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EXAMINING THE INFLUENCE OF INFLATION, UNEMPLOYMENT, POVERTY, AND POPULATION GROWTH ON ECONOMIC DEVELOPMENT IN INDIA

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Abstract: This article delves into a comprehensive analysis of how inflation, poverty, unemployment, and population growth impact the economic growth of India utilizing time series data spanning from 1990 to 2021. To ascertain the stationarity of the variables, unit root testing is conducted, while the asymmetric non-linear autoregressive distributed lag technique (NARDL) is employed to uncover the interplay among these variables, considering both short-run and long-run dynamics. The findings reveal several key relationships. Inflation and poverty exhibit negative connections with economic growth, suggesting that they can hinder progress. Conversely, unemployment displays a positive association with economic growth, indicating a complex interplay between joblessness and economic development. Additionally, population growth demonstrates a negative correlation with economic growth, highlighting its impact on both the short-run and long-run dynamics. Unemployment and inflation have emerged as critical concerns in India, necessitating the implementation of effective government policies to address these issues and stimulate economic advancement. By acknowledging these findings, policymakers can devise strategies to alleviate poverty, control inflation, reduce unemployment, and manage population growth, consequently fostering sustainable economic progress in India.

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

JEL: C25, E32, E37, E51

1. THE MACROECONOMIC CHALLENGES OF INFLATION, UNEMPLOYMENT, AND POVERTY ON ECONOMIC DEVELOPMENT

In underdeveloped and emerging countries, the macroeconomic indicators of poverty, unemployment, and inflation have cast a shadow over economic development. Among these indicators, inflation and unemployment play a particularly significant role, posing concerns for policymakers and experts in various nations, including India. Inflation, characterized by rising prices resulting from factors such as increased money supply, can have far-reaching effects on an economy. Its impact encompasses economic growth, investment, income, and wealth distribution, as well as social and political conditions. Different economies have experienced inflation to varying degrees, with some encountering volatility while others witnessing a steady increase in prices. {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, the condition of being jobless or unable to find work, presents a formidable challenge in emerging countries. Factors contributing to unemployment in these nations include technological advancements, female labor force participation, demographic changes, income disparities, and rural-to-urban migration driven by the demand for employment opportunities. The detrimental effects of unemployment in developing countries, such as India, adversely affect consumption, purchasing power, and overall production capacity. Addressing unemployment has remained a key priority for policymakers in India, as research reveals the existence of labor market barriers that perpetuate poverty, marginalization, inequality, and further economic hardships. From a macroeconomic standpoint, India's unemployment situation impacts monetary policy, gross domestic product (GDP) fluctuations, and the relationship between unemployment and inflation {Sinha (2022); Sinha (2022), Sinha (2022) (7-9)}.

Economic growth has also garnered significant attention, particularly in emerging economies, and has been extensively studied in connection with inflation and unemployment. Understanding the concepts of inflation and unemployment is crucial for making effective economic decisions, as these factors influence savings, investments, exports, poverty reduction, and overall economic growth. Inflation can detrimentally affect social well-being, while low inflation rates may result in slower economic growth, increased poverty rates, reduced employment opportunities, and sluggish economic decline. Unpredictable price increases associated with inflation can lead to declining purchasing power, necessitating

careful management to avoid adverse effects on the economy. Achieving a balance between inflation and unemployment poses a challenge due to the conceptual trade-off between the two. {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, a significant barrier to achieving a high standard of living, persists worldwide. Unemployment is one of the primary drivers of poverty, as its rise inevitably leads to an increase in poverty levels. Many countries have observed a positive correlation between poverty and unemployment. Additionally, population growth poses challenges for low-income and lower-middle-income countries, making it more difficult to allocate sufficient per capita public expenditures to eradicate poverty, address hunger and malnutrition, and ensure universal access to essential services such as healthcare and education.

2. Exploring the Interplay of Unemployment, Inflation, Poverty, Population Growth, and Economic Development in India

The relationship between unemployment and critical manpower shortages, coupled with a scarcity of modern machinery and productive inputs, creates a theoretical link. This leads to a shortfall in domestic production, requiring a higher reliance on imported goods and services. Consequently, the economy tends to demand more imports than it exports, resulting in a trade deficit that necessitates rupee devaluation, subsequently fueling inflation. To combat inflation, the Indian Government has implemented the Inflation Targeting (IT) framework, aiming for a range of 3% to 6%. However, this adversely affects employed individuals as their real wages erode due to inflation. The Phillips Curve, which explains the trade-off between unemployment and wage changes (inflation), is often employed in this context.

While rapid economic growth typically alleviates unemployment concerns, the situation in India is distinct. Despite significant GDP growth, the creation of high-paying employment opportunities remains limited, resulting in persistent unemployment even during periods of strong economic improvement. India faces macroeconomic challenges characterized by stagnant economic growth and high unemployment rates. From 2012 to 2016, employment growth in India slowed, leading to a net decline in employment and an increase in unemployment, as reported by a survey [Kannan & Raveendran,2019(13)]. Negative activities, labor substitution, and an expanding workforce supply contribute to the unemployment

situation in India. The government's efforts to address rising unemployment and stagnant growth have fallen short, exacerbating the issue. The relationship between unemployment and economic growth in the USA has been extensively studied, but a deeper investigation is needed in the Indian context. 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)}.

Unemployment and inflation are primary drivers of rising poverty, and addressing poverty becomes imperative to promote the nation's welfare and overall progress. The global challenge of population growth further complicates the situation. Effectively tackling rising prices, declining real income levels, and increasing unemployment is key to achieving successful economic development. This paper aims to contribute to the existing literature on inflation, unemployment, poverty, population growth, and economic growth in India. The study verifies the stationarity of the variables using annual data and employs two unit root tests. Additionally, the Nonlinear Autoregressive Distributed Lag (NARDL) model is utilized to analyze the positive and negative shocks of decomposed variables on economic growth, estimating both short-run and long-run dynamics.

3.   ADDRESSING UNEMPLOYMENT, INFLATION, AND POVERTY: THEIR INTERCONNECTIONS AND IMPLICATIONS

Unemployment has been a pressing issue for both developed and emerging economies, persisting despite significant reductions in rich countries and continuing to grow rapidly in emerging nations. This trend has led to diminished family incomes, lower living standards, and an increase in poverty rates [Jibir, Bappayaya, & Babayo, 2015 (18)]. Economic opportunities play a crucial role in poverty levels, and the lack of social mobility exacerbates the effects of racial and economic inequality. Experts suggest that targeted measures aimed at closing gaps and ensuring economic security for disadvantaged groups can combat poverty and inequality [Ogleide & Agu, 2015 (19)].

Poverty is often associated with a lack of basic necessities, such as food and shelter, which stems from insufficient income. The poverty line serves as a benchmark to determine whether a person's income falls below the threshold.

The quantity of poverty in a specific location is influenced by various factors, including economic growth, inflation, and open unemployment. These factors play a significant role in determining a country's poverty level [Misini & Bodivuku, 2017 (20); Peter, Adewale, Siyan & Agegoriob, 2017 (21); Nurdiana, Hasan, Arisah, Riesso & Hashanah, 2020 (22)].

Furthermore, unemployment has adverse implications for both individual and public health, as it directly affects income levels. Studies in social epidemiology support the notion that poverty, loss of income, and economic stress mediate the relationship between unemployment and health. Poverty has both physical and psychological consequences on health and well-being. Long-term unemployment leads to poverty and material deprivation due to the loss of income and associated benefits [Marmot (2022); Roeff, Shor, Davidson & Schwartz (2011) (23-24)].

Public expenditure plays a critical role in addressing externalities and providing essential goods, services, and knowledge through tax-funded efforts. However, the effectiveness of public expenditure can be enhanced when citizens come together and take collective action. The connection between public funds and the capacity of civil society organizations to collaborate has significant implications. Strengthening social capital, such as trust-building, reducing opportunism, and promoting knowledge externalities, can contribute to economic development and poverty reduction Sasmal & Sasmal (2016) [25].

Economic factors, such as the price of goods and services, are influential in determining the difficulties individuals face. Price fluctuations impact both the currently unemployed and full-time employed individuals. Economic growth rates also have implications for employment, as slow expansion may limit job opportunities for new entrants to the workforce. Long-term unemployment correlates with a higher incidence of poverty. Discrimination in employment practices further hampers individuals' ability to overcome the poverty line. Educational attainment plays a vital role in job advancement and income growth. Individuals with less education face higher unemployment rates, fewer workdays per year, and lower earnings [Williams, Adegoke, Dae (2017); Tsaurag (2021) (26-27)]. Economic growth, accompanied by financial development, has a significant impact on poverty reduction [Sherawal & Giri (2015); Seven & Coskun (2016) (28-29)].

Unemployment, inflation, and poverty are complex concepts in the realm of economics. The interplay between these factors has been a subject of interest among economists for many years. Governments aim for macroeconomic stability, including growth, price stability, and full employment, to improve the well-being of people. Unemployment and price instability have led to considerable variability in growth rates [Siyan, Adegoriola & Adolphus (2016) (30)]. Factors such as

disruptions in the supply chain and artificial excess demand due to government-imposed shutdowns and relief packages have contributed to global inflation concerns [Avdin & Unger (2022); Salin & Isah (2018) (31-32)].

Low inflation and unemployment are desirable goals for policymakers in any economy. Achieving macroeconomic stability, characterized by single-digit inflation and a reasonable level of unemployment, is crucial for growth, planning, and development. Rising prices, particularly when they outpace income growth, adversely affect the economy and disproportionately impact the poor, who lack the resources to offset price increases. Consequently, individuals become aware of their reduced purchasing power [Oriji, Oriji, & Okaper (2015) (33-34)].

Reducing poverty is a significant development goal for both developing and developed countries. Various approaches, such as promoting economic development and implementing redistribution policies, have been undertaken with varying degrees of success. The effectiveness of development policies greatly influences poverty outcomes across nations [Anguez (2014) (35)].

4.   METHODOLOGY

4.1. Variables and Data Treatment in the Study

This study investigated the relationship between several variables using data from India. The variables included in the investigation were as follows: i) Economic Growth (annual %); ii) Inflation (annual %); iii) Poverty (% population); iv) Unemployment (% of the total labor force); v) Population Growth (annual %). Data for these variables covering the period 1990-2021 were sourced from the World Bank and the MoSPI website.

To ensure the reliability of the analysis, the stationarity of the study variables was examined using two unit root tests: i) Augmented Dickey-Fuller Test and ii) Phillips-Perron Test. Lag length criteria for the variables were also explored. Moreover, bound testing was conducted to confirm the presence of cointegration among the variables. Additionally, the Johansen Cointegration test was employed to further investigate the robustness of the relationship among the variables. Finally, the Non-Linear Autoregressive Distributed Lag (NARDL) approach was utilized to analyze the impact of inflation, unemployment, population growth, and poverty on economic growth by estimating the long-run and short-run dynamics.

4.2. Model for Investigation

For this study, the asymmetric Nonlinear Autoregressive Distributed Lag (NARDL) technique was employed to examine the association among the variables and estimate both short-run and long-run effects. The model used to investigate the

relationship between economic growth (E), inflation (I), poverty (P), unemployment (U), and population growth (G) can be expressed as:

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

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:

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

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

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

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

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

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

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

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

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:

$$E_t = \beta_0 + \Sigma \alpha_a \Delta E_{t-a} + \Sigma \lambda_a \Delta I^+_{t-a} + \Sigma \mu_a \Delta I^-_{t-a} + \Sigma\pi_a \Delta P^+_{t-a} + \Sigma \varphi_a \Delta P^-_{t-a} + \Sigma \xi_a \Delta U^+_{t-a} + \Sigma \text{€}_a$$
$$\Delta U^-_{t-a} + \Sigma \gamma_a \Delta G^+_{t-a} + \Sigma \delta_a \Delta G^-_{t-a} + \eta_1 E_{t-1} + \eta_2 I^+_{t-1} + \eta_3 I^-_{t-1} + \eta_4 P^+_{t-1} + \eta_5 P^-_{t-1} + \eta_6 U^+_{t-1} + \eta_7 U^-_{t-1} + \eta_8 G^+_{t-1} + \eta_9 G^-_{t-1} + \varepsilon_t$$

$$\tag{12}$$

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:

$$E_t = \beta_0 + \Sigma \, \alpha_a \, \Delta E_{t-a} + \Sigma \, \lambda_a \, \Delta I^+_{t-a} + \Sigma \, \mu2_a \, \Delta I^-_{t-a} + \Sigma \, \pi_a \, \Delta P^+_{t-a} + \Sigma \, \varphi_a \, \Delta P^-_{t-a} + \Sigma \, \xi_a \, \Delta U^+_{t-a} + \Sigma \, \text{€}_a \, \Delta U^-_{t-a} + \Sigma \, \gamma_a \, \Delta G^+_{t-a} + \Sigma \, \delta_a \, \Delta G^-_{t-a} + \eta_1 E_{t-1} + \eta_2 I^+_{t-1} + \eta_3 I^-_{t-1} + \eta_4 P^+_{t-1} + \eta_5 P^-_{t-1} + \eta_6 U^+_{t-1} + \eta_7 U^-_{t-1} + \eta_8 G^+_{t-1} + \eta_9 G^-_{t-1} + \vartheta \, ECM_{t-1} + \varepsilon_t$$

(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 presents key statistics for the variables analyzed in this study: economic growth, inflation, poverty, unemployment, and population growth in the Indian economy.

The average economic growth rate was 4.402 percent, with a maximum of 8.104 percent and a minimum of 2.935 percent during the study period. The Jarque-Bera value of 32.21 and a probability value of 0.000 indicate that economic growth did not follow a normal distribution.

Inflation stood at 7.929 percent, with a maximum of 9.605 percent and a minimum of 4.915 percent. The Jarque-Bera value of 13.883 and a probability value of 0.214 suggest that inflation could be considered normally distributed.

Poverty increased by 1.305 percent during the study period, with a maximum of 2.160 percent and a minimum of 0.392 percent. The Jarque-Bera value of 2.356 and a probability value of 0.232 indicate that poverty distribution did not significantly deviate from normality.

Population growth in the Indian economy was 0.703 percent, with a maximum of 1.117 percent and a minimum of 0.628 percent. The Jarque-Bera value of 3.072 and a probability value of 0.215 suggest that population growth can be considered normally distributed.

Unemployment experienced growth of 1.410 percent. The Jarque-Bera value of 7.563 and a probability value of 0.022 indicate that the distribution of unemployment was not normal.

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 relationship between the variables analyzed in this study revealed interesting findings. The inflation rate and unemployment displayed a negative correlation with economic growth, aligning with economic theory's expectation that higher unemployment or inflation rates hinder economic growth.

In contrast, poverty and population growth exhibited a positive association with economic growth in India during the study period. This outcome contradicts the priori economic expectations that population growth exerts pressure on the economy, leading to higher poverty levels and reduced economic growth. Additionally, inflation demonstrated a positive relationship with both poverty

and population growth, but a negative relationship with economic growth. These results are in line with the expected economic theory.

Surprisingly, poverty showed a positive association with economic growth, inflation, and population growth, while having a negative association with unemployment. This deviation from prior expectations may be attributed to issues such as poor governance and low institutional quality, which can foster corruption and hinder economic progress.

Nevertheless, it is crucial for the Indian government to pursue policies that prioritize the well-being of its population. Efforts should be made to address the underlying factors contributing to the unexpected associations between variables, and measures should be implemented to improve governance and institutional quality to foster sustainable economic growth and alleviate poverty effectively.

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 NARDL methodology was employed to examine the influence of inflation, poverty, unemployment, and population growth on India's economic growth during the period from 1990 to 2021. This analysis involved conducting bounds tests and assessing cointegration, which required generating F-statistics within an acceptable timeframe based on the Akaike Information Criterion (AIC).

The AIC is a measure of prediction error and serves as an indicator of the relative quality of statistical models for a given dataset. When using a statistical model to represent the data-generating process, it is rare for the representation to be exact, resulting in some information loss. The AIC quantifies the amount of information lost by a particular model, where a lower information loss signifies a higher quality model. The AIC considers the balance between the model's goodness of fit and its simplicity. It addresses the trade-off between the risk of overfitting (excessive complexity) and the risk of underfitting (insufficient complexity).

The findings, presented in Table 4, demonstrate that the F-statistic yields statistically significant estimates, indicating the presence of meaningful relationships between the variables under investigation.

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).

The F-statistic value of 4.977 was computed to test the null hypothesis, which suggests no relationships between the variables. Furthermore, the Johansen-Juselius cointegration technique (1990) was applied with a critical value of 5%. This method employs maximum likelihood inference to analyze cointegration vectors in non-stationary vector-valued autoregressive time series models with Gaussian errors. The model incorporates constant term and seasonal dummies. The hypothesis of cointegration is expressed in a simple parametric form, involving cointegration vectors and their weights. The relationship between the constant term and a linear trend in the non-stationary component of the process is linked to these weights. Tests were conducted to assess the presence of cointegration vectors, both with and without a linear trend in the non-stationary part of the process. The results of these tests are presented 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*	8.54×10^{-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.

The findings from the short-run and long-run analyses, as presented in Table 7, reveal significant relationships between inflation, poverty, population growth, unemployment, and economic growth in India during the study period. The coefficients associated with positive and negative shocks indicate that inflation, poverty, and population growth have negative effects on economic growth, while

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
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				
R2	0.580	AIC		1.669
Adj- R2	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).

unemployment has a positive impact on economic growth in both the short run and long run.

The R2 value of 0.580 indicates that 58.0 percent of the total variation in the economic growth rate can be explained by the joint influence of inflation, poverty,

unemployment, and population growth rate in India during the study period. However, it suggests that the four variables considered in this study, namely inflation, poverty, unemployment, and population growth rate, do not significantly explain economic growth. This highlights the limitations of the study as it does not incorporate other important factors such as foreign direct investment, expenditure, revenue, and imports and exports. Additionally, the model's goodness of fit remains low even after adjustments, as indicated by the Adj-R2 value of 0.420, which corresponds to 42.0 percent.

The Durbin-Watson statistic of 2.467 in Table 7 indicates the presence of some negligible serial correlation in the model, but it does not significantly affect the meaningfulness of the model. This statistic suggests that a unit root test can still be conducted despite the slight serial correlation.

6. CONCLUSION

This study investigates how inflation, poverty, unemployment, and population growth impact the economic growth of India from 1990 to 2021. The stationarity of the variables was assessed using unit root tests, and the asymmetric non-linear autoregressive distributed lag technique (NARDL) was utilized to analyze the relationships between the variables in both the short run and long run. The results indicate that inflation and poverty have a detrimental effect on economic growth, while unemployment exhibits a positive influence. Moreover, population growth is found to have a negative association with economic growth in both the short run and long run. The study emphasizes that inflation, poverty, and population growth exert adverse effects on India's economic growth through positive and negative shocks, whereas unemployment has a favorable impact on economic growth through positive and negative shocks, as observed in both short-run and long-run estimations.

7. RECOMMENDATIONS

The study proposes several recommendations based on its findings:
1. Address the link between economic development and inflation: The government should implement policies and measures that effectively tackle inflation and promote economic development, recognizing the interconnection between these two factors.
2. Prioritize macroeconomic policies for stable domestic prices and economic growth: The government's macroeconomic policies should prioritize maintaining stable domestic prices, ensuring steady economic growth, and reducing unemployment. This approach will contribute to the eradication of poverty and enable people to lead normal, healthy, and sustainable lives, gradually improving their quality of life.

3. Focus on poverty alleviation: Recognizing the link between economic development and poverty, the government should fulfill its fundamental responsibility of providing basic necessities such as shelter, food, and clothing to enable people to lead normal and healthy lives. Policies and measures should be implemented to address this responsibility, which has the potential to accelerate economic growth and address various socioeconomic issues.

4. Target rural development: Key sectors in India's rural areas play a crucial role in economic development. To control and manage inflation, the government's strategy should involve increasing interest rates and reducing economic demand. A universal and necessary transformation is needed in these sectors to drive economic development effectively.

5. Promote economic competitiveness and efficiency: India needs policies that enhance economic competitiveness and efficiency in order to reduce long-term expenditures. This approach will contribute to sustainable economic growth and help mitigate inflationary pressures.

6. Consider higher income tax rates: Implementing higher income tax rates may be necessary to curb excessive spending, demand, and inflationary pressures. This can contribute to maintaining a stable economic environment.

7. Optimize budget allocation: The government should design budgets that systematically reduce recurrent expenditures, allowing for the allocation of more resources to capital spending. Increased capital spending has been found to generate employment opportunities and support economic growth.

8. Remove price controls and structural rigidities: To promote competition and private sector investment, the government should carefully eliminate price controls and structural rigidities. This approach will create a conducive environment for market competition and encourage private sector participation.

9. Implement sustainable subsidies for production: The government should adopt sustainable subsidy programs that incentivize private sector investment, leading to a substantial reduction in unemployment. These subsidies should be targeted toward key employment-generating sectors such as agriculture, transportation, energy production, telecommunications, manufacturing, and mining.

10. Design suitable incentive packages: The government should develop appropriate incentive packages for sectors that have a significant impact on employment generation. Sectors such as agriculture, transportation,

energy production, telecommunications, manufacturing, and mining should be given special attention to stimulate economic growth and generate more job opportunities.

8.   LIMITATIONS AND FURTHER SCOPE.

This study has identified several limitations but also highlights potential areas for further research:

1. Incorporating primary data: While this study relies on secondary annual time-series data, future research should consider incorporating primary data to strengthen the analysis and provide more robust insights into the relationship between inflation, poverty, unemployment, and economic growth.

2. Consideration of additional variables: To comprehensively understand the impact of major factors on economic growth, it is essential to include other significant variables such as foreign direct investment, expenditure, revenue, imports, exports, and their relationship with economic growth. This expanded analysis can provide a more holistic perspective on the dynamics at play.

3. Constraints on overconsumption and sustainable practices: The study suggests the need to address issues related to incentivizing overconsumption, degradation of communal bonds, and the depletion of natural resources. Future investigations should explore ways to constrain these practices and promote sustainable economic development that considers social and environmental impacts.

4. Integration of Green Economy variants: To ensure economic systems operate within the ecological limits of the planet, the study recommends incorporating variants of the Green Economy into the analysis. This would involve examining the constraints and implications of adopting sustainable practices and the potential for achieving prosperity while respecting environmental boundaries.

5. Emphasizing sustainable development: The study encourages a central focus on investments, employment, and skills that support sustainable changes in consumption and production patterns. Future research can explore strategies for promoting sustainable development without compromising the environment, considering the long-term implications and the need for a balance between economic growth and environmental stewardship.

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