Shadow of Inflation-Unemployment-Poverty on the Economic Development in India

Jitendra Kumar Sinha

Retired Sr. Jt. Director & Head, DES, Bihar, India. E-mail: jksinha2007@rediffmail.com

Abstract: This article analyses the impact of inflation, poverty, unemployment, and population growth on the economic growth of India using the time series data from 1990-2021. The stationarity for the variables was tested through unit root testing, while the asymmetric non-linear autoregressive distributed lag technique (NARDL) was applied to reveal the association among the variables via short-run and long-run dynamics. It was found that inflation and poverty have negative linkages with economic growth; unemployment has a positive association with economic growth, and population growth showed a negative association with economic growth via short-run and long-run dynamics. Unemployment and inflation are now emerging issues in India, and government policies are required to tackle these issues to boost economic progress.

Keywords: Inflation; Unemployment; Poverty: Economic Growth; NARDL.

JEL: C25, E32, E37, E51

1. Introduction

The macroeconomic indicators of Poverty, Unemployment, and Inflation have eclipsed the economic development in most underdeveloped and emerging countries. Inflation and unemployment are the macroeconomic indicators that have a substantial impact on economic development and almost every country has a problem with unemployment. India is also severely affected by their impact which has made its policymakers and experts worried.

Inflation is the rise in prices, which may be due to cost pull or demand-pull, as the amount of money in circulation increases. It refers to increasing prices of goods and services. Various economies throughout the world have experienced inflation for some time. The decision considerations may have been when, why, how long, and the broader economic situation. Inflation may have an impact on a country's economic growth, investment, income and wealth distribution, and social and political

conditions{Mohseni &Jouzaryan (2016); Jelilov, Obasa & Isik (2016); and Yelwa, David &Awe (2015)(1-3)}. The prices are rising in all economies, developed and emerging. Volatilities may have been the only thing going on in certain economies, while a steady rise in prices may be the only thing going on in others. Despite the overall increase in costs, the economy of certain economies has thrived, making it beneficial for them{Olu & Idih (2015); Bawa & Abdullahi (2012); Osuala, A.E. Osuala, K.I. and Onyeike, S.C. (2013) ;(4-6)}.

Unemployment is the condition of not having a job or being unemployed or the fraction of the population that is both able to work and actively seeking work, but is unable to do so for whatever reason. The prominent reasons for unemployment in emerging countries include technological development, the involvement of females in the labor force, demographic, income status, and migration from rural to urban owing to rising demand for power products. The negative effect of unemployment in developing countries like India has created the greatest problem for the people and society and adversely affects consumption, purchasing power, and the capability of production for the economy. Reduction of the unemployment rate remained the prime concern for the planners from the beginning of the planning process in India. Research evidence has shown that several labor market barriers exist that prevent people from overcoming unemployment and earning a living – most of which affect mainly the poor and arise from a pool of poverty leading to marginalization, inequality, and further poverty. More importantly, however, is the overall impact of India's unemployment situation on the economy from a macroeconomic perspective which is accentuated by the influence of labor market fluctuations on monetary policy, changes in the gross domestic product (GDP) as accounted for by unemployment, as well as the relationship between unemployment and inflation in India {Sinha & Sinha (2022), Sinha (2022) (7-9)}.

Economic growth has also received a lot of attention in recent decades and has also been researched in connection with inflation and unemployment, as economic characteristics are especially prominent in emerging economies. To make effective economic decisions, one must understand the economic concept of inflation and unemployment. Inflation and unemployment are two of the most significant issues that influence a variety of economic activities including savings, investments, exports, poverty reduction, and economic growth. Inflation will hurt social wellbeings. Low inflation, on the other hand, is likely to result in lower economic growth rates, a larger proclivity for poverty, lower employment, and a sluggish economic decline. Unpredictable price rises in products and services signify inflation {Bahera & Mishra, (2017)(10)}. This situation will surely affect falling purchasing power, implying that

inflation has a significant impact. However, if it is not managed properly, it may have an impact on the economy. By addressing these difficulties, a country's government policies may be utilized in tandem. Because of the conceptual trade-off between inflation and unemployment, achieving both goals is challenging{ Wulandari, Utomo, Narmaditya, & Kamaluddin (2019); Kasseh, P.A.(2018) (11,12}.

Poverty is another significant hindrance to achieving a high standard of living and it may be found in practically every corner of the world. Unavoidable unemployment is one of the main causes of poverty. The poverty level inevitably rises as unemployment rises. Some nations have found a positive correlation between poverty and unemployment. Lastly, population growth makes it more difficult for low-income and lower-middle-income countries to afford the increase in public expenditures on a per capita basis that is needed to eradicate poverty, end hunger and malnutrition, and ensure universal access to health care, education, and other essential services.

2.   Indian Scenario

There appears to be a theoretical relationship between unemployment that is caused by critical manpower shortages and scarcity of productive inputs in the form of modern types of machinery, equipment, and other critical inputs. The result is that domestic production falls short of the required output which has to be met by imported goods and services. The tendency is for the economy to demand more imports than its exports. The consequence is building a trade deficit which in the long run requires devaluation of the rupee and its attendant inflation implications. To control inflation, the Government of India has put in place the Inflation Targeting (IT) framework of 3%-6%. This further affects people who are employed as their real wages are eroded via inflation. The Phillips Curve was developed to explain the trade-off between unemployment and changes in wages (inflation).

Rapid economic growth generally ameliorates unemployment concerns, but the situation in India is different. GDP growth in India resulted in the creation of a limited number of well-paying employment, implying that unemployment will continue to rise even with strong economic improvement. India's macroeconomic challenges continue to be stagnant economic growth with high unemployment. Employment growth in India slowed from 2012 to 2016 and a survey [Kannan & Raveendran,2019(13)] reported a net decline in employment and an increase in unemployment. Unemployment in India is attributed to negative activities, the substitution of labor for capital, and an increase in workforce supply. The initiative taken by the Government of India to curb the problem of rising unemployment and stagnant growth has lagged and led to more unemployment. Studies mention a unidirectional relationship between

unemployment and economic growth in the U.S.A., and the scenario in India needs to be investigated. As inflation and unemployment are a grave concern for the economy, the macroeconomic policy goals aim to keep them low for maintaining stable domestic prices, steady economic growth, and employment stability. The three most important indices of macroeconomic success are low unemployment, low inflation, and higher production growth. When inflation and exchange rates destabilize gross domestic production (GDP), economic evidence shows a range of responses because the link between fluctuating exchange rates and GDP is especially troublesome in emerging and developing economies. Furthermore, the economic survey's findings show that the relationship between the exchange rate volatilities and inflation- GDP is not widely recognized. It is critical to investigate the link between exchange rate volatility, inflation, and income from a regional perspective{Darma & Onimisi (2017); Olamide, Ogujinha & Maredza (2022)(14-15). Poverty is also a major concern for the economy as the nation has the basic responsibility to ensure that its citizen has the minimum resources to lead normal, healthy, and sustainable lives. Poverty may be reduced by identifying its roots and effects. Poverty and unemployment have a causal relationship, which may hamper economic progress. Thus poverty, inflation, and economic growth have a dynamic causal connection, so experts must take into consideration the dynamic interaction between poverty and the factors that cause it{Nansadiqe, Masber, & Majid (2019); Majid, Dewi, Aliasudin, & Kassin (16-17)}.

The primary reasons for rising poverty are unemployment and inflation. So, if poverty is not tackled the country's welfare and nation's progress would suffer. The problem of global population growth is difficult to address. The success of economic development hinges on how effectively the issues of rising prices, declining real income levels, and rising unemployment are dealt with. This paper proposes to make an addition to the current literature on inflation, unemployment, poverty, population growth, and economic growth in India. The study variables were first verified for stationarity using the annual data, and two unit root tests were employed to confirm that. The positive and negative shocks of decomposed variables with economic growth were checked using Nonlinear Autoregressive Distributed Lag (NARDL) model with the estimation of short-run and long-run dynamics.

3.   Review of Literature

Unemployment is a critical problem in both developed and emerging economies for several decades, even though it has reduced considerably in rich countries- while growing fast in emerging countries, resulting in reduced family income and poor living standards, which contribute to a rise in the frequency and severity of poverty {Jibir,

Bappayaya, & Babayo (2015);(18)}. A lack of economic opportunity is seen to increase the level of poverty for individuals and families, which is a major impediment to economic progress. This lack of social mobility is exacerbated by racial and economic inequality. Experts believe that measures targeted at closing gaps and ensuring that the disadvantages of certain groups are economically secure may combat poverty and inequality{Ogleide &Agu (2015)(19)}. Poverty is also associated with a lack of means of subsistence, which includes being unable to afford the most basic requirement of life, such as food and shelter. In terms of money, a person's basic needs are viewed as a financial measure, and the poverty line is a word used to define the value of a person's basic needs. A person is deemed poor if their income falls below the federal poverty line. Several factors influence the quantity of poverty in a given location. Many studies on economic growth, inflation, and open unemployment have been undertaken. These factors have an important influence on establishing a country's poverty level. Inequality, inflation, and unemployment are all horrible global events that have various levels of impact on people of all ages, stages, and socioeconomic backgrounds. In general, economic growth is the most significant necessity for poverty reduction, followed by poverty reduction economic growth. Gross Domestic Product growth is not enough to eliminate poverty, but it is a necessary evil. Strong economic progress does not result in fewer people living in poverty in the absence of income equality{Misini & Bodivuku (2017); Peter, Adewale, Siyan& Agegoriob (2017); Nurdiana, Hasan, Arisah, Riesso & Hashanah (2020) (20-22)}.

Lack of income is a key socially determining factor in poor health, and it is a major consequence of unemployment in the labor market. The assumption that poverty, loss of income, or economic stress is a mediator between unemployment and health is supported by social epidemiology investigations. Poverty has several physical and psychological repercussions on one's health and well-being. The long-term consequence of unemployment on poverty and individual health has been studied extensively for decades. According to pieces of evidence, those who are unemployed are more likely to suffer poverty and material deprivation as a result of the loss of income and job-related benefits (23-24). In terms of externalities, the government is a fundamental response to the free rider corundum. Public goods and services are provided, common resources are managed, and knowledge externalities are developed through tax-funded educational, extension, and training efforts. However, a democratic society can achieve some of these aims more successfully than the government. The effectiveness of public expenditure is improved when citizen band together and take action. There is substantial ramification from the connection between public money and the capacity of civil society organizations to operate together. People feel that higher main growth will help reduce

poverty via social capital. The poor individual has lower opportunity costs in terms of time, material assets, and financial resources. Due to the time-consuming nature of the social relationship, the poor may decide to prioritize social capital. Increasing trust, decreasing opportunism, and developing knowledge externalities may all contribute to economic development and poverty reduction (25).

Necessities such as adequate health care, enough education, and sufficient earnings make life more difficult for many individuals. The status of the economy influences the price of products and services. Price fluctuations have a significant influence on people who are currently unemployed, as well as those who are employed full-time. Economic growth rates have an impact on employment as well. For instance, it may be difficult to offer employment for individuals joining the workforce if the economy expands too slowly. Some full-time workers may find themselves working part-time or far below their capacities as a consequence of the growth in the number of jobless people in the economy. There will be a clear correlation between long-term unemployment and the incidence of poverty. Discrimination in job practices has made it difficult for some people to move beyond the poverty line. To advance in one's job and earn more money, one must now have the ability to get by without a proper education level. These characteristics increase the chance that a person with less education would be jobless, work fewer days per year, and earn less (26-27). Poverty alleviation may be achieved via a variety of means, one of which is financial growth. Financial progress seems to have a significant and irrefutable influence on poverty alleviation. Economic growth has a greater influence on poverty reduction when it is accompanied by financial development (28-29).

Economic concepts such as unemployment and inflation are among the most complicated concepts in the financial world. The question of how the growing and falling of unemployment, inflation, and poverty are linked has occupied the minds of economists for many years. The government's macroeconomic goals include growth, price stability, and full employment, which are pursued to improve the conditions of the people. Significant unemployment and unstable pricing have resulted in substantial variability in growth rates (30). The extent to which such monetary policy cause inflation is critical. The International Monetary Fund (IMF) has mentioned several factors responsible for the rise in global inflation. The global pandemic has disrupted the supply chain resulting in inflationary supply shocks. The Government imposed shutdown and the subsequent financial relief packages are producing artificial excess demand, which is matched with the constrained supply, resulting in another inflation trigger. There is a lot of uncertainty in the market concerning inflation forecast because of these issues together. Inflation may be predicted using a variety of mathematical models that takes into account changes in the economy (31-32).

In any economy, inflation and unemployment are significant challenges. In principle, all policymakers want low inflation and low unemployment. Other things being equal, it is commonly considered that a country's macroeconomic stability would be assumed by single-digit inflation and unemployment of some percentage. Because macroeconomic stability is crucial to growth, planning, and development, changes in other economic fundamentals must be monitored if stability goals are to be met. Inflation is an average measure of the total price level, as prices may grow, fall, or stay constant at any one moment; a continuous rise in prices affects the economy, particularly the poor, who have little or no reserve to offset price spikes. The average person knows when his money can buy a smaller number of items or services than before (33-34). One of the most important development goals for both developing and developed countries is to reduce poverty. Over the last several decades both developing and developed countries have made headways toward this aim by boosting economic development, instituting redistribution policies, or both. However, poverty results vary greatly among nations depending on the unique effectiveness of their development policies (35).

4. Methodology

4.1. Study variables & Data treatment

The study variables used in this investigation were: i) Economic Growth (annual %); ii) Inflation (annual %); iii) Poverty (% population); iv) Unemployment (% of the total labor force); v) Population Growth (annual %). The data set for these five variables for India were taken from the World Bank and the MoSPI website for 1990-2021.

Stationary of the study variables was investigated by using two unit root tests: i) Augmented Dickey-Fuller Test; and ii) Phillips- Perrons Test along with an exploration of the lag length criteria for the variables. The investigation also used bound testing to confirm the presence of cointegration. In addition, the Johansen Cointegration test was also used to further examine the robustness among the variables. Finally, the Non-Linear Autoregressive Distributed Lag (NARDL) approach was used to examine the influence of inflation, unemployment, population growth, and employment on economic growth via the estimation of the long-run and short-run dynamics.

4.2. Model for Investigation

This study adopted the asymmetric Nonlinear Autoregressive Distributed Lag (NARDL) technique to uncover the association among the variables with a short-run and long-run estimation. The model utilized for the examination of the connection between

economic growth(E), inflation(I), poverty(P), unemployment(U), and population growth(G) was expressed as:

$$E_t = \phi\{I_t, P_t, U_t, G_t\} \tag{1}$$

A linear version of equation (1) could be expressed as :

$$E_t = \beta_0 + \beta_1 I_t + \beta_2 P_t + \beta_3 U_t + \beta_4 G_t + \varepsilon_t \tag{2}$$

In equations (1) and (2) β's are the parameters of the linear model, ε the error term, and t demonstrates the time extent.

The Autoregressive Distributed Lag (ARDL) technique developed by Pesaran (2001){ expoilated to check the linkage amid the variables}, was expression as:

$$\Delta E_t = \theta_0 + \Sigma\alpha_f \Delta E_{t-f} + \Sigma \eta_f \Delta I_{t-f} + \Sigma \pi_f \Delta P_{t-f} + \Sigma \mu_f \Delta U_{t-f} + \Sigma \lambda_f \Delta G_{t-f}$$
$$+ \theta_1 E_{t-1} + \theta_2 I_{t-1} + \theta_3 P_{t-1} + \theta_4 U_{t-1} + \theta_5 G_{t-1} + \varepsilon_t \tag{3}$$

Equation (3) provides the link between the variables. It is more suited than other standard procedures for the discovery of certain important factors in small samples because of its incentive effects on respondents. Shin *et al.* (2014) assumed a longer-run perspective to use the F- test for long-run prediction verification. As immediately as cointegration is established, the long-term elasticity can be calculated by θ_1- θ_5 and then regulated by θ_0. When decomposition variables such as inflation, poverty, unemployment, and population growth are decomposed into positive and negative shocks $\{I^+q, P^+q, U^+q, G^+q\}$ and $\{I^-q, P^-q, U^-q, G^-q\}$; an asymptotic could be created and represented as follow:

$$\text{Pos.}\{I_t\} = I^+q = \Sigma\Delta I^+q = \Sigma\max. (\Delta I^+q, 0) \tag{4}$$

$$\text{Neg.}\{I_t\} = I^-q = \Sigma\Delta I^-q = \Sigma\min. (\Delta I^-q, 0) \tag{5}$$

$$\text{Pos.}\{P_t\} = P^+q = \Sigma\Delta P^+q = \Sigma\max. (\Delta P^+q, 0) \tag{6}$$

$$\text{Neg.}\{P_t\} = P^-q = \Sigma\Delta P^-q = \Sigma\min. (\Delta P^-q, 0) \tag{7}$$

$$\text{Pos.}\{U_t\} = U^+q = \Sigma\Delta U^+q = \Sigma\max. (\Delta U^+q, 0) \tag{8}$$

$$\text{Neg.}\{U_t\} = U^-q = \Sigma\Delta U^-q = \Sigma\min. (\Delta U^-q, 0) \tag{9}$$

$$\text{Pos.}\{G_t\} = G^+q = \Sigma\Delta G^+q = \Sigma\max. (\Delta G^+q, 0) \tag{10}$$

$$\text{Neg.}\{G_t\} = G^-q = \Sigma\Delta G^-q = \Sigma\min. (\Delta G^-q, 0) \tag{11}$$

In equations (4) to (11) summation extends over 1 to q. This set of eight equations provides information on the effects of both positive and negative shocks on variables. The model's asymmetric representation may be summarized as:

$$E_t = \beta_0 + \Sigma\,\alpha_a\,\Delta E_{t-a} + \Sigma\,\lambda_a\,\Delta I^+_{t-a} + \Sigma\,\mu_a\,\Delta I^-_{t-a} + \Sigma\,\pi_a\,\Delta P^+_{t-a} + \Sigma\,\phi_a\,\Delta P^-_{t-a}$$
$$+\Sigma\,\xi_a\,\Delta U^+_{t-a} + \Sigma\,\epsilon_a\,\Delta U^-_{t-a} + \Sigma\,\Upsilon_a\,\Delta G^+_{t-a} + \Sigma\,\delta_a\,\Delta G^-_{t-a} + \eta_1 E_{t-1} + \eta_2 I^+_{t-1} + \eta_3 I^-_{t-1}$$
$$+ \eta_4 P^+_{t-1} + \eta_5 P^-_{t-1} + \eta_6 U^+_{t-1} + \eta_7 U^-_{t-1} + \eta_8 G^+_{t-1} + \eta_9 G^-_{t-1} + \varepsilon_t \qquad (12)$$

Equation (12) explores the asymmetric representation of the variables. Summation runs on the term with E_t runs from 1 to X, while for the rest of the following terms it extends from 0 to X in the rest of the eight terms thereafter. The exploration of the error correction model may be stated as follow:

$$E_t = \beta_0 + \Sigma\,\alpha_a\,\Delta E_{t-a} + \Sigma\,\lambda_a\,\Delta I^+_{t-a} + \Sigma\,\mu_a\,\Delta I^-_{t-a} + \Sigma\,\pi_a\,\Delta P^+_{t-a} + \Sigma\,\phi_a\,\Delta P^-_{t-a} + \Sigma\,\xi_a\,\Delta U^+_{t-a}$$
$$+ \Sigma\,\epsilon_a\,\Delta U^-_{t-a} + \Sigma\,\Upsilon_a\,\Delta G^+_{t-a} + \Sigma\,\delta_a\,\Delta G^-_{t-a} + \eta_1 E_{t-1} + \eta_2 I^+_{t-1} + \eta_3 I^-_{t-1} + \eta_4 P^+_{t-1} + \eta_5 P^-_{t-1}$$
$$+ \eta_6 U^+_{t-1} + \eta_7 U^-_{t-1} + \eta_8 G^+_{t-1} + \eta_9 G^-_{t-1} + \vartheta\,ECM_{t-1} + \varepsilon_t \qquad (13)$$

Equation (13) describes the exploration of the error correction model.

5. Results & Findings

5.1. Descriptive Statistics

Basic statistics related to the five variables, viz., economic growth, inflation, poverty, unemployment, and population growth; under consideration in this study are presented in Table 1.

Table 1: Descriptive Statistics of Economic Growth, Inflation, Poverty, Unemployment, and Population Growth

	Economic Growth	*Inflation*	*Poverty*	*Unemployment*	*Population Growth*
Mean	4.402	7.929	1.305	1.410	0.703
Median	4.524	7.509	1.581	1.525	0.578
Maximum	8.104	9.605	2.160	1.549	1.117
Minimum	2.935	4.915	0.392	0.978	0.628
Stand. Dev.	0.684	0.706	0.108	0.810	1.115
Skewness	-1.653	-1.553	-0.752	1.611	0.502
Kurtosis	5.498	7.764	2.302	2.552	1.806
Jarque-Bera	32.210	13.883	2.356	7.563	3.072
Probability	0.000	0.214	0.232	0.022	0.215

Source: Author's computation (E-views 7).

Table 1 shows that the Indian economy was growing with an average of 4.402 percent, the maximum economic growth during the study period was 8.104 percent, while the minimum growth rate of the economy stood at 2.935 percent. Jarque – Bera value of 32.21 and the probability value of 0.000 shows that economic growth was not normally distributed. The Table shows that inflation in the Indian economy stood

at 7.929 percent, the maximum during the study period was 9.605 percent, while the minimum stood at 4.915 percent. Jarque – Bera value of 13.883 and the probability value of 0.214 shows that we would fail to reject that inflation was normally distributed. It also shows that poverty increased during the study period by 1.305 percent in the Indian economy, the maximum was 2.160 percent, while the minimum stood at 0.392 percent. Jarque – Bera value of 2.356 and the probability value of 0.232 shows that we would fail to reject that poverty was normally distributed. The population growth in the Indian economy stood at 0.703 percent, the maximum during the study period was 1.117 percent, while the minimum stood at 0.628 percent. Jarque – Bera value of 3.072 and the probability value of 0.215 shows that for population growth also we would fail to reject the normality hypothesis. Unemployment in the Indian economy has also grown by 1.410 percent. Jarque – Bera value of 7.563 and the probability value of 0.022 shows that population growth was not normally distributed.

5.2. *Correlation Coefficient*

The association between the response and explanatory variables was studied through the correlation coefficient presented in Table 2.

Table 2: Correlation Coefficient among economic growth, inflation, poverty, unemployment, and population growth

	Eco. Growth	*Inflation*	*Poverty*	*Unemployment*	*Popu. Growth*
Eco. growth	1.000	-0.218	0.148	-0.196	0.236
Inflation	-0.218	1.000	0.313	-0.490	0.295
Poverty	0.148	0.313	1.000	-0.851	0.874
Unemployment	-0.196	-0.490	-0.851	1.000	-0.761
Popu. Growth	0.236	0.295	0.874	-0.761	1.000

Source: Author's computation (E-views 7).

The inflation rate and unemployment depicted a negative relationship with economic growth, which is consistent with the economic theory suggesting that an increase in the unemployment rate or inflation reduces the rate of economic growth. Poverty and population growth showed a positive association with the economic growth in India during the period covered in this study, which is not consistent with apriori economic expectations that population growth put pressure on the economy leading to higher poverty and reducing economic growth. The behavior of inflation had a positive relationship with poverty and population growth, but a negative relationship with economic growth & unemployment was along the expected economic theory. Surprisingly, however, poverty showed a positive association with economic growth, inflation, and population growth

though had a negative association with unemployment. The reason for the violation of the apriori expectation may be attributed to poor governance and institutional quality which encourage corruption. However, the government of India needs to pursue policies aimed to enhance the well-being of its populace.

5.3. Stationarity Test

The stability of the five study variables was tested by two unit root approaches Augmented Dickey-Fuller (ADF) Test, and Phillips Perron(PP) Test. The result of the test is mentioned in Table 3.

Table 3: Results of Stationarity Test

Variables	*ADF Test (T statistics & p-value)*		*PP Test (T statistics & p-value)*	
	At the level I(0)	*At the level I(1)*	*At the level I(0)*	*At the level I(1)*
Economic Growth	-2.421 (0.142)	-6.166 (0.000)	-2.719(0.217)	-6.294(0.000)
Inflation	-4.163(0.002)	-8.746(0.000)	-4.179(0.002)	-9.979(0.000)
Poverty	0.545(0.985)	-7.729(0.000)	-1.121(0.696)	-15.133(0.000)
Unemployment	0.015(0.953)	-5.578(0.000)	-0.105(0.940)	-5.604(0.000)
Population growth	-1.646(0.445)	-3.344(0.003)	-1,036(0.779)	-2.367(0.152)

Source: Author's computation (E-views 7).

The test statistics reveal a stationary trend. The model's four non-stationary variables, viz., economic growth, poverty, unemployment, and population growth are changed into stationary variables in a single step using integral modification I(1). A measure of stationarity dictates that the variable can not be eliminated one after the other, as they are believed to be stationary.

5.4. Bounds Testing

The impact of inflation, poverty, unemployment, and population growth on the economic growth Akaike information criterion (AIC)of India during 1990-2021 was examined using the NARDL methodology. This needed bounds tests with the cointegration assessment, which necessitated the creation of F- statistics in an acceptable period, according to the Akaike Information Criterion (AIC). This is an estimator of prediction error and thereby the relative quality of statistical models for a given set of data. When a statistical model is used to represent the process that generated the data, the representation will rarely be exact; so some information will be lost by using the model to represent the process. AIC estimates the relative amount of information lost by a given model: the less information a model loses, the higher the quality of that

model. In estimating the amount of information lost by a model, AIC deals with the trade-off between the goodness of fit of the model and the simplicity of the model. In other words, AIC deals with both the risk of overfitting and the risk of underfitting. The results are indicated in Table 4, which shows that the F-statistic produces statistically significant estimates.

Table 4: Bounds Tests to Cointegration

Significance level	10%	5%	2.5%	1%
I(0)	1.85	2.11	2.33	2.62
I(1)	2.85	3.15	3.42	3.77

Source: Author's computation (E-views 7).

Since the F-statistic value was 4.977, the null hypothesis found no connections. In addition, the cointegration technique of Johansen & Juselieu (1990) was also used with a critical value of 5%. It gives a systematic application of maximum likelihood inference concerning cointegration vectors in non-stationary vector-valued autoregressive time series models with Gaussian errors, where the model includes a constant term and seasonal dummies. The hypothesis of cointegration is given a simple parametric form in terms of cointegration vectors and their weights. The relation between the constant term and a linear trend in the non-stationary part of the process is related to the weights. Tests for the presence of cointegration vectors, both with and without a linear trend in the non-stationary part of the process are derived. The results are depicted in Table 5.

Table 5: Cointegration of the variables

Hypo-No. of CE	Eig-Value	Trans -Test	C- value(0.05)	Prob.
None*	0.864	105.395	69.818	0.000
At most 1	0.530	39.362	47.856	0.246
At most 2	0.250	14.432	29.797	0.815
At most 3	0.131	2.932	15.494	0.815
At most 4	0.008	0.290	3.841	0.589
Maximum Eigenvalue				
	Eig -value	Max.-eigenvalue	C –value(0.05)	Prob.
None*	0.864	66.032	33.876	0.000
At most 1	0.530	24.929	27.584	0.105
At most 2	0.250	9.500	21.131	0.790
At most 3	0.131	4.642	14.264	0.780
At most 4	0.008	0.290	3.841	0.589

Source: Author's computation (E-views 7).
*Specifies the denial of hypothesis at 0.05 level.
** Shows the probability value of Mac Kinnon- Haug Michalis (1999).

5.5. Optimal Lag Length

Akaike Information Criterion (AIC) is used to determine the optimal order of lagged data. It was used in this study to determine the appropriate lag length for variables that should be included in the model. The results of the optimal lag length criterion are presented in Table 6.

Table 6: Optimal Lag length Criterion

Lag	Log L	LR	FPE	AIC	SC	HQ
0	-6.132	NA	1.26×10^{-6}	0.670	0.917	0.747
1	116.617	194.662	6.66×10^{-9}	-4.743	-3.383	-4.285
2	127.398	82.641*	$8.54 \times 10^{-10*}$	-6.712*	-4.217*	-5.772*

Source: Author's computation (E-views 7).
Note: 1. *Designate the selected lag order by the criterion.
  2. LR: Sequential modified LR Test statistic (each test at 5% level).
  3. FPE: Final Prediction Error. 4. AIC: Akaike Information Criterion.
  5. SC: Schwarz Information Criterion. 6. HQ: Hannan- Quinn InformationCriterion.

5.6. Asymmetric Analysis

Asymmetric analysis results for short-run and long-run dynamics have been worked out from the model. Results are presented in Table 7.

Table 7: Asymmetric Analysis Results for short-run & long-run dynamics

Variables	Coefficient	Standard Error	t- statistic	Prob.
Asymmetric Short-run Estimation				
C	1.585	0.674	2.684	0.015
Eco. Gr(-1)	-0.779	0.185	-4.141	0.000
Inf.Pos. (-1)	-0.716	0.233	-3.256	0.004
Inf.. Neg	-0.290	0.245	-1.182	0.235
Pov.Pos.	-6.122	5.733	-1.077	0.287
Pos. Neg.	-5.594	3.462	-1.615	0.120
Unem.Pos.	0.133	0.327	0.408	0.686
Unem.Neg.	1.156	1.142	1.011	0.322
Popu. Gr.Pos.	-7.926	12.260	-0.646	0.524
Popu. Gr. Neg.	-7.079	2,845	-2.485	0.620
D(Inf. Pos)	-0.154	0.207	-0.742	0.465
Cointeg. Eq.(-1)	-0.789	0.121	-6.476	0.000
Asymmetric long-run Estimation				
Inf.Pos. (-1)	-0.874	0.287	-3.008	0.006
Inf.. Neg	-0.365	0.285	-1.245	0.235
Pov.Pos.	-7.756	7.300	-1.063	0.289

Variables	Coefficient	Standard Error	t- statistic	Prob.
Pos. Neg.	-7.095	4.475	-1.583	0.137
Unem.Pos.	0.179	0.422	0.400	0.683
Unem.Neg.	1.474	1.503	0.973	0.330
Popu. Gr.Pos.	-10.138	15.140	-0.663	0.504
Popu. Gr. Neg.	-8.987	4.063	-2.206	0.048
C	1.890	0.619	3.610	0.001
Stability Tests				
R^2	0.580	AIC		1.669
Adj- R^2	0.420	SC		2.153
SE of regression	0.485	HQC		1.882
SS residual	5.573	D-Watson stat		2.467
F-stat	3.694			
Prob. (F-stat)	0.005			

Source: Author's computation (E-views 7).

The outcomes of the short-run analysis as well as the long-run analysis presented in Table 7 reveal that inflation, poverty, and population growth through the positive and negative shocks have negative coefficients with significant probability values, indicating adversative linkages with the economic growth of India during the study period. On the other hand, the coefficients of unemployment through the positive and negative shocks were positive with significant probability values, revealing thereby that unemployment in India has constructive linkages with the economic growth of India in the short run as well as the long run.

The R^2 value of 0.580 implied that 58.0 percent of the total variation in economic growth rate was explained jointly by inflation, poverty, unemployment, and population growth rate in India during the study period. This further indicated that the economic growth was not significantly explained by the four variables considered in this study,i.e., inflation, poverty, unemployment, and population growth rate in India during the study period. This also speaks about the limitations of the study as it has not incorporated the influence of other significant variables such as foreign direct investment, expenditure, revenue, and imports &exports. Coincidentally, the goodness of fit of the model remained low after adjustments as indicated by Adj- R^2 (0.420), i.e., 42.0 percent. The Durban- Watson statistic of 2.467 in Table 7 was observed to be higher than the R^2 value of 0.580, indicating that the model is non-spurious (meaningful). The value of the Durban –Watson statistic shows that there was some serial correlation though negligible that made it possible to conduct a unit root test.

6. Conclusion

This study analyses the impact of inflation, poverty, unemployment, and population growth on the economic growth of India using the time series data from 1990-2021. The stationarity for the variables was tested through unit root testing, while the asymmetric non-linear autoregressive distributed lag technique (NARDL) was applied to reveal the association among the variables via short-run and long-run dynamics. It was found that inflation and poverty have negative linkages with economic growth; unemployment has a positive association with economic growth, and population growth showed a negative association with economic growth via short-run and long-run dynamics. This study has revealed that inflation, poverty, and population growth have an adverse association with the economic growth of India via positive and negative shocks in both short-run and long-run dynamics. However, unemployment demonstrates a positive influence on economic growth via positive and negative shocks in both short-run and long-run estimations.

7. Recommendations

The study recommends:

(i)   Economic development and inflation are inextricably linked. So, policies and measures are required to address them by the government.

(ii) Government macroeconomic policies prioritize maintaining stable domestic prices, steady economic growth, and reducing unemployment to accelerate the eradication of poverty to ensure that people have a normal, healthy, and sustainable life to gradually improve their quality of life.

(iii) Economic development is also linked to poverty. Providing necessities of shelter, food, and clothes to lead a normal & healthy life is the fundamental responsibility of the government. Policies and measures are needed to meet this fundamental responsibility, which has the potential to accelerate economic growth and sort out many socioeconomic issues.

(iv) A universal and necessary change is needed in developing and emerging India's rural areas key sectors, which have a crucial role to play in economic development. To restrict and manage inflation, the government strategy should change to increase interest rates and lower economic demand.

(v)   India needs policies that boost economic competitiveness and efficiency to lower long-term expenditure.

(vi) Higher-income tax rates may be required to rein in spending, demand, and inflationary pressures.

(vii) The Government should design the budget to systematically reduce recurrent expenditure, to free more resources for capital spending that is found to help generate employment.

(viii) The Government should carefully remove price control and structural rigidities to encourage competition and by extension private sector investment.

(ix) Sustainable subsidies towards production should be adopted to encourage private sector investment, hence, the substantial reduction in unemployment.

(x) The Government should design suitable incentive packages for key employment generation sectors, prominently Agriculture, Transportation, Energy Production, Telecommunication, Manufacturing & Mining.

8. Limitations and further scope

This study has suffered from various limitations, but provides scope for further investigations, which are :

1. This study is based on the annual secondary time-series data. This needs to be substantiated by the primary data in respect of the relationship between inflation, poverty, unemployment, and economic growth.

2. The influence of other significant variables such as foreign direct investment, expenditure, revenue, imports &exports, and economic growth need to be incorporated to discover the impact of all major factors.

3. Incentivizing overconsumption, degrading communal bonds, and destroying natural wealth, which is plaguing the economy need to be constrained.

4. Some variants of Green Economy and their constraints may also be included in the model to ensure economies need to operate through the vision that provides prosperity for all within the ecological limits of the planet.

5. The study may encourage sustainable development without degrading the environment with a central focus on investments, employment, and skills and supports to accelerate and consolidate sustainable changes in both consumption and production patterns.

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