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Non-linear Inflation-Growth Nexus in Indonesia

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ABSTRACT

Purpose – This study primarily aims to assess the asymmetric effects of inflation on economic growth in Indonesia.
Design/methodology/approach – The empirical work draws on annual time-series observations spanning 1990 to 2024. The data sources are the Central Statistics Agency, the World Bank, Bank Indonesia, the Ministry of Trade and Caldara & Iacoviell (2022) for the global geopolitics index. To capture the non-linear inflation and growth nexus in Indonesia, the Smooth Transition Threshold Regression (STR) framework is adopted. Global geopolitics, investment, government expenditure, and trade openness serve as the control variables.
Finding/Results – For the retained specification, the Escribano-Jorda procedure points to a Logistic Smooth Transition Regression (LSTR) rather than an Exponential Smooth Transition Regression (ESTR). The estimates confirm that inflation, together with the controls, affects Indonesian growth asymmetrically. Within the lower regime, movements in inflation are positively and significantly linked to growth; global geopolitics, investment, and trade openness are positive yet statistically insignificant, whereas government expenditure exerts a significant positive influence on growth. In the non-linear component, the change in inflation turns significantly negative for growth. Over this segment, global geopolitics, investment, and trade openness are negative but insignificant, while government expenditure becomes significantly negative. A threshold for the change in inflation is identified at 3.42 per cent.
Originality/Value – The contribution of the study lies in modelling the non-linear inflation and growth relationship through the STR method, an approach not previously deployed in the Indonesian setting, and in bringing a global geopolitical variable into the specification as a control.

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1. Introduction

The health of the economy can be assessed by looking at economic growth, which is one of its fundamental pillars (Dinç et al., 2019), and the welfare of the population in many countries (Tanjung et al., 2025; Tanjung et al., 2026). Over the past decade, Indonesia's economic growth has averaged above 5 per cent; whilst this has not yet met the 8 per cent target set by President Prabowo, it is still among the best in Association of Southeast Asian Nations (ASEAN). Current economic growth conditions are influenced not only by domestic shocks but also by external shocks. Domestic shocks, such as price stability, are often a prerequisite for sustainable economic growth (Hamdi et al., 2024), as controlled inflation reduces uncertainty, protects purchasing power, and supports efficient financial intermediation (Adaramola and Dada, 2020; Girdzijauskas et al., 2022). However, empirical studies indicate that this relationship is not always linear; some suggest a negative relationship, whilst others find a positive one (Mandeya and Ho, 2021). Consistent with this, evidence assembled across countries suggests that the inflation and growth connection is neither linear nor homogeneous, with inflation capable of raising or lowering output depending on the level and regime under observation (Soltani, 2025; Olamide et al., 2022; Becha et al., 2023).

In Indonesia, this phenomenon is evident in the inflation trends for the 2020–2025 period, which show fluctuations but remain under control. Average inflation stood at 2.04 per cent in 2020 and 1.56 per cent in 2021. These figures remain below Bank Indonesia's target of 3±1 per cent. In 2022, inflation rose to an average of 4.21 per cent, a figure above Bank Indonesia's target of 3±1 per cent. In 2023–2024, the average inflation rate in Indonesia returned to below Bank Indonesia's target at 3.69 per cent (2023), and 2.3 per cent (2024). This range is well below the various non-linear thresholds observed in many developing countries, where the negative effects of inflation only become apparent at levels of around 5–10 per cent or higher (Olamide et al., 2022; Kusumatrisna et al., 2022; Atigala et al., 2022; Becha et al., 2023).

Because of this intricacy, examining how inflation relates to growth remains a pivotal question that calls for continual refinement, both through more advanced empirical techniques and through a broader array of explanatory variables. Prevailing global turbulence adds an external dimension to the growth picture: a nation's growth trajectory hinges on how effectively it can absorb and adjust to shocks such as geopolitical conflict. A wide range of determinants has been advanced to account for economic growth (Bruns and Ioannidis, 2020). Inflation is one such driver (Karahan and Çolak, 2020). In addition, factors that have a significant positive impact on economic growth include global geopolitical risk (Asafo-Adjei et al., 2023; Jawadi et al., 2024), investment (Morina et al., 2023), government expenditure (Mohamud and Abdulle, 2025),trade openness (Onafowora and Owoye, 2019).

In contrast to the findings above, some studies have reached contrary conclusions, such as:Al Shehab and Al Farsi, (2024) for instance, report that accelerating inflation benefits growth while decelerating inflation harms it over both short and long horizons, Thanh et al., (2024) found that government spending has a negative impact on economic growth.

Notwithstanding the substantial body of work on inflation and growth, the literature still offers comparatively thin coverage of asymmetry and of the Smooth Transition Threshold model as applied to Indonesia. Moreover, no prior investigation has embedded a global geopolitical variable within an analytical framework linking inflation to Indonesian growth.

The present study addresses this shortfall by investigating the inflation and growth relationship in Indonesia while introducing global geopolitics as a central control, together with investment, government expenditure, and trade openness. Folding global geopolitics into the model yields perspective on how inflation shapes growth against the backdrop of intensifying geopolitical turbulence. Grasping the influence of the current geopolitical climate assists policymakers in crafting growth strategies amid pervasive geopolitical uncertainty. The study likewise adds to the literature by furnishing empirical evidence on the asymmetric interplay among inflation, global geopolitics, investment, government expenditure, trade openness, and growth in Indonesia.

2. Literature Review and Hypothesis Development

2.1 Inflation and Economics Growth

Theoretically, classical and neoclassical views tend to emphasise the long-run neutrality of money and suggest that high inflation reduces growth by distorting savings and investment decisions. Meanwhile, the New Growth Theory (Romer, 1990), which incorporates a cash-in-advance constraint on expenditure on education and Research and Development (R&D), suggests that inflation can reduce human capital accumulation and innovation, thereby dampening long-term growth (Sequeira, 2021). The Keynesian approach, conversely, emphasises the role of aggregate demand: moderate inflation accompanying fiscal and monetary expansion can co-exist with high growth as long as there is significant spare capacity, but excessive inflation will create uncertainty and reduce private investment. Within this framework, the inflation–growth relationship is potentially non-linear, resembling an inverted U-shaped curve, where low to moderate inflation is compatible with or even conducive to growth, whilst high inflation reduces economic growth.

Cross-country empirical evidence confirms this non-linear pattern through various threshold approaches. A study by Azam and Khan (2022) on 16 developing and 11 advanced economies, using fixed effects and feasible generalised least squares (FGLS) methods, found a significant negative relationship between inflation and economic growth above a certain threshold. A study in Asia using a static panel threshold model identified an inflation threshold of around 10.5%, at which economic growth turns negative once inflation exceeds the threshold (Thanh et al., 2024). In Tunisia, threshold and smooth transition regression models identified an inflation threshold of around 3.5–3.6%; below this threshold, inflation is positively associated with economic growth, but above it, the correlation turns negative (Becha et al., 2023). In Indonesia, a fixed-effects threshold panel model indicates that inflation does not have a significant negative effect under low and moderate inflation regimes, but becomes highly negative when inflation exceeds approximately 9.6% (Kusumatrisna et al., 2022).

H1: Inflation has a positive effect on economic growth

2.2 Global Geopolitics and Economic Growth

Global Geopolitical refers to risks arising from political and economic conflicts, the struggle for military dominance, and anti-democratic processes within and between countries (Doğan and Özarslan doğan, 2021). Countries facing high levels of local or global geopolitical risk are likely to experience a slowdown in real economic activity, including economic growth. Empirically, various panel and time-series studies have found that an increase in the global geopolitical risk index is negatively correlated with real Gross Domestic Product (GDP) growth and 'business cycle' indicators in many developing and emerging economies,

including 18 emerging economies and several Turkic republics, with a significant contractionary effect on growth performance (Asafo-Adjei et al., 2023). The results of a study conducted by Jawadi et al., (2024) on the reaction of economic growth to global geopolitical risk in Europe using the Autoregressive Distributed Lag (ARDL) method indicate that global geopolitical risk reduces economic growth.
H2: Global geopolitics has a negative effect on economic growth.

2.3 Investment and Economic Growth

The Solow framework holds that stepping up investment enlarges the capital stock and thereby lifts national output and long-run (Solow, 1956). For Indonesia, investment occupies a strategic place in propelling growth, notably via gross fixed capital formation, infrastructure build-out, and the expansion of industry and services. Rising domestic investment alongside foreign direct investment (FDI) serves as a key lever for reinforcing national productive capacity and sharpening competitiveness. A study by Morina et al. (2023) on the long-term relationship between investment and economic growth in Organization for Economic Co-operation and Development (OECD) countries, using cointegration methods, indicates that investment has a positive and significant impact on economic growth.
H3: Investment has a positive impact on economic growth.

2.4 Government Expenditure and Economic Growth

In line with Keynesian views and Wagner's theory of government expenditure, an increase in government expenditure drives economic growth (Majenge et al., 2024). Government expenditure will be able to drive economic growth if it is productive, such as expenditure on infrastructure, education and health. Selvanathan et al. (2021) conducted a study on the impact of government expenditure in Sri Lanka using the ARDL method, finding that government expenditure has a positive and significant effect on economic growth. Mohamud and Abdulle, (2025) also conducted a study on the effect of government expenditure on economic growth in Somalia using the ARDL method for the period 1990–2022, finding that government expenditure has a positive and significant effect on economic growth.
H4: Government expenditure has a positive effect on economic growth.

2.5 Trade Openness and Economic Growth

Endogenous growth theory maintains that opening up to trade widens markets, hastens the diffusion of technology and innovation, and accelerates the accumulation of physical and human capital, all of which raise the long-run growth rate (Monyela and Saba, 2024). Because openness can foster innovation, the argument is especially pertinent to Indonesia, which can draw on advanced-economy technologies to speed its own growth. Jalil and Rauf (2021) conducted an empirical study on the relationship between trade openness and economic growth from 1960 to 2017 across 82 countries. The models used were the common correlated effects mean group (CCEMG) and the generalised method of moments (GMM). The results indicate that trade openness contributes significantly to economic growth. Another article by Nguyen and Bui (2021) analysed trade openness and economic growth in the ASEAN-6 countries (Indonesia, Malaysia, Thailand, Singapore, the Philippines, and Vietnam) using a fixed-effects panel threshold approach. It found that below a certain threshold, trade openness has a positive and significant effect on economic growth; however, once this threshold is exceeded, the impact of openness on economic growth diminishes, although it remains positive.

H5: Trade openness has a positive effect on economic growth.

3. Methodology

This study probes the non-linear inflation–growth relationship for Indonesia over the 1990–2024 period, relying on secondary data assembled from several sources. The dependent variable is economic growth (PE, GDP growth, %). The variable of interest is inflation; the controls are the global geopolitical-risk index (GPI), investment (INV, gross fixed capital formation as % of GDP), government expenditure (GE) and trade openness (TO). Definitions and sources appear in Table 1.

3.1 Variables and transformations

To keep the notation internally consistent across the model, tables and discussion, the following prefix convention is used throughout: L denotes the natural logarithm and D denotes the first difference. Thus LGPI = ln(GPI), and DINFLASI = ΔINFLASI, DINV = ΔINV, DLGE = Δln(GE) and DLTO = Δln(TO). The transformation applied to each series is dictated by its order of integration (Section 4.2). Economic growth (PE) and the log geopolitical-risk index (LGPI) are stationary in level, I(0), and enter in level. Inflation, investment, government expenditure and trade openness are I(1) and enter in first-differenced form; this mirrors the standard treatment of I(1) regressors in recent applied work.

Table 1. Defenition of Variables

Variables	Measurement	sources	Transformation	Role
Economic Growth (PE)	GDP growth annual (%)	Badan Pusat Statistik (BPS)	Level, I(0)	Dependent Variable
Inflation	The percentage change in the Consumer Price Index (CPI) for a given month compared with the CPI for the same month of the previous year (%)	Bank Indonesia	First difference	Independent Variable
Global Geopolitical risk	The level of uncertainty and threats arising from international political events, as measured by the Geopolitical Risk (GPR) Index	Caldara and Iacoviell (2022)	Log level, I(0)	Control Variable
Invesment	The GDP ratio of gross fixed capital	World Development Indicators (WDI)	First difference	Control Variable

	formation (% of GDP)			
Government Expenditure	All government expenditure on the procurement of goods and services used in the performance of government functions and the provision of public services (Billions of Rp)	BPS	Log, first difference	Control Variable
Trade Opennes	Percentage change in the terms of trade	WDI	Log, first difference	Control Variable

Source: authors' compilation, 2026

3.2 The Smooth Transition Regression (STR) model

For the analysis, this study adopts the Smooth Transition Threshold Model (STR) formulated by Terasvirta and Anderson 1992 and Teräsvirta (1994). Designed for time-series data, the STR model generalises the autoregressive specification, granting the parameters greater flexibility by permitting a smooth transition between regimes. Its general form here is:

$$PE_t = \alpha_0 + \delta_1 DINFLASI_t + \delta_2 LGPI_t + \delta_3 DINV_t + \delta_4 DLGE_t + \delta_5 DLTO_t + (\alpha_1 + \omega_1 DINFLASI_t + \omega_2 LGPI_t + \omega_3 DINV_t + \omega_4 DLGE_t + \omega_5 DLTO_t).h[(DINFLASI_t); \gamma, c] + \mu_t \quad (1)$$

Where, α_0 and α_1 constants for the linear and non-linear parts; δ_1, δ_2, δ_3, δ_4, δ_5, ω_1, ω_2, ω_3, ω_4, and ω_5 are the parameters of the variables Inflation, Global Geopolitics, Investment, Government Expenditure and Trade Openness in linear and non-linear parts, which differ across regimes; $h[(DINFLASI_t); \gamma, c]$ represents the continuous transition function. The parameter γ, the slope of that function, governs how quickly the economy moves from one extreme regime to the other, and c is the estimated inflation threshold. The estimation sequence is: (i) test stationarity (ADF and PP); (ii) test linearity; (iii) select the model type (LSTR vs. ESTR) using the Teräsvirta sequential and Escribano–Jordá tests; (iv) estimate the model by non-linear least squares. Further, to verify the adequacy of the model, diagnostic tests were also conducted, including tests for normality, no remaining non-linearity, heteroscedasticity, and serial correlation.

3.3 Lag selection

The dynamic specification likes PE(−2), DINV(−1) and DLTO(−1) was chosen following a general-to-specific strategy guided by (i) information criteria (AIC, SIC/BIC and Hannan-Quinn), (ii) economic reasoning and (iii) residual diagnostics. The two-period lag on growth PE(−2), captures the well-documented persistence and delayed propagation of output dynamics in Indonesia and is statistically significant (p = 0.046). The one-period lags on

investment and trade openness, DINV(−1) and DLTO(−1), reflect the standard implementation lag between capital formation or trade adjustment and its realised effect on output: newly formed capital and reallocated trade flows become productive only with delay. Among the competing lag structures considered, this specification minimised the information criteria while delivering clean residual diagnostics—no serial correlation and homoskedastic errors (Section 4.4)—and no evidence of neglected non-linearity (Section 4.5). These properties are what qualify it as the preferred specification rather than any single in-sample fit statistic.

4. Result and Discussion

4.1 Descriptive statistical analysis

Table 2 presents the descriptive statistical analysis of the variables used in this study, covering the period from 1990 to 2024.

Table 2. Descriptive statistics

	PE	LGPI	LTO	LGE	INFLASI	INV
Mean	4.908857	4.584976	3.932795	13.19350	8.478286	27.94303
Median	5.070000	4.590594	3.948877	13.53798	6.470000	29.14559
Maximum	9.120000	5.172196	4.566286	15.02738	77.63000	32.81193
Minimum	-13.13000	3.930152	3.495664	10.59047	1.570000	19.42916
Std. Dev.	3.788483	0.289000	0.211092	1.448423	12.57528	4.376691
Skewness	-3.281859	0.181769	0.484144	-0.459489	4.932934	-0.783758
Kurtosis	16.12050	2.862980	3.932803	1.837057	27.71178	2.354609
Jarque-Bera	313.8769	0.220112	2.636234	3.203893	1032.511	4.190717
Probability	0.000000	0.895784	0.267639	0.201504	0.000000	0.123026
Sum	171.8100	160.4742	137.6478	461.7724	296.7400	978.0060
Sum Sq. Dev.	487.9886	2.839724	1.515030	71.32955	5376.680	651.2844
Obs.	35	35	35	35	35	35

Source: researchers' analysis in e-views 13, 2026.

The descriptive discussion centres on the coefficient of variation. The coefficient of variation is the percentage ratio of the standard deviation to the mean; its purpose is to assess the degree of variation and the stability of the data. Based on Table 2, the Economic Growth (EG) variable yielded a coefficient of variation of 78.85 per cent, indicating a relatively high level of variation compared to the mean, suggesting significant fluctuations in performance during the observation period; this accords with Arif et al. (2022) who emphasised that high variability in economic indicators reflects sensitivity to external shocks such as crises or structural changes. The Global Geopolitical (LGPI) variable has a coefficient of variation of 6.35 per cent, indicating low variability and highly consistent data. The Trade Openness variable (LTO) has a coefficient of variation of 5.37 per cent, indicating low variability and highly consistent data. The Government Expenditure variable (LGE) has a coefficient of variation of 10.97 per cent, indicating a low level of variability. The Inflation (INFLATION) variable indicating high variability, as indicated by a coefficient of variation of 148.3 per cent. The Investment (INV) variable has a coefficient of variation of 15.6 per cent, indicating a low level of data variability.

4.2 Data stationarity test

Attention next turns to stationarity. Here the ADF and PP tests are deployed to establish each series' order of integration. Table 3 sets out the corresponding results.

Table 3. ADF and PP test results

Variables	ADF		PP	
	[Intercept]	[Trend and Intercept]	Intercept	Trend and Intercept
Economic Growth (PE)	-4.106010	-4.044570	-4.032432	-3.970536
	(0.0030)***	(0.0164)**	(0.0037)***	(0.0196)**
Inflation (DINFLASI)	-3.447540	-4.804853	-33.72930	-34.93936
	(0.0176)**	(0.0039)***	(0.0001)***	(0.0000)***
Global geopolitical risk (LGPI)	-3.180359	-3.203948	-3.218097	-3.151872
	(0.03000**	(0.1006)	(0.0275)**	(0.1111)
Invesment (DINV)	-3.370341	-3.325899	-3.305701	-3.363827
	(0.0195)**	(0.0797)*	(0.0227)**	(0.0014)***
Government Expenditure (DLGE)	-5.567606	-6.357495	-5.624141	-6.338195
	(0.0001)***	(0.0000)***	(0.0000)***	(0.0000)***
Trade Opennes (DLTO)	-6.206354	-6.118006	-8.529530	-8.415530
	(0.0000)***	(0.0001)***	(0.0000)***	(0.0000)***

Notes: ***, **, and * are expressed as statistical significance at the 1%, 5% and 10% levels
Source: researchers' analysis in e-views 13, 2026.

4.3 Linearity test and model-type selection tests

The results of the linearity and Teräsvirta (1994) sequential test and Escribano and Jorda (2001) test in this study are shown in Table 4 below:

Table 4. Results of the Linearity and model-type selection tests

Null-Hypothesis	F statistic	P value
Panel A. Linearity test		
H_{04}: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$	6.731311	0.0004
H_{03}: $\beta_1 = \beta_2 = \beta_3 = 0$	6.731311	0.0004
H_{02}: $\beta_1 = \beta_2 = 0$	6.731311	0.0004
H_{01}: $\beta_1 = 0$	13.55306	0.0000
Panel B. Teräsvirta sequential test		
H_2: $\beta_2 = 0 \mid \beta_3 = 0$	0.3860	0.8507
H_1: $\beta_1 = 0 \mid \beta_2 = \beta_3 = 0$	14.5121	0.0000
Recommended: first-order logistic (LSTR)		
Panel C. Escribano–Jordá test		
H_0L: $\beta_2 = \beta_4 = 0$	0.3860	0.8507
H_0E: $\beta_1 = \beta_3 = 0$	0.7676	0.5873
Recommended: first-order logistic with non-zero threshold (LSTR)		

Source: researchers' analysis in e-views 13, 2026.

Panel A of Table 4 reports p-values below 0.005 throughout, so H_0 is rejected—compelling evidence of non-linearity in the data and, correspondingly, grounds for preferring the Smooth Transition Regression (STR) model over a conventional linear one. Put differently, the relationship among the variables shifts smoothly as the threshold variable moves past a given value. The subsequent task is to choose between the Logistic Smooth Transition Regression (LSTR) and the Exponential Smooth Transition Regression (ESTR). Guided by the Teräsvirta sequential and Escribano–Jorda tests in Panels B and C of Table 4, the LSTR model is selected to represent the non-linear relationship investigated here.

4.4 LSTR estimation results

The analysis then fits the Logistic Smooth Transition Regression (LSTR) model to scrutinise the non-linearity of the inflation and growth nexus in Indonesia. The estimates reveal that growth conforms to a non-linear pattern, with inflation acting as the transition variable inside the logistic smooth transition function. Table 5 reports the results of this non-linear LSTR model featuring a single inflation threshold.

Table 5. Estimation results of the LSTR model

Variables	Coef.	t-statistic	p-value
Linier Part			
C	-28.42568	-0.995464	0.3335
PE(-2)	1.072468	2.158583	0.0455
DINFLASI	0.119106	2.663600	0.0164
LGPI	5.881317	1.087752	0.2919
DINV(-1)	0.059600	0.153269	0.8800
DLGE	6.953230	1.958404	0.0668
DLTO(-1)	11.23580	1.131444	0.2736
Non-linier Part			
C	36.60386	1.046910	0.3098
PE(-2)	-0.926677	-1.548650	0.1399
DINFLASI	-0.339251	-4.828902	0.0002
LGPI	-5.359552	-0.793752	0.4383
DINV(-1)	-0.009148	-0.018310	0.9856
DLGE	-28.48394	-2.970300	0.0086
DLTO(-1)	-11.65916	-0.791531	0.4395
Threshold Part			
Slope	0.592624	1.124552	0.2764
Threshold	3.415974	2.115444	0.0495
R^2	0.904053	Adjusted R^2	0.819394
Normality test (JB)	37.81532[0.0000]		
Serial correlation test (B-G LM)	0.642542[0.7252]		
Heteroscedasticity test (BPG)	2.583020[0.8591]		

Source: researchers' analysis in e-views 13, 2026.

The diagnostic evidence in Table 5 indicates that the fitted model honours most of the classical assumptions. With an Obs·R-squared probability of 0.7252 (> 0.05), the Breusch–Godfrey test

detects no autocorrelation, while the Breusch–Pagan–Godfrey test, at an Obs·R-squared probability of 0.8591 (> 0.05), signals no heteroscedasticity. The residuals are therefore independent and display constant variance.

Normality is, however, rejected: The Jarque–Bera statistic is 37.82 (p ≈ 0.000). This is not treated as fatal but is reported honestly. Non-normality is driven almost entirely by the 1998 crisis, when growth collapsed to −13.1 per cent and inflation spiked to 77.6 per cent; a single extreme episode of this kind routinely produces excess kurtosis in short annual samples. Because the non-linear least squares estimator remains consistent under non-normal but otherwise well-behaved errors, and because serial-correlation and heteroskedasticity tests are passed, inference is qualitatively robust; nonetheless the normality violation is a genuine limitation and the significance levels for the marginal coefficients should be read with corresponding caution.

4.5 **Robustness and sensitivity**

Three checks support the adequacy of the retained specification. First, the *remaining non-linearity test* (additive form, using DINFLASI as the transition variable) fails to reject linearity of the residuals at every order (H03: F = 1.259, p = 0.367), indicating that a single logistic transition captures the non-linear structure and that no second transition function is required. Second, the *encapsulated non-linearity test*—which probes parameter constancy in the STR sense—also fails to reject (H03: F = 0.744, p = 0.694), so the estimated regime structure is stable and not an artefact of an omitted transition. Third, as noted, the specification was retained from a general-to-specific search precisely because parsimonious alternatives with different lag structures produced inferior information criteria or residual pathologies. Table 6 presents these results.

Table 6. Remaining and encapsulated non-linearity tests

Null-Hypothesis	F statistic	P value
Panel A. Remaining (additive) non-linearity		
H_{04}: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$	1.2589	0.3672
H_{01}: $\beta_1 = 0$	1.6838	0.2148
Result: Original model not rejected at 5% (H03): no remaining non-linearity.		
Panel B. Encapsulated non-linearity (parameter constancy)		
H_{04}: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$	0.7440	0.6941
H_{01}: $\beta_1 = 0$	0.7456	0.6879
Recommended: Original model not rejected at 5% (H03): parameters stable.		

Source: researchers' analysis in e-views 13, 2026.

4.6 Discussion

Inflation and Economic Growth Nexus

The estimates in Table 5 furnish statistically grounded evidence of an asymmetric inflation and economic growth relationship. Under the lower regime, movements in inflation are positively and significantly tied to growth. Because the regime-shift coefficient is negative and highly significant, the marginal association between inflation changes and growth flips to negative once the transition variable crosses the estimated threshold.

These findings suggest that the implementation of various government policies and those of Bank Indonesia will ensure that inflation remains below the threshold, which will strongly support economic growth in Indonesia. Moderate inflation reflects strengthening aggregate demand, increased profitability, and more flexible price/wage adjustments, thereby encouraging investment and the utilisation of production capacity, which ultimately contributes to stimulating economic growth. This is consistent with findings from studies in various countries that inflation below the threshold can be growth-enhancing or growth-neutral (Chu et al., 2019; Oyadeyi et al., 2025). Above the threshold value, the findings of this study are also consistent with almost all studies that have identified a significant negative impact on economic growth (Ndoricimpa, 2017; Kusumatrisna et al., 2022). With high inflation, households on fixed incomes will see their purchasing power eroded and a decline in real consumption. Furthermore, rising price uncertainty is causing households and businesses to postpone consumption and investment, which will slow economic growth.

Global Geopolitics and Economic Growth Nexus

Furthermore, there is a positive effect of global geopolitics (LGPI) on economic growth in Indonesia, with an estimated coefficient of 5.881317 and statistical significance above 10% in the linear section. Once the threshold is exceeded, the effect of global geopolitics on economic growth in Indonesia becomes negative, with an estimated coefficient of -5.359552 and a statistical significance of over 10% in the non-linear segment. This indicates that global geopolitical turmoil does not yet have a dominant influence. Indonesia, as a developing country with a large domestic market, a relatively diversified economic structure, and a position as an exporter of various strategic commodities such as palm oil, coal and nickel, can benefit from rises in global commodity prices, which are often triggered by geopolitical uncertainty. From the perspective of international trade theory and the commodity boom hypothesis, rising commodity prices resulting from global conflicts can boost export earnings, investment in the extractive sector, and government revenue, thereby driving economic growth. However, once the value of geopolitical risk exceeds a certain threshold, the effect turns negative with a coefficient of -5.359552. These results are consistent with the uncertainty shock theory, which states that an excessive increase in geopolitical uncertainty will reduce economic activity through various transmission channels, such as a decline in investment, disruptions to global supply chains, increased financial market volatility, and a weakening of international trade (Bloom, 2009). Under such conditions, economic agents tend to postpone investment and consumption decisions due to increased risk and uncertainty regarding future economic prospects. Furthermore, protracted geopolitical conflicts can disrupt global trade and investment flows, which ultimately dampens Indonesia's economic growth.

Investment and Economic Growth Nexus

The variable representing The one-period lags on change in investment variable (DINV(-1)) has a positive effect on economic growth in Indonesia, with an estimated coefficient of 0.059600 and a statistical significance level of over 10% in the linear section. Once the optimal level is exceeded, the effect of the previous period's change in investment DINV(-1) on economic growth in Indonesia becomes negative, with an estimated coefficient of -0.009148 and a statistical significance level above 10%. Change in Investment in the previous period had a positive and significant effect on economic growth, with a coefficient of 0.059600. This finding is consistent with the neoclassical theory of economic growth proposed by Robert Solow, as

well as the endogenous growth theory, which identifies investment as one of the main factors in capital accumulation. Economically, these results indicate that an increase in investment in the previous period is capable of expanding production capacity, creating jobs, increasing the productivity of factors of production, and driving output growth in the subsequent period. This lag effect is to be expected, as the benefits of investment are generally not felt immediately upon investment being made, but rather require time before new capital can be utilised productively in economic activities.

The existence of this non-linear relationship suggests that the impact of investment on Indonesia's economic growth is not constant, but rather depends on the level of investment already achieved. At low to moderate levels of investment, an increase in investment provides a positive boost to economic growth. However, once a certain threshold is crossed, the additional benefits of investment begin to decline and may even have a negative impact. These findings suggest that government policy should not only focus on increasing the volume of investment, but also on the effectiveness, productivity and quality of investment, so that its contribution to economic growth remains optimal in the long term.

Government Expenditure and Economic Growth Nexus

The change in government expenditure variable (DLGE), used as a proxy for fiscal policy, has a positive effect on economic growth in Indonesia, with an estimated coefficient of 6.953230 and statistical significance at the 10% level in the linear section. Once a threshold is crossed, the effect of change in government expenditure (DLGE) on economic growth in Indonesia becomes negative, with a coefficient of -28.48394 and statistical significance at the 1% level. These findings indicate that the effectiveness of fiscal policy through government expenditure depends on economic conditions, whereby government spending is not always capable of driving economic growth. This is often associated with fiscal inefficiency or unproductive allocation of expenditure. In times of high inflation, government expenditure has a negative impact on economic growth if the source of funding is debt. However, once the threshold value is exceeded, the effect of government expenditure turns negative with a fairly large coefficient of –28.48394, which is significant at the 1 per cent level. The magnitude of this negative coefficient indicates that the contractionary impact of government expenditure on economic growth is far stronger than its positive impact under the first regime. This finding suggests that the effectiveness of fiscal policy is highly dependent on prevailing macroeconomic conditions. When government expenditure rises above the optimal level, additional government spending is no longer able to stimulate economic growth; indeed, it may even act as a hindrance to growth.

Theoretically, these results can be explained by the concepts of fiscal inefficiency and the crowding-out effect. Excessive government expenditure is often accompanied by a decline in budgetary efficiency, particularly when spending is allocated more towards consumptive rather than productive expenditure. Under such conditions, additional government spending does not result in a sufficient increase in production capacity, thereby diminishing its contribution to economic growth. Indeed, budgetary waste, poor-quality development projects and weak fiscal governance can lead to government spending actually reducing the overall efficiency of the economy.

Furthermore, the findings of this study support the view that, during periods of high inflation, the effectiveness of fiscal policy becomes more limited. When government expenditure is financed through debt, an increase in government spending can heighten inflationary

pressures, raise interest rates, and reduce private sector investment through the crowding-out mechanism. In such a situation, the government and the private sector compete for sources of financing in the financial markets, leading to higher capital costs and a decline in productive investment activity. Consequently, the ultimate impact on economic growth is negative.

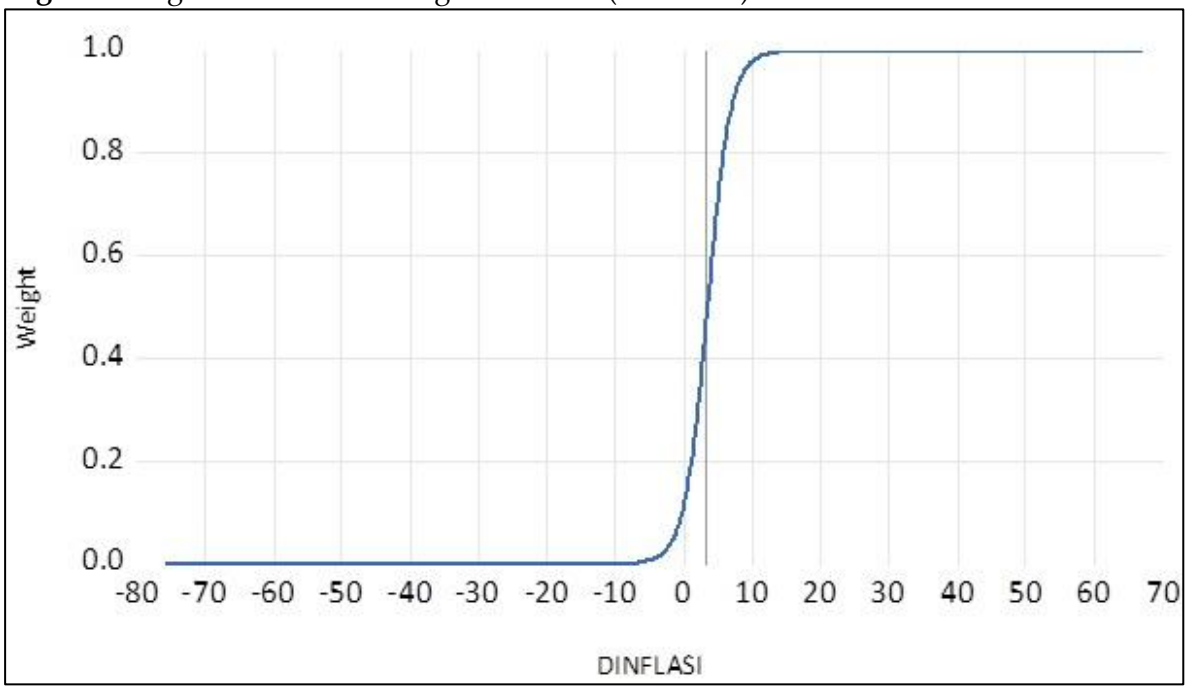
Trade Openness and Economic Growth nexus

Similarly, it was found that The one-period lags on the change in trade openness variable (DLTO(-1)) has a positive effect on economic growth in Indonesia, with an estimated coefficient of 11.23580 and statistical significance at a level above 10% in the linear section. Once the threshold is exceeded, the effect of The one-period lags on the change in trade openness (DLTO(-1)) on economic growth becomes negative, with a coefficient of -11.65916 and statistical significance at a level above 10% in the non-linear segment. This illustrates that trade openness has a double-edged effect; that is, under normal conditions, Indonesia's international trade enhances efficiency, technology transfer and market expansion, whereas in conditions of global instability, openness actually increases vulnerability to external shocks, but the statistical evidence is insufficient to confirm an effect.

Threshold Function

The LSTR estimates place the slope of the transition function, γ, at 0.592624, denoting a gradual rather than abrupt movement between regimes; γ is nonetheless statistically insignificant ($p = 0.276$). A small slope parameter thus means inflation acts on Indonesian growth incrementally. The results further show that the change in inflation, serving as the transition variable, traces an asymmetric S-shape with a threshold of 3.42% ($c = 3.415974$), which at $p = 0.0495$ is significant at the 5% level. Holding the change in inflation below this threshold therefore benefits Indonesian growth, whereas allowing it to rise above the threshold harms growth. Figure 1 depicts the estimated transition function and the passage from one economic regime to another.

Figure 1. Logistic Threshold Weight Function (c=3.41597)



Source: researchers' analysis in e-views 13, 2026

5. Conclusion and Suggestion

This study revisits, from a non-linear angle, how inflation relates to economic growth in Indonesia, drawing on time-series data for 1990–2024. Estimation rests on the LSTR model, which pinpoints the inflation threshold with precision. The evidence establishes that inflation exerts an asymmetric effect on growth across the period studied.

The LSTR estimates show that the change in inflation lifts growth positively and significantly up to the threshold, whereas above it the change in inflation weighs on growth negatively and significantly. The estimated threshold for the change in inflation is 3.42%, significant at the 5% level, and the slope parameter points to a smooth passage between regimes. During spells of moderate inflation, global geopolitics, investment, government expenditure, and trade openness each contribute positively to growth; in high-inflation spells, all four turn negative for growth. A novel result is that global geopolitical turmoil, taken directly, does not significantly affect Indonesian growth. Against a backdrop of unsettled global geopolitics, the government should keep inflation anchored at a moderate level to sustain growth and should steer expenditure toward more productive, publicly beneficial budget allocations, so that under mounting geopolitical uncertainty such spending operates as a fiscal stimulus that keeps growth advancing.

One constraint of this study is the still-short data span, which has yet to encompass the geopolitical turbulence surrounding the US–Iran conflict; a longer and more current horizon is therefore needed.

6. Limitations and Future Research

Three caveats temper these conclusions. First, the annual single-country sample is short (33 usable observations), which limits inferential power and inflates the leverage of the 1998 crisis; the insignificance of several controls and the imprecise transition slope should be read in that light. Second, the residuals depart from normality, driven by that crisis episode; while the estimator remains consistent, marginal significance levels should be treated cautiously. Third, because the transition variable is the first difference of inflation, the threshold pertains to the change in inflation; researchers seeking a threshold on the inflation level should re-estimate with the inflation level as the transition variable. Future work could extend the sample, adopt a regional or cross-country panel STR (Panel Smooth Transition Regression) to sharpen inference on the geopolitical, investment and openness channels, apply outlier-robust estimation, and incorporate more recent geopolitical episodes.

Declaration of Artificial Intelligence (AI) and AI-assisted technologies in the writing process (if author[s] utilize AI)

During the preparation of this work, the author(s) used ChatGPT, Turnitin, DeepL, Claude in in order to support academic writing clarity, improve linguistic accuracy, and ensure compliance with plagiarism standards. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

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