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Do Global Factors Drive Domestic Inflation? Evidence from ASEAN Emerging Markets Using ARDL Approach

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Abstract

General Background Price stability remains a major macroeconomic challenge for emerging economies that are vulnerable to global economic fluctuations. **Specific Background** In five ASEAN emerging markets, namely Indonesia, Malaysia, Thailand, the Philippines, and Vietnam, domestic price dynamics are linked to global supply chain pressure, crude oil prices, and the U.S. Federal Funds Rate. **Knowledge Gap** Previous studies often examine these external shocks separately, focus on single-country cases, or rely on annual data, leaving limited evidence on their combined role using monthly panel data across ASEAN emerging markets. **Aims** This study analyzes how the Global Supply Chain Pressure Index, crude oil prices, and the Federal Funds Rate relate to domestic inflation from January 2015 to December 2025. **Results** Using 660 monthly observations and a panel Autoregressive Distributed Lag model with the Pooled Mean Group estimator, the study confirms a stable long-run equilibrium. Oil prices show a positive long-run coefficient of 0.050, while GSCPI and FFR show significant negative coefficients of -0.557 and -0.394. The error correction term indicates that 55.2% of disequilibrium is corrected monthly. Country-specific findings show heterogeneous short-run patterns across Indonesia, Vietnam, the Philippines, Thailand, and Malaysia. **Novelty** This study integrates three global external variables into a cross-country monthly panel framework for ASEAN emerging markets. **Implications** Policymakers should distinguish long-run global shock transmission from country-specific short-run responses when preserving price stability.

Highlights:

- GSCPI and FFR produced significant negative coefficients in PMG estimation.
- Equilibrium correction reached 55.2% each month across the pooled model.
- Country patterns differed across Indonesia, Vietnam, Philippines, Thailand, and Malaysia.

Keywords: Inflation, Panel ARDL, Federal Funds Rate, ASEAN Emerging Markets, Global Supply Chain Pressure Index

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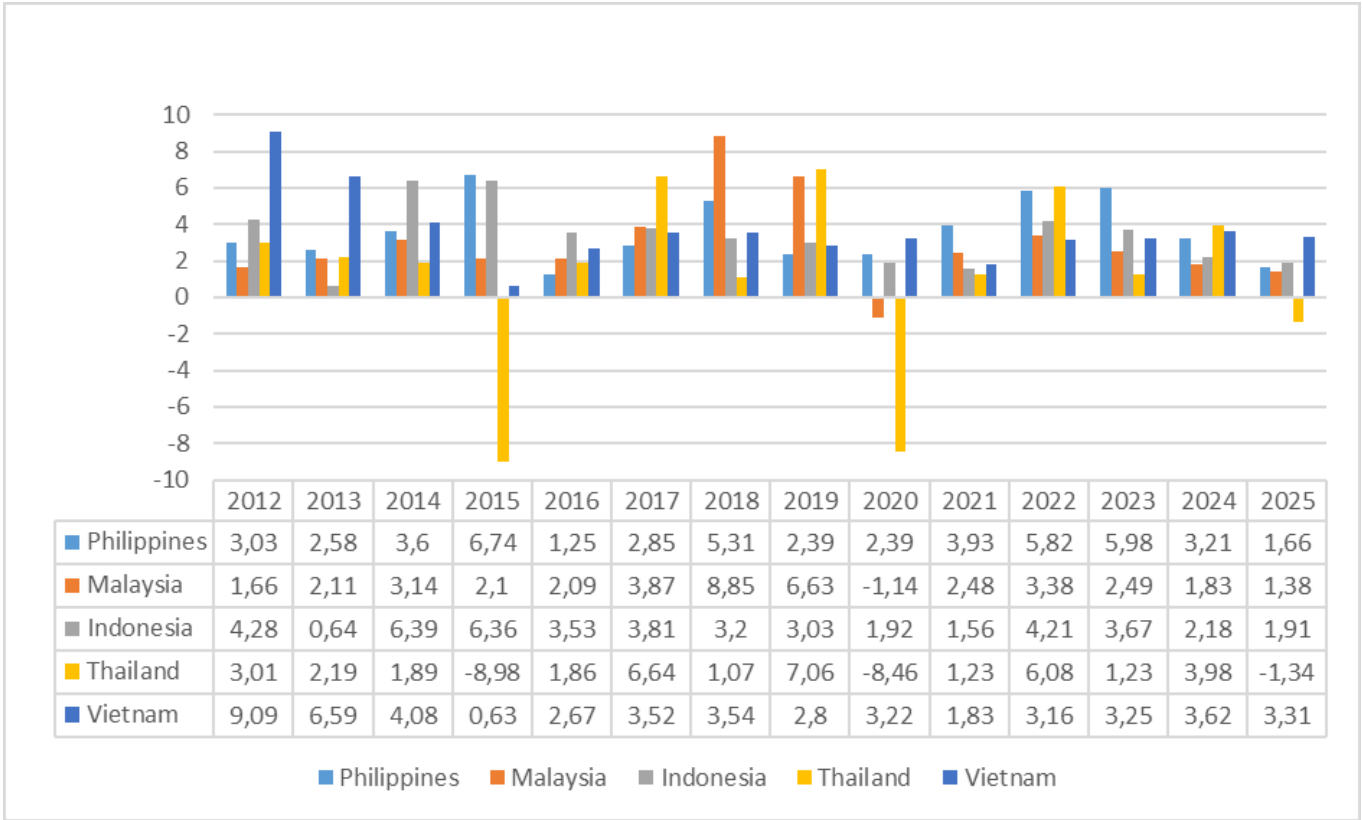
Introduction

Inflation is one of the most important economic indicators used to assess the health of a country's economy. In simple terms, inflation measures how fast the prices of everyday goods and services are rising, and as prices rise, the value of money gradually falls, meaning people can buy less with the same amount of money. When inflation stays at a low and stable level, it generally reflects a healthy economy where demand is growing steadily [1]. However, when prices rise too fast and too sharply, the effects go far beyond just higher numbers on price tags. Ordinary households struggle to cover basic daily needs such as food, electricity, and housing, especially when their incomes do not grow as fast as prices do. Businesses also feel the pressure, as the cost of producing goods and services increases, forcing them to cut costs, reduce hiring, or hold back on expanding their operations. Investors and financial markets become more cautious, as rising prices make it harder to predict future returns and erode trust in the economic outlook. In the worst cases, prolonged and uncontrolled inflation can seriously damage public confidence in a country's monetary system and weaken the ability of central banks to manage the economy effectively [2].

In Southeast Asia, these concerns carry particular weight. Price increases have been a recurring and disruptive force across the region, with direct consequences for household purchasing power, living costs, business decisions, and growth prospects. The challenge runs deeper than just managing price levels, however. ASEAN economies are structurally more exposed to inflationary pressure than wealthier nations, partly because most of them still depend on imported raw materials, energy, and food to keep their economies running, and partly because their fiscal positions leave relatively little room to absorb external shocks when they hit [3]. Add to that a high degree of trade openness and close ties to global commodity markets, and it becomes clear why price movements originating abroad tend to find their way into domestic markets fairly quickly [4]. Against this backdrop, maintaining price stability has naturally become a central concern for monetary authorities across the region, from Bank Indonesia and Bank Negara Malaysia to the Bank of Thailand, Bangko Sentral ng Pilipinas, and the State Bank of Vietnam.

Figure 1 illustrates the fluctuations in inflation rates across five ASEAN emerging market countries during the 2012–2025 period.



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Philippines	3,03	2,58	3,6	6,74	1,25	2,85	5,31	2,39	2,39	3,93	5,82	5,98	3,21	1,66
Malaysia	1,66	2,11	3,14	2,1	2,09	3,87	8,85	6,63	-1,14	2,48	3,38	2,49	1,83	1,38
Indonesia	4,28	0,64	6,39	6,36	3,53	3,81	3,2	3,03	1,92	1,56	4,21	3,67	2,18	1,91
Thailand	3,01	2,19	1,89	-8,98	1,86	6,64	1,07	7,06	-8,46	1,23	6,08	1,23	3,98	-1,34
Vietnam	9,09	6,59	4,08	0,63	2,67	3,52	3,54	2,8	3,22	1,83	3,16	3,25	3,62	3,31

Figure 1. Inflation Rate in Five ASEAN Emerging Market Countries (2012–2025)

Based on data above, Vietnam recorded the highest inflation at the start of the period, reaching 9.09% in 2012, before slowly declining over the following years. Thailand showed the most extreme swings, where inflation fell to -8.98% in 2015 and again to -8.46% in 2020, before increasing to 6.08% in 2022. The Philippines faced persistent inflationary pressure, especially in 2022–2023, with inflation peaking at 5.98%. Indonesia experienced notable price increases in 2014–2015, recording 6.39% and 6.36% respectively, largely driven by cuts to fuel subsidies. Malaysia also experienced a sharp increase

of 8.85% in 2018 before entering deflation at -1.14% in 2020. These different patterns across countries suggest that price stability in the ASEAN region is still fragile and easily disrupted by shocks from the global economy [5].

One of the key external forces behind these inflationary pressures is disruption to the global supply chain. ASEAN countries are highly open to trade and are deeply connected to international production networks. When global supply chains break down, the effects quickly show up in domestic markets through higher import costs and shortages of goods [6]. These disruptions reached an extreme level during the COVID-19 pandemic as factory closures, travel restrictions, container shortages, and logistical breakdowns hit major trade and production centers around the world at the same time. To monitor the severity of these disruptions, the Federal Reserve Bank of New York developed the Global Supply Chain Stress Index (GSCPI), a composite measure that integrates data on transportation costs, freight rates, and production surveys in multiple countries. [7]. The index reached its all-time high in late 2021., which coincided with a broad surge in inflation across many developing economies. Supporting this, Rees and Rungcharoenkitkul [8] It was found that global supply chain disruptions significantly contributed to the rise in inflation observed across countries in the post-pandemic period. More recently, Platitas and Ocampo [2] confirmed that supply chain shocks lead to a dramatic and statistically significant increase in inflation in the Philippines, Thailand, and other East Asian economies.

Apart from supply chain disruptions, global Crude oil prices are another important factor influencing inflation in ASEAN, especially for countries that depend heavily on imported energy such as Thailand, the Philippines, and Vietnam. When oil prices increase, transportation, distribution, and production costs also rise, which eventually resulting in higher prices for goods and services [9]. Previous studies have found that movements in oil prices typically lead to more significant and enduring effects on inflation in developing countries than in advanced economies [10]. Using monthly data across ASEAN+3 countries, Aharon et al. [5] confirmed that oil-specific demand shocks had significant inflationary effects in the Philippines, Thailand, and Malaysia, with stronger impacts during the COVID-19 period. This vulnerability became increasingly visible during the 2014–2016 oil price crash and the Russian invasion of Ukraine, which triggered sharp increases in global energy prices and intensified imported inflation risks across ASEAN economies [11].

Apart from disruptions in supply chains and fluctuations in oil prices, U.S. monetary policy also represents another major external driver of inflation in ASEAN emerging markets, particularly through changes in the Federal Funds Rate. Higher interest rates in the United States encourage global investors to shift their investments toward U.S. assets, which in turn leads to capital outflows and depreciation pressures in ASEAN economies [12]. Currency weakening leads to higher import costs for goods denominated in U.S. dollars, which may raise domestic inflation through exchange rate pass-through effects [13]. This phenomenon became particularly evident during the aggressive monetary tightening cycle of 2022–2023, when many ASEAN currencies weakened against the U.S. dollar and faced higher imported inflation risks. Lastauskas and Nguyen [13] further found that U.S. monetary tightening generates significant cross-border effects on inflation in emerging market economies, particularly during periods of global uncertainty.

While there is already a substantial body of research on inflation determinants in developing countries, important gaps remain. Most previous studies examine global supply chain disruptions, crude oil prices, or U.S. monetary policy separately rather than analyzing these external shocks simultaneously within a single [14]. In addition, many studies focus on a single country or rely on annual data, which limits their ability to capture short-term inflation dynamics [15]. Studies that specifically examine the combined effects of Global Supply Chain Pressure Index, Crude oil prices, and the Federal Funds Rate on inflation across ASEAN emerging markets using monthly panel data remain highly limited. Therefore, this study aims to analyze how these three global external factors affect domestic inflation in Indonesia, Malaysia, Thailand, the Philippines, and Vietnam during the 2015–2025 period. By integrating these variables into a cross-country panel framework, this research provides a more thorough understanding of how global shocks are transmitted into domestic inflation in ASEAN emerging markets and offers relevant policy implications for maintaining price stability amid increasing global uncertainty.

Method

The population in this study consists of emerging market countries in Southeast Asia that are members of ASEAN. Sample selection was carried out using purposive sampling technique based on the country is classified as an emerging market economy based on the International Monetary Fund (IMF) and the country has a significant level of trade openness and integration into global supply chains. Based on these criteria, five countries were selected as the research sample, namely Indonesia, the Philippines, Vietnam, Thailand, and Malaysia, with a total of 132 monthly observations per country, resulting in a balanced panel dataset of 660 observations in total.

Monthly secondary data are used in this study from January 2015 to December 2025. Four variables are used. The dependent variable is the domestic inflation rate, measured by year-on-year CPI growth, sourced from the IMF and each country's central bank. The first independent variable is the Global Supply Chain Pressure Index (GSCPI), a composite index that monitors global shipping costs, freight rates, and manufacturing PMI, collected from the Federal Reserve Bank of New York. The second independent variable is crude oil price, measured by Brent crude oil price in USD per barrel, sourced from the U.S. Energy Information Administration (EIA). The third independent variable (X3) is the Federal Funds Rate (FFR), which refers to the policy interest rate determined by the Federal Open Market Committee (FOMC), representing the rate at which commercial banks lend and borrow excess reserves overnight, with data obtained from the Board of Governors of the Federal Reserve System

This study examines the effects of the Federal Funds Rate (FRR), oil prices, and the Global Supply Chain Stress Index

(GSCPI) on housing prices in the short and long run using a distributed lag autoregressive (ARDL) panel model with a group estimator (PMG). The PMG estimator is suitable because it restricts the homogeneity of long-run continuous variables among panel members while allowing for variations in short-run volatility, speed of change, and error variance across countries.

Before estimating the model, several preliminary tests are conducted. First, To determine if the panel data are impacted by common global shocks across nations, the cross-sectional dependence test is utilized. SecondTo evaluate the variables' stationarity and ensure that none are integrated of order two, the CIPS unit root test is utilized, which is a fundamental requirement for the panel ARDL approach. Subsequently, a panel cointegration test is performed to examine the existence of a long-run relationship among the variables prior to estimating the panel ARDL model

The short-run dynamic model is specified as follows:

$$\Delta INF_{it} = \alpha_i + \sum_{j=1}^{p} \lambda_{ij} \Delta INF_{i,t-j} + \sum_{j=0}^{q} \delta_{ij} \Delta GSCPI_{t-j} + \sum_{j=0}^{q} \gamma_{ij} \Delta OIL_{t-j} + \sum_{j=0}^{q} \theta_{ij} \Delta FFR_{t-j} + \phi_i ECT_{i,t-1} + \varepsilon_{it} \quad (1)$$

where INF_{it} represents the inflation rate of country i at time t, $GSCPI_t$ represents the Global Supply Chain Pressure Index, represents crude oil prices, represents the Federal Funds Rate, and is the error term. The lag lengths and are selected based on the lowest Akaike Information Criterion (AIC) value. Based on the AIC selection criterion, the optimal lag order for this study is determined as ARDL(1,1,1,1), indicating one lag for the dependent variable (inflation) and one lag for each of the three independent variables (GSCPI, crude oil price, and FFR).

The error correction term $CT_{i,t-1}$ in Equation (1) measures the speed at which inflation returns to long-run equilibrium after short-run shocks. The coefficient is expected to be negative and statistically significant to confirm the existence of a valid long-run relationship.

The long-run model is expressed as:

$$INF_{it} = \beta_{0i} + \beta_1 GSCPI_t + \beta_2 OIL_t + \beta_3 FFR_t + \mu_{it} \quad (2)$$

where β_1, β_2, and β_3 represent the long-run effects of the Global Supply Chain Pressure Index (GSCPI), crude oil prices, and the Federal Funds Rate (FFR) on domestic inflation, respectively. These long-run coefficients are taken to be consistent across nations under the Pooled Mean Group (PMG) estimator.

As a robustness test, the Mean Group (MG) estimator developed by M. Hashem Pesaran and Ron Smith (1995) is additionally applied. Moreover, the Hausman test is conducted to assess whether the PMG or MG estimator is more suitable for the dataset..

Results and Discussion

A. Unit Root Test

Table 1 presents the results of the panel unit root tests, employing the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) approaches.

Table 1. Results of Panel Unit Root Tests (ADF-Fisher and PP-Fisher)

Variable		Stat (Level)	Prob	Stat (1st diff)	Prob	Order of Interation
Inflation	ADF	70.069	0.0000	192.464	0.0000	I(0)
	PP	222.912	0.0000	143.158	0.0000	I(0)
GSCPI	ADF	20.182	0.0276	92.103	0.0000	I(1)
	PP	17.111	0.0719	258.789	0.0000	I(1)
Oil Price	ADF	9.861	0.4527	97.994	0.0000	I(1)
	PP	15.117	0.1278	291.150	0.0000	I(1)
FFR	ADF	10.275	0.4167	18.161	0.0113	I(1)
	PP	3.877	0.9527	94.760	0.0000	I(1)

The findings suggest the presence of both I(0) and I(1) variables. The inflation variable is stationary at the level, or I(0), with both ADF and PP statistics yielding probability values well below 0.05, confirming the absence of a unit root in its original form. In contrast, the GSCPI, crude oil price (OIL), and Federal Funds Rate (FFR) shows non-stationary behavior at level, yet becomes stationary once differenced, classifying them as I(1). For GSCPI, the ADF test marginally rejects the unit root at the level (p = 0.0276) while the PP test does not (p = 0.0719); following the conservative approach common in the literature,

GSCPI is treated as I(1). The resulting mixed integration order of I(0) and I(1) confirms that the panel ARDL-PMG framework is the most appropriate estimation strategy, as it is explicitly designed to accommodate such mixed orders. Crucially, no variables are found to be integrated at the second order, thereby satisfying the requirement for ARDL estimation.

B. Cointegeration Test

Table 2 presents the results of the panel cointegration tests using the Pedroni and Kao approaches.

Table 2. Result of Panel Cointegeration Test

Test Method	Statistic	Prob	Decision
Pedroni Panel ADF-Statistic	-7.415553	0.0000	Cointegrated
Pedroni Group ADF-Statistic	-7.597977	0.0000	Cointegrated
Kao ADF-Statistic	-6.309579	0.0000	Cointegrated

All three test statistics, namely the Pedroni Panel ADF-Statistic (-7.416), the Pedroni Group ADF-Statistic (-7.598), and the Kao ADF-Statistic (-6.310), are statistically significant at the 1% level with probability values of 0.0000. This unanimous evidence strongly confirms that a stable long-run equilibrium relationship exists among domestic inflation, GSCPI, crude oil prices, and the Federal Funds Rate across the five ASEAN countries examined. In order to ensure that short-run dynamics are in line with a significant long-run relationship, the confirmation of cointegration also justifies the application of the error correction mechanism inside the panel ARDL model.

C. Long-Run Estimation

Table 3 reports the long-run estimation results of the panel ARDL model using the Pooled Mean Group (PMG) estimator.

Table 3. Long-Run Estimation Results of the Panel ARDL Model

Variable	Coefficient	Standard Error	t-statistic	p-value
GSCPI	-0.557292	0.148518	-3.752.366	0.0002
OIL	0.049641	0.012615	3.935.070	0.0001
FFR	-0.394251	0.120249	-3.278.632	0.0011

The first concerns the GSCPI, which carries a negative and statistically significant long-run coefficient of -0.557 (t = -3.752, p = 0.0002). At first glance, this direction seems odd. Supply chain disruptions are usually associated with rising costs and upward price pressure, so a negative sign on GSCPI is not what conventional cost-push logic would predict. The more plausible explanation runs through the demand side: when supply chain conditions deteriorate over a prolonged period, trade volumes contract and business investment pulls back, and the resulting weakness in aggregate demand tends to dominate whatever cost-push pressure existed in the short run [6]. This pattern is consistent with what Ye et al. [14] found, namely that the long-run relationship between supply chain pressure and inflation differs between rich and developing economies, with demand suppression playing a relatively larger role in the latter group. On top of that, ASEAN central banks have generally responded to sustained external supply disruptions by tightening monetary conditions, which adds further downward pressure on inflation over time [4]

The second finding is more straightforward. Crude oil prices have a positive and significant long-run effect on inflation, with a coefficient of 0.050 (t = 3.935, p = 0.0001). This is exactly what cost-push theory would anticipate, and it lines up with earlier evidence from the region [16]. The relatively small magnitude of the coefficient probably reflects the fact that fuel subsidy programs in several ASEAN countries absorb part of the price shock before it fully reaches consumers

Third, the Federal Funds Rate shows a significant negative long-run effect on ASEAN inflation, with a coefficient of -0.394 (t = -3.279, p = 0.0011). This result may seem to cut against exchange rate pass-through logic, which would predict that U.S. rate hikes weaken ASEAN currencies and push import prices up. Over a longer horizon, however, the more dominant force appears to be global demand compression. When the Federal Reserve tightens aggressively, economic activity abroad slows and international commodity prices tend to fall, and it is this disinflationary spillover that ultimately prevails across ASEAN economies [12].

D. Short-Run Estimation

Table 4 reports the pooled short-run estimation results from the PMG model, reflecting the average dynamic adjustment across all five ASEAN countries

Table 4. Short-Run Estimation Results of the Panel ARDL Model

Variable	Coefficient	Standard Error	t-statistic	p-value
COINTEQ01	-0.551903	0.055766	-9.896.786	0.0000

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D(GSCPI_X1)	0.100116	0.100884	0.992391	0.3214
D(OIL_X2)	-0.014348	0.013660	-1.050.353	0.2940
D(FFR_X3)	0.838260	0.456441	1.836.513	0.0668
C	0.170638	0.230221	0.741191	0.4589

The most critical result is the error correction term (COINTEQ01), which carries a coefficient of -0.552 and is highly significant (p = 0.0000). This confirms the validity of the long-run cointegrating relationship and indicates that approximately 55.2% of any deviation from the long-run equilibrium is corrected within a single month, reflecting relatively active monetary policy management by ASEAN central banks. Regarding individual global factors, none of the three variables, D(GSCPI), D(OIL), and D(FFR), achieve conventional significance at the 5% level in the pooled short-run specification. The Federal Funds Rate shows marginal significance at the 10% threshold (p = 0.0668), with a positive coefficient of 0.838, suggesting a tendency for inflation to temporarily rise following a U.S. rate increase, possibly through exchange rate depreciation channels. The overall pattern implies that the transmission of global shocks into ASEAN inflation is more pronounced in the long run, and that significant country-level heterogeneity in short-run responses may obscure meaningful individual effects when averaged across the panel

E. Country-Specific ShortRun Effects

1. Indonesia

Table 5 presents the short-run estimation results for the Indonesia.

Table 5. Long-Run Estimation Results of the Panel ARDL Model

Variable	Coefficient	Standard Error	t-statistic	p-value
COINTEQ01	-0.410796	0.005573	-73.71167	0.0000
D(GSCPI_X1)	0.299133	0.079258	3.774158	0.0326
D(OIL_X2)	0.000417	0.000376	1.109001	0.3483
D(FFR_X3)	0.220376	0.475130	0.463824	0.6744
C	0.339499	0.088365	3.841995	0.0311

The short-run results for Indonesia in Table 5 show that GSCPI has a positive and statistically significant effect on inflation, with a coefficient of 0.299 (p = 0.0326). This indicates that increases in global supply chain pressure are associated with higher domestic prices in the short run. This may reflect Indonesia's reliance on imported inputs, where supply disruptions increase production costs and are passed through to consumer prices [6]. In contrast, crude oil prices and the Federal Funds Rate do not have significant short-run effects, which may be explained by domestic policy measures such as fuel subsidies and exchange rate management. The error correction term is negative and significant (-0.411; p = 0.0000), indicating that approximately 41.1% of deviations from long-run equilibrium are corrected each month.

2. Philippines

Table 6 presents the short-run estimation results for the Philippines.

Table 6. Short-Run Estimation Results of the Panel ARDL Model

Variable	Coefficient	Standard Error	t-statistic	p-value
COINTEQ01	-0.645480	0.006952	-92.84587	0.0000
D(GSCPI_X1)	-0.130585	0.220863	-0.591250	0.5959
D(OIL_X2)	-0.009200	0.000996	-9.232846	0.0027
D(FFR_X3)	1.272676	1.330323	0.956667	0.4093
C	0.743878	0.212098	3.507232	0.0393

For the Philippines, crude oil price changes have a statistically significant negative short-run effect on domestic inflation, with a coefficient of -0.009 (p = 0.0027). While this negative sign may initially appear inconsistent with cost-push theory, it can be explained through a demand compression mechanism: sharp oil price increases rapidly erode household real income and reduce discretionary spending, temporarily offsetting upward pressure from higher energy costs. This pattern reflects the Philippines' high sensitivity to energy price swings given its status as one of the region's most oil-dependent economies and its limited fiscal buffers to absorb oil shocks [2]. Rosnawitang [17] documented asymmetric short-run oil-inflation dynamics in ASEAN, where the demand-side channel can dominate in the immediate period following an oil price shock. Neither GSCPI nor FFR shows a statistically significant short-run impact. The error correction coefficient of -0.645 (p = 0.0000) indicating that approximately 64.5% of any inflationary deviation from long-run equilibrium is corrected within a single month.

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3. Vietnam

Table 7 presents the short-run estimation results for the Vietnam.

Table 7. Short-Run Estimation Results for Indonesia

Variable	Coefficient	Standard Error	t-statistic	p-value
COINTEQ01	-0.678966	0.008571	-79.21685	0.0000
D(GSCPI_X1)	0.330707	0.211366	1.564619	0.2156
D(OIL_X2)	-0.060867	0.000966	-63.02738	0.0000
D(FFR_X3)	-0.415175	1.276334	-0.325287	0.7663
C	0.464187	0.236475	1.962944	0.1444

Vietnam exhibits the most pronounced short-run response to oil price changes among all five countries. The coefficient on D(OIL) is -0.061 and highly significant (p = 0.0000), indicating that short-term oil price movements exert a strong contemporaneous negative effect on Vietnam's domestic inflation. As with the Philippines, this negative relationship likely reflects the dominance of the demand compression channel over the cost-push channel in the immediate short run. Given Vietnam's high trade openness and its status as a significant net importer of refined petroleum, fluctuations in global oil prices affect real purchasing power and aggregate demand more rapidly than they feed into producer and consumer prices [18]. Vietnam also records the highest error correction speed in the entire panel, with a COINTEQ01 coefficient of -0.679 (p = 0.0000), implying that roughly 67.9% of any inflation gap from the long-run equilibrium is closed within a single month, reflecting the State Bank of Vietnam's effective monetary policy response. Short-run effects of GSCPI and FFR are not statistically significant, indicating that near-term domestic price dynamics are primarily shaped by energy cost fluctuations rather than broader supply chain or U.S. monetary spillover effects [3].

4. Thailand

Table 8 presents the short-run estimation results for the Thailand.

Table 8. Short-Run Estimation Results for Philippines.

Variable	Coefficient	Standard Error	t-statistic	p-value
COINTEQ01	-0.427812	0.004785	-89.39829	0.0000
D(GSCPI_X1)	-0.136752	0.679089	-0.201376	0.8533
D(OIL_X2)	0.020972	0.002968	7.066123	0.0058
D(FFR_X3)	2.261279	3.739804	0.604652	0.5881
C	-0.547766	0.193748	-2.827203	0.0663

In the short run, Thailand exhibits distinct results relative to the Philippines and Vietnam regarding the oil price effect, with the coefficient of D(OIL) being positive and statistically significant at 0.021 (p = 0.0058) indicating that short-term oil price increases lead to contemporaneous inflationary pressure. This positive direction is more aligned with conventional cost-push theory and reflects the structural characteristics of Thailand's energy market, where oil price movements transmit more directly into consumer prices given the relatively developed downstream petroleum and transport sectors and the partial phasing out of major fuel price controls [14]. This directional difference from the Philippines and Vietnam underscores that even within ASEAN, the same global shock can produce contrasting short-run outcomes depending on each country's energy pricing structure, subsidy regime, and economic composition. GSCPI and FFR do not show significant short-run effects. The constant term is marginally negative and significant at the 10% level (p = 0.0663), consistent with Thailand's documented episodes of deflation during the sample period as shown in Figure 1. Thailand's error correction coefficient of -0.428 (p = 0.0000) implies an adjustment speed of approximately 42.8% per month.

5. Malaysia

Table 9 presents the short-run estimation results for the Malaysia.

Table 9. Short-Run Estimation Results for Vietnam.

Variable	Coefficient	Standard Error	t-statistic	p-value
COINTEQ01	-0.596461	0.006688	-89.19031	0.0000
D(GSCPI_X1)	0.138078	0.177104	0.779642	0.4925

D(OIL_X2)	-0.023060	0.000808	-28.54559	0.0001
D(FFR_X3)	0.852143	1.060845	0.803269	0.4806
C	-0.146608	0.172598	-0.849424	0.4581

Malaysia's short-run results in Table 9 indicate that crude oil price changes have a statistically significant negative short-run effect on domestic inflation, with a coefficient of -0.023 (p = 0.0001). This negative short-run relationship is consistent with the demand compression mechanism, whereby rising energy prices reduce real household income and temporarily dampen broader consumption and price growth. Sek (2023), in a study specifically examining the asymmetric oil price-inflation relationship in Malaysia, confirmed that negative and positive oil price shocks have differential pass-through effects on the consumer price index, with demand-side effects playing a more prominent role in the short run. Additionally, Malaysia's managed fuel pricing system, which included various subsidy and price ceiling mechanisms throughout much of the sample period, attenuated the direct pass-through of global oil prices to the CPI in the near term [11]. Neither GSCPI nor FFR exerts a significant short-run effect. The error correction coefficient for Malaysia is -0.596 (p = 0.0000), indicating that approximately 59.6% of any inflationary deviation is corrected each month, placing Malaysia as the third-highest adjustment speed in the sample after Vietnam (-0.679) and the Philippines (-0.645). Taken together, the country-specific short-run results across all five ASEAN nations reveal substantial heterogeneity in the transmission of global external shocks into domestic inflation, even when long-run effects are constrained to be homogeneous.

Conclusion

This study looked at how three global factors, the Global Supply Chain Pressure Index, crude oil prices, and the U.S. Federal Funds Rate, affect inflation in Indonesia, Malaysia, Thailand, the Philippines, and Vietnam between 2015 and 2025. Using a panel ARDL model with the Pooled Mean Group estimator, the results show that global conditions do shape domestic inflation in this region, though the extent and direction of that influence depends on whether you are looking at the short run or the long run, and which country you are focusing on.

Over the long run, oil prices drive inflation upward, which is what most people would expect. What is less obvious is that both the GSCPI and the Federal Funds Rate pull inflation downward over time. This happens because prolonged supply chain stress and tighter U.S. monetary policy tend to slow down global trade and reduce overall demand, and that slowdown ends up putting more downward pressure on prices than the cost increases do. For ASEAN economies that are heavily tied to global markets, this demand channel turns out to be the stronger force in the long run.

The short-run story is less uniform. On average, the panel corrects about 55.2 percent of any inflation gap within a single month, which suggests that central banks in the region are fairly responsive. But looking at each country separately reveals some real differences. Indonesia sees inflation rise when supply chains tighten, largely because it depends on imported inputs. Vietnam and the Philippines both experience a short-run drop in inflation when oil prices rise, which sounds odd but makes sense when you consider that higher energy costs eat into household spending and dampen overall demand before prices fully adjust. Thailand moves in the opposite direction, with oil price increases feeding directly into consumer prices through its transport and energy sectors. Malaysia also shows a negative short-run oil effect, partly because its fuel subsidy system shields consumers from the full impact of price swings in the global market. These differences matter because they show that even within the same region, the same global shock can produce very different outcomes depending on each country's economic structure and policy setup.

For policymakers, the key takeaway is that not every external shock requires the same response. A short-term jump in oil prices or a brief disruption to supply chains does not automatically call for aggressive monetary tightening, since the immediate pass-through to inflation is limited and uneven across countries. The longer-run effects, especially those coming from shifts in U.S. monetary policy, deserve closer attention given how quickly they can filter through exchange rates and import costs. Better regional coordination through existing ASEAN surveillance frameworks could also help governments get ahead of these spillovers rather than simply reacting to them.

There are some limitations worth noting. The study covers only five countries over a fixed time window, and adding more countries or a longer period could change some of the conclusions. Future work could also explore whether the relationship between oil prices and inflation behaves differently during periods of sharp price increases versus declines. Bringing exchange rates more explicitly into the model would also help clarify the exact path through which U.S. rate decisions feed into domestic prices across the region.

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