the price of their products. Past studies have shown that money supply is positively associated with inflation rates, as was proven by the work of researchers like Abderrahim and Laourari (2022) and Anderl and Caporale (2023).

2.1 H_1: Broad money supply (MS) is positively related with inflation in Sub-Saharan Africa countries.

This hypothesis is primarily justified based on the classical theory and the monetarist theory which postulate that excessive money supply causes increases in the overall price levels.

The relationship between exchange rate and inflation is complex due to the ability of the exchange rate to affect demand and supply through international business, transport, expectations, financial activities, and production among others. In case the currency of a country depreciates, the price level of imported goods and services rises, increasing the general prices in the economy. There have been conflicting findings regarding the

effect of exchange rates on inflation because different research studies produced varying findings based on their methodologies. For example, Jackson et al. (2023) and Kuma and Gata (2023) revealed that there was a positive relationship between exchange rate and inflation, whereas Olamide et al. (2022) and Islam et al. (2017) found an indirect relationship between currency depreciation and inflation. Research studies carried out by Feyisa (2024), Tolasa et al. (2022) and Maitah et al. (2024) on causes of inflation found a positive and significant relationship between exchange rate and inflation.

2.2 H_2: Exchange rate depreciation and inflation are positively related in Sub-Saharan African countries.

Inflation is caused by an increase in price levels when there is depreciation in the exchange rate according to the Mundell-Fleming Model, thus resulting in imported inflation.

Expenditure by the government serves as an anti-inflation policy when it is utilized in productive investments such as infrastructure, agriculture, education, and production-oriented sectors which help increase the production capability of the economy. It is through increased production capabilities and reduced cost of production that the expenditure becomes an effective tool for stabilizing prices in the economy. However, if government expenditure increases aggregate demand faster than the production capabilities of the economy, then it serves to increase inflation, particularly when financed through borrowing and creation of money.

2.3 H_3: Government spending is hypothesized to exhibit a negative relationship with inflation in the Sub-Saharan African countries whenever such spending is towards productive activities like construction, agriculture, education, and manufacturing.

There was evidence of inconsistency in the relationship between economic growth and inflation in developing countries. For example, according to Olamide et al. (2022) and Demeke and Tenaw (2021), there was an inverse relationship between economic growth and inflation whereas studies by Kahssay (2017) and Okoye et al. (2019) indicated a positive relationship between economic growth and inflation in developing countries. Economic growth can stimulate inflation due to demand-pull and cost-push effects. In simple words, economic growth stimulates inflation through a demand-pull effect since it increases investments and expenditures of consumers and the government whereas economic growth increases inflation by stimulating cost-push effect because the rise in production leads to an increase in labor costs, shortage of resources, fuel costs, and electricity costs. However, economic growth can reduce inflation pressure through an increase in production supply, efficiency, productivity, and production diversity (Kinlaw et al., 2022).

2.4 H_4: Economic growth is negatively related to inflation in Sub-Saharan Africa countries.

This hypothesis is mainly justified based on the quantity theory of money.

Population growth is likely to increase inflation in the developing world (Ayanaw & Belay, 2024). A large rate of population growth may lead to demand-pull inflation when the supply of products and services fails to match the demands. Furthermore, an increase

in the population rate may cause congestion in urban areas, hence causing the demand for houses and transportation facilities, among others, to go up. In addition, a rise in the population will make it more difficult for natural resources like land and water to be available, hence leading to cost-push inflation (Broniatowska, 2018; Lubbock et al., 2022; Sisay et al., 2022; Weiske, 2019).

2.5 H_5: Population growth is hypothesized to affect inflation positively in SSA countries by increasing aggregate demand for goods and services beyond production capability.

Previous Price Level Positively Influences the Inflation Rate of the Present Time Due to the Influence of Previous Price Levels in Relation to the Cost Structure, Pricing Policy, and Inflationary Expectations. As a result of previous price levels, people become more expectant about rising prices and motivate businesses to charge higher prices along with increased salary expectations by employees, which leads to a high inflation rate (Blanchard, 2017; Mankiw, 2019). Empirical evidence reveals that lagged price levels are a significant determinant of the inflation rate; particularly, inflation inertia exists in developing countries (Gujarati & Porter, 2009).

2.6 H_6: Lagged value of inflation is positively related with current inflation in SSA countries.

This hypothesis implies that previous inflation levels positively influence current inflation rates.

3 DATA AND METHODS

3.1 Data

The data used in this study consisted of a panel dataset for 43 African countries between 1990 and 2023. This was mainly informed by the availability of data on the variables that were used in the study. Data on Consumer Price Index (CPI), Gross Domestic Product (GDP), Money Supply (MS), Government Expenditure (G), Exchange Rate (EXR), and Population (POP) were sourced from the World Development Indicators database. In addition, GDP, money supply, and government expenditure were all in current US dollars, while the exchange rate was a ratio of the local currency to US dollars.

3.2 System Generalized Method of Moments

Some of these theories include Classical Theory of Inflation, Keynesian Theory of Inflation, Monetarist Theory of Inflation, and Mundell Fleming Theory of Inflation. By incorporating additional elements thought to be responsible for inflation, the following Dynamic Panel Data Econometric Model was created.

$$LCPI_{it} = \beta_0 + \beta_1 LCPI_{it-1} + \beta_2 LGDP_{it} + \beta_3 LMS_{it} + \beta_4 G_{it} + \beta_5 LEXR_{it} + \beta_6 LPOP_{it} + \alpha_i + U_{it} \quad (2)$$

For example, in the equation (2), t is a symbol used to represent time, where t ranges from 1990 to 2023 in this research, and i is the number of countries in Sub-Saharan Africa. If we apply the ordinary least squares estimation approach to equation (2), it will produce biased results due to endogeneity. The reason being that the independent variable can have a relation with the error term. This concept was initially identified by Arellano and Bond (1991). In the same way, application of static panel regression models like fixed effect and random effect approaches can also cause biased estimations. To solve the endogeneity problem, we can either employ instrumental variables (IV) technique or two stages least square (2SLS) techniques. These techniques would provide unbiased results provided that the number of instruments is less than the number of regressors.

GMM is an estimation method that yields unbiased estimates that are efficient. GMM estimation method is applied to short panels when T is less than 25 and N exceeds 25. Some of the issues addressed using GMM include measurement error, lagged dependent variable, missing variable, non-exogeneity of the regressor, fixed effect, heteroskedasticity, and autocorrelation. GMM estimation method involves the use of internal and external instruments. There are two major methods under GMM, namely difference GMM and system GMM. To address the correlation between the lagged dependent variable $\Delta LCPI_{it-1}$ and ΔU_{it}, the first difference GMM uses two-period and three-period lagged values of the outcome variables as instruments for $\Delta LCPI_{it-1}$ as shown in equation (3).

$$\Delta LCPI_{it} = \beta_1 \Delta LCPI_{it-1} + \beta_2 \Delta LGDP_{it} + \beta_3 \Delta LMS_{it} + \beta_4 \Delta LG_{it} + \beta_5 \Delta LEXR_{it} + \beta_6 \Delta LPOP_{it} + \Delta U_{it} \quad (3)$$

Nevertheless, the lagged values of the instruments might not work well on the first differences of the regressors in the case of short panel data (Blundell & Bond, 1998). In this regard, the first-difference GMM transforms the dataset by taking out the previous value of a particular variable from its current value, hence resulting in loss of information. Fortunately, such losses can be compensated by employing the system GMM, which restores the lost information by re-transforming the dataset differently by subtracting the mean value of all variables. In other words, the system GMM consists of two equations: the level and the first difference. Following the methodology set forth by Arellano & Bover (1995) and Blundell & Bond (1998), the system GMM estimators used in this research can be derived using a system of equations.

$$LCPI_{it} = \beta_0 + \beta_1 LCPI_{it-1} + \beta_2 LGDP_{it} + \beta_3 LMS_{it} + \beta_4 G_{it} + \beta_5 LEXR_{it} + \beta_6 LPOP_{it} + \alpha_i + U_{it} \quad (4)$$

$$\Delta LCPI_{it} = \beta_1 \Delta LCPI_{it-1} + \beta_2 \Delta LGDP_{it} + \beta_3 \Delta LMS_{it} + \beta_4 \Delta LG_{it} + \beta_5 \Delta LEXR_{it} + \beta_6 \Delta LPOP_{it} + \Delta U_{it} \quad (5)$$

Therefore, the system GMM estimation method involves estimating equations (4) and (5) together, using two different sets of instruments. These instruments are divided into two groups: $Z_i = Z_D + Z_L$, Z_D which are used for the first difference model, and Z_L, which are used for the level model.

Variables and Measurements

The dependent variable for this study is inflation, which is determined through the Consumer Price Index (CPI_{it}). CPI_{it} reflects the changes in prices of goods and services bought by consumers and is usually used as an index for inflation. In the regression analysis, the logarithm of the CPI_{it} ($LCPI_{it}$) is used. It is because the use of the log stabilizes variance and makes it possible to interpret the coefficients in elasticities form. The past value of the CPI_{it} ($LCPI_{it-1}$) will be used as one of the independent variables to reflect inflation inertia.

Another explanatory variable, GDP_{it}, is used to indicate the degree of economic activity. It is recorded in real terms and logged, referred to as $LGDP_{it}$. As predicted by quantity theory of money, output growth might lead to price decrease. Money supply (MS_{it}) also plays a significant role in explaining inflation and is indicated by broad money supply that comprises currency, demand deposits, and quasi-money. It is recorded in log terms, denoted by LMS_{it}. Monetarist theory suggests that an increase in money supply results in excess liquidity, leading to higher aggregate demand and thus inflation.

Government expenditure (G_{it}) is included in the model in order to show the impact of fiscal policy on inflation. Government expenditure is computed as total government expenditure and is input into the model in log form. The impact of government expenditure on the levels of inflation will be reducing in case the expenditure was done in productive areas like agriculture, infrastructural development, and industries, which will help to improve the supply of commodities. In other cases, the effect would be increasing inflation, whereby the level of expenditure will cause the aggregate demand to grow beyond the country's production capacity. The official exchange rate (EXR_{it}), computed as the number of Ethiopian Birr per US dollar, is also included in log form ($LEXR_{it}$). An increase in exchange rate devaluation will raise the cost of production inputs and hence imported inflation. The variable of population (POP_{it}) is included as an explanatory variable and is expressed in terms of millions. The natural log of the population ($LPOP_{it}$) is included in the model. An increasing population implies higher demands on goods and services, thus creating inflationary pressures where there is no corresponding increase in production.

Table 1: Description of Variables, Measurement and Expected Hypotheses

Variables	Description	Expected Relations	Citations	Data Sources
$LCPI_{it}$	Consumer Price Index			
$LGDP_{it}$	Gross Domestic Product in Millions of US dollar	$-$	Demeke and Tenaw (2021), Kinlaw et al. (2022), and Olamide et al. (2022)	World Development Indicator
LMS_{it}	Broad Money Supply in Millions of US dollar	$+$	Abderrahim and Laourari (2022) and Anderl and Caporale (2023)	
LG_{it}	Government Spending in Millions of US dollar	$\pm$	Keynes (1936), Kinlaw et al. (2022), and Maitah et al. (2024)	
$LEXR_{it}$	Exchange Rate (Birr/dollar)	$+$	Feyisa (2024), Maitah et al. (2024), and Tolasa et al. (2022)	
$LPOP_{it}$	Population in Millions of people	$+$	Ayanaw and Belay (2024), Lubbock et al. (2022), Sisay et al. (2022), and Weiske (2019)	
$LCPI_{it-1}$	Lagged Consumer Price Index	$+$	Blanchard (2017), Gujarati and Porter (2009), and Mankiw (2019)	

Source: Author compilation based on literature (2025)

4 RESULTS AND DISCUSSION

Sub-Saharan African countries have experienced high inflation rates in the past ten years which have had an impact on production, social wellbeing, and economic welfare. The average inflation rates for the three Sub-Saharan African countries, namely Zimbabwe, South Sudan, and Ethiopia, were 127.93%, 73.32%, and 17.77%, respectively, from 2013 to 2023. Inflation in Sub-Saharan African countries can be attributed to different aspects including demand, supply, and structural aspects, among others (Caselli & Roitman, 2019). Emerging economies, especially in Sub-Saharan Africa, are known to exhibit the following characteristics: low agricultural productivity, high reliance on imports, rapid population growth and urbanization, budget deficits, corruption, and inefficiencies (Bjornlund et al., 2020; Boz et al., 2022).

Table 2: Top Eight Sub-Saharan African Countries with the highest inflation rates

Years	Zimbabwe	South Sudan	Ethiopia	Angola	Malawi	Ghana	Sierra Leone	Nigeria
2013	1.63	-2.74	8.07	8.78	28.28	11.67	5.52	8.50
2014	-0.21	4.25	7.40	7.30	23.78	15.49	4.64	8.05
2015	-2.41	52.99	9.57	9.16	21.86	17.15	6.69	9.01
2016	-1.56	346.05	6.63	30.69	21.73	17.46	10.89	15.70
2017	0.91	213.00	10.69	29.84	11.54	12.37	18.22	16.50
2018	10.61	83.40	13.83	19.63	9.22	9.84	16.03	12.09
2019	255.29	49.29	15.81	17.08	9.38	7.14	14.81	11.40
2020	557.21	23.98	20.35	22.28	8.64	9.89	13.45	13.25
2021	98.55	30.23	26.79	25.77	9.34	9.98	11.87	16.95
2022	193.40	-3.21	33.94	21.36	20.84	31.71	27.21	18.85
2023	667.36	40.20	30.22	13.64	30.30	37.53	47.72	24.66
Mean	127.93	73.32	17.77	17.41	16.52	14.40	14.11	13.70

Source: Author's Computation (2025)

Monetary policy ease, government budget deficit, currency rate movement, dependence on imports, rapid population growth, economic growth, and price expectation are among the factors that may lead to inflation in emerging economies (Jackson et al., 2023). Exchange rate movement is likely to be important in affecting inflation in economies that depend on imports and have supply constraints. For instance, ten countries in Sub-Saharan Africa have adopted floating currency regimes, which include South Africa, Ghana, Nigeria, Zambia, Uganda, Kenya, Tanzania, Ethiopia, Malawi, and Rwanda. Table 1 suggests that four of these countries have very high levels of inflation, including Ethiopia, Malawi, Ghana, and Nigeria. Many empirical studies in the past have shown that exchange rate pass-through to inflation is larger in economies with flexible floating and managed floating currencies (Gita et al., 2020; Kabundi & Mlachila, 2019; Nachega et al., 2024). For small economies that depend on imports and have limited supplies, tight monetary policies should be sustained over a long period of time to offset inflation due to depreciated currencies (Andersson & Li, 2019).

The Quantity Theory of Money states that inflation is fundamentally a monetary phenomenon. The theory proposes that if the money supply in the economy increases faster than the output, then inflation is bound to occur. In this theory, the relationship between the money supply and the rate of inflation is assumed to be directly proportional such that if the money supply increases by one percent, then so does the inflation rate. In Figure 1 below, the relationship between the rise in the inflation rate in Sub-Saharan Africa and the growth of the money supply from 2013 to 2023 can be seen. Generally, governments in Sub-Saharan Africa tend to print more money so as to fund their budget deficit and increase total expenditure. Despite good intentions on the part of the politicians, managing the rate of inflation in most African countries proves to be quite challenging.

In the case of developing nations, the impact of the COVID-19 crisis was characterized by a reduction in economic activity, for which government support came in the form of direct transfers, subsidies, and other forms of expenditure. In Sub-Saharan Africa, governments engaged in an expansionary monetary policy strategy that facilitated higher expenditure. As seen from Figure 1, there is a direct correlation between the money supply growth and the growth of inflation in the SSA nations in 2020. Such evidence can be used to confirm the quantity theory of money and the monetary theory of inflation, according to which money supply and inflation are directly correlated. The average annual growth rate of money supply in Sub-Saharan Africa ranged from 12.47% to 35.19%, and average annual inflation grew from 5.86% to 18.05%.

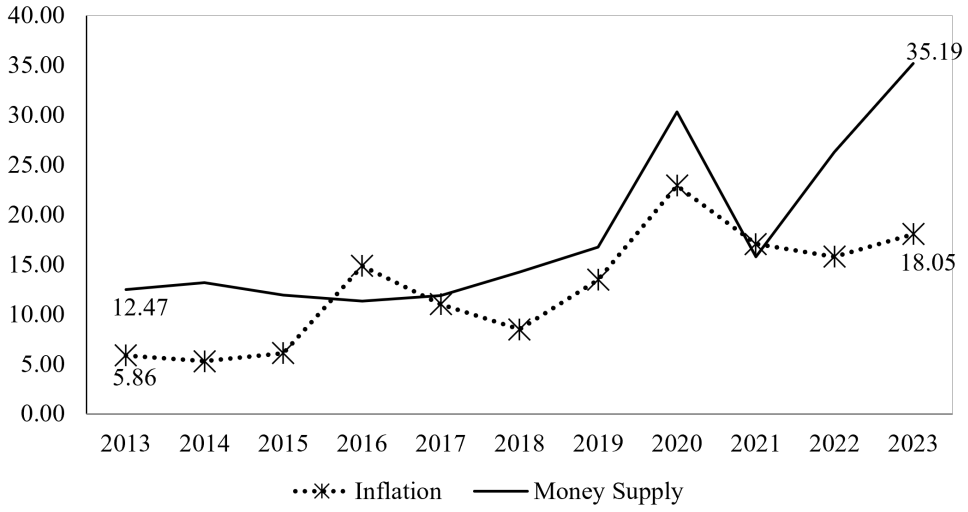

Figure 1: Trend of Average Growth of Money Supply and Inflation in Sub Saharan Africa

Moreover, different views exist about the relationship between economic growth and inflation in both theory and empirical research. Economic growth may create demand-pull inflation through the promotion of consumer expenditure, government expenditure, and easy money policies. Conversely, economic growth could lower the level of inflation through the creation of supply push factors such as more supply, productivity, efficiency, and diversification of production. As shown in Figure 2, during the years under review, a relatively higher average annual economic growth was observed when compared with relatively lower average annual inflation rate of those SSA countries.

Moreover, according to Figure 2 below, it can be observed that during the outbreak of Coronavirus disease in the Sub-Saharan African region in 2020, the annual average inflation rate was highest, while the average annual economic growth was lowest. This simply implies that by ensuring economic growth through increasing efficiency and productivity, as well as increasing the diversity of the goods, there will be reduced inflation, which is one of the most persistent challenges facing Sub-Saharan Africa.

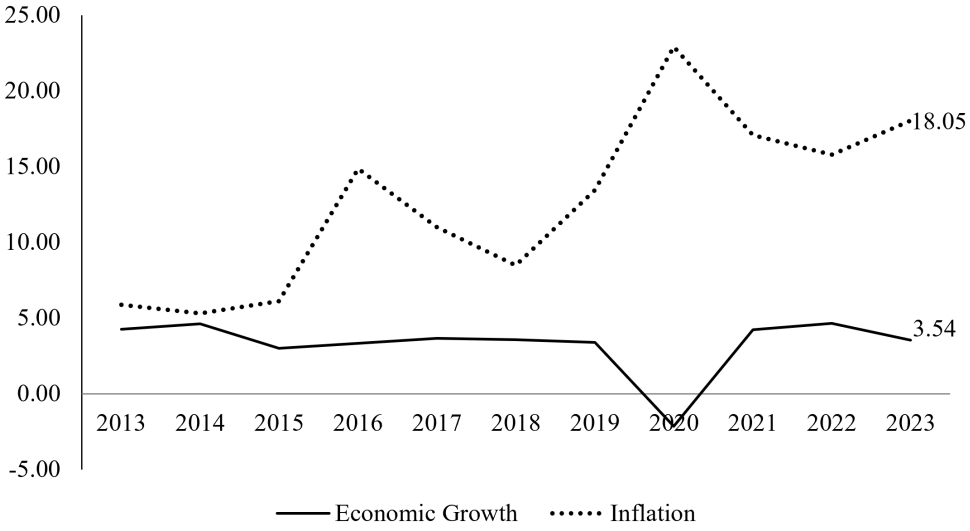

Figure 2: Trends of Average Economic Growth and Inflation in Sub-Saharan Africa

4.1 Regression Result

To avoid any spurious associations, it is important to check whether the time series are stationary or not. To check for stationarity of variables, LLC (Levin Lin Chu) test was performed and whether variables are non-stationary or not was examined. If a variable is found to have a unit root, then the same LLC test was applied to see whether differencing once makes it stationary or not, as seen in Table 2. It is clear from Table 2 that all the variables are non-stationary at level except government expenditure, which is of order I (1). In view of these results, it can be said that the LLC test proves that all variables are stationary at level except government expenditure. Hence, government expenditure is considered as the independent variable in the regression after differencing once.

The application of diagnostic tests for cointegration and cross-sectional dependence in panel data econometrics is critical towards guaranteeing the stability of the parameter estimates used. While cointegration tests provide crucial information in terms of identification of long run equilibria within non-stationary panels, their relevance to the estimation method of system generalized methods of moments (System GMM) is not very high. This is due to the fact that the System GMM estimation approach is based on small T, large N panel sets, whereby the short time series does not allow for any formal cointegration tests, and internal instruments are used in the estimation process to counteract the issue of endogeneity. For cross-sectional dependency, the Pesaran CD test was used to investigate if there were any correlations between shocks in one cross-sectional unit to others. As can be seen from table 6, the results reveal strong dependence in the sample, considering that the CD statistic has a high value (CD = 31.986) with a significant probability level of (p=0.000) and a correlation coefficient of 0.383. In order to reduce the problem of bias and inconsistency caused by such dependencies, year fixed effects will be used as explanatory variables.

The results of estimation using the generalized moment method (SGMM) are illustrated in Table 3 below. The F-statistic has been proved statistically significant at the 1 percent level of significance, showing that at least one variable has a significant influence on inflation. From the results of diagnostic tests, it can be seen that the tests relevant to the system generalized moment method are appropriate for the estimation (Roodman, 2009). The number of groups (36) exceeds the number of instruments (35).

Table 3: Levin Lin Chu (LLC) Stationarity Test Result

Logarithm of variables	Data at level		Data at First Difference	
	Test Statistics	P-value	Test Statistics	P-value
Price Level, CPI	-6.3520***	0.000		
Money Supply, MS	-5.4799***	0.000		
Gross Domestic Product, GDP	8.4573***	0.000		
Exchange Rate, EXR	-6.5746	0.000		
Government Spending, G	0.9808	0.8367	-12.1754***	0.000
Population	-9.5880***	0.000		

Source: Authors' computation (2025)

Regarding the specification test for the system generalized moment method, the Arellano-Bond test for second-order autocorrelation did not reject the null hypothesis of no autocorrelation in the residuals, as the chi-square probability exceeded 5%. In the same vein, the Hansen test for the validity of all instruments also have not rejected the null hypothesis regarding the exogeneity of all instruments as a group as presented in Table 3. Besides, the lagged values of the consumer price index, money supply, and population are positively and significantly affecting inflation in SSA countries. On the other hand, economic growth, government expenditure, and the official exchange rate are negatively and significantly associated with inflation in Sub-Saharan African countries. The positive value in the year coefficient implies that the yearly growth in inflation is 1.78%.

As shown in Table 3, last year's inflation influences the current year's price level because of the statistically significant positive coefficient for the one-period lagged value of the consumer price index at 1%. This implies that the inflation rate has an auto-regressive characteristic during the observed period with the past inflation rate playing a critical role in determining the current inflation rate. In this case, if there is a 1% increase in the last year's inflation rate, the current inflation rate will increase by 0.731%. The link between money supply and inflation is fundamental in any discussion about inflation theory and practice. According to the theory of quantity of money, there is bound to be inflation if there is an increase in the money supply and no increase in economic production. In other words, inflation is the disparity between the growth of money supply and economic production. As can be observed from Table 3 below, the coefficient of broad money supply is positive and statistically significant at 1%, which means there is a positive relationship between the two variables, as indicated by QTM and classical monetary theories.

According to classical monetary theory, there exists a high level of correlation between money supply and inflation such that the money supply is the key determinant of inflation. As can be observed from the regression results in Table 3, it is evident that a one percentage change in the broad money supply causes an increase in inflation by 0.2626%, which is significant at 1%. Similarly, previous literature has shown a positive and statistically significant relationship between money supply and inflation in developing economies (Demeke & Tenaw, 2021; Maitah et al., 2024; Tolasa et al., 2022; Ujkani & Gara, 2023). The positive relationship between money supply and inflation was also established by the research works conducted by Wudu (2020) and Salma (2021). On the other hand, Salim et al. (2021) showed a negative and significant relationship between the two variables.

The economic growth rate affects inflation in the economy in two different ways: demand-side and supply-side effects. Depending on which side dominates, the effect on inflation will be different. The economic growth rate impacts inflation through demand side through higher consumer spending, higher government expenditures, and through adopting expansionary monetary policy measures. On the other hand, it impacts inflation

Table 4: Estimation Results of the two-step Generalized Moment Method (SGMM)

F(7, 35) = 11117.90 Number of groups = 36
Prob>F = 0.000 Number of Instruments = 35

Natural Logarithms of Independent Variables	Two-step system Generalized Moment Method			
	Coefficient	Std. Error	t-Value	p-value
Lagged CPI	0.7308***	0.0215	33.95	0.000
GDP	-0.2658**	0.1265	-2.10	0.043
Exchange Rate	-0.2106*	0.1109	-1.90	0.066
Money Supply	0.2626***	0.0659	3.98	0.000
Population	0.4837**	0.1797	2.69	0.011
Government Spending	-0.2255**	0.1042	-2.16	0.037
Years	0.0178*	0.0091	1.94	0.060
Constant	-34.4615**	16.7293	-2.06	0.047

Arellano and Bond test for second-order autocorrelation:
Arellano-Bond test for AR (1): Z=-2.01 Prob>Z= 0.045
Arellano-Bond test for AR (2): Z= -0.68 Prob>Z= 0.498

Hansen and Sargan Test for the validity of all instruments as a group:
Sargan test of over identification restriction: $\chi^2(24) = 30.84$ Prob> χ^2= 0.278
Hansen test of over identification restriction: $\chi^2(24) = 29.75$ Prob> χ^2=0.325

Cross-sectional Dependency (CD) Test:
Pesaran's test of Cross-sectional Independence =31.986, Probability=0.000
Average absolute value of the off-diagonal elements=0.383

Note: ***, **, and * are statistical significance at 1, 5, and 10 percent level respectively.

Source: Author's Computation (2025)

through supply side through increased goods and service supply, efficiency, production, and diversification. However, while the demand side causes an increase in the inflation rate, the supply side acts to reduce the inflation rate. From Table 3 below, the coefficient for the economic growth rate is negative and statistically significant at 5% level. To be more specific, economic growth by 1% has been found to result in an average reduction in inflation by 0.2658% in Sub-Saharan Africa, all other things being equal. In previous studies, varying results have been obtained on the relationship between economic growth and inflation. For instance, according to the study by Olamide et al. (2022) and Demeke and Tenaw (2021), there is a negative and significant relationship between economic growth and inflation, while according to Kahssay (2017), Gita et al. (2020), Okoye et al. (2019), Tolasa et al. (2022), and Maitah et al. (2024), there exists a positive and significant association. This implies that economic growth by way of productivity, efficiency, and advancement in technology can reduce inflation in developing economies.

In this case, the coefficient of the exchange rate is negative and statistically significant at a 10 percent level of significance. It shows that on an average, 1 percent fall in the value of the exchange rate results in 0.211 percent decline in the inflation rates for sub-Saharan African countries. There are different theoretical as well as empirical approaches regarding the relationship between the effects of exchange rate devaluation and the inflation rate. On one hand, exchange rate devaluation may worsen inflation because it makes expensive for the country to buy industrial products from the international market, especially if the country has less foreign currency. On the other hand, exchange rate devaluation reduces inflation. The effectiveness of exchange rate depreciation in controlling inflation depends on the economic composition of the country, the policy

environment, and the commitment of the government and central bank towards dealing with the issues of exchange rate depreciation. According to Olamide et al. (2022) and Islam et al. (2017), there is a significant negative correlation between exchange rate depreciation and inflation. In addition, the negative correlation between exchange rate and inflation could be explained by the exchange rate pass-through effect, which refers to the reduction in price that results from the appreciation of the exchange rate, leading to reduced prices for foreign products and commodities in the local economy.

Population growth may enhance aggregate demand in supply-constrained countries by raising consumption, government spending, and urbanization. Population growth may even affect supply through labor and innovations. The population growth coefficient, as indicated in Table 3, is positive and statistically significant at the 5% significance level. This shows that population growth in supply-constrained developing nations usually causes inflation, largely because of the increased demand for goods and services. Increased population growth causes inflation because of the high demand for goods and services (Al-Mutairi et al., 2020; Ayanaw & Belay, 2024; Maitah et al., 2024; Salma, 2021; Wudu, 2020). Where supply of products/services is not able to cater to the level of demand, demand pull inflation might arise. Moreover, population increase leads to higher concentration of individuals in cities, creating more need for housing, transport services, and utilities. Population increase might also create shortages of resources like land and water, thereby causing cost push inflation (Broniatowska, 2018; Lubbock et al., 2022; Sisay et al., 2022; Weiske, 2019).

5 CONCLUSION

The inflationary forces originate from either demand, supply, or structural factors. Demand-pull inflation emanates from excessive consumer spending, government spending, and lax monetary policies while supply-induced inflation emanates from rising production costs. The causes of structural inflation include poor production efficiency, inelasticity of the supply side, disruptions in supply chains, and poor infrastructure development. Moreover, external factors such as global commodity prices, fluctuations in exchange rates, and political instability impact inflation in developing countries, which rely heavily on imports. The study was guided by the demand-pull, cost-push, and structural inflation theories while employing the system generalized moment technique as the analytical framework for identifying the sources of inflation in the Sub-Saharan African countries. In addition, the study considered panel data from 36 Sub-Saharan African countries over a period of 34 years from 1990 to 2023.

From the study, it is evident that the factors such as the money supply, price expectations, and population growth have a positive effect on inflation, whereas economic growth, currency depreciation, and government expenditure have a negative impact on inflation within the region under investigation. It is crucial for governments in Sub-Saharan Africa to consider expenditures that contribute to the improvement of economic productivity through import substitution, and at the same time, encourage economic growth. Stringent monetary policies should be put in place as well since this finding supports the quantity theory of money and the monetarist theory of inflation. Since there are several factors behind inflation that differ from economy to economy, it becomes necessary for one to adopt an approach that combines the best of monetary management along with some measures that can ensure economic stability in the Sub-Saharan region both in the short run and the long run. It was found by the study that population growth had a very strong positive correlation with inflation in Sub-Saharan Africa. In such a case, population management can be achieved by educating women, family planning, and creating jobs, among others.

However, despite giving valuable insight into the causes of inflation in Sub-Saharan

African countries, this study has several weaknesses. For instance, the analysis was concentrated mostly on macroeconomic variables while ignoring other equally important factors that may play an essential role in explaining inflation dynamics in SSA countries, such as political instability, quality of institutions, external shocks, environmental changes, and global prices for commodities. Moreover, differences in data availability and quality among various countries can have an effect on the results obtained from the regression analysis. Furthermore, using aggregated data to conduct a study on panel can distort unique features of individual SSA countries. Thus, future research may focus on integrating institutional and external sector variables into the analysis, applying regional comparisons of individual countries, and conducting studies with different econometric methods.

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Data Availability

Data can be made available on the behavior of the request

Declaration of interests' statement

The author declare no competing interests.

References

Abderrahim, M., & Laourari, M. (2022). Inflation dynamics and determinants in algeria: An empirical investigation, 1–15.

Al-Mutairi, A., Al-Abduljader, S., & Naser, K. (2020). Determinants of inflation in kuwait. *The Journal of Developing Areas*, *54*(3). https://doi.org/10.1353/jda.2020.0034

Anderl, C., & Caporale, G. M. (2023). Asymmetries, uncertainty and inflation: Evidence from developed and emerging economies. *Journal of Economics and Finance*, *47*(4), 984–1017. https://doi.org/10.1007/s12197-023-09639-6

Andersson, F., & Li, Y. (2019). Are central bankers inflation nutters? an mcmc estimator of the long-memory parameter in a state space model. *Computational Economics*, *55*(2), 529–549. https://doi.org/10.1007/s10614-019-09900-3

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte carlo evidence and an application to employment equations. *The Review of Economic Studies*, *58*(2).

Ayanaw, T., & Belay, M. (2024). Empirical investigation on the dynamics effects of population and economic growth in ethiopia: An application of the vec model. *Cogent Social Sciences*, *10*(1). https://doi.org/10.1080/23311886.2024.2338861

Bjornlund, V., Bjornlund, H., & Van Rooyen, A. F. (2020). Why agricultural production in sub-saharan africa remains low compared to the rest of the world–a historical perspective. *International Journal of Water Resources Development*, *36*(sup1), 1–34. https://doi.org/10.1080/07900627.2020.1739512

Blanchard, O. (2017). *Macroeconomics* (7th). Pearson Education.

Boz, E., Casas, C., Georgiadis, G., Gopinath, G., Le Mezo, H., Mehl, A., & Nguyen, T. (2022). Patterns of invoicing currency in global trade: New evidence. *Journal of International Economics*, *136*, 103604. https://doi.org/10.1016/J.JINTECO.2022.103604

Broniatowska, P. (2018). How demography affects the economy - impact of population ageing on inflation. *Metody Ilościowe w Badaniach Ekonomicznych*, *19*(1), 1–11. https://doi.org/10.22630/mibe.2018.19.1.1

Caselli, F. G., & Roitman, A. (2019). Nonlinear exchange-rate pass-through in emerging markets. *International Finance*, *22*(3), 279–306. https://doi.org/10.1111/infi.12344

Demeke, H., & Tenaw, D. (2021). Sources of recent inflationary pressures and interlinkages between food and non-food prices in ethiopia. *Heliyon*, *7*(11), e08375. https://doi.org/10.1016/J.HELIYON.2021.E08375

Dornbusch, R., Fischer, S., & Startz, R. (1996). *Macroeconomics theory* (11th, Vol. 11).

Erdoğan, S., Yildirim, D. Ç., & Gedikli, A. (2020). Dynamics and determinants of inflation during the covid-19 pandemic period in european countries: A spatial panel data analysis. *Duzce Medical Journal*, *22*(Special Issue 1), 61–67. https://doi.org/10.18678/dtfd.794107

Ferreira, V., Abreu, A., & Louçã, F. (2024). The rise and fall of inflation in the euro area (2021-2024): A heterodox perspective. *Structural Change and Economic Dynamics*, 1–8. https://doi.org/10.1016/j.strueco.2024.12.004

Feyisa, B. (2024). Sources of inflation in ethiopia: A dynamic ardl model. *Cogent Economics and Finance*, *12*(1). https://doi.org/10.1080/23322039.2024.2421702

Friedman, M., & Schwartz, A. (1963). *A monetary history of the united states, 1857-1960*.

Gita, G., Boz, E., Casas, C., Díez, F. J., Gourinchas, P. O., & Plagborg-Møller, M. (2020). Dominant currency paradigm. *American Economic Review*, *110*(3), 677–719. https://doi.org/10.1257/aer.20171201

Gujarati, D. N., & Porter, D. C. (2009). *Basic econometrics* (5th). McGraw-Hill Education.

Islam, R., Bashawir, A., Mahyudin, E., & Manickam, N. (2017). Determinants of factors that affecting inflation in malaysia. *International Journal of Economics and Financial Issues*, *7*(2), 355–364.

Jackson, E. A., Kamara, P., & Kamara, A. (2023). Determinants of inflation in sierra leone. *SSRN Electronic Journal*, 117278. https://doi.org/10.2139/ssrn.4443790

Kabundi, A., & Mlachila, M. (2019). The role of monetary policy credibility in explaining the decline in exchange rate pass-through in south africa. *Economic Modelling*, *79*, 173–185. https://doi.org/10.1016/J.ECONMOD.2018.10.010

Kahssay, T. (2017). Determinants of inflation in ethiopia: A time-series analysis. *Journal of Economics and Sustainable Development*, *8*, 1–6.

Keynes, J. M. (1936). *The general theory of employment, interest and money* (Vol. 1). https://doi.org/10.2307/2278703

Kinlaw, W. B., Kritzman, M., Metcalfe, M., & Turkington, D. (2022). The determinants of inflation. *SSRN Electronic Journal*, *21*(3), 29–41. https://doi.org/10.2139/ssrn.4137861

Kuma, B., & Gata, G. (2023). Factors affecting food price inflation in ethiopia: An autoregressive distributed lag approach. *Journal of Agriculture and Food Research*, *12*, 100548. https://doi.org/10.1016/J.JAFR.2023.100548

Lubbock, K. J. B., Merin, M. A., & Gonzalez, A. (2022). The impact of inflation, unemployment, and population growth on philippine economic growth. *Journal of Economics, Finance and Accounting Studies*, *4*(2), 55–64. https://doi.org/10.32996/jefas

Maitah, M., Malec, K., Rojik, S., Aragaw, A., & Fulnečková, P. R. (2024). Inflation, exchange rate, and economic growth in ethiopia: A time series analysis. *International Review of Economics & Finance*, 103561. https://doi.org/10.1016/j.iref.2024.103561

Mankiw, N. G. (2019). *Macroeconomics* (10th). Worth Publishers.

Mundell, R. (1960). The monetary dynamics of international adjustment under fixed and flexible exchange rates. *The Quarterly Journal of Economics*, *47*(SPEC. ISS.), 215–227.

Nachega, J.-C., Kwende, G., Kemoe, L., & Barroeta, F. (2024). Domestic and external drivers of inflation. *Selected Issues Papers*, *2024*(004). https://doi.org/10.5089/9798400267796.018

Okoye, L. U., Olokoyo, F. O., Ezeji, F. N., Okoh, J. I., & Evbuomwan, G. O. (2019). Determinants of behavior of inflation rate in nigeria. *Investment Management and Financial Innovations*, *16*(2), 25–36. https://doi.org/10.21511/imfi.16(2).2019.03

Olamide, E., Ogujiuba, K., & Maredza, A. (2022). Exchange rate volatility, inflation and economic growth in developing countries: Panel data approach for sadc.

Roodman, D. (2009). How to do xtabond2: An introduction to difference and system gmm in stata. *Stata Journal*, *9*(1), 86–136. https://doi.org/10.1177/1536867x0900900106

Salim, N. J., Leng, N. K., Husnin, M., Yusof, M., Yahya, H., Salim, N. J., Leng, N. K., Husnin, M., & Yusof, M. (2021). Determinants of inflation in selected asian countries. *International Journal of Academic Research in Business and Social Sciences*, *11*(11), 2318–2326. https://doi.org/10.6007/IJARBSS/v11-i11/11278

Salma, U. (2021). Macroeconomic determinants of inflation in bangladesh. *6*(5), 264–267.

Sisay, E., Atilaw, W., & Adisu, T. (2022). Impact of economic sectors on inflation rate: Evidence from ethiopia. *Cogent Economics and Finance*, *10*(1). https://doi.org/10.1080/23322039.2022.2123889

Tolasa, S., Whakeshum, S. T., & Mulatu, N. T. (2022). Macroeconomic determinants of inflation in ethiopia: Ardl approach to cointegration. *European Journal of Business Science and Technology*, *8*(1), 96–120. https://doi.org/10.11118/ejobsat.2022.004

Ujkani, X., & Gara, A. (2023). Determinants of the inflation rate: Evidence from panel data. *ECONOMICS - Innovative and Economics Research Journal*, *11*(2), 169–182. https://doi.org/10.2478/eoik-2023-0054

Weiske, S. (2019). Population growth, the natural rate of interest, and inflation.

Wudu, T. (2020). Macro-economic determinants of recent inflation in ethiopia. *Journal of World Economic Research*, *9*(2), 136. https://doi.org/10.11648/j.jwer.20200902.17