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Economic Turbulence in Indonesia: The Effects of Instability and Crisis

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Abstract

Research Originality: This study presents a novel perspective by examining Indonesia's economic growth over three crisis periods. It uniquely highlights how global economic uncertainty can strengthen Indonesia's growth resilience when met with credible domestic policy responses.

Research Objectives: The research investigates the effects of exports, imports, production value, interest rates, economic globalization, exchange rates, and state obligations on Indonesia's economic growth at constant prices.

Research Methods: Using quarterly time-series data from 1991Q1 to 2024Q1, the study employs a Dummy Variable–Autoregressive Distributed Lag model.

Empirical Results: Exports have a direct negative effect on economic growth but when influenced indirectly by the global crisis and the pandemic, exports can actually contribute to growth. On the other hand, imports directly boost growth, but their impact is negatively affected by the global crisis. Additionally, interest rates support long-term growth but hinder it in the short run; however, crises may moderate this impact positively.

Implications: These findings underscore the need for policymakers to craft dynamic, adaptable economic strategies that can safeguard Indonesia's growth against future global shocks and uncertainties.

Keywords:

economic shock; crisis phase; global political tension; structural transformation

How to Cite:

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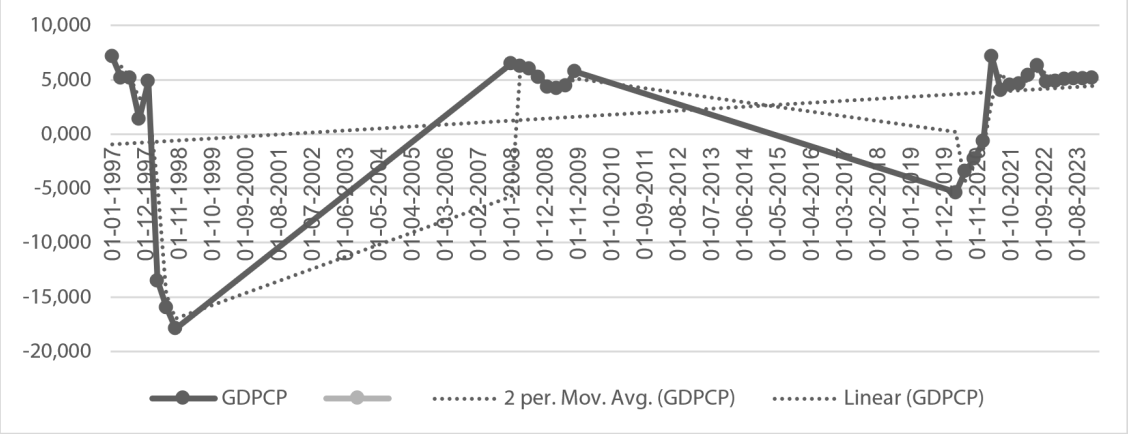
INTRODUCTION

Indonesia's economic growth has experienced significant volatility over the past three decades, shaped by three major crises: the Asian Financial Crisis (1997–1998), the Global Financial Crisis (2008–2009), and the COVID-19 pandemic (2020–2023). These shocks disrupted trade flows, undermined currency stability, and exposed structural vulnerabilities within Indonesia's macroeconomic framework. In such episodes, government responses have typically focused on monetary measures aimed at stabilizing inflation and exchange rates (Desdiani et al., 2022; Hidthiir et al., 2024). As shown in Figure 1, real GDP growth contracted sharply by –5.365% in Q1 2020, reflecting widespread economic dislocations, including labor market contraction, trade disruptions, and productivity stagnation (Dutu, 2016; Ghannili & Choiri, 2024; Nugraha, 2020; Tinungki et al., 2022).

Despite its abundant natural resources and large population, Indonesia's recovery has remained uneven. Manufacturing output and investment have repeatedly been hindered by elevated global uncertainty (Claveria, 2022; Setyawan, 2020). Scholars continue to debate whether crises such as the COVID-19 pandemic catalyze long-term recovery or entrench structural stagnation (Silva & de Araújo, 2023). The International Monetary Fund (2024) emphasizes that economic uncertainty now encompasses not only inflation and growth volatility, but also geopolitical risk, technological disruption, and climate-related threats. In this regard, the World Uncertainty Index (WUI) has become a critical indicator for evaluating asymmetric global shocks to investment, inflation, exchange rates, and capital flows (Bush & López Noria, 2021; Demir & Danisman, 2021; Nguyen & Lee, 2021).

Figure 1. Economic Growth at Constant Prices in Indonesia During the Monetary, Global, and Pandemic Crises



Source: FRED (2024), Data Processed

Indonesia's economic resilience thus depends on effective coordination between external policy instruments and domestic macroeconomic management. The central bank plays a pivotal role in guiding monetary policy, often employing Dynamic Stochastic General Equilibrium (DSGE) models to evaluate inflation targeting and interest rate transmission (Mohamad et al., 2020; Zams, 2021). However, many existing studies are

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limited in scope—either examining single crisis episodes, focusing narrowly on individual macroeconomic variables (Ghannili & Lucky, 2024; Sutarjo et al., 2021), or employing static models that fail to capture structural dynamics across time. Furthermore, few studies incorporate structural breaks or nonlinearities associated with crisis episodes, despite their relevance in shaping long-run economic outcomes. While some studies highlight the roles of trade and productivity (Van der Eng, 2010), others question their effectiveness under conditions of sustained volatility (Bonciani & Ricci, 2020; Thorbecke, 2023).

Many studies overlook how crises evolve. Hidthiir et al. (2024) found that while financial development boosts long-term growth in ASEAN countries, short-term stability needs comprehensive policies. Sutarjo et al. (2021) highlighted the long-term effects of exports, imports, interest rates, and exchange rates on Indonesia's growth from 1990 to 2029. Mohamad et al. (2020) found mixed effects of exchange rates on growth in several Asian countries during the 1997 crisis. Van der Eng (2010) finds that Indonesia's manufacturing sector had a negative impact on growth in specific periods, though gains were seen later, reflecting policy and institutional changes. TFP stabilized during major shocks, highlighting the role of stable monetary policy, as shown by Dutu (2016), who found that interest rate smoothing and exchange rate responsiveness enhance growth. Thorbecke (2023) notes that industrial and sectoral measures had little impact in mitigating the COVID-19 crisis. Similarly, Bonciani & Ricci (2020) highlight that global economic uncertainty, as measured by the World Uncertainty Index, severely hampers growth in 144 small and developing economies, particularly those in trade and monetary alliances.

This study fills a significant gap in the literature by examining how multiple crises and global economic uncertainty simultaneously shape Indonesia's economic performance over an extended period. Previous studies typically address isolated crisis events or fail to capture the structural shifts that accompany long-term volatility. By integrating structural break analysis and the World Uncertainty Index into the DV-ARDL framework, this study reveals how global uncertainty, rather than being solely a challenge, can act as a catalyst for resilient growth when met with credible domestic policy responses (Gonese et al., 2023; Handoyo et al., 2020; Hatmanu et al., 2020; Sunde, 2017; Ugurlu, 2024). The study also incorporates the World Uncertainty Index to account for the influence of global volatility explicitly. Specifically, this research aims to evaluate the asymmetric effects of key macroeconomic variables on growth during and after crisis periods and provide empirically grounded policy insights to strengthen Indonesia's economic resilience in the face of future shocks.

METHODS

This study uses quarterly time-series data from 1991-Q1 to 2024-Q1, sourced from the Federal Reserve Economic Data, focusing on Indonesia's real GDP (hereafter GDPCP or growth) as the dependent variable. The use of FRED data in this study is because the database provides greater accuracy in economic time series data obtained

from various sources. These time series include banking, business/fiscal, consumer price index, employment and population, exchange rate, gross domestic product, interest rate, monetary aggregates, producer price index, and others. Independent variables include the price value of goods and services measured through exports (hereafter EXP) and imports (hereafter IMP), productivity, as measured by total manufacturing output (hereafter PRO), interest rate policy represented by the overnight (<24 hours) benchmark interest rate (hereafter IR), the exchange rate measured by the real effective exchange rate (hereafter ER), economic globalization measured using the global uncertainty index (hereafter EG), and the state obligations measured by foreign debt (hereafter FD). Three dummy variables represent major crises: the Asian financial crisis (1997-Q1 to 1998-Q4), the global financial crisis (2008-Q1 to 2009-Q4), and the COVID-19 pandemic (2020-Q2 to 2023-Q1). Variable descriptions are detailed in Table 1.

Table 1. Description of Data and Data Sources

Variables	Description	Unit description	Sources
GDPCP	Economic growth at constant prices	Quarterly percentage	Statistika (2025)
EXP	The price value of goods and services measured through exports	Percentage of GDP	Statistika (2025)
IMP	The price value of goods and services measured through imports	Percentage of GDP	Statistika (2025)
PRO	Productivity, as measured by total manufacturing output	Percentage of GDP	Statistika (2025) and Federal reserve economic data
IR	Interest rate policy represented by the overnight (<24 hours) benchmark	Percentage	Statistika (2025)
EG	Economic globalization measured using the global uncertainty index	Global index	Statistika (2025) and Federal reserve economic data
ER	The exchange rate measured by the real effective exchange rate	Percentage of US$	Federal reserve economic data
FD	The state obligations measured by foreign debt	Percentage of US$	Federal reserve economic data
D1	Monetary Crisis (1997-Q1 to 1998-Q4)	0 did not experience a crisis and 1 experienced a crisis	Author compilation (dummy)
D2	Global Crisis (2008-Q1 to 2009-Q4)	0 did not experience a crisis and 1 experienced a crisis	Author compilation (dummy)
D3	Pandemic Crisis (2020-Q2 to 2023-Q1)	0 did not experience a crisis and 1 experienced a crisis	Author compilation (dummy)

Source: Author Compilation

This study applies the Dummy Variable–Autoregressive Distributed Lag model, a modified ARDL (Autoregressive Distributed Lag) approach, to assess the impacts of

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the monetary crisis, global financial crisis, and COVID-19 pandemic on Indonesia's economy. The method is suitable for time-series analysis with mixed integration orders and allows for consistent estimation across crisis periods. It aligns with macroeconomic research using GDPCP as the dependent variable, as supported in time-series literature (Breitung & Salish, 2021). Moreover, ARDL captures dynamic effects before, during, and after each crisis period. The econometric form of the model is specified as follows:

Equation (1) short-term estimation:

$$GDPCP_t=\propto_0+\propto_1 EXP_T+\propto_2 IMP_T+\propto_3 PRO_T+\propto_4 IR_T+\propto_5 EG_T+\propto_6 ER_T+\propto_7 FD_T+\propto_8 EXP^*Crisis_t + \propto_9 IMP^*Crisis_t + \propto_{10} IR^*Crisis_t + \propto_{11} D_{n(t)}+\alpha_{12} EC_{t-1} + \epsilon_t \quad (1)$$

Equation (2) long-term estimation:

$$\Delta GDPCP_t=\beta_0+\beta_1\Delta(EXP)_T+B_2\Delta(IMP)_T+B_3\Delta(PRO)_T+B_4\Delta(IR)_T+B_5\Delta(EG)_T+B_6\Delta(ER)_T+B_7\Delta(FD)_T + \beta_8\Delta(EXP^*Crisis)_t + \beta_9\Delta(IMP^*Crisis)_t + \beta_{10}\Delta(IR^*Crisis)_t+\beta_{11}\Delta(D_{n(t)})+ + \epsilon_t \quad (2)$$

In Equations (1) and (2), EC is the error correction term, capturing the balance of shocks over time, while other abbreviations refer to Table 1.

The DV-ARDL model estimation follows several key stages. First, descriptive statistics, OLS regression, and heteroscedasticity tests are performed to examine the characteristics of each variable, assess their individual effects, and ensure the efficiency of the model's error term. Second, unit root tests are conducted to determine the stationarity of the data, whether at level (0) or first difference (1) (Sunde, 2017), including structural break analysis to ensure model reliability (Çamalan et al., 2025). Third, a cointegration bounds test assesses the joint significance of crisis variables at 1%, 5%, and 10% levels (Breitung & Salish, 2021). DV-ARDL then estimates short- and long-term crisis effects, with model stability confirmed through CUSUM and CUSUM-Q tests (Figures 2–4).

RESULTS AND DISCUSSION

Table 2 presents the descriptive statistics of all variables used in this study. The dependent variable, GDPCP, has a mean of 4.768, a median of 5.188, with a maximum of 10.74 and a minimum of –17.93. Among the independent variables, exchange rate has the lowest mean (0.195), while productivity has the highest (53.977). Foreign debt averages US$22,492.565, reflecting the state's fiscal burden. The data shows a significance level below 1%, indicating the overall data has no similarity (stochastic). A total of 129 observations meets the requirement for time-series analysis. These findings align with prior research (Hidthiir et al., 2024; Mohamad et al., 2020; Sutarjo et al., 2021; Van der Eng, 2010).

Table 3 presents regression results from 1991-Q1 to 2024-Q1, showing the impact of crises on economic growth. The model is significant with an R-squared value of 0.651524, indicating a good fit and consistency. Production does not have an effect, while most other variables are significant. GDPCP impacts commodity imports and economic globalization, while foreign debt has a strongly negative impact on GDP. Exchange and interest rates have minimal impact on productivity and lack significant

correlation with growth. Global uncertainty and imports are key growth drivers, while exchange rates, interest rates, and monetary policies have a limited impact on sustained economic performance.

Table 2. Descriptive Analysis

	GDPCP	EXP	IMP	PRO	IR	EG	ER	FD	D1	D2	D3
Mean	4.768	22.181	16.749	53.977	10.708	0.198	0.195	3.594	0.06	0.06	0.09
Median	5.188	20.309	16.392	-13.098	8	0.165	-0.069	3.771	0	0	0
Maximum	10.744	48.833	28.619	5057.952	68.76	0.877	50.350	4.908	1	1	1
Minimum	-17.929	14.320	0	-2711.992	3.5	0	-48.219	0	0	0	0
Std. Dev.	4.058	6.241	3.534	689.494	8.839	0.165	7.440	1.095	0.239	0.239	0.287
Skewness	-3.394	2.043	-0.832	4.635	3.830	1.397	0.140	-0.877	3.7	3.7	2.861
Kurtosis	17.198	8.669	10.024	37.089	22.162	5.364	30.920	4.195	14.689	14.689	9.183
Jarque-Bera	1372.486	270.652	288.739	6915.881	2359.984	74.257	4320.216	24.980	1060.612	1060.612	393.2
Probability	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sum	634.223	2950.041	2227.586	7178.965	1424.217	26.303	25.927	478.072	8	8	12
Sum Sq. Dev.	2174.3	5140.6	1649	62753140	10313.5	3.597	7307.5	158.2	7.5	7.5	10.9
Observations	133	133	133	133	133	133	133	133	133	133	133

Source: Author Compilation

Table 3. Regression Results of the Crisis Effect on Growth

Variable	Indonesia's Growth During Crisis (*Static*)			
	Coefficient	Std. Error	t-statistic	Prob.
Constant	12.29648	1.386360	8.869360	0.0000[a]
Export	-0.252787	0.056062	-4.509062	0.0000[a]
Import	0.338819	0.085624	3.957063	0.0001[a]
Productivity	0.000440	0.000322	1.366481	0.1743
Interest Rate	-0.259930	0.036832	-7.057204	0.0000[a]
Economic Globalization	3.114855	1.471598	2.116647	0.0363[b]
Exchange Rate	-0.071679	0.031427	-2.280813	0.0243[b]
Foreign Debt	-1.352065	0.278778	-4.849972	0.0000[a]
Economic Crisis	-2.745493	0.564155	-4.866561	0.0000[a]
R-squared	0.651524			
F-statistic	28.97934			
Prob (F-statistic)	0.000000			

Note : Symbol [a,b, dan c] is the value of the significant level of 1%, 5%, and 10%.
Source: Author Compilation, FRED (2024)

Table 4 presents various heteroscedasticity tests to assess whether the residual variance in the regression model is constant. The tests include ARCH, White test, Breusch-Pagan

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test, Harvey test, and Glejser test. The ARCH, Harvey, White, Breusch-Pagan and Glejser tests accept the alternative hypothesis (H_1), indicating potential heteroscedasticity. These results indicate that the regression model is affected by heteroscedasticity, although not consistently across all tests.

Table 4. Heteroscedasticity Test

	ARCH	White	Breusch-P	Harvey	Glejser
F-statistic	2.030496	1.232358	1.374296	0.337133	1.421439
Obs*R-squared	2.030020	84.05345	16.06341	4.342423	16.54485
Scaled explained SS		210.4695	40.22273	8.271924	23.39571
Prob. F(1,128)	0.1566				
Prob. F(77,53)		0.2110			
Prob. F(12,118)			0.1877	0.9807	0.1656
Prob. Chi-Square (1)	0.1542*				
Prob. Chi-Square (77)		0.2725*			
Prob. Chi-Square(12)			0.1883*	0.9764*	0.1675*

Notes: *The critical value is greater than 5
Source: Author Compilation

Table 5. Unit Root Test

Variables	Augmented Dickey-Fuller test (ADF)		Phillips-Perron test (PP)		Information
	Level	First Diff.	Level	First Diff.	
GDPCP	-4.364089[a]		-3.230846[b]		I(0)
EXP	-2.367199	-9.479852[a]	-2.674416[c]		I(1)
IMP	-4.219713[a]		-3.193389[b]		I(0)
PRO	-11.48424[a]		-11.48518[a]		I(0)
IR	-3.648597[a]		-3.358865[b]		I(0)
EG	-7.199698[a]		-7.489305[a]		I(0)
ER	-8.174290[a]		-10.87866[a]		I(0)
FD	-1.165113	-11.39559[a]	-1.261215	-11.39559[a]	I(1)
D1	-3.043954[b]		-3.312543[b]		I(0)
D2	-3.043954[b]		-3.312543[b]		I(0)
D3	-0.234720	-6.452996[a]	-2.635767[c]		I(I)

Notes: Symbol [a,b, dan c] is the value of the significant level of 1%, 5%, and 10%.
Source: Author Compilation

Table 5 shows that all variables—EXP, IMP, PRO, IR, EG, ER, FD, D1, D2, D3, and GDPCP—are non-stationary at level but become stationary at the first difference. These results justify the use of the ARDL model for both short-run and long-run

cointegration analysis, particularly when ADF and PP tests fail to confirm stationarity at level (I(0)) but confirm it at the first difference (I(1)). Thus, it is concluded that all variables meet the stationarity requirement and are suitable for further ARDL-based cointegration analysis.

Table 6 shows the results of unit root testing with two structural breaks at the lower (BTB) and upper (BTA) bounds. In model (I), GDPCP remains stable between 1991-Q4 and 1999-Q3 (t = –5.099). In model (II), when the trend is influenced by the crisis, the stability shifts slightly to 1991-Q3 to 1998-Q4 (t = –6.037), reflecting the impact of the economic crisis. Productivity remains stable until 2009-Q4, while foreign debt shows stability at 2011-Q4. These results suggest that several variables—including GDPCP, EXP, IMP, PRO, IR, EG, ER, and FD—undergo significant structural changes before, during, and after crises, beginning in 1991-Q1.

Table 6. Unit Root Test with Two Structural Breaks

Variables	Break point basic intercept (I)			Break point basic intercept and trend (II)		
	t-stats	BTB	BTA	t-stats	BTB	BTA
GDPCP	-5.099366	1991Q4	1999Q3	-6.037504	1991Q3	1998Q4
EXP	-3.085121	1992Q1	2008Q2	-6.487571	1992Q2	1997Q3
IMP	-6.772725	1991Q1	1998Q1	-6.682381	1991Q4	2007Q4
PRO	-14.43551	1991Q2	2009Q4	-14.29234	1991Q2	2009Q4
IR	-6.755477	1991Q3	1998Q2	-8.274454	1993Q1	1999Q3
EG	-8.183207	1991Q2	2005Q1	-8.951782	1991Q2	2001Q3
ER	-12.38558	1991Q2	1998Q4	-12.84569	1991Q2	1998Q4
FD	-1.325642	1991Q3	2011Q4	-2.927510	1991Q3	2002Q1

Note: The test model shows the critical values in model (I) (-4.949, -4.443, -4.193) and in model (II) (-5.719, -5.176, -4.894) at 1%, 5%, and 10%, respectively. BTB (lower quarter limit) and BTA (upper quarter limit) are the first and second breaks. GDPCP, EXP, IMP, PRO, IR, EG, ER, FD affected by the trend of economic crisis in 1991-Q1.

Source: Author Compilation

Table 7 outlines the optimal lag selection based on the Akaike Information Criterion (AIC) and Schwarz Criterion (SC). The AIC suggests the optimal lag at lag 8 (AIC-KP = 52.99847), while the SC identifies lag 2 as optimal across multiple models (AC-KM = 55.54666, KG = 56.31314, KP = 55.62366). These criteria help determine how much past economic activity (inertia) influences current growth. Thus, the SC model is preferred due to its lower inertia at lag 2, compared to the AIC model, which indicates higher inertia at lag 6.

Table 8 presents the cointegration test results using the bound test for the variables during the crisis periods. The F-statistic values are 21.29096 (monetary crisis), 14.60115 (global crisis), and 18.76307 (pandemic crisis), all of which are greater than the critical values of 1.5 at the 10% level, confirming a long-term relationship between them during each crisis. Therefore, the bound test results confirm the presence of a long-term relationship in the ARDL model.

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Table 7. Lag Order of Economic Crisis using VAR (Vector Autoregression)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-4094.153151200108	NA	2.30e+18	67.82071	68.02866	67.90517
1	-3231.894665249074	1581.995	5.69e+12	54.90735	56.98686*	55.75192*
2	-3134.659718397112	163.9333	4.44e+12	54.63900	58.59008	56.24369
3	-3043.589331736858	139.9925	3.96e+12*	54.47255	60.29519	56.83735
4	-2971.041869364821	100.7271	5.06e+12	54.61226	62.30646	57.73717
5	-2895.919075531219	93.12743	6.68e+12	54.70941	64.27517	58.59443
6	-2795.154976759749	109.9245*	6.40e+12	54.38273*	65.82005	59.02786
7	-2735.031099066479	56.64564	1.39e+13	54.72779	68.03667	60.13303
8	-2646.730157879596	70.05695	2.32e+13	54.60711	69.78756	60.77247

Note: *indicates lag order selected by the criterion
Source: Author Compilation

Table 8. Cointegration Test (Bound Test)

Dependent/ independent variables	F-statistic	10%		5%		1%		Explanation
		I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	
Monetary crisis	21.29096	1.76	2.77	1.98	3.04	2.41	3.61	Accepted Ha
Global crisis	14.60115	1.76	2.77	1.98	3.04	2.41	3.61	Accepted Ha
Pandemic crisis	18.76307	1.76	2.77	1.98	3.04	2.41	3.61	Accepted Ha

Source: Author Compilation

Table 9 shows the long-term and short-term estimation results from ARDL. During the monetary crisis in exports and foreign debt have a significant negative impact on growth, while imports have a significant positive effect. During the global crisis in interest rates, exchange rate negatively affects growth, while economic globalization contributes positively. During the pandemic in interest rates, exports, exchange rates —all indirectly affected by the crisis — significantly boost growth. The model shows strong statistical significance, with an F-statistical probability of 0.000 (<1.5 and 10%) and R-square of 0.580263 (monetary crisis), 0.368377 (global crisis), and 0.460572 (pandemic), indicating fairly good explanatory power and fairly consistent variation across crises.

And, presents the short-term estimation results. During the monetary crisis in imports and foreign debt significantly and negatively affect growth. In the global crisis in imports and economic globalization has a significant positive impact on growth. In contrast, during the pandemic in interest rates and exchange rate again shows a significant negative effect, reinforcing its adverse influence across crisis periods. The R-squared values are 0.7503 (monetary crisis), 0.6089 (global crisis), and 0.6660 (pandemic), indicating strong model fit. Additionally, all models report a probability (F-statistic) of 0.000 < 1.5 and 10%, confirming the short-term significance of the variables and rejecting the null hypothesis (H_0).

Table 9. Stability of Long-Term and Short-Term Estimates

Variables	Monetary Crisis (I)		Global Crisis (II)		Pandemic Crisis (III)	
	Long Term	Short Term	Long Term	Short Term	Long Term	Short Term
GDPCP(-1)		0.0267		0.7999		0.7899
		-0.190447[b]		-0.022965		-0.022234
EXP	0.1025	0.0282*	0.0383	0.0281	0.0244	0.0170
	0.194703	0.245126[b]	-0.190023[b]	-0.194387[b]	-0.191808[b]	-0.196072[b]
IMP	0.4302	0.4288	0.5326	0.5320	0.5690	0.5685
	0.052460	0.062451	0.059446	0.060811	0.047899	0.048964
PRO	0.0411	0.1252*	0.5456	0.5437	0.7979	0.7983
	0.000533[b]	0.000269	0.000121	0.000124	-4.26E-05	-4.36E-05
IR	0.0030	0.0028*	0.0000	0.0009*	0.0000	0.0003*
	-0.241963[a]	-0.204818[a]	-0.254274[a]	-0.157505[a]	-0.250759[a]	-0.157714[a]
EG	0.7897	0.7896	0.0100	0.0683*	0.0270	0.1595*
	0.115247	0.137195	4.483510[b]	1.977029[c]	3.671205[b]	1.408058
ER	0.2332	0.2275	0.0043	0.0017	0.0012	0.0004
	-0.033052	-0.039347	-0.073878[a]	-0.075574[a]	-0.078138[a]	-0.079876[a]
FD	0.3676	0.3659	0.9007	0.9007	0.0047	0.0037
	-0.228582	-0.272115	-0.047129	-0.048211	1.890791[a]	1.932831[a]
EXP*Crisis	0.0003	0.0031*	0.9360	0.9361	0.9013	0.9013
	-1.346690[a]	-1.304268[a]	-0.039864	-0.040780	-0.072395	-0.074004
IMP*Crisis	0.0261	0.0202*	0.8977	0.8977	0.6476	0.6471
	1.074856[b]	1.245570[b]	0.080456	0.082304	0.321848	0.329004
IR*Crisis	0.0022	0.0806*	0.9176	0.9175	0.0099	0.0075
	0.349580[a]	0.169837[c]	-0.113699	-0.116310	-2.362706[a]	-2.415238[a]
Constant	0.5917		0.7576		0.9516	
	-0.062748		-0.051107		-0.009491	
CointEq		0.0000		0.0000		
		-1.190447		-1.022965		
R-squared	0.580263	0.750291	0.368377	0.608959	0.460572	0.666037
F-statistic	9.189190	21.29096	5.249011	14.60115	7.684348	18.76307
Prob(F-statistic)	0.000000		0.000000		0.000000	
Akaike info criterion	3.876457	3.708518	4.237483	4.069544	4.079699	3.911760
Schwarz criterion	4.271523	3.862155	4.544756	4.135388	4.386972	3.977605

Note: The critical level criteria [a, b, and c] are the percentages of 1%, 5%, and 10%. The independent variable is economic growth at constant prices. ARDL-crisis (I) (1,1,0,1,1,0,0,0,1,1,1), ARDL-crisis (II) (1,0,0,0,1,1,0,0,0,0,0), ARDL-crisis (III) (1,0,0,0,1,1,0,0,0,0,0). * p-values are incompatible

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Figure 2. CUSUM and CUSUM-Q for coefficient stability of ARDL Monetary Crisis Model

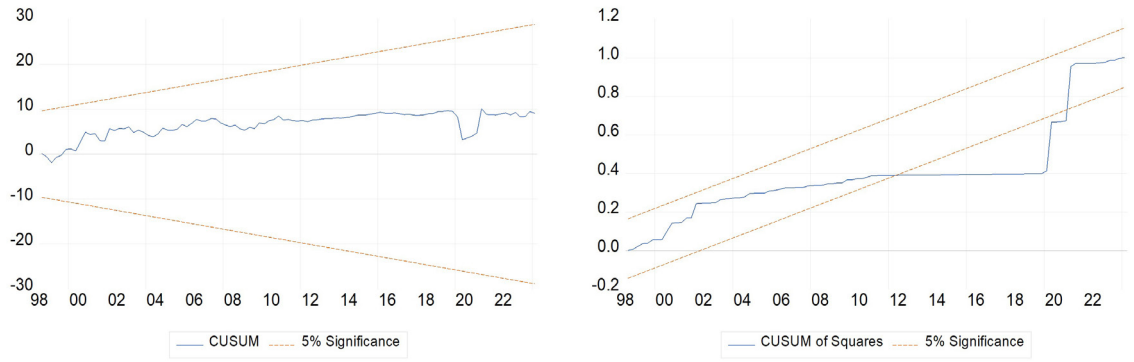
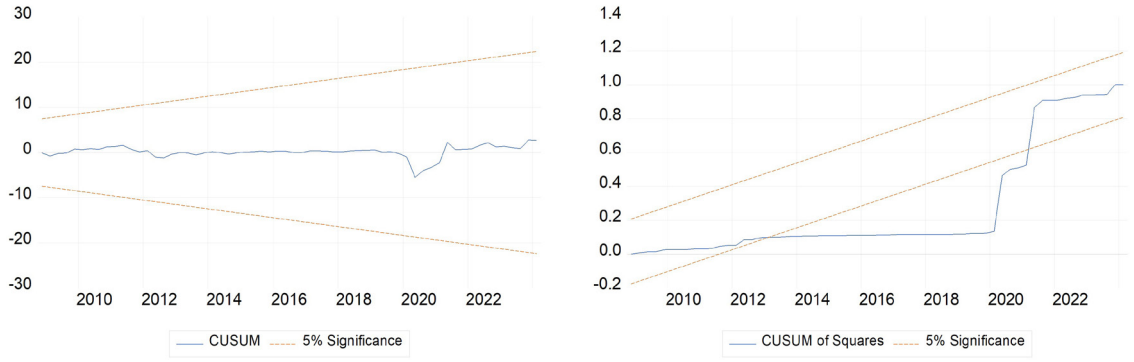


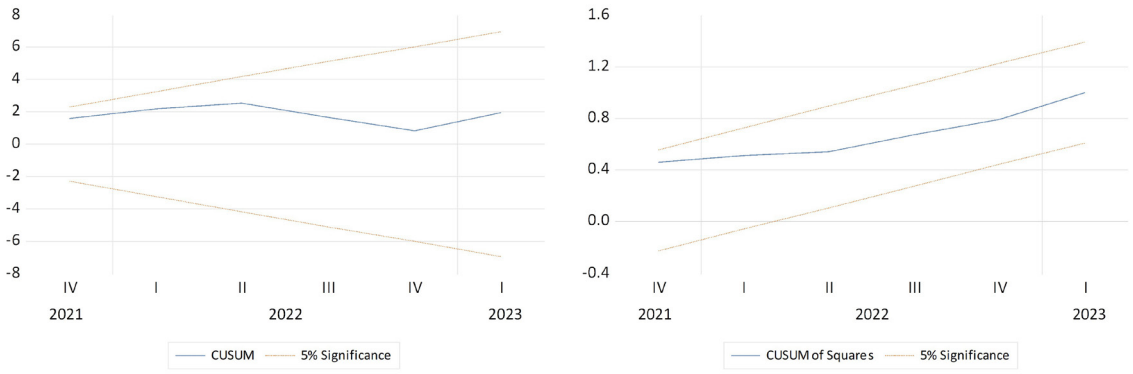
Figure 3. CUSUM and CUSUM-Q for coefficient stability of the ARDL Global Crisis Model



Figures 2 to 4 show CUSUM and CUSUM-Q test plots assessing ARDL model coefficient stability during different crises. In Figure 2 (monetary crisis), the CUSUM plot remains stable within the 5% significance bounds, but the CUSUM-Q plot shows growth variability shifts from 2011 to 2020. In Figure 3 (global crisis), the CUSUM plot shows slight deviations, with growth fluctuations from 2012 to 2020. Figure 4 (pandemic crisis) shows no major structural shocks, with both plots within confidence bounds. Overall, these results suggest that economic stability varied across crisis periods, with greater instability observed during the monetary and global crises than during the pandemic.

This study finds that trade, particularly exports, significantly influences Indonesia's economic growth at constant prices, both in the short and long term. However, unlike previous research by Ghazouani et al. (2020), Carrasco & Tovar-García (2021), Nasreen & Anwar (2014), and Were (2015), which identifies trade as a consistent engine of growth, our results suggest a more nuanced relationship. While exports and imports contribute positively in the short term, their long-run effects appear negative due to structural inefficiencies and elevated residual values. These findings underscore the limitations of Indonesia's trade infrastructure, exacerbated by institutional weaknesses and external shocks.

Figure 4. CUSUM and CUSUM-Q for coefficient stability of ARDL Pandemic Crisis Model



Rahman (2021) argues that trade benefits younger economies, but this study shows that such advantages diminish over time when structural rigidity persists. Our results highlight the urgent need for legal reform, improved export competitiveness, and policy coordination—supporting perspectives from Elfaki et al. (2021) and Nathaniel et al. (2021) regarding commodity governance and international cooperation.

Indonesia's manufacturing sector exhibits only marginal influence on GDP growth, particularly during times of crisis. Although short-term gains were observed during the monetary and global crises, these were not statistically significant. The long-term impact was negative, especially during the global crisis and the pandemic. These findings align with Van der Eng (2010) and Thorbecke (2023), who contend that manufacturing may offer temporary recovery benefits but lacks resilience under sustained shocks. In contrast to studies that emphasize the industrial sector's role in recovery, our analysis reveals a systemic weakness in Indonesia's manufacturing framework. This emphasizes the need for structural transformation through enhanced production quality, investment in human capital, and adaptive industrial policies (Aginta & Someya, 2022).

The study confirms that Indonesia's benchmark interest rate had a negative short-term effect during the 1997/1998 monetary crisis, but exerted a positive influence over the long term. This finding is consistent with Sutarjo et al. (2021), who noted the extreme volatility of Bank Indonesia Certificates—reaching 58.4%—and the resulting inflationary shock of approximately 70%. Such macroeconomic turmoil triggered loan defaults, business closures, and capital flight, amplified by weak monetary oversight and political instability. Bonciani & Ricci (2020) similarly note that during the global financial crisis, monetary policy struggled to stabilize financial cycles amid rising interest rates and exchange rate pressures. In contrast to previous studies, our findings illustrate the dual role of interest rates in crisis contexts: both as stabilizers and sources of volatility. This result underscores the need for context-sensitive monetary policy aligned with institutional and market realities.

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In contrast to conventional expectations, this study finds that global uncertainty—measured by the Global Economic Uncertainty Index—had a positive impact on Indonesia's economic growth during crisis periods. This outcome supports the theoretical models proposed by Behera et al. (2023), Dai et al. (2021), and Fazelabdolabadi (2019), which suggest that uncertainty can incentivize reform-oriented and resilient economic behavior.

Céspedes et al. (2020) emphasize the role of public confidence in crisis management. Extending this view, our findings stress that policy credibility, institutional adaptability, and transparent communication are equally vital. Indonesia's ability to convert external shocks into momentum for investment and reform marks a unique contribution to the literature on growth under uncertainty.

This study finds minimal and inconsistent effects of the real effective exchange rate on GDP across crisis periods. During the pandemic, the long-run contribution was only 0.0291%. These findings diverge from Dutu (2016) and Sutarjo et al. (2021), who argue that exchange rate appreciation fosters growth. The discrepancy likely stems from structural factors: reliance on imported inputs, volatile export pricing, and underutilization of the local currency. While previous studies, such as those by Mohamad et al. (2020), highlight mixed impacts depending on the model used (OLS, REM, FEM), our study adds clarity by identifying the critical role of coordinated policy—particularly in currency pricing, fiscal incentives, and export diversification—in enhancing the growth potential of exchange rate adjustments.

Consistent with Azam et al. (2013), Cahyadin & Sarmidi (2019), and Triatmanto et al. (2023), our analysis confirms the negative impact of foreign debt on growth during monetary, global, and pandemic crises. Poorly managed external debt leads to depreciation, inflation, and reduced investor confidence, ultimately eroding economic stability. While Sudarma & Yasa (2021) and Bordo & Meissner (2009) note the conditional benefits of debt in supporting key sectors, our study underscores the primacy of governance. Transparent, targeted, and accountable debt strategies are essential for converting external financing into productive investment, especially in labor-intensive and social infrastructure sectors.

CONCLUSION

This study analyzes the impact of various economic factors on Indonesia's GDP from 1991-Q1 to 2024-Q1, using a Dummy Variable – Autoregressive Distributed Lag (ARDL) approach to determine the effects of the monetary, global, and pandemic crises. This study reveals that Indonesia's macroeconomic growth dynamics are shaped not only by traditional variables such as trade, interest rates, and exchange rates, but also by institutional adaptability and the capacity to respond to crisis-induced uncertainty. Contrary to mainstream literature, our findings suggest that the positive effects of trade and interest rates are often temporary and vulnerable to external shocks and governance inefficiencies. Meanwhile, manufacturing output and foreign debt contribute little—or

even negatively—to long-term growth when not aligned with structural reforms. Most notably, this study highlights a counterintuitive but critical insight: global economic uncertainty, when met with responsive and credible domestic policy, can act as a growth catalyst. This challenges conventional crisis narratives and introduces a new perspective—where resilience, not mere recovery, becomes the foundation of sustained economic progress.

This implication provides insight into the importance of policymakers to reframe trade policy for a value creation shift from commodity volume to value-added exports through industrial upgrading, legal reform, and investment in trade infrastructure. Revitalizing manufacturing with innovation is redirecting industrial policy towards technology, skilled labor, and crisis-resilient supply chains to restore long-term productivity. Refining monetary instruments for stability involves tailoring interest rate responses to crisis contexts and strengthening coordination between fiscal and monetary actors to protect growth. Institutionalizing crisis-responsive governance leverages uncertainty through agile policymaking—building anticipatory systems, transparent communication, and stakeholder trust. An anchor exchange rate strategy in domestic strength enhances domestic currency utility and reduces external vulnerability by fostering local input usage and currency-based trade. Aligning debt with strategic sectors ensures foreign borrowing supports high-impact areas like health, education, and infrastructure, with strict accountability and performance-based outcomes.

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