Inflation Nexus Economic Growth in Ethiopia: Implications for Long-Run Development

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Abstract: Price stability and achieving sustainable economic growth are the major goals of macroeconomic policy and the key indicators of macroeconomic stability. Pursuing of price stability is primary to long-run growth and development; it should be the concern of every economy. This study investigated the nexus of inflation and economic growth in Ethiopia, using the vector autoregressive (VAR) model by employing the data series for the period ranging from 1980 to 2021. The ADF Unit root test confirmed that the variables in the model are integrated of order I (0). The descriptive statistics concludes that the relationship between inflation and economic growth are inconclusive. From VAR regression result, the lagged value of inflation has positive and significant effect on inflation at 1% level of significance. But the lagged value of economic growth has insignificant effect on inflation in Ethiopia. On the other hand, the lagged value of economic growth has positive and significant effect on economic growth and the lagged value of inflation has positive and significant effect on economic growth at 1% level of significance. The estimated model passes diagnostic tests and the Eigen value stability condition displays all the Eigen values lay inside the unit circle. Hence, VAR satisfies stability condition. Long run sustainable development emphasis should be given to accelerate economic growth and compute the threshold inflation-growth level, so that growth rate takes care of the stability in inflation.

Keywords: Inflation, Economic Growth, Vector Autoregressive Model, Akaike Information Criterion

1. Introduction

1.1. Background of the Study

Price stability and achieving sustainable economic growth are the major goals of macroeconomic policy and the key indicators of macroeconomic stability. It is widely accepted that the pursuit of price stability is primary to long-run growth and development; it should be the concern of every economy. Given this scenario, the focus of monetary policy is primarily to be narrowed to the pursuit of moderate inflation rather than output or unemployment [14].

Inflation is a sustained rise in general price level of goods and services in a given economy. The definition of inflation concern neither increase in price of particular commodity nor for particular period of time. For an inflation to be happened, the rise in the general price of goods and services should be sustained. Inflation takes a crucial role in the healthy functioning of a countries economic performance. It is commonly recognized that an unpredictable fluctuation in the rate of inflation is considered a major indicator of the instability of economic activity of a country [11].

Economic growth is an increase in the production of economic goods and services, compared from one period of time to another. It is a complex, long-run phenomenon, subjected to constraints like: excessive rise of population, limited resources, inadequate infrastructure, inefficient utilization of resources, excessive governmental intervention, institutional and cultural models that make the increase difficult. [8].

Every country of the world both developing and developed achieving sustainable and high economic growth with moderate inflation is their most fundamental macroeconomic policy. However, the relationship between inflation and economic growth has remained speculative till now. Specially, the question of whether or not inflation is harmful to economic growth has been a subject of intense debate among policy makers, central monetary authorities and

macroeconomists. The debate originally evolves from the controversy of the structuralisms' and the monetarist. The structuralism advocates believe that inflation is essential for economic growth while monetarists argue that inflation is detrimental to economic growth [6].

In Ethiopia the history and trend of inflation shows that prior to 2002 inflation has remained more or less stable. During the Derg regime, price was controlled by the government, viz, had kept price stable. The government was also rationing goods at fixed price to the public which in turn had contributed to the lower inflation attaining during the Derg regime. In the same case, the country had not suffered from high inflation and annual average inflation was only 5.2 percent during 1980-2002 (WB, 2010; NBE, 2010). During the earlier years of the current government, inflation rate was low despite the huge inflow of money by International Monetary Fund (IMF) and World Bank (WB). This happens because of the displacement of former governments and layoffs of workers due to structural adjustment policy (SAP) followed by the country had depressed demand [16].

However, in the post 2002/03, the situations have been dramatically changed. Inflation started to increase. During the same period, the economy has recorded fast growth rate (On average 10.5 percent GDP growth) and continued growing consecutively for the last eight years, according to reports (WB, 2010; NBE, 2010). In 2000 and 2001, the inflation rate was negative 7.2 and 8.5 percent respectively. However, in 2002, the inflation rate had been increased to 15.1 percent. But the recovery of the agricultural production and general economic growth has reduced the inflation rate to 6.1 percent in 2004. In 2004, the inflation rate declined by 60 percent as compared to 2002. After 2004, the inflation rate could not show any sign of declining till 2008. In 2008, the inflation reached its highest 36.4 percent (NBE, 2010).

In 2010 the annual average general inflation at the close of the fiscal year 2010/11 was 18.1 percent, 15.3 percentages point higher than the preceding year level. This was predominantly due to the hike in the prices of food items that contributes the lion's share of 14.1 percentage point of the total annual change in headline inflation while non-food items made up the remaining 1.2 percentage point (NBE, 2010). But the average annual inflation has declined to 8.1 in 2013/14 due to the slowdown in both food & non-alcoholic beverages and non-food inflation by 6.7 and 3.9 percentage points, respectively.

Inflationary pressure was contained by imports and cross-regional redistribution of domestic market purchases of foodstuffs supported by a restrictive monetary policy stance. From an 11.9 percent peak in 2015, headline inflation receded to 7.5 percent by 2016, driven by food price moderation [10].

Ethiopia has registered remarkable economic performance with annual growth averaging 10.9% over the past ten years. In recent years, the Ethiopian economy continued to register a notable growth even when the world faces challenging macroeconomic and social conditions owing to the outbreak of COVID-19 pandemic. In 2019/20 fiscal year, real GDP grew by 6.1 percent compared to 3.5 percent average growth estimated for Sub - Saharan Africa [19]. The Ethiopian economy recorded 8.2 percent average growth rate per annum during the GTP II period (2015/16-2019/20) which was 2.8 percentage point lower than the average growth target set for the plan period [20].

Though Ethiopia has experienced a low inflation, recently, double digit inflation has become worrisome for policy makers as well as the society [12]. Abate (2015) has studied the optimal level of inflation in Ethiopia around which inflation affect economic growth optimally. The study has applied threshold approach. By doing so on the data from 1974-2012 inflation level of about 9-10 percent is optimal for Ethiopia. Any inflation level, greater or less than the estimated threshold level, may not allow long-term and sustainable economic growth. Thus, it is essential that the government intervene to control the price trend in the country. However, such intervention requires appropriate policies devised from careful observation of the forces behind the price fluctuations. Therefore, studying the possibility of controlling inflation is one of the themes to be addressed in Ethiopia.

1.2. Statement of the Problem

Achieving high and sustainable economic growth with stable price level is one of the macroeconomic objectives of many developing countries. The relationship between inflation and economic growth remains a controversial issue in macroeconomic theory and a deliberated subject among the policy makers. In Ethiopia, despite the recent economic growth, the country still faces some structural weaknesses that present significant challenges in the medium term. Its growth performance and considerable development gains is challenged by macroeconomic problem of high inflation. Pressures on prices and the balance of payment heightened as a result of the global food and economic crisis. Ethiopia's economy is highly vulnerable to exogenous shocks by virtue of its dependence on primary commodities and rain fed agriculture. It has experienced major exogenous shocks during the past five to seven years. These are notably droughts and adverse terms of trade in commodities like coffee and fuel [2]. There is a strong correlation between weather conditions and its growth performance.

High and unpredictable inflation has a negative impact on investment and economic growth by creating uncertainty to investors. Inflation can lead to uncertainty about the future profitability of investment projects especially when it is coupled with increased price variability. This lead investors to follow conservative investment policy, ultimately leads to lower level of investment and hence economic growth. Inflation may also reduce the international competitiveness of a nation by making its exports relatively more expensive, thus affecting the balance of payment.

High inflation can cause serious problems. It would bring a large distribution of income. Higher food price would hurt the urban poor who spend most of their income on food. Moreover, although it would have a positive effect on the

rural food producers, it would have an adverse effect on the rural food buyers, which may consist of about half of population in the rural Ethiopia. Thus, higher inflation, particularly through higher food price, could worsen the economic inequality. High inflation would also increase uncertainty about future inflation [5].

Moderate inflation rates are desirable for the sustainability of output growth, while high and fluctuating rates of inflation has proven to be growth-retarding and inversely related to sustainable development. Nevertheless, an insignificant agreement exists in the literature on the exact link between inflation and output growth, and the determining factors of inflation which may affect the productivity level. Until recently, macroeconomist has adopted an econometrics technique which establishes that the effect of inflation on real output growth could be positive up to a certain threshold level, and beyond which, the effect turns to be negative. This, however, supports the argument of both the structuralists and the monetarists to a greater magnitude, meaning that, lower inflation rate is essential to output growth but once the economy attains a higher level of growth, then, high inflation becomes harmful for the sustainability of such output growth.

Over the years, there have been a considerable number of researches in the field of inflation and economic growth. [15] using the annual data from India for the period of 1971–1998 analyze the threshold effect of inflation economic growth. The findings clearly suggest that the increase in inflation from any level has negative effect on economic growth and substantial gains can be obtained by focusing the monetary policy towards maintaining price stability.

The authors [9] using growth accounting equation as basis of their model examine the possible threshold effect of inflation on economic growth in China. They find that the inflation threshold effect is highly significant and robust. Above the 2.50 percent threshold level, every 1 percentage point increase in the inflation rate impedes economic growth by 0.61 percent; below this threshold, every 1 percentage point increase in inflation rate stimulates growth by 0.53 percent. This indicates that inflation harms economic growth whereas moderate inflation benefits growth in China.

The authors [4] try to ascertain if there is relationship between growth and inflation using Nigeria's consumer price index from 1970-2005. He concludes that there is no long run relationship between inflation and economic growth in Nigeria but shows that inflation has an impact on growth. [13] studies the cost and benefit of inflation by dividing the South Africa's inflationary experience into four episodes. The empirical results suggest that there is nonlinear relationship between inflation and economic growth. Within the single-digit zone inflation is beneficial to growth, while it costs in terms of slower growth at higher level. However, further results indicate that even during periods when deflationary policy yielded growth benefits as a result of a more stable economic environment, the costs of deflation outweighed the benefits.

The author [18] explains the relationship between inflation and economic growth in Ethiopia using statistical analysis.

The author states that it is difficult to specify the exact relationship between inflation and growth. By comparing the rate of inflation and economic growth of Ethiopia to that of Sub Saharan Africa, he explains how inflation affects economic growth through time. Using statistical comparison of the rate of inflation and economic growth, he tries to figure out the relation between them from 2004 to 2010. Accordingly, inflation affects economic growth nonlinearly in the country. Between 2004-2006 inflation and economic growth has positive relationship while from 2006-2008 they have negative relationship. Despite the variation in the magnitude between 2008 and 2010, he states that inflation and economic growth has positive relationship.

The authors [1] studied inflation and growth relationships: a comparative study of Ethiopia and Uganda by employing a vector error correction model. The author concluded the inflation-growth relationships in Ethiopia show the existence of a positive significant bi-directional feedback relationship between inflation and economic growth in both in the short run and in the long run. But for Uganda there exist only a unidirectional negative relationship between inflation and growth that runs from growth to inflation.

The authors [7] studied the relationship between inflation and economic growth in Ethiopia. The author concluded that the inflation rate has a serious negative effect on the growth of one country's economy especially in Ethiopia, if inflation has a double digit of an annual growth. The author also concludes that if inflation grows in a single digit it has a positive effect on economic growth. He reasoned that rise in the price of goods and services promote the producers to produce more and maximize the welfare of the consumers by increasing their consumption habit.

Even though many researchers have undertaken a variety of researches regarding the nexus of inflation and economic growth in Ethiopia, they did not clearly put the relationships between inflation and economic growth in Ethiopia. This paper will try to fill the gap that has been seen in the above literatures.

1.3. Objectives of the Study

1.3.1. General Objective

The general objective of the study is to investigate the nexus of inflation and economic growth in Ethiopia.

1.3.2. Specific Objectives

The specific objectives are:
1) To analyze the trends of inflation and economic growth in Ethiopia.
2) To investigate the relationship between inflation and economic growth in Ethiopia.

1.4. Scope of the Study

In this study, the relationship between inflation and economic growth in Ethiopia were studied using annual time series data that covered the time period from 1980 up to 2021.

2. Methodology

2.1. Type and Source of Data

The study has employed time series data covering the period 1980-2021. Annual data was extracted from secondary sources like International Monetary Fund (IMF) and World Bank (WB)). The relevant secondary data were collected from the above mentioned sources by referring appropriate websites.

2.2. Methods of Data Analysis

After the required secondary data was collected, the research used both descriptive and econometric analysis. The descriptive analysis was used to analyze the trend of inflation and economic growth in Ethiopia while econometric analysis was applied to examine the relationship between inflation and economic growth. In dealing with the econometric analysis, the researcher used vector autoregressive (VAR) model to examine the relationships between inflation and economic growth in the model.

2.3. Model Estimation Procedures

2.3.1. The Unit Root Test

Hence, stationarity of variables is a priori statistical condition so as to deal with subsequent econometric procedures in analyzing the behavior of economic variables; otherwise nothing would be accomplished. For a time series to be stationary, as of Gujarati (2004); it should possess time invariant mean, variance and auto covariance (at possibly various lags). With non-stationary variables, we would only be able to examine the behavior of variables for the study period covered. However, the core task in any econometric analysis is to forecast the future trend and behavior of the economic and financial variables, so as to enable design any appropriate economic policy. Most of the time series variables become stationary only at their first differences, i.e. yt ~ I (1); indicates a variable 'y' integrated of order one. If it is already stationary at level, it could be represented by yt ~ I (0).

The Augmented Dickey-Fuller (ADF) unit root tests will be applied in order to examine the stationarity property of each variable entered the inflation model of the present study. It is conducted by extending all the equations under consideration by adding the lagged terms of the dependent variables, and requires estimation of the following regression;

$$\Delta yt = \beta' Dt + \varphi Yt - 1 + \sum_{i=1}^{s} \Pi j \Delta yt - j + \varepsilon t$$

Where, εt; is the usual pure white noise error term; Dt is vector of deterministic terms of the constant term. The S lagged difference terms, Δyt-j are used to approximate the ARMA structure of the error terms. The value of s is set so that the error terms (εt) are serially uncorrelated.

2.3.2. Vector Autoregressive Model

A Multivariate time series has more than one time-dependent variable. Each variable depends not only on its past values but also has some dependency on other variables. The vector autoregressive (VAR) model is a workhouse multivariate time series model that relates current observations of a variable with past observations of itself and past observations of other variables in the system. In a VAR model, each variable is a linear function of the past values of itself and the past values of all the other variables.

The vector autoregressive model is computed as follows;

$$\text{Inf}_t = B_{10} + B_{11}\text{Inf}_{t-1} + \cdots + B_{1n}\text{Inf}_{t-n} + a_{11}\text{growth}_{t-1} + \cdots + a_{1n}\text{growth}_{t-n} + \varepsilon_{1t}$$

$$\text{Growth}_t = B_{10} + B_{11}\text{growth}_{t-1} + \cdots + B_{1n}\text{growth}_{t-n} + a_{11}\text{Inf}_{t-1} + \cdots + a_{1n}\text{Inf}_{t-n} + \varepsilon_{2t}$$

Where, Inf_t and Growth_t are inflation and economic growth at time t. Where the β's are unknown coefficients and ε_{1t} and ε_{2t} are error terms.

3. Data Analysis and Interpretation

3.1. Descriptive Data Analysis

3.1.1. Trends of Inflation

Inflation in Ethiopia during 1980-2021 showed a fluctuating behavior characterized by successive ups and downs. Food inflation also showed similar trends with the general inflation indicating its strong impact on it. Non-food Inflation has also showed ups and downs but its impact on influencing the trend of inflation was minimal as shown in figure 1.

Historically, Ethiopia has not suffered from high inflation. The annual average growth rate was only 4.8 percent from 1980–2021, and major inflationary episodes have occurred only during conflict and drought. Annual average inflation reached a record of 16.4 percent during 1985 and because of drought, and 21.9 percent in 1991 due to political instability, and again 10.9 percent during the 2002/03 drought happened in the country.
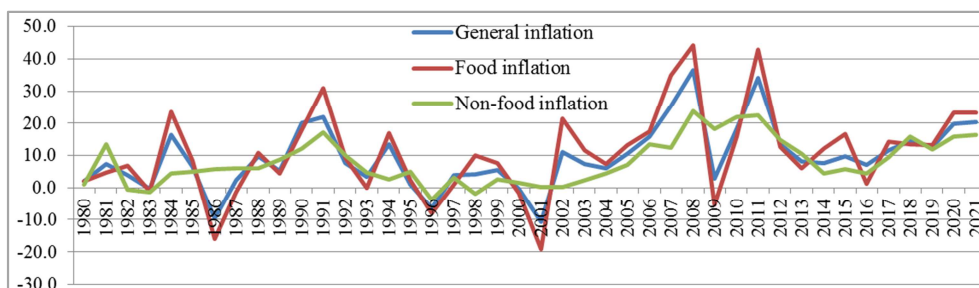

Figure 1. Trends of inflation (General, food and non food inflation).

In 2001, the inflation rate was negative -10.9 percent due to good harvests and significant amounts of food aid inflows [22]. In 2002, the inflation rate increased to 10.9 percent. But the recovery of the agricultural production and the general economic growth has reduced the inflation rate to 6.1 percent in 2004. After 2004, the inflation rate could not show any sign of declining till 2008. In 2008, the inflation rate reached its highest 36.4 percent due to worldwide economic and financial crises (NBE, 2009/10).

Annual general inflation declined to 2.8 percent at the end of 2009. This was largely attributed to the slowdown in the prices of food items. In 2010 and 2011 the annual average general inflation was 18.1 and 34.1 percent respectively. This was predominantly due to the hike in the prices of food and non food items (NBE, 2011/12). But the average annual inflation has declined to 8.1 in 2013 due to the slowdown in both food & non-alcoholic beverages and non-food inflation by 6.7 and 3.9 percentage points, respectively (NBE, 2013/14).

3.1.2. Trends of Inflation and Economic Growth

Comparing Ethiopia's inflation against the growth rate of real GDP, one may expect a negative relationship between the two as the Ethiopian economy is agrarian and increase in output means high food supply and this in turn reduces prices of food items, which account 57% of consumer price index (UNDP, 2014/15). However, the trend analysis in figure 2 below indicates inconclusive pictures about their relation for the period 1980 to 2021. It depicts almost an inverse relationship in the earlier periods (1980-1994) and after 2012. Besides, high inflation was occurred at the time of low economic growth when the economy was affected by drought in 1985 and 2003 and war (political instability) in 1991/92. However, in the later period, between 1994 and 2006, the trends of inflation and economic growth have reversed and showed positive relation. This may be due economic growth is followed by more than proportionate increase in money supply; which may further increase the price level.

In recent years, economic growth in Ethiopia declines due to the unprecedented social and economic impact of the COVID-19 pandemic. In addition, the conflict that started in November 2020 is likely to affect agriculture production, and hinder economic recovery. In the same year 2020, Ethiopia has been experiencing the worst locust invasion which severely affects agricultural production which in turn affects economic growth. On the other hand, in recent years inflation continuously increases.
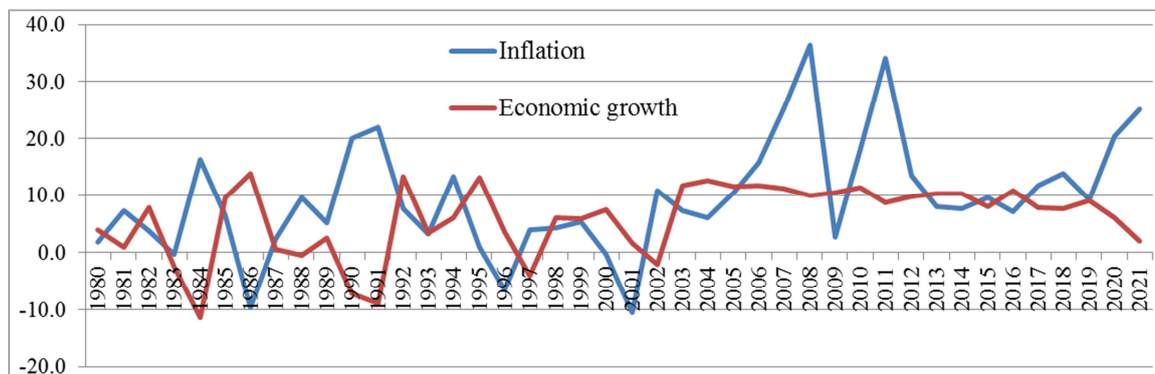

Figure 2. Trends of inflation and real GDP growth.

3.2. Econometric Results and Discussion

3.2.1. Unit Root Test

Since the data set used in this study was a time series data, stationary of the variables is important. First, a 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. In addition, regression of non-stationary time series on another non stationary time series may lead to spurious regression. Augmented Dickey Fuller (ADF) test has been chosen to test for the existence of unit root because it accounts for correlation and in addition it is also widely used in unit root tests.

Table 1. ADF tests for unit root.

Variables	Test statistic (at level with constant only)	Test statistic (at level with constant and trend)	Test statistic (at level with constant and drift)
Inf_t	-4.053***	-4.575***	-4.053***
$Growth_t$	-4.474***	-5.192***	-4.474***
*** indicates 1% level of significance and rejection of the null hypothesis of unit root respectively.			

Note: ADF critical values with constant are -3.641, -2.955 and -2.611 at 1%, 5%, and 10% respectively, ADF critical values with constant and trend are -4.233, -3.536 and -3.202 at 1%, 5%, and 10% respectively, and ADF critical values with constant and drift are -2.426, -1.685,-1.304 at 1%, 5%, and 10% respectively.

From the table shown above, inflation and economic growth are stationary at level I (0) at 1% level of significance.

If all variables are stationary at level, then that means no co-integration between these times series. In this situation, performing a co-integration test is not necessary. This is because any shock to the system in the short run quickly adjusts to the long run. Consequently, only the long run model should be estimated.

3.2.2. Vector Autoregressive Model

Before estimating the VAR model, the first task is to choose the number of lags that should be included in the model. From table below, based on the Akaike information criterion *(*AIC*)* the optimal lag length is two. The lag length p can be chosen using the Akaike's Information Criteria (AIC) because it known as the best information criteria to use. [3] argue that AIC has theoretical as well as practical advantage because it is derived from principles of information criteria. [21] also argues that the rate at which AIC converges to the optimum is the best possible.

Table 2. Optimal lag length selection.

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-265.527		4		4467.83	14.0804	14.1111	14.167
1	-254.072	22.911*	4	0.000	3019.69	13.688	13.78*	13.947*
2	-249.976	8.1918	4	0.085	3011.74*	13.683*	13.8363	14.114
3	-246.635	6.6814	4	0.154	3135.09	13.7177	13.9323	14.321
4	-242.261	8.7486	4	0.068	3104.29	13.698	13.9739	14.474

A Vector auto regression (VAR) expresses each variable as a linear function of its own past values, the past values of all other variables being considered, and a serially uncorrelated error term. Both economic growth and inflation rate are stationary at level.

Table 3. The estimation result of Vector Autoregressive Model.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Inf_t				
Inf_t				
L1	0.3630291	0.1500331	2.42	0.016
L2	0.0173084	0.1739307	0.10	0.921
$Growth_t$				
L1	-0.1763551	0.2618425	-0.67	0.501
L2	0.6890049	0.2266257	3.04	0.002
_cons	3.20872	2.428318	1.32	0.186
$Growth_t$				
Inf_t				
L1	0.2911982	0.0943686	3.09	0.002
L2	-0.0189525	0.1093999	-0.17	0.862
$Growth_t$				
L1	0.3961048	0.1646951	2.41	0.016
L2	-0.1698619	0.1425443	-1.19	0.233
_cons	2.098036	1.527377	1.37	0.170

Estimation of the VAR model for inflation and economic growth with two lags is computed as follows;

$$Inf_t = 3.208 + 0.363 Inf_{t-1} + 0.017 Inf_{t-2} - 0.176 growth_{t-1} + 0.689 growth_{t-2}$$

$$Growth_t = 2.098 + 0.396 growth_{t-1} - 0.169 growth_{t-1} + 0.291 Inf_{t-1} - 0.018 Inf_{t-2}$$

From the above table, the lagged value of inflation (Inf_{t-1}) has positive and significant effect on inflation at 1% level of significance. But economic growth ($growth_{t-1}$) has insignificant effect on inflation in Ethiopia.

On the other hand, the lagged value of economic growth ($growth_{t-1}$) has positive and significant effect on economic growth at 1% level of significance. In addition, the lagged value of inflation (Inf_{t-1}) has positive and significant effect on economic growth at 1% level of significance.

3.2.3. Granger Causality Test

To examine the direction of causality between inflation and economic growth, Granger-Causality Wald test is employed. The result of a Granger causality test shows that the null hypothesis that inflation does not Granger cause growth is rejected at 1% level of significance. Similarly, in the second test the null hypothesis that economic growth does not Granger cause inflation is rejected at 1% level of significance indicating the existence of bi-directional relationship between economic growth and inflation.

Table 4. Granger causality Wald tests.

Equation	Excluded	Chi2	df	Prob > Chi2
Inf_t	$Growth_t$	9.5683	2	0.008
Inf_t	All	9.5683	2	0.008
$Growth_t$	Inf_t	11.095	2	0.004
$Growth_t$	All	11.095	2	0.004

3.2.4. Diagnostic Tests

Essential post estimation diagnostic tests like Breusch-Pagan/Cook-Weisberg test for heteroscedasticity, Jarque Bera test for normality, Lagrange-multiplier (LM) test for

autocorrelation and stability condition of VAR estimates are employed to check the validity and the robustness of the estimated model. From the table below, the information displays the estimated model passes the above mentioned diagnostic tests. Stability test has been conducted for estimated parameters by using Eigen value stability condition and the result displays all the Eigen values lie inside the unit circle. VAR satisfies stability condition.

Table 5. Results of diagnostic tests.

Breusch-Pagan test for heteroskedasticity			
	Chi2	Prob > Chi2	
	0.21	0.6497	
Lagrange-multiplier test for autocorrelation			
Lag	Chi2	df	Prob > Chi2
1	3.3156	4	0.50646
Jarque-Bera test			
Equation	Chi2	df	Prob > Chi2
Inf_t	0.207	2	0.90180
$Growth_t$	2.875	2	0.23751
All	3.082	4	0.54423
Eigen value stability condition			
Eigen value		Modulus	
0.7379782		0.737978	
-0.01001414 + 0.5769034i		0.57699	
-0.01001414 + 0.5769034i		0.57699	
0.04118388		0.041184	
All the Eigen values lie inside the unit circle. VAR satisfies stability condition.			

4. Conclusions and Recommendations

Price stability and achieving sustainable economic growth are the major goals of macroeconomic policy and the key indicators of macroeconomic stability. Pursuing of price stability is primary to long-run growth and development; it should be the concern of every economy.

This study investigated the nexus of inflation and economic growth in Ethiopia, using the vector autoregressive (VAR) model by employing the data series for the period ranging from 1980 to 2021. The ADF Unit root test confirmed that the variables are integrated of order I (0).

The descriptive statistics concludes that inflation in Ethiopia during 1980-2021 showed a fluctuating behavior characterized by successive ups and downs. Annual average inflation reached a record of 21.9 percent in 1991 due to war and political instability in the country. In addition, annual average inflation reached a record of 36.4 percent due to worldwide economic and financial crises (NBE, 2009/10). The relationship between inflation and economic growth in the study period is inconclusive. There inverse relationship between inflation and economic growth in the earlier periods (1980-1994) and after 2012. Between 1994 and 2006, the trends of inflation and economic growth have reversed and showed positive relation.

From VAR regression result, the lagged value of inflation has positive and significant effect on inflation at 1% level of significance. But the lagged value of economic growth has insignificant effect on inflation in Ethiopia. On the other hand, the lagged value of economic growth has positive and significant effect on economic growth and the lagged value of inflation has positive and significant effect on economic growth at 1% level of significance.

The result of a Granger causality test shows that the null hypothesis that inflation does not Granger cause growth is rejected at 1% level of significance. Similarly, in the second test the null hypothesis that economic growth does not Granger cause inflation is rejected at 1% level of significance indicating the existence of bi-directional relationship between economic growth and inflation. The estimated model passes diagnostic tests and the Eigen value stability condition displays all the Eigen values lie inside the unit circle. Hence, VAR satisfies stability condition.

Therefore, long run sustainable development emphasis should be given to accelerate economic growth and compute the threshold inflation-growth level, so that growth rate takes care of the stability in inflation.

Declarations

This is to certify that, the research paper submitted by me is an outcome of my independent and original work and the work has not been submitted for any other degree or professional qualification. I have duly acknowledged all the sources from which the ideas and extracts have been taken. The research is free from any plagiarism and has not been submitted elsewhere for publication.

Availability of Data and Materials

The data that support the findings of this study will be available upon reasonable request.

Competing Interests

The author declares no competing interest.

Authors' Contributions

The author contributed to the study conception and design. Methodology, data collection and analysis were performed by the author.

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