

Examining Inflation Effect on Economic Growth: Empirical Evidence & Analysis from SAARC Countries

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Abstract: The primary objective of this study is to investigate the impact of inflation on economic growth and thereby the inflation threshold for SAARC countries. For this purpose, “Inflation, consumer prices (annual % growth)” and “GDP (annual % growth)”- data series for the period of 1990 to 2024 have been considered. Three econometric models, like Panel Least Squares (PLS), Panel Threshold Regression (PTR), and Panel Spline Regression (PSR), are employed to estimate whether there is a linear or non-linear relationship between inflation and economic growth, and the optimal inflation rate to ensure sustainable future economic growth. The findings expose a non-linear and statistically significant inverse relationship when inflation exceeds the threshold level of 10%. Afterwards, inflation begins to hinder economic growth in the SAARC countries. The outcomes are statistically significant at the 0.000 level, which is well below the 0.05 (5%) significance level. These upshots provide valuable insights for governments, policymakers, central banks, and financial analysts to develop effective monetary and fiscal policies, ultimately aiding investors in making investment decisions.

Keywords: Inflation, Economic Growth, Panel Least Squares (PLS), Panel Threshold Regression (PTR), Panel Spline Regression (PSR)

1. Introduction

Economic growth and inflation are the most closely observed issues in the history of economics. Researchers, governments, central banks, and international organizations are always concerned with these indicators to secure the sustainable economic development of a country.

Gross Domestic Product (GDP) represents the total monetary worth of all finished goods and services produced within an economy during a specific time frame, serving as a key indicator of the economy's overall size and performance. The GDP growth rate measures how the economy expands compared to the previous year. Thus, GDP growth rate is a foremost suitable metric of economic growth (e.g., Malik and Chowdhury, 2001; Ahmed and Mortuza, 2005; Saaed, 2007; Rahman, 2014; Jacob et al., 2023; Vu et al., 2024; Su and Soon, 2024). Conversely, inflation indicates a decrease in the value of money, as it tracks

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the pace at which the overall price level of all final goods and services in an economy rises over a given time frame. Inflation, consumer prices (annual % growth), is considered as inflation rate as consumer price is the ultimate effect of inflation and it is the most representative indicator of inflation (e.g., Malik and Chowdhury, 2001; Saaed, 2007; Rahman, 2014; Jacob et al., 2023; Vu et al., 2024; Su and Soon, 2024).

The South Asian Association for Regional Cooperation (SAARC) is an economic bloc of eight South Asian countries, including Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka. Two countries of these regions are excluded from this analysis. Due to the unavailability before 2001, Afghanistan is excluded from this study. On the contrary, the average inflation rate of the Maldives is 4.35%, compared to 7.33% for all other countries. Besides, the average inflation of the Maldives of the last ten years is only 1.11% which is much lower than that of other countries. Because of being homogeneous inflation rate Maldives is excluded from this study.

Figure 1: Country-wise GDP Growth rate and Inflation rate (1990-2024) of SAARC Countries

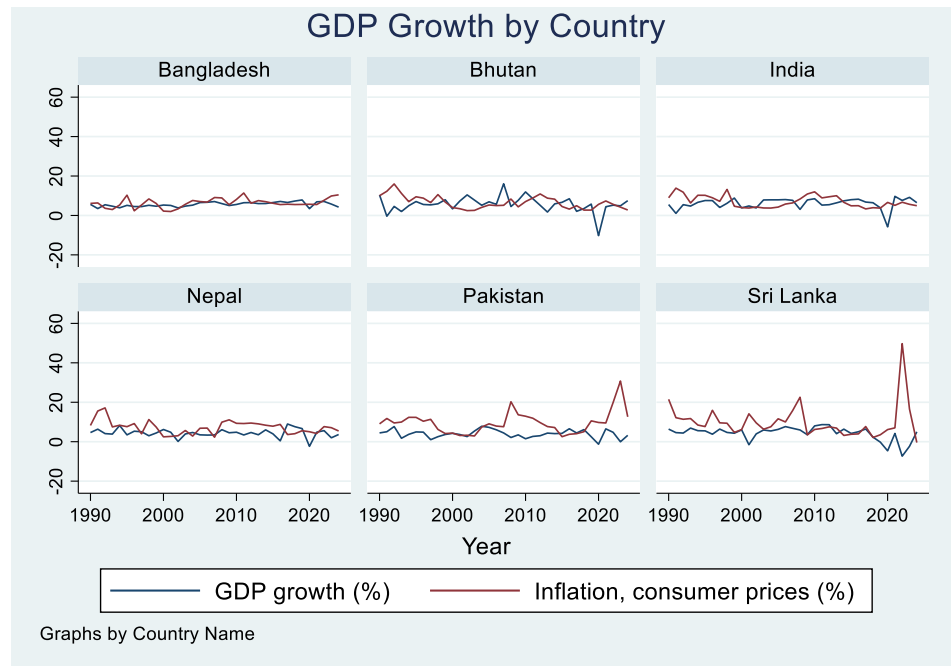


Figure 1 shows the patterns that moderate inflation is generally compatible with stable growth, as observed in Bangladesh, Bhutan, and India, while episodes of high and volatile inflation, especially in Pakistan and Sri Lanka, coincide with sharp downturns in output. Nepal shows a similar pattern during crisis years, where inflation persists despite weak growth. These country-specific lines reinforce the notion of a threshold effect: once inflation rises beyond a certain range, it tends to destabilize growth rather than support it. These patterns underline the importance of keeping inflation within a manageable range to conserve macroeconomic stability and long-run growth.

The nexus between inflation and economic growth is a central and widely contentious issue in macroeconomics. Many theories have already been developed in the field of economics to demonstrate the relationship between them. It is generally acknowledged that inflation and GDP are interrelated macroeconomic variables. Yet there exists no straightforward or clear declaration about the association between inflation and GDP. A lot of studies have taken place on this issue. Some studies have found no definitive connection between inflation and economic growth (Dorrance, 1963, 1966; Sidrauski, 1967; Islam, 2005). Several studies have reported a direct correlation between inflation and economic growth (Mundell, 1965; Tobin, 1965; Malik & Chowdhury, 2001; Hossain, 2007; Abidemi & Maliq, 2010; Huang et al., 2021; Yilmazkuday, 2021). Multiple studies have shown that higher level of inflation hinders the pace of economic development (Fischer & Modigliani, 1978; Gultekin, 1983; Fischer, 1993; Bruno & Easterly, 1998; Faria & Carneiro, 2001; Saaed, 2007; Rahman, 2014; Su & Soon, 2024). Other studies suggested the presence of an inflation threshold, below which it may stimulate economic growth, but above which it becomes detrimental (Mubarik, 2005; Pollin & Zhu, 2006; Khan & Senhadji, 2001; Espinoza et al., 2010; Hussain et al., 2011; Thanh, 2015; Arawatari et al., 2018; Ghossoub, 2023). Although most studies have been conducted in developed countries, a limited number have focused on developing countries. There is a conspicuous absence of studies on the SAARC countries using panel data. The study attempts to investigate the inflationary effect on economic growth by employing panel least squares estimates, panel threshold regression, and panel spline regression models, and the threshold inflation rate to ensure sustainable growth. The outcomes of this paper will have many practical implementations for policymakers, central banks, governments, financial analysts, and investors.

1.1 Objectives of the Study

This study is carried out to scrutinize the influence of inflation on economic growth in SAARC countries. The objectives of this study are:

- a. Analysis of annual inflation and GDP growth series to determine the nature of the association between them.
- b. Employ panel least squares estimate, panel threshold regression, panel spline regression model;
- c. Determine the optimal inflation rate to ensure sustainable future economic growth.

1.2 Structure of the Paper

The text is structured into six parts: Part One, “Introduction”, describes the importance of examining the inflationary effect on growth with a brief background and objectives; Part Two, “Literature Review”, provides an overview of academic literature on inflation-growth nexus; Part Three, “Methodology”, presents the data sources and the research methods; Part Four, “Analysis and Findings”, discusses the study’s results; Part Five, “Conclusion”, summarizes the findings and pin points research limitations; Part Six, “References”, lists the cited sources including journal titles.

2. Literature Review

The linkage between inflation and growth has been a persistent topic of debate in economic theory. According to the Quantity Theory of Money, one of the oldest fundamentals, the money supply directly and proportionally influences the price level. So, inflation is a monetary phenomenon and unrelated to growth. (Fisher, 1911; Friedman, 1956). But the Keynesian view argues that inflation can actually stimulate economic growth. An increase in price level inspires people to invest and produce more, due to the expectation of higher profit from the rise in price level. As a result, the overall output and employment increase (Keynes, 1936; Tobin, 1965). This theory lost confidence in the 1970s when stagflation, stagnant economic growth with a high inflation rate, contradicted the Phillips curve, which suggested an inverse relationship between inflation and unemployment (Phelps, 1967; Friedman, 1968). Later, the Neoclassical and Endogenous Growth Models suggest that inflation may have a negative impact on long-term growth by distorting price signals, increasing uncertainty, and reducing the efficiency of investment and leading to less productive, short-term investments and a decline in capital formation. (Bruno & Easterly, 1998; Khan & Senhadji, 2001).

It is important to note that several influential studies from the 1990s found no effects of inflation on growth (Levine and Renelt, 1992; Levine and Zervos, 1993; Sala-i-Martin, 1997). Paul et al. (1997) identified approximately 40% of the countries showed no causal connection, around 20% exhibited bidirectional causality, and the rest demonstrated a one-way relationship—either from inflation to growth or vice versa. Islam (2005) reported no influence of inflation on growth in Bangladesh for the post-reform period 1992-2004. Similarly, Jui et al. (2024) found no noticeable impact on GDP IN Bangladesh and Sri-Lanka.

Mallik and Chowdhury (2001) investigated a significant direct linkage between inflation and economic growth across all four South Asian countries—Bangladesh, India, Pakistan, and Sri Lanka. Hossain (2007) concluded a notable long-run positive correlation between inflation and GDP over the period of 1984-2004 in Bangladesh. Similarly, Majumder (2016) showed a significant long-run direct association between inflation and GDP during the period of 1975-2013 in Bangladesh. Erbaykal and Okuyan (2008) concluded that economic growth does not drive inflation, whereas inflation influences economic growth. Similarly, Hossain et al. (2012) exposed a one-way causal link from inflation to GDP in Bangladesh over the period 1978–2010. Zhou (2019) offered a theoretical perspective signifying that moderate inflation can exacerbate economic growth through its influence on investment. In particular, inflation may enhance economic activity by reducing the liquidity risks linked to investment decisions. Huang et al. (2021) suggested that within the Schumpeterian growth framework, inflation can promote economic growth when diversity-intensifying R&D is constrained by a prepayment requirement that necessitates holding cash prior to activities like consumption, production, or investment. Yilmazkuday (2021) found that inflation can foster long-term growth in countries with ineffective institutions, where limited access to private or foreign capital makes an expanded money supply a substitute that stimulates real investment.

Fischer (1993) found that the inverse relationship would hold, even at low rates of inflation. Barro (1996) presented the evidence that inflation reduces investment by diminishing investors' confidence and, as a result, hampers economic growth. However, this relationship is observed primarily when the inflation is above the normal level, and the resulting impact on growth is relatively modest. De Gregorio (1993) and Smyth (1992, 1995) also found that inflation adversely affects economic development. Ahmed and Mortaza (2005) concluded a notable long-run negative relationship between inflation and GDP in Bangladesh. Similarly, Rahman (2014) identified a significantly indirect relationship between inflation and GDP for 1976–2011 in Bangladesh. Monica and Singh (2023) also stated the evidence of a long-run negative relationship between inflation and GDP growth for India. Gajurel (2023) reported that the impact of inflation varies across SAARC member countries: some countries exhibit negative effects, while others show no robust negative effect; results depend on the model and specification used. Vu et al. (2024) explored the association between inflation and economic growth across 45 countries from 2010 to 2021. They examined the influence of factors such as inflation, unemployment, FDI, trade openness, lending rates, and population growth on economic performance. Overall, inflation was found to negatively affect growth, particularly in developed countries, although a positive relationship emerged during the period of COVID-19 (2019–2021). Su and Soon (2024) reported that inflation hurts economic growth in the Philippines and Indonesia, but not Singapore. Israq (2025) concluded that inflation fuels the economic progress of Bangladesh over 1987–2022.

The concept of an inflation threshold suggests that inflation below a certain level may support economic growth. Burdekin et al. (1994), using panel data from 23 industrially developed countries, found that a sharp rise in inflation from zero to 10% could reduce economic growth up to two hundred basis points. Sarel (1995) concluded that sustained growth is only possible under low inflation, while rates above roughly 8% sharply undermine it. Bruno and Easterly (1998) contended that the adverse link between inflation and growth becomes significant only when annual inflation surpasses roughly 40%. Ghosh and Phillips (1998) proposed a lower inflation cutoff of around 5%, suggesting that medium inflation levels—roughly between 5% and 30% annually—can adversely affect economic growth. Younus (2000) identified a nonlinear effect of inflation on economic growth in Bangladesh, with a cutoff inflation level of approximately 7–8% over the period of 1976–2012. Gylfason and Herbertsson (2001) found that inflation rates above 10–20% per year typically hinder economic growth, with the relationship turning negative beyond this threshold. Likewise, Arawatari et al. (2018) reported that inflation exceeding 15–20% significantly reduces long-run income growth, while He (2023) identified that the marginal effect of inflation on growth becomes zero when inflation is 5% using OLS estimation and at 3% using IV estimation. Chu et al. (2019) identified an optimal inflation rate of 1.44% for developed countries, based on panel data from 18 nations from 1980 to 2016. Rahman (2023) stated that moderate inflation can coexist with growth, but persistent high inflation undermines long-term development in Bangladesh over 1960–2018. Jacob et al. (2023) provided robust evidence that high inflation significantly constrains Pakistan's economic growth, identifying—using an ARDL approach on 2000–2022 time series data—an 8% threshold beyond which growth is negatively affected. Dar and Nain (2023) estimated a threshold of about 3.5% for SAARC countries, above which inflation begins to hinder financial development.

Khan and Senhadji (2001) provided strong evidence of a nonlinear relationship: inflation above 1–3% significantly impedes growth in industrial countries, whereas the threshold inflation rate for developing countries is substantially higher, at 11–12%. Espinoza et al. (2010) found that developing countries have an inflation threshold above 10%, whereas the threshold for advanced economies was considerably lower. Pollin and Zhu (2006) reported that inflation rates up to 15–18% correspond with modest GDP growth gains. However, this relationship varies significantly when countries are divided by income level. However, the relationship varied by income level: no clear pattern was observed for OECD countries; middle-income countries exhibited a positive but statistically insignificant link, with a turning point around 14–16%; and low-income countries showed a stronger positive correlation. Thanh (2015) concluded that inflation exceeding 7.84% in ASEAN-5 countries significantly hampers economic growth, highlighting the importance of keeping inflation below this threshold, whereas Azam and Khan (2020), examining 27 countries over 1975–2018, reported that inflation becomes detrimental to growth once it surpasses 12.3% in developing economies and 5.4% in developed economies. Ghossoub (2023) noted that developing economies tend to have higher inflation thresholds than advanced economies, owing to more focused banking systems and stricter financial regulations.

3. Methodology

3.1 Data source

This paper aims to evaluate the inflationary effect on economic growth of the SAARC countries. For this purpose, Inflation is measured by “Inflation, consumer prices (annual % growth)” and economic growth is measured by “GDP (annual % growth)” (e.g., Malik and Chowdhury, 2001; Saaed, 2007; Rahman, 2014; Vu et al., 2024; Su and Soon, 2024). The dataset was gathered from the website of the World Bank during the period of 1990–2024. This study excludes Afghanistan, due to missing data before 2001, and the Maldives, whose unusually low inflation rates (averaging just 1.11% over the past decade compared with 7.33% for others) make it unrepresentative of regional trends. Their exclusion ensures a more consistent and comparable dataset for analysis. A variety of statistical tools were employed to analyze the data using EViews and Stata software.

3.2 Panel Least Squares Model

To assess how inflation fosters economic growth, the Panel Least Squares (PLS) framework is employed. PLS model applies the standard Ordinary Least Squares (OLS) estimation approach to panel datasets, allowing the analysis of relationships between variables across both cross-sectional units and time periods. The basic model is as follows:

$$GDP_{it} = \alpha + \beta \text{Inflation}_{it} + \varepsilon_{it}$$

Where the dependent variable is GDP for country i at time t , the independent variable is Inflation for country i at time t , α is the intercept (can be common or country-specific), β is the estimated coefficient, and ε_{it} is the error or residual term.

Estimation begins with pooled OLS, which assumes homogeneity across countries and time. To account for potential heterogeneity and unobserved country-specific factors, both

fixed effects and random effects models are also employed. The fixed effects model controls for time-neutral country characteristics, whereas the random effects model presumes these unseen factors are uncorrelated with the explanatory factors. Comparing results across these specifications offers a robust insight into the inflation–growth dynamics in a longitudinal data context (Baltagi, 2005; Greene, 2012).

3.3 Panel Threshold Regression Model

The Panel Threshold Regression (PTR) model is designed to capture nonlinear relationships in panel data by allowing the influence of an explanatory variable on the outcome variable to change when an observed variable crosses a certain threshold. In other words, it splits the data into distinct regimes using a threshold and estimates separate relationships for each regime. It provides a flexible framework to examine nonlinear effects in the inflation–growth relationship. Unlike linear models, which impose a constant marginal effect of inflation, threshold models allow the impact to vary once inflation crosses a certain turning point. Formally, the model can be articulated as:

$$\text{GDP}_{it} = \mu_i + \beta_1 \text{Inflation}_{it} 1(q_{it} \leq \gamma) + \beta_2 \text{Inflation}_{it} 1(q_{it} > \gamma) + \varepsilon_{it}$$

where the dependent variable is GDP for country i at time t , independent variable is Inflation for country i at time t , q_{it} is the threshold variable (inflation) that determines the regime, γ is the unknown threshold parameter to be assessed, $1(\cdot)$ is an indicator function equal to 1 if the condition is satisfied, and 0 otherwise, β_1 , β_2 is the coefficients in each regime μ_i captures country-specific effects, and ε_{it} denotes the idiosyncratic error term.

The key feature of PTR is that it allows β_1 and β_2 to differ across regimes, enabling different slopes contingent on whether the threshold variable q_{it} exceeds γ . Estimation is typically done via least-squares minimization with a grid search over possible threshold values, and inference often uses bootstrap methods due to the nonstandard distribution of the threshold estimator (Hansen, 1999; 2000). In macroeconomic contexts, PTR is widely used to examine how inflation affects growth differently depending on whether it falls below or exceeds a certain threshold.

3.4 Panel Spline Regression Model

To account for potential nonlinearities in the inflation–growth relationship, this study employs a Panel Spline Regression (PSR) model. PSR extends conventional spline methods to panel data. Splines introduce knots (threshold points) where the slope of the relationship can change, making it useful for detecting threshold effects. For panel data with $i=1,2,\dots, N$ countries and $t=1,2,\dots, T$ time periods, a basic panel spline regression can be written as:

$$\text{GDP}_{it} = \alpha_i + \sum_{k=1}^K \beta_k S_k(\text{Inflation}_{it}) + \varepsilon_{it}$$

where the dependent variable is GDP for country i at time t , $S_k(\text{Inflation}_{it})$ is spline basis functions of Inflation for country i at time t , K represents the number of spline segments or

basis functions, β_k is the coefficients in each regime, α_i captures country-specific effects, and ε_{it} denotes the idiosyncratic error term.

Unlike traditional linear models, spline regression fits piecewise polynomials at specified knots, allowing the slope of the explanatory variable to vary flexibly across different ranges while maintaining smooth transitions at the junctions (Li & Racine, 2007; Muggeo, 2003). In a panel data context, this approach captures both cross-sectional and temporal variation, with fixed or random effects controlling for unobserved heterogeneity (Baltagi, 2005; Cai and Li, 2008). This approach is particularly suited to macroeconomic analysis, where inflation's impact on growth may change gradually rather than linearly across different levels.

4. Analysis and Findings

The descriptive statistics in Table 1 illustrate the diversity of annual GDP growth rates and inflation rates across countries and over time. GDP growth averaged about 5.02% with decent within-country variation (2.80), indicating that most of the variations in growth come from year-to-year fluctuations rather than static cross-country differences. While inflation averaged about 7.82% with larger within-country dispersion (4.82), showing that inflation rates are highly volatile within each country across time.

Table 1: Overall (Full Panel) Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max	Between SD	Within SD
GDP growth (%)	5.02	2.92	-10.22	16.10	0.89	2.80
Inflation (%)	7.82	5.03	-0.43	49.72	1.57	4.82

Notes: Table reports overall mean, standard deviation, and range across the full panel (N=210, T=35, n=6). Between and within standard deviations reflect cross-country vs. time-series variation.

Table 2 demonstrates the country-level descriptive statistics for annual GDP growth rate and annual inflation rate across six countries. Average GDP growth rates range from 3.99% (Pakistan) to 6.12% (India), with relatively modest dispersion in most of the countries except for Bhutan (4.13). Inflation levels are more diverse: Bangladesh, Bhutan, India, and Nepal exhibit mean inflation between 6.37 - 7.28% with modest variation, Pakistan and Sri Lanka consistently have high and volatile inflation. These outlines underline both cross-country diversity and within-country fluctuation that account for the use of panel techniques in subsequent analysis.

Table 2: Country-Level Descriptive Statistics

Country	Mean GDP Growth (%)	SD GDP Growth (%)	Min GDP Growth (%)	Max GDP Growth (%)	Mean Inflation (%)	SD Inflation (%)	Min Inflation (%)	Max Inflation (%)
Bangladesh	5.61	1.16	3.45	7.88	6.37	2.33	2.01	11.40
Bhutan	5.71	4.13	-10.22	16.10	6.60	3.23	2.46	15.98
India	6.12	2.83	-5.78	9.69	7.08	3.03	3.33	13.87
Nepal	4.37	2.18	-2.37	8.98	7.28	3.41	2.27	17.15
Pakistan	3.99	2.07	-1.27	7.83	9.57	5.65	2.53	30.77
Sri Lanka	4.32	3.56	-7.35	8.67	10.01	8.62	-0.43	49.72

Notes: Statistics based on 35 annual observations per country (N=210 total).

To ensure the rationality of ensuing panel estimations, multiple panel unit root procedures are employed to determine whether the factors are stationary. Both common and individual unit root frameworks are employed to get a robust insight into stationarity, as they address the potential diversity in panel data. The use of multiple tests is compatible with established practices, ensuring that the results are not driven by the assumptions of any single methodology.

Table 3: Summary of Panel unit root tests

Variable	Test	Statistic	p-value
GDP Growth (annual %)	Levin–Lin–Chu (LLC)	–5.388	0.0000
	Im–Pesaran–Shin (IPS)	–6.376	0.0000
	ADF–Fisher	64.689	0.0000
	PP–Fisher	112.209	0.0000
Inflation, Consumer Prices (annual %)	Levin–Lin–Chu (LLC)	–3.132	0.0009
	Im–Pesaran–Shin (IPS)	–4.275	0.0000
	ADF–Fisher	41.193	0.0000
	PP–Fisher	46.958	0.0000

Notes: Null hypothesis = series has a unit root.

Table 3 summarizes the outcomes of panel unit root tests conducted on the variables used in the study. For both variables, all tests strongly rejected the null hypothesis at the 1% significance level, ratifying that GDP growth and inflation are stationary in levels across

the panel. As both series are stationary, they can be directly employed in panel regressions without the need for differencing or cointegration analysis.

Table 4: Dumitrescu–Hurlin (DH) panel causality test

Null Hypothesis	W-Stat	Zbar-Stat	p-value	Conclusion
Inflation does not Granger-cause GDP Growth	3.219	1.121	0.262	Fail to reject $H_0 \rightarrow$ No homogeneous causality.
GDP Growth does not Granger-cause Inflation	3.039	0.932	0.351	Fail to reject $H_0 \rightarrow$ No homogeneous causality.

Notes: All tests run at 5% significance unless otherwise indicated.

The Dumitrescu–Hurlin panel causality test was performed to scrutinize the causal relationship between inflation and GDP growth for the sample period 1990–2024. From Table 4, it is seen that there is no significant bidirectional causality between inflation and growth, implying that the two variables move independently in the short run. This supports the use of threshold or nonlinear modeling approaches, rather than relying solely on simple Granger-type causality, to capture potential regime-dependent long-run effects.

Table 5: Summary of Panel Least Squares Estimates

Variables	Model		
	Pooled Ordinary Least Squares (POLS)	Fixed Effects (FE)	Random Effects (RE)
Inflation, consumer prices	-0.1713*** (0.0384)	-0.1469*** (0.0533)	-0.1610*** (0.0385)
Constant	6.3574*** (0.3570)	6.1664*** (0.4917)	6.2772*** (0.3934)
Observations	210	210	210
F Test	19.90	7.58	17.38
p-value	0.0000	0.0094	0.0000
R-squared	0.083	0.064	0.098
Number of Country ID	6	6	6

Notes: Robust standard errors were used in the fixed effects model to accommodate heteroscedasticity, autocorrelation, and cross-sectional dependence. Standard errors are in parentheses, *** $p < 0.01$, respectively.

From Table 5, it can be said that greater inflation is related to lower GDP growth across POLS, FE, and RE models. The effect is statistically significant in all models. While the magnitude differs slightly across methods, the direction is consistently negative. Model fit is modest, reflecting other factors influencing growth.

Table 6: Model Specification

Methods	Null Hypothesis	Test	Statistic	d.f.	Prob.
Redundant FE Test (POLS vs FE)	Pooled OLS is sufficient	Cross-section F	2.377	(5,203)	0.0401
		Cross-section Chi ²	11.949	5	0.0355
Hausman Test (FE vs RE)	RE is consistent	Cross-section random	2.743	1	0.0977

Notes: All tests run at 5% significance unless otherwise indicated.

To determine the most suitable panel specification, a redundant fixed effects test was conducted, and from Table 6, it can be said that the results confirmed the presence of country-specific effects, thereby rejecting the pooled OLS model. The Hausman test further suggests that the random effects model is consistent and efficient ($p = 0.0977$), making it the preferred specification over fixed effects. Therefore, panel least squares with random effects provides meaningful and reliable estimates for the association between inflation and economic growth in this study. However, outcomes are consistent across both FE and RE specifications, showing a statistically significant detrimental effect of inflation on economic growth.

Table 7: Residual Cross-Section Dependence Test

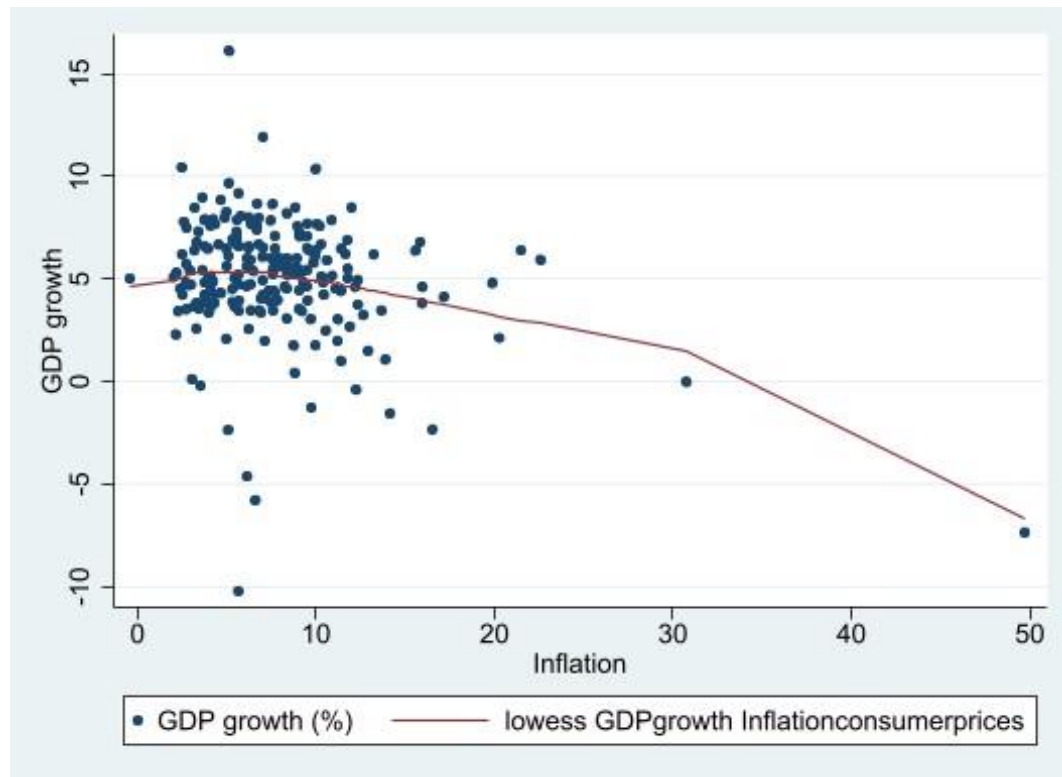
Test	Statistic	Prob.
Breusch–Pagan LM	68.4651	0.0000
Pesaran Scaled LM	9.7614	0.0000
Pesaran CD	7.4410	0.0000

Notes: Null hypothesis = no cross-section dependence. All tests were conducted at 5% significance level.

The outcomes of the cross-section dependence diagnostics are reported in Table 7. It is seen that there exists cross-sectional dependency at the 1% significance level. This indicates that residuals across the six countries are significantly correlated, consistent with the presence of common shocks or spillover effects in the panel. Consequently, standard FE/RE estimates may suffer from biased standard errors, and robust inference methods are required to consider cross-sectional dependency.

Although the Hausman test suggested the RE model as consistent, the presence of residual cross-sectional dependence violates a core assumption of RE estimation. To address this, alternative robust approaches were considered. Given the time-dominant panel ($N=6$, $T=35$), the Fixed Effects estimator with Driscoll–Kraay robust errors was selected as the main specification. Because Driscoll–Kraay robust errors simultaneously account for heteroscedasticity, autocorrelation, and cross-sectional dependence.

Figure 2: Lowess Curve



To examine the possibility of nonlinear effects of inflation on economic growth, a scatter plot of GDP growth against inflation (consumer prices) with a lowess (locally weighted regression) smoother is fitted. The fitted curve from Figure 2 suggests a nonlinear relationship between inflation and economic growth. At a lower inflation rate (below approximately 8–10 percent), GDP growth remains relatively stable and does not exhibit a strong sensitivity to inflation fluctuations. However, once inflation exceeds this range, the relationship turns markedly negative, with higher inflation associated with slower or even negative growth. This pattern is aligned with the inflation-growth threshold hypothesis.

Table 8: Panel Threshold Regression Results

Regime	Coefficient	Std. Error	p-value
Inflation $\leq$ 6.62%	−0.3458	0.1223	0.005
Inflation > 6.62%	−0.1828	0.4444	0.000
R-squared	0.0775		
F stat	6.49		
p-value	0.1967		

Notes: Estimated inflation threshold = 6.6%; Threshold estimator (95% CI): Lower = 6.5055 and Upper = 6.6657

From Table 8, it is seen that the panel threshold regression identifies an estimated inflation threshold of approximately 6.62%. In both cases, regime-specific coefficients reveal a consistently negative and statistically significant inflationary effect on growth. However, the bootstrap test fails to reject the null hypothesis of no threshold effect as the p-value is greater than 0.05. Small sample size makes the results insignificant, and the findings suggest that the effect changes gradually rather than abruptly.

Table 9: Summary of Panel Spline regression at various knots

Variables	Knot= 6	Knot= 7	Knot= 8	Knot= 9	Knot=10	Knot= 11	Knot= 12	Knot= 15
	GDP growth	GDP growth	GDP growth	GDP growth	GDP growth	GDP growth	GDP growth	GDP growth
Inflation (low)	0.1369	0.105	0.0761	0.042	0.016	-0.0080	-0.025	-0.046
	(0.1713)	(0.129)	(0.1039)	(0.084)	(0.073)	(0.911)	(0.064)	(0.049)
Inflation (high)	- 0.193***	- 0.209** *	- 0.226***	- 0.238** *	- 0.248** *	- 0.253***	- 0.258** *	- 0.286** *
	(0.0359)	(0.036)	(0.0336)	(0.033)	(0.034)	(0.001)	(0.039)	(0.032)
Constant	4.7928** *	4.827** *	4.8917** *	5.024** *	5.136** *	5.2625** *	5.354** *	5.471** *
	(0.8319)	(0.697)	(0.612)	(0.529)	(0.481)	(0.4637)	(0.443)	(0.353)
Observations	210	210	210	210	210	210	210	210
R-squared	0.0776	0.084	0.0886	0.090	0.091	0.0887	0.087	0.087
F Test	28.33	37.14	48.33	54.8	56.36	61.74	69.64	166.01
p-value	0.0019	0.0010	0.0005	0.0004	0.0004	0.0003	0.0002	0.0001

Notes: Standard errors are in parentheses, *** $p < 0.01$, respectively.

Panel spline regression captures gradual changes and flexible shapes. Spline regression is performed at various knots starting from 6% (as PTR identifies a 6.62% inflation threshold) to 15% to find the threshold inflation. The results from Table 9 reveal clear evidence of nonlinearity in the inflation-growth relationship. At lower inflation levels, the coefficients are gradually decreasing up to 10% and turn negative afterwards. The estimated coefficients are small and statistically insignificant, indicating that moderate inflation below 8-10% exerts little effect on growth. In contrast, once inflation exceeds this range, the coefficients become strongly negative and statistically significant, suggesting a substantial adverse effect on growth. R-squared and F- F-statistics improve gradually with higher knots, and R-squared reaches its peak around a 10 percent inflation cutoff. These findings point to a threshold effect; once inflation surpasses roughly 10 percent, it will create a detrimental effect on growth. The findings are moreover consistent with earlier evidence from cross-country studies (Bruno & Easterly, 1998; Khan & Senhadji, 2001) and in line with Hansen's (1999, 2000) framework for threshold estimation.

5. Conclusion

This paper investigates the impact of inflation on economic growth in SAARC countries over the period 1990–2024 using a panel data framework. For this purpose, “Inflation, consumer prices (annual % growth)” and “GDP (annual % growth)” – data series have been considered. The descriptive analysis highlighted substantial within-country variability in both inflation and growth, where Pakistan and Sri Lanka experienced persistently high and volatile inflation compared to relatively moderate patterns in Bangladesh, Bhutan, India, and Nepal.

From the empirical analysis, it can be said that inflation and the GDP series are stationary during the period from 1990 to 2024. Driscoll–Kraay robust errors are considered to simultaneously account for heteroscedasticity, autocorrelation, and cross-sectional dependence. The results are statistically significant at the 0.000 level, well below the 0.05 (5%) threshold, indicating a statistically significant negative effect of inflation on economic growth across panel least squares models, including Pooled Ordinary Least Squares (POLS), Fixed Effects, and Random Effects. It indicates that higher inflation hinders long-term growth prospects. The results are largely consistent with previous studies (e.g., Fischer, 1993; Barro, 1996; Bruno & Easterly, 1998; Faria & Carneiro, 2001; Saeed, 2007; Rahman, 2014; Su & Soon, 2024). No significant short-run bidirectional causality has been found between inflation and growth in the Dumitrescu–Hurlin (DH) panel causality test. It also suggests that their interaction is better understood through nonlinear frameworks. Besides, both the Lowess curve and Spline Regressions confirmed the existence of nonlinearities in the relationship between inflation and growth. Moreover, the Panel Spline regression shows that moderate inflation below 8-10 percent appeared to exert little measurable effect on growth, but once inflation exceeded this threshold, its impact became strongly negative and highly significant. On the contrary, the panel threshold regression identified a turning point around 6.6 percent. But the effect was statistically weak, possibly due to the limited sample size. In contrast, the spline regression indicates that inflation hampers economic growth when it surpasses 10 percent. The results are broadly consistent with earlier findings (e.g., Khan & Senhadji, 2001; Espinoza et al., 2010), which identified an inflation threshold of 10% for developing countries.

Mostly, this paper proposes that inflation in South Asian countries is endurable up to a moderate level but becomes unfavorable when it exceeds 8-10 percent. So it is decisive to maintain low and constant inflation for sustainable economic development in these regions. For policymakers, the findings will be supportive of commencing suitable monetary and fiscal policies. Those frameworks will prevent high inflation while letting enough policy flexibility to accommodate growth needs. This study effectively scanned the inflationary effect on growth in SAARC countries, suggesting that further research should explore the factors of inflation to deepen insight and formulate precise measures to control it.

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