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Trade Openness and Inflation Dynamics in Indonesia: Long-Run Evidence Across Four Structural Break Episodes (1969–2024)

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trade openness; inflation; ARDL bounds testing; structural breaks; Indonesia; Romer hypothesis.

Abstract

Trade openness and its relationship with inflation dynamics have long been a crucial and extensively debated topic in the macroeconomic literature, particularly in developing economies where structural vulnerabilities make price stability a vital concern for investment and the business environment. This study empirically examines the short-run and long-run relationship between trade openness and inflation in Indonesia over the period 1969–2024, covering 56 annual observations and four major structural break episodes: the 1974 OPEC embargo, the 1998 Asian financial crisis, the 2008 global financial crisis, and the 2020 COVID-19 pandemic. Using the ARDL Bounds test, the F-bounds test confirms cointegration among the variables, with an F-statistic of 6.744 that substantially exceeds the upper critical bound at the 5% significance level. The long-run estimation yields a positive and significant coefficient on trade openness ($\beta = 0.207$, $p < 0.05$), which runs counter to the Romer (1993) hypothesis, indicating that greater trade exposure is associated with higher inflation in the Indonesian context. The error correction term (ECT = −1.407) is negative and significant, confirming a short-run adjustment mechanism toward long-run equilibrium. The robustness check further confirms that structural break dummies are not only theoretically justified but empirically necessary, as the long-run significance of all variables disappears entirely when dummies are excluded.

INTRODUCTION

The empirical debate between inflation and trade activity has long been a significant topic in both developing and developed economies (Watson, 2016). The core foundation of this debate is the Romer hypothesis, which holds that more open economies tend to experience lower inflation because trade openness pressures authorities to manage monetary policy more effectively (Altwijry & Tahir, 2025; Lin et al., 2017). According to Romer (1993), exposure to trade openness causes a country's currency to depreciate, prompting the government to implement monetary policies with a smaller inflationary effect. From an investment perspective, this condition warrants careful consideration given its implications for business activity (Hossain et al., 2024; Malec et al., 2024). The relationship between trade openness and inflation is therefore not merely theoretical but carries practical consequences for economic governance (Luangaram & Wongpunya, 2024).

Indonesia represents an interesting and relevant case within this global discussion (Pham et al., 2023). World Bank data show that Indonesian inflation, as measured by the Consumer Price Index, averaged approximately 10% over the past 55 years. The highest inflation recorded during the 1969–2024 period occurred during the 1998 Asian financial crisis, at 58.45%, while the lowest, at 1.56%, was recorded in the modern era of the 2000s. During the same period, trade as a percentage of GDP ranged from a low of 23.8% to a high of 96.1%. Indonesia also

experienced four major financial crises that significantly disrupted the global international trade structure (Perron, 1989): the 1974 OPEC embargo, the 1998 Asian financial crisis, the 2008 global financial crisis, and the 2020 COVID-19 pandemic, all of which left significant marks on the country's inflation and trade dynamics (Widarjono et al., 2023). Overall, Indonesia provides a relevant empirical case for assessing the short- and long-run relationship between trade and inflation (Çelik et al., 2024).

Prior studies assessing the relationship between trade and inflation using long-run time series with structural break controls remain limited (Darkwah et al., 2024). Much of the existing research on inflation in Indonesia continues to focus on monetary mechanisms, central bank policy, and the exchange rate pass-through effect, while the channel through which trade openness affects inflation remains underexplored in the academic literature (Sari et al., 2023). Many studies also neglect important control variables such as broad money supply (M2), GDP growth, the exchange rate, and structural break dummies (Ha et al., 2020; Jašová et al., 2020). As Perron (1989) argues, structural breaks in long time series must be identified to isolate major economic shifts and enable more accurate interpretation of results. These methodological and empirical gaps present a concrete and important research opportunity.

Failure to understand the key determinants of long-run inflation in Indonesia carries significant practical consequences (Forbes et al., 2018). From an investment perspective, uncertainty about inflation raises the risk premium, increasing the cost of capital for businesses and ultimately weakening Indonesia's ability to attract productive and sustainable investment. If policymakers also lack a sound understanding of the effects of trade openness on inflation, a mismatch between policy and the business environment may arise (Darkwah et al., 2024), potentially creating serious economic consequences, particularly during periods of heightened uncertainty. The empirical question raised in this research therefore aims not only to address theoretical concerns but also to contribute to the development of Indonesia's economic policy framework.

The novelty of this research lies in several aspects. First, it employs the ARDL bounds testing approach (Pesaran et al., 2001), which is particularly suited to small sample sizes ($n = 56$) and variables with a mixed order of integration, I(0) and I(1). Second, it covers an exceptionally long period — 1969 to 2024, spanning 56 years — which is among the longest time frames analyzed in the Indonesian trade-inflation literature. Third, it explicitly accommodates four structural break episodes (1974, 1998, 2008, and 2020), following Perron's (1989) argument on the importance of accounting for structural breaks in long time series analysis. Fourth, the model includes comprehensive control variables: GDP growth (demand-side pressures), broad money supply (monetary channel), and the USD/IDR exchange rate (imported inflation channel), all sourced from World Bank data. Fifth, a robustness check is conducted by re-estimating the model without structural break dummies, revealing that long-run significance disappears entirely when dummies are excluded and demonstrating that break controls are not only theoretically justified but empirically necessary. Sixth, the study finds a positive coefficient on trade openness ($\beta = 0.207$, $p < 0.05$) that contradicts the Romer hypothesis, opening new avenues for understanding imported inflation mechanisms in developing economies.

This study aims to empirically examine the short- and long-run relationship between trade openness and inflation over the period 1969–2024 using the Autoregressive Distributed

Lag (ARDL) bounds testing approach (Pesaran et al., 2001). The model includes GDP growth, broad money supply, and the USD/IDR exchange rate as control variables, all sourced from World Bank data, alongside dummy variables to accommodate structural breaks in 1974, 1998, 2008, and 2020, following Perron's (1989) recommendation. The combination of a long observation period, theory-based variable selection, and structural break adjustment is expected to strengthen this study's contribution to the inflation literature in Indonesia (Widarjono et al., 2023). The remainder of this study is organized as follows: Chapter 1 presents the introduction, Chapter 2 reviews the literature, Chapter 3 explains the methodology, Chapter 4 presents the empirical results, and Chapter 5 provides the discussion and conclusion.

Theoretical Foundation: The Romer Hypothesis

The theoretical landscape for this research is based on the Romer Hypothesis (Altwijry & Tahir, 2025; Romer, 1993). According to Romer (1993), an open economy tends to have a lower inflation rate because the open market will offset the cost increases from an expansionary monetary policy. In an open economy, the government will face faster currency depreciation due to an increase in the growth rate of the money supply. As a result, this condition will reduce political and economic incentives to push inflation. In addition, this open-economy mechanism serves as an indirect disciplinary tool, enabling the authority to manage public funds circulating globally. From an investment perspective, this proposition has important implications, as lower inflation will reduce the risk premium and make it more predictable. In turn, lower and more predictable risk premiums provide a more proper and conducive business ecosystem. Therefore, the Romer hypothesis provides a strong theoretical framework for examining the dynamics of trade openness and inflation in Indonesia during the 1969 – 2024 period.

Although it provides a strong theoretical foundation, the Romer hypothesis yields various empirical findings (Bowdler & Malik, 2017). A study by Lin et al. (2017) supports the Romer hypothesis in the context of Sub-Saharan Africa. Their finding shows that integration into a more globally connected economy is associated with a lower inflation rate (Auer et al., 2019). According to Watson (2016), despite having price rigidities as a variable mediator, trade openness and inflation still have a negative relationship. In contrast, Darkwah et al. (2024) show that trade and inflation in ECOWAS countries are strongly influenced by control variables. Similarly, using a panel ARDL approach, Celik et al. (2024) found mixed evidence regarding the relationship between trade and inflation. Therefore, these mixed findings provide a clear empirical basis for applying a specific approach to a particular country, as each economy has different sensitivities (Tahir et al., 2023).

Control Variables and Structural Break Accommodation

Outside the context of trade openness, the empirical literature consistently identifies the exchange rate, the broad money supply, and GDP growth as necessary control variables in macroeconomic discussions (Beirne et al., 2024). Studies by Pham et al. (2023) and Forbes et al. (2018) show that exchange rate movements are transmitted to the domestic price index through import channels. Therefore, for Indonesia, a country that experienced a sharp financial crisis in 1998, exchange rate control is not only a formal methodology but also an empirical necessity. Furthermore, Jawo et al. (2023) suggest that the broad money supply has a significant effect on inflation through the classic monetary channel. This emphasized the importance of including the broad money supply as the variable control of this research (Asab, 2025). Meanwhile, GDP growth captures demand-side inflationary pressures through the output gap

mechanism, thereby separating supply-side and openness-related channels from demand-pull dynamics (Nguyen et al., 2026). Overall, these three control variables form a set of control tools to enhance the credibility and substantive results of the study's estimation.

The accommodation of structural breaks is also an important aspect of this study. According to Perron (1989), the failure to account for discrete structural changes in data formatting can introduce bias in unit root and cointegration tests. Moreover, four high-impact financial crises that occurred, such as the 1974 OPEC Embargo, 1998 Asian financial crisis, 2008 global financial crisis, and 2020 COVID-19 crisis, provide different inflation responses. For instance, the 1974 crisis yielded a 40% inflation rate, and the 1998 crisis a 58,45% inflation rate. These abnormal episodes are controlled through structural-break dummy variables. Therefore, these structural break dummy variables are not only relevant but also statistically necessary.

Research Gap

Although the literature discussion is relatively broad, there is still an important gap that needs to be assessed, especially in Indonesia context. Previous studies primarily focused on inflation as the monetary mechanism, while the role of trade openness as a long-term determinant of the long-term structure remains underexplored. In addition, many studies are limited to short sampling periods, neglect important control variables, and do not accommodate Perron (1998) structural breaks. Accordingly, this research contributes to the study of the relationship between trade openness and inflation by providing long-term empirical analysis.

Conceptual Framework

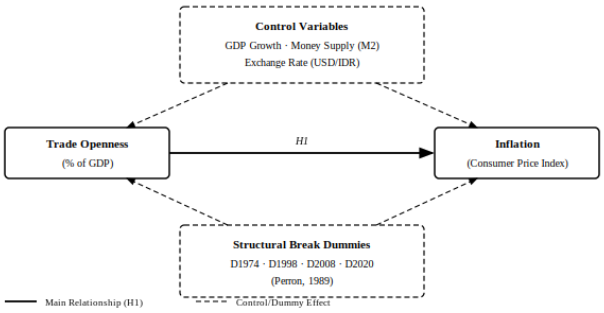

Figure 1. Conceptual Framework

2.5 Research Hypothesis

Based on the theoretical framework and empirical literature that have been discussed, this research proposes the following hypothesis:

H1: Trade openness has a significant long-run effect on inflation in Indonesia over the period 1969–2024.

H2: Trade openness has a significant short-run effect on inflation in Indonesia over the period 1969–2024.

METHOD

Data and Variables

This research uses secondary data from 1969 – 2024, yielding 56 annual observations. All variables are obtained from the World Development Indicators provided by the World Bank.

Inflation, as the dependent variable in this research, will be measured using the consumer price index (CPI), while trade openness will be the independent variable. Also, there are necessary controls that may influence the results of this study, such as GDP growth, broad money supply, and USD/IDR exchange rate. Then, to accommodate Perron's (1989) structural breaks theory, 4 dummy variables representing crucial financial crises in Indonesia will also be included in the model. Those dummies are D1974, D1998, D2008, and D2020. Respectively, those dummies represent the 1974 OPEC embargo, the 1998 Asian financial crisis, the 2008 global financial crisis, and the 2020 COVID-19 crisis.

Descriptive Statistics and Pre-Diagnostic Tests

Before the main estimators are run, several pre-diagnostic tests must be conducted to ensure the validity of the data. First, a unit root test to ensure all data is stationary. Because the ARDL model is applied in this research, the level and 1st difference are valid for use. If a variable is only stationary on the 2nd difference level, that variable must be formed with the log transformation method or be dropped. Then, a simple correlation test will be run to assess the correlation between variables. The safe score for the correlation test is a maximum 9, for a variable to be considered fit into the model. The last is descriptive statistics. The purpose of this test is to draw a big-picture view of all variable data-set situations.

Main Estimators

Using ARDL bound testing, there ar 2 main models will be tested in this research.

Equation 1, Long Term Model:

$$INF_t = \alpha_0 + \beta_1 TO_t + \beta_2 GDP_t + \beta_3 M2_t + \beta_4 USDIDR_t + \lambda_1 D1974_t + \lambda_2 D1998_t + \lambda_3 D2008_t + \lambda_4 D2020_t + \varepsilon_t$$

Equation 2, Short Term / Error Correction Model:

$$\Delta INF_t = \alpha_0 + \beta_1 \Delta TO_t + \beta_2 \Delta GDP_t + \beta_3 \Delta M2_t + \beta_4 \Delta USDIDR_t + \lambda_1 D1974_t + \lambda_2 D1998_t + \lambda_3 D2008_t + \lambda_4 D2020_t + \theta ECT_{t-1} + \mu_t$$

Table 1. Variable Notations

Simbol	Definisi
INF_t	Inflation, estimated by CPI (%)
TO_t	Trade Openness, estimated by the percentage of total trade per GDP (%)
GDP_t	GDP Growth, estimated by the annual percentage growth (%)
M2_t	The percentage of Broad money supply per GDP (%)
USDIDR_t	Exchange rate of USD/IDR
D1974, D1998, D2008, D2020	Structural break dummy variables
α_0	Intercept
β_1–β_4	Independent Variable Coefficient
λ_1–λ_4	Dummy Variable Coefficient
θ	ECT Coefficient
ECT_{t-1}	Error Correction Term, 1 lag
Δ	Operator first difference
ε_t, μ_t	Error term

A hypothesis will be accepted if the corresponding coefficient is statistically significant at the 5% level ($p < 0.05$), and the F-statistic from the bounds test exceeds the upper critical bound for H1.

Post Estimation Diagnostic Tests

After the main estimations have been successfully conducted, several post-tests must be run to ensure the validity of the results. First, a multicollinearity test with variance inflation factors. According to Hair et al. (2010), a VIF lower than 1 indicates no multicollinearity, 5–10 indicates mild multicollinearity, and values above 10 indicate that the variable in question may degrade the validity of the model and should be dropped or noted in the study limitations. Second, the correlation in the model residuals will be tested using the Breusch-Godfrey LM test. Third, a test for heteroscedasticity using the Breusch-Pagan-Godfrey method. Both the Breusch-Godfrey LM and Breusch-Pagan-Godfrey tests yield satisfactory results if the p-value is >0.05. The last is a normality test using the Jarque-Bera method. This test is to ensure the residuals are normally distributed. The failure of normally distributed residuals is not critical in the ARDL model however, it still needs to be mentioned in the limitations.

Robustness Test

To validate the sensitivity and reliability of the main models, this research also conducts a robustness check by re-estimating the models without structural breaks. This method aims to examine whether the model produces the same result when applied to a modified version. The model of robustness check will be formed as follows:

Equation 3 — Robustness Long-Run Model (Without Dummies):

$$INF_t = \alpha 0 + \beta 1\ TO_t + \beta 2\ GDP_t + \beta 3\ M2_t + \beta 4\ USDIDR_t + \varepsilon t$$

Equation 4 — Robustness Short-Run / ECM (Without Dummies):

$$\Delta INF_t = \alpha 0 + \beta 1\ \Delta TO_t + \beta 2\ \Delta GDP_t + \beta 3\ \Delta M2_t + \beta 4\ \Delta USDIDR_t + \theta\ ECT(t-1) + \mu t$$

RESULTS AND DISCUSSION

Pre-Estimation Diagnostic and Descriptive Tests

The unit root test will be conducted with the ADF method. Based on Table 1. below, the results of all variables are satisfactory. Although the broad money supply and the exchange rate are not stationary at their base levels, they need to be expressed in 1st differences; this condition is still suitable for the ARDL model because it can handle the base level and 1st differences simultaneously.

Table 2. ADF Unit Root Test Results

Variable	Level		First Difference		Order of Integration
	t-Statistic	Prob.	t-Statistic	Prob.	
Inflation (CPI)	-4.881	0.0002***	—	—	I(0)
Trade Openness	-3.552	0.0101**	—	—	I(0)
GDP Growth	-5.190	0.0001***	—	—	I(0)
Money Supply (M2)	-1.866	0.3455	-4.367	0.0009***	I(1)
Exchange Rate (USD/IDR)	-0.031	0.9512	-8.750	0.0000***	I(1)

Note: ADF = Augmented Dickey-Fuller test. All tests include intercept only, with automatic lag length selection based on Schwarz Information Criterion (SIC). Probabilities based on MacKinnon (1996) one-sided p-values. '—' indicates the variable is stationary at level and first differencing is not required. Critical values: 1% = −3.555, 5% = −2.916, 10% = −2.596. *** p<0.01, ** p<0.05, * p<0.10. Sample period: 1969–2024.

Then, the correlation matrix shows potential correlations or multicollinearity among variables in the model. Based on the table below, all variables show satisfactory results in the correlation test.

Table 3. Correlation Matrix

Variable	(1)	(2)	(3)	(4)	(5)
(1) Inflation	1.000				
(2) Trade Openness	0.455	1.000			
(3) GDP Growth	-0.409	-0.465	1.000		
(4) Money Supply (M2)	-0.147	0.563	-0.424	1.000	
(5) Exchange Rate (USD/IDR)	-0.294	0.072	-0.383	0.612	1.000

Note: Values represent Pearson correlation coefficients. Only the lower triangle is reported. Sample period: 1969–2024 (n = 56).

Next, the table below presents the descriptive statistics for all variables used in this research. Inflation, as the dependent variable, has averaged about 10% over the last 55 years, with a spread of around 9%. Then, trade openness, as the independent variable, has an average value of 49%. This indicates that around half of Indonesia's GDP growth driver is still domestic activity. The interesting score to look at is the Jarque-Bera Score. Inflation, trade openness, GDP growth, and exchange rate have extreme scores, indicating they are not normally distributed. The extreme score is due to several financial crises mentioned in previous chapters. In short, those descriptive numbers made Indonesia a particularly rich and dynamic case for studying the long-run relationship between trade openness and inflation, given the extensive variation in all key variables across the sample period.

Table 4. Descriptive Statistics

	Inflation	Trade Openness	GDP Growth	M2	Exchange Rate (USD/IDR)
Mean	10.212	49.177	5.392	34.777	6,033.881
Median	7.896	48.876	5.737	38.947	2,625.838
Maximum	58.451	96.182	9.880	59.860	15,855.45
Minimum	1.560	23.841	-13.127	8.462	326.000
Std. Dev.	9.525	11.358	3.182	13.964	5,421.858
Skewness	3.124	1.111	-3.786	-0.335	0.358
Kurtosis	14.645	7.034	22.075	1.941	1.550
Jarque-Bera	407.507	49.496	982.792	3.666	6.102
Probability	0.0000	0.0000	0.0000	0.1599	0.0473
Observations	56	56	56	56	56

Note: All variables cover the period 1969–2024 (n = 56). Inflation measured as annual CPI growth (%); Trade Openness as total trade as % of GDP; GDP Growth as annual real GDP growth (%); M2 as broad money supply as % of GDP; Exchange Rate as official USD/IDR rate. All data sourced from World Bank.

Main Estimation

The results of the F-bounds test are presented in Table 4. Furthermore, the F-statistic of 6.744 substantially exceeds the upper critical bound of 3.15 at the 5% significance level, with k = 8 regressors included in the model. Hence, the null hypothesis of no level relationship is firmly rejected, and cointegration among the variables is confirmed.

Table 5. ARDL Bounds Test Results

Test Statistic	Value	k (Regressors)	I(0) Bound (5%)	I(1) Bound (5%)
F-statistic	6.744***	8	2.11	3.15
Observations	54			
Decision		**Cointegration Confirmed**		

Note: Critical values at 5% significance level from Pesaran et al. (2001). k denotes the number of regressors excluding dummies and constant. Selected model: ARDL(2, 0, 1, 2, 2, 0, 0). Dummies D1974, D1998, D2008, and D2020 included as fixed regressors to control for structural breaks. *** p<0.01. Cointegration is confirmed when the F-statistic exceeds the upper bound I(1) critical value.

The long-run estimation results are presented in Table 5. The interesting information in the table below is the R^2 and adjusted R^2 scores of 0.92 and 0.88, respectively. This indicates that the model can explain 88-92% of the problems discussed in this study. Also, trade openness, as the main independent variable in this research, shows a significant relationship with inflation, as indicated by a p-score lower than 0.05. Thus, H1, which states that trade openness significantly affects inflation in the long term, can be accepted.

Table 6. Long-Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Trade Openness	0.207**	0.068	3.046	0.0043
GDP Growth	0.581**	0.284	2.044	0.0483
Money Supply (M2)	-0.134**	0.050	-2.683	0.0109
Exchange Rate (USD/IDR)	-0.0003**	0.0001	-2.519	0.0163
D1974	43.067**	4.950	8.701	0.0000
D1998	55.728**	9.485	5.876	0.0000
D2008	0.031	2.566	0.012	0.9905
D2020	9.007**	3.537	2.547	0.0153
Constant	1.521	3.663	0.415	0.6805

R^2 = 0.921 Adjusted R^2 = 0.883 F-statistic = 24.521 (p = 0.000) DW = 2.068

Note: Dependent variable: Inflation (CPI). Selected model: ARDL(2, 0, 1, 2, 2, 0, 0). Sample: 1971–2024 (n = 54). Dummies D1974, D1998, D2008, and D2020 included as fixed regressors following Perron (1989). ** p<0.05.

Furthermore, the short-term relationship between inflation and trade is presented in Table 6. The ECT coefficient has a negative value, and a p-score lower than 0.05, which indicates there is a short-term connection between inflation and trade. Therefore, H2, which posits a short-term relationship between inflation and trade, can be accepted.

Table 7. Short-Run Dynamics and Error Correction Term

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INFLATION(-1))	-0.336**	0.150	-2.245	0.0310
D(TRADE)	0.291**	0.100	2.914	0.0061
D(GDPGROWTH)	0.817**	0.388	2.105	0.0423
D(M2)	-0.914**	0.282	-3.240	0.0026
D(USDIDR)	-0.000133	0.001	-0.139	0.8906
D(D1974)	23.811**	5.175	4.602	0.0001
D(D1998)	57.641**	10.227	5.640	0.0000
D(D2008)	0.043	3.609	0.012	0.9905
D(D2020)	12.669**	4.821	2.628	0.0126
ECT(-1)*	**-1.407****	**0.188**	**-7.476**	**0.0000**

$R^2 = 0.921$ Adjusted $R^2 = 0.883$ F-statistic = 24.521 (p = 0.000) DW = 2.068

Note: Dependent variable: ΔInflation (CPI). D() denotes first difference operator. ECT(-1) is the error correction term representing the speed of adjustment toward long-run equilibrium. A negative and significant ECT (-1) confirms long-run cointegration. Selected model: ARDL (2, 0, 1, 2, 2, 0, 0). Sample: 1971–2024 (n = 54). * p-value incompatible with t-Bounds distribution. ** $p<0.05$.

Post Estimation Diagnostic Tests

To ensure the validity of the main test results, several post-diagnostic tests must be conducted. Table 7. shows the results of post-estimation tests of the results, such as multicollinearity, autocorrelation, and heteroscedasticity, and the Jarque-Bera normality test. Other than the normality test, almost all tests show satisfactory results. The Jarque-Bera indicates the residuals of this study are not normally distributed. However, that is not a significant problem in this study because the ARDL bound test can accommodate that. The non-normality has just needed to be mentioned in the limitation. Thus, Table 7. below suggests that there is no problem with the validity of the study results that are shown in Tables 4-6.

Table 8. Post-Estimation Diagnostic Tests

Diagnostic Test	F-Statistic	Prob.	Decision
Multicollinearity (VIF)	Max VIF = 5.162	—	No Multicollinearity ✓
Serial Correlation — Breusch-Godfrey (2 lags)	0.269	0.7659	No Serial Correlation ✓
Heteroscedasticity — Breusch-Pagan-Godfrey	0.634	0.8421	Homoscedastic ✓
Normality — Jarque-Bera	874.176	0.0000	Non-Normal †

Note: H_0 for Breusch-Godfrey: no serial correlation; H_0 for Breusch-Pagan-Godfrey: homoscedasticity. Failure to reject (prob. > 0.05) indicates no problem. VIF threshold: VIF < 5 = acceptable, VIF 5–10 = moderate, VIF > 10 = high multicollinearity. † Normality of residuals is rejected at 5% level; however, as noted by Pesaran & Pesaran (1997), residual normality is not a strict requirement for ARDL validity. Non-normality is attributed to extreme structural break observations in 1974 and 1998. CUSUM stability test and Hausman endogeneity test omitted due to software limitations; endogeneity is addressed by the ARDL bounds test framework which is robust to regressor endogeneity per Pesaran et al. (2001). Sample: 1971–2024 (n = 54).

Robustness Test

Finally, the robustness test will show the consistency of the study results. Table 8 below shows that, when structural breaks are not included, the results are quite mixed. Although cointegration still exists, the significance of the short- and long-term relationships differs markedly. In the short term, trade as the independent variable significantly affects inflation. Aside from GDP growth, other controls, such as the money supply and the exchange rate, also have a significant relationship with inflation in the short term. The contradiction arises in the long term, when independent variables and all control variables have no significant relationship with inflation. Thus, this underscores the importance of the structural-break dummy in explaining the inflation-trade relationship more holistically.

Table 9. Robustness Check — ARDL Without Structural Break Dummies

Variable	Main Model (With Dummies)		Robustness (Without Dummies)	
	Coefficient	Prob.	Coefficient	Prob.
Long-Run Coefficients				
Trade Openness	0.207**	0.0043	0.190	0.3031
GDP Growth	0.581**	0.0483	-0.738	0.1080
Money Supply (M2)	-0.134**	0.0109	-0.184	0.1786
Exchange Rate (USD/IDR)	-0.0003**	0.0163	-0.001	0.0753
Short-Run Coefficients				
D(Trade Openness)	0.291**	0.0061	0.543**	0.0012
D(GDP Growth)	0.817**	0.0423	-0.553	0.1198
D(Money Supply M2)	-0.914**	0.0026	-0.861**	0.0279
D(Exchange Rate USD/IDR)	-0.000133	0.8906	0.003**	0.0359
F-Bounds Statistic	**6.744*** **		**8.210*** **	

Variable	Main Model (With Dummies)		Robustness (Without Dummies)	
	Coefficient	Prob.	Coefficient	Prob.
k (Regressors)	8		4	
I(1) Bound (5%)	3.15		3.49	
ECT(-1)	**-1.407****		**-0.750****	
Decision	**Cointegration Confirmed**		**Cointegration Confirmed**	

Note: The main model includes structural break dummies D1974, D1998, D2008, and D2020 following Perron (1989). The robustness model excludes all dummies. Both models use AIC lag selection. The disappearance of long-run significance in the robustness model confirms that structural breaks fundamentally shape Indonesia's long-run inflation dynamics, and that dummy inclusion is not only theoretically justified but empirically necessary. Short-run trade, money supply, and exchange rate effects remain significant in both models, confirming immediate transmission mechanisms are robust. ECT(-1) remains negative and significant in both models confirming long-run cointegration holds regardless of dummy inclusion. F-bounds critical values from Pesaran et al. (2001) at 5% significance level. ** $p<0.05$, *** $p<0.01$.

Discussion of the Main Findings

The empirical findings generally contradicted the Romer Hypothesis (1993). Inflation and trade have a significant positive relationship, meaning that the more trade activity there is in Indonesia, the higher inflation is. Although, the long-term coefficient of that relationship is quite low, with only 0.207. That score indicates that for every 1% increase in trade activity, inflation will increase by 0.2%. Further analysis: this finding can open new opportunities for research, as it suggests that imported inflation is a probability that drives the country's inflation score. This imported inflation can be implied from the Indonesian currency, which has been declining over the last 50 years. Also, for the short-term relationship, a significant result is shown. This shows the movements of inflation and trade, which are also cointegrated in the short term. Therefore, from the results obtained, H1 and H2 that were formed in the previous chapter, are both accepted.

Control Variables and Structural Breaks

The control variables yield results consistent with the theoretical literature. GDP Growth has a significant long-term relationship and a positive coefficient. This mechanism aligns with demand-pull inflation, which holds that demand activity will create its own inflation. Other controls, such as money supply and exchange rate, also show a significant relationship with inflation. The interesting controls to look at are the structural break dummies. During the robustness test, excluding the dummy variables yields different study findings. Although cointegration still exists, the long-term relationship between inflation and all other independent and control variables becomes insignificant. While, in the short-term, other than GDP growth, the independent and control variables are still significant. These mixed results show the importance of a structural breaks dummy variable in clarifying the research model. In short, those results collectively confirm that Indonesia's inflation dynamics are shaped by a complex interaction of trade exposure, demand conditions, monetary depth, exchange rate movements, and historical structural shocks.

Limitations and Future Research

This study has several limitations that warrant discussion to examine the research results. First, the Jarque-Bera normality test indicates that the residuals are non-normally distributed. Although Pesaran (1997) has stated that the normality test is not critical in the ARDL model, this limitation still needs to be addressed. Also, the CUSUM and Hausman tests cannot be conducted due to software limitations. Furthermore, the suggestion for future research is to address trade openness more thoroughly. As stated above, the contrary of Roman's (1993) theory raises an important question, regarding how trade activities in Indonesia. Thus, assessing how export and import, as part of trade activities, can be an interesting follow-up study for this research. In short, those limitations do not fundamentally undermine the reliability of the results but point toward a productive and vital research agenda for future empirical work on trade and inflation in developing economies.

CONCLUSION

This study concludes that trade openness has a positive and significant effect on inflation in Indonesia in both the short run and the long run during the period 1969–2024. Using the ARDL Bounds Testing approach, the results confirm the existence of a long-run equilibrium relationship among trade openness, inflation, GDP growth, money supply, exchange rate, and structural break variables. Contrary to the Romer Hypothesis, the findings indicate that greater trade openness is associated with higher inflation in Indonesia, suggesting the presence of imported inflationary pressures within an increasingly integrated economy. Furthermore, GDP growth, money supply, and exchange rate dynamics significantly influence inflation, while major structural events such as the 1974 OPEC embargo, the 1998 Asian financial crisis, the 2008 global financial crisis, and the 2020 COVID-19 pandemic play a crucial role in shaping long-term inflation behavior. The robustness analysis further demonstrates that accounting for structural breaks is essential for accurately explaining Indonesia’s inflation dynamics. Overall, the study highlights that inflation in Indonesia is driven by a complex interaction of trade exposure, macroeconomic conditions, exchange rate movements, and historical economic shocks, emphasizing the need for integrated policies that balance trade expansion with macroeconomic stability.

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