



Exchange-Rate Pass-Through to Consumer-Price Inflation in ASEAN-6: Dynamic and Asymmetric Evidence, 2000–2024

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Abstract

This study estimates exchange-rate pass-through (ERPT) to consumer-price inflation in Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Viet Nam over 2000–2024. Annual World Development Indicators data are analyzed using two-way fixed-effects models with country and year effects and Driscoll–Kraay panel-HAC standard errors. Nominal depreciation is measured as the annual log change in the local-currency-per-US-dollar exchange rate. The analysis distinguishes contemporaneous, one-year, and two-year effects, calculates cumulative pass-through, tests depreciation–appreciation asymmetry, and evaluates cross-country coefficient equality. In the baseline specification, a 1% depreciation is associated with approximately a 0.20-percentage-point increase in annual consumer-price inflation. In the distributed-lag model, the contemporaneous coefficient becomes statistically insignificant, while the one-year lag is 0.220 ($p < .001$) and the two-year lag is 0.095 ($p = .035$). The cumulative current-to-two-year coefficient is 0.436 ($p = .001$), indicating that pass-through is predominantly delayed and cumulative. Depreciation also exhibits asymmetric transmission: the depreciation coefficient is 0.361 ($p < .001$), whereas appreciation is not associated with a statistically significant reduction in inflation; the symmetry restriction is rejected ($p = .044$). Country-specific coefficients differ numerically, but a joint equality test does not establish statistically significant cross-country heterogeneity ($p = .298$). Results remain robust to alternative treatment of trade openness and to an inflation-persistence specification. The findings indicate that ASEAN-6 ERPT is best characterized as incomplete, delayed, cumulative, and directionally asymmetric rather than instantaneous and mechanically proportional.

Keywords: *exchange-rate pass-through; inflation; ASEAN-6; depreciation; asymmetry; dynamic panel; monetary policy*

1. Introduction

Exchange-rate movements constitute an important channel through which external economic conditions are transmitted into domestic prices. When a national currency depreciates, imported consumer goods, intermediate inputs, energy, machinery, and other externally sourced products become more expensive in local-currency terms. Firms may absorb part of these higher costs through margins, offset them through productivity or sourcing adjustments, or transfer them to downstream buyers. The extent to which exchange-rate movements ultimately affect domestic prices is commonly referred to as exchange-rate pass-through (ERPT). For monetary authorities, both the magnitude and timing of ERPT matter because currency depreciation need not translate into inflation immediately, proportionately, or uniformly across economies. Recent Philippine evidence has likewise examined dollar strength and oil prices as external forces operating on the domestic economy (R. G. O. Atento, Quinto, et al., 2026).

The conventional question of whether depreciation is inflationary has consequently evolved into a more demanding empirical question: how much pass-through occurs, how long does it take, and under what conditions is it stronger or weaker? Research has consistently shown that ERPT is incomplete in many economies and that its magnitude varies across countries, periods, price measures, and monetary-policy environments. The inflation environment itself can condition pass-through, while policy credibility and inflation-targeting frameworks may alter firms' expectations about the persistence of cost shocks (Choudhri & Hakura, 2006; Gagnon & Ihrig, 2004; Ha et al., 2020). Recent annual WDI evidence for China and the Philippines also indicates that inflation regimes are country-specific rather than governed by a single common pattern (Chen & Atento, 2026).

These issues are particularly relevant to Southeast Asia. ASEAN economies are deeply integrated into regional and international production networks, yet they differ substantially in economic structure, exchange-rate arrangements, inflation experience, trade exposure, and monetary institutions. Existing evidence confirms that exchange rates matter for

ASEAN inflation, but estimated pass-through is generally incomplete and varies by price stage, horizon, and country (Võ et al., 2021; Pham et al., 2023; Widarjono et al., 2023). Emerging-Asia evidence likewise shows that producer-price pass-through tends to exceed consumer-price pass-through and that longer-horizon responses can be larger than short-run effects (Beirne et al., 2023). Related ASEAN panel studies using WDI data have likewise reported cross-country heterogeneity in macro-structural relationships and have found inflation to be secondary to structural factors in some settings (Quinto & Atento, 2025; R. G. Atento, 2026).

A further complication is asymmetry. The inflationary effect of a 10% depreciation need not be the mirror image of the disinflationary effect of a 10% appreciation. Firms facing higher imported-input costs may increase selling prices to protect margins, whereas subsequent appreciation may be absorbed through wider margins, delayed repricing, or incomplete downward adjustment. ASEAN-specific evidence has documented stronger inflation responses to depreciation than appreciation in Indonesia, Malaysia, and the Philippines (Widarjono et al., 2023), while wider Asian evidence also supports nonlinear and asymmetric transmission (Kassi et al., 2019).

Despite a substantial literature, several issues remain open. Many ASEAN studies use country-specific time-series models, focus on ASEAN-5 rather than ASEAN-6, or end before the pandemic and subsequent global inflation episode. Dynamic pass-through, cumulative transmission, directional asymmetry, and cross-country differences are also frequently examined in separate frameworks. This study therefore estimates these dimensions jointly using a harmonized annual panel for Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Viet Nam from 2000 to 2024.

The study asks: To what extent does nominal exchange-rate depreciation pass through to consumer-price inflation in ASEAN-6 economies, how rapidly does this transmission occur, and does the response vary across countries and between depreciation and appreciation episodes? Its contribution lies in combining two-way fixed effects, distributed exchange-rate lags, a formal cumulative pass-through statistic, asymmetric depreciation–appreciation terms, and joint tests of country-specific coefficient equality in one common empirical framework.

2. Review of Related Literature

2.1 Exchange-Rate Pass-Through to Consumer Prices

Exchange-rate pass-through refers to the response of domestic prices to movements in the nominal exchange rate. Depreciation can affect consumer prices directly through imported final goods and indirectly through imported intermediate inputs, energy, raw materials, and capital equipment. Yet the transmission is rarely complete at the consumer-price level because firms can adjust margins, substitute inputs, delay repricing, and absorb part of the shock within distribution costs.

Evidence from Asia supports this incomplete-transmission view. Ito and Sato (2008) found relatively high pass-through to import prices in post-crisis Asian economies but generally low pass-through to consumer prices. Võ et al. (2021) similarly found incomplete pass-through in five ASEAN economies, with producer prices responding more strongly than consumer prices. Dang and Pham (2024) reported positive effects of exchange-rate shocks on price changes in Viet Nam and other Asian economies but found that the exchange rate played a limited role in explaining CPI movements relative to broader external influences. Beirne et al. (2023) likewise documented incomplete ERPT across nine emerging Asian economies, with larger effects on producer than consumer prices.

These findings imply that exchange-rate depreciation is an inflationary pressure rather than a one-for-one determinant of consumer inflation. The present study therefore treats the estimated coefficient as a conditional inflation response associated with depreciation, not as a mechanical conversion rate from exchange-rate change to the CPI.

2.2 Dynamic and Cumulative Pass-Through

The timing of exchange-rate pass-through is as important as its magnitude. Imported goods may arrive under contracts negotiated at earlier exchange rates, firms may hold inventories acquired before the currency movement, and retail prices may adjust only periodically. Exchange-rate shocks can therefore move gradually through importers, producers, wholesalers, distributors, and retailers.

The emerging-Asia evidence is consistent with this dynamic interpretation. Beirne et al. (2023) found that longer-term ERPT to producer and consumer prices was generally larger than shorter-term ERPT. Pham et al. (2023) likewise

reported differences between short-run and long-run responses across ASEAN-5 economies. These findings imply that a contemporaneous regression can understate the economic importance of ERPT when the bulk of transmission occurs with a lag.

For annual data, multi-quarter adjustment can appear as a next-year or second-year effect. The present study therefore estimates contemporaneous depreciation together with one- and two-year lags and defines cumulative pass-through as the sum of the three coefficients. This allows the analysis to distinguish immediate transmission from the total inflation response that develops over the estimated horizon.

2.3 Asymmetric Pass-Through: Depreciation versus Appreciation

Linear ERPT models impose an implicit symmetry restriction: a depreciation and an equally sized appreciation are assumed to have effects of equal absolute magnitude and opposite sign. A growing literature questions this restriction. Caselli and Roitman (2019) documented nonlinear and asymmetric ERPT across emerging markets, while Iorngurum (2024), in a meta-analysis of 72 primary studies covering 111 countries, found that methodological and country characteristics explain substantial variation in ERPT estimates and that depreciation and appreciation can have materially different effects.

ASEAN-specific evidence is particularly relevant. Widarjono et al. (2023) found long-run asymmetric ERPT in Indonesia, Malaysia, and the Philippines and reported that depreciation had a stronger inflationary effect than appreciation. Wider Asian evidence is not fully uniform: Kassi et al. (2019) also documented asymmetry but found that the relative magnitude of appreciation and depreciation effects depends on horizon and subregion. This disagreement supports a two-sided empirical test of asymmetry rather than assuming in advance which direction must dominate.

Potential mechanisms include menu costs, contracts, strategic pricing, inventory valuation, imperfect competition, and margin restoration. These mechanisms can make upward price adjustment after depreciation faster or larger than downward adjustment after appreciation. Aggregate macroeconomic data cannot identify the microeconomic mechanism directly, but they can test whether the two responses are statistically symmetric.

2.4 Cross-Country Heterogeneity in ERPT

ERPT can differ across economies because inflation histories, monetary institutions, exchange-rate regimes, import dependence, trade structures, invoicing practices, and domestic competition differ. Pham et al. (2022) found comparatively high ERPT in Viet Nam and linked this pattern to inflation volatility, openness, and the exchange-rate regime. Kurnia and Sugiyanto (2023) reported that the magnitude of pass-through and the influence of openness varied across Asian inflation-targeting economies. Benchmarking of the Philippines against the ASEAN-6 economies has likewise reported uneven economic-resilience and governance signals across the group (Atento, 2025).

Microeconomic evidence also shows that aggregate national coefficients can conceal substantial underlying heterogeneity. Apaitan et al. (2024), using Thai transaction-level customs data, found that ERPT to import prices varied across products, firm market power, invoice currency, and the direction of the exchange-rate movement. At the broader level, Iorngurum (2024) identified trade openness, exchange-rate flexibility, development status, exchange-rate persistence, and commodity dependence as important sources of cross-study and cross-country heterogeneity. WDI-based comparisons across ASEAN economies similarly show pronounced heterogeneity in initial income levels (Balingit et al., 2026).

A methodological distinction is necessary, however. Different point estimates across countries do not by themselves demonstrate statistically significant heterogeneity. The present study therefore reports country-specific interaction coefficients and conducts a joint equality test rather than inferring structural differences from coefficient rankings alone.

2.5 Inflation Environment, Inflation Targeting, and Monetary Credibility

The Taylor hypothesis proposes that ERPT depends on the inflation environment. When inflation is low and stable, firms may treat exchange-rate-induced cost movements as transitory and adjust final prices less aggressively. Choudhri and Hakura (2006) found a strong positive association between average inflation and the degree of pass-through across countries and regimes. Gagnon and Ihrig (2004) similarly linked lower pass-through to reduced inflation variability and greater emphasis on inflation stabilization.

Recent Asian evidence remains mixed. Kurnia and Sugiyanto (2023) found that exchange-rate changes increased consumer prices in the short run but that pass-through tended to weaken over longer horizons under credible inflation targeting. Ha et al. (2020) found lower ERPT where flexible exchange rates coexist with credible inflation targets and emphasized that the shock generating the exchange-rate movement also matters. By contrast, Naqvi et al. (2024) found little evidence that inflation-targeting adoption itself altered ERPT across their Asian sample and concluded that world commodity prices explained more of domestic inflation variation than local-currency depreciation. Recent evidence for China and the Philippines points in the same direction, suggesting that inflation regimes are country-specific and must be interpreted in relation to macroeconomic structure and exceptional shock periods (Chen & Atento, 2026).

The literature therefore supports a conditional rather than deterministic conclusion: the inflation environment, monetary-policy regime, and policy credibility can influence ERPT, but the magnitude and direction of these effects vary across countries, periods, and empirical specifications.

2.6 Synthesis, Research Gap, and Hypotheses

The literature supports five broad propositions. Exchange-rate depreciation can raise domestic inflation, but CPI pass-through is generally incomplete. Transmission can be delayed and cumulative. Depreciation and appreciation can have asymmetric effects. Country structures and institutions provide strong reasons to expect heterogeneity. Finally, the inflation and policy environment can condition pass-through, while global commodity and financial shocks complicate interpretation.

The remaining gap is to evaluate these dimensions jointly in a common ASEAN-6 framework extending through 2024. The present study therefore estimates contemporaneous, lagged, and cumulative ERPT; tests depreciation–appreciation asymmetry; and evaluates whether country-specific coefficients are statistically distinguishable within the same panel specification.

H1. Nominal exchange-rate depreciation is positively associated with consumer-price inflation in ASEAN-6 economies.

H2. Exchange-rate depreciation exhibits significant delayed pass-through to subsequent consumer-price inflation.

H3. The cumulative contemporaneous and lagged exchange-rate pass-through coefficient is significantly greater than zero.

H4. Exchange-rate pass-through differs significantly across ASEAN-6 economies.

H5. Consumer-price responses to currency depreciation and appreciation are asymmetric.

3. Methodology

3.1 Research Design

The study employs a quantitative longitudinal panel design covering Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Viet Nam. Annual observations span 2000–2024, with the country-year as the unit of analysis. The design combines descriptive analysis with two-way fixed-effects estimation, distributed-lag specifications, asymmetric exchange-rate terms, and country interaction models. Two-way fixed-effects panel designs based on WDI data have also been applied to ASEAN economies in related macro-level research (Dela Cruz & Atento, 2026; Lantin-Magana & Atento, 2026; R. G. Atento & Quinto, 2026).

The study is observational and uses aggregate macroeconomic data. Accordingly, the estimated coefficients are interpreted as conditional associations rather than fully identified causal effects. Country and year fixed effects, lag structures, and macroeconomic controls reduce several sources of confounding but do not eliminate simultaneity, policy endogeneity, or omitted time-varying factors.

3.2 Data Source and Variables

Annual data were drawn from the World Bank World Development Indicators (WDI). The analytical sample contains 150 country-year observations: six economies observed over 25 years. The 1999 official exchange-rate

observation was additionally retained solely to construct the 2000 depreciation rate. No observations in the four core series were interpolated or imputed.

Consumer-price inflation is measured by FP.CPI.TOTL.ZG. The official exchange rate is PA.NUS.FCRF, expressed as local currency units per US dollar and averaged over the reference period. GDP growth is NY.GDP.MKTP.KD.ZG. Trade openness is NE.TRD.GNFS.ZS, defined as exports plus imports of goods and services as a percentage of GDP.

Table 1. Variables and Operational Definitions

Variable	WDI code / construction	Measurement	Role
Inflation	FP.CPI.TOTL.ZG	Annual CPI inflation (%)	Dependent variable
Official exchange rate	PA.NUS.FCRF	LCU per US\$, annual average	Source variable
Depreciation	$100[\ln(ER_t) - \ln(ER_{t-1})]$	Annual log change; positive = depreciation	Main explanatory variable
GDP growth	NY.GDP.MKTP.KD.ZG	Annual real GDP growth (%)	Primary control
Trade openness	NE.TRD.GNFS.ZS	Trade as % of GDP	Descriptive / robustness
Change in trade openness	Constructed	Annual first difference of trade share	Robustness control
Lagged depreciation	Constructed	DEP _{t-1} and DEP _{t-2}	Dynamic ERPT

Exchange-rate depreciation is calculated as:

$$DEP_{it} = 100[\ln(ER_{it}) - \ln(ER_{i,t-1})]$$

Because the exchange-rate series is local currency per US dollar, positive values denote depreciation and negative values denote appreciation.

3.3 Preliminary Diagnostics

The panel is complete for the four underlying indicators over 2000–2024. Variance-inflation factors for depreciation, GDP growth, and trade openness are approximately 1.01–1.06, indicating no substantive multicollinearity.

Country-level augmented Dickey–Fuller diagnostics were supplemented by Fisher-combined evidence because each national series contains only 25 annual observations. The combined evidence rejects a unit root for inflation, exchange-rate depreciation, and GDP growth, but not for the level of trade openness (combined $p \approx .634$). Accordingly, trade openness in levels is not treated as a compulsory regressor in the principal model; its annual change is used as a robustness control.

Residual cross-sectional dependence remains relevant in an integrated regional panel. The controlled two-way fixed-effects specification produced a Pesaran CD statistic of approximately -2.31 ($p = .021$), supporting the use of covariance estimates robust to contemporaneous dependence across countries.

3.4 Econometric Specifications

Baseline two-way fixed effects: $INF_{it} = \alpha_i + \lambda_t + \beta DEP_{it} + \gamma GDPGROWTH_{it} + \varepsilon_{it}$

Dynamic ERPT: $INF_{it} = \alpha_i + \lambda_t + \beta_0 DEP_{it} + \beta_1 DEP_{i,t-1} + \beta_2 DEP_{i,t-2} + \gamma GDPGROWTH_{it} + \varepsilon_{it}$

Cumulative ERPT: $ERPT_{0-2} = \beta_0 + \beta_1 + \beta_2$

Asymmetric ERPT: $INF_{it} = \alpha_i + \lambda_t + \beta_D DEP^+_{it} + \beta_A APP^+_{it} + \gamma GDPGROWTH_{it} + \varepsilon_{it}$

For the asymmetric model, DEP^+ is the positive magnitude of depreciation and APP^+ is the positive magnitude of appreciation. Symmetry implies $\beta_D = -\beta_A$. Country heterogeneity is examined with depreciation-by-country interactions and a joint equality test across the six country-specific slopes. Lagged explanatory variables have likewise been used in recent ASEAN panel work that includes inflation and trade openness among its controls (Patron et al., 2026).

3.5 Estimation and Inference

Models are estimated by ordinary least squares with country and year fixed effects. Inference uses Driscoll–Kraay panel-HAC standard errors with two annual lags, an approach appropriate when residuals may exhibit heteroskedasticity,

serial dependence, and cross-sectional dependence (Driscoll & Kraay, 1998). Statistical tests are two-sided at $\alpha=.05$. Heteroskedasticity- and autocorrelation-consistent inference has similarly been used in related WDI-based Philippine time-series work that conditions on inflation (Refozar et al., 2026).

A sensitivity model includes lagged inflation to assess whether exchange-rate coefficients persist after accounting for inflation inertia. Because a lagged dependent variable in a fixed-effects panel can introduce finite-T bias, this specification is treated as a robustness exercise rather than the principal estimator.

4. Results

4.1 Descriptive Characteristics

Across the 150 country-year observations, mean consumer-price inflation was 3.56%, while mean annual nominal depreciation was 1.01%. The pooled raw correlation between depreciation and inflation was only $r=.121$, indicating that the unconditional relationship is weak and motivating the use of fixed effects and lag structures.

Table 2. Selected Descriptive Statistics by Economy

Economy	Mean inflation (%)	Mean depreciation (%)	SD depreciation
Indonesia	5.82	2.81	7.51
Malaysia	2.09	0.74	5.27
Philippines	3.92	1.53	5.98
Singapore	1.88	-0.95	3.63
Thailand	1.94	-0.28	5.05
Viet Nam	5.70	2.20	2.39

4.2 Baseline and Dynamic Pass-Through

The baseline two-way fixed-effects model yields a depreciation coefficient of 0.198 ($SE \approx 0.085$, $p=.022$). Thus, conditional on country effects, year effects, and GDP growth, a 1% depreciation is associated with approximately a 0.20-percentage-point increase in annual consumer-price inflation. GDP growth is not statistically significant in the baseline specification.

Table 3. Baseline and Dynamic Exchange-Rate Pass-Through

Term	Coefficient	SE	p	Interpretation
Baseline depreciation	0.198	0.085	.022	Positive contemporaneous ERPT
Current depreciation, dynamic model	0.121	0.095	.202	Not significant after lags
Depreciation t-1	0.220	0.064	<.001	Strongest delayed response
Depreciation t-2	0.095	0.044	.035	Additional delayed response
GDP growth, dynamic model	-0.082	0.079	.307	Not significant
Cumulative ERPT, t to t-2	0.436	0.131	.001	Significant cumulative response

Once current and lagged depreciation are entered simultaneously, the contemporaneous coefficient is no longer statistically significant. The one-year lag is the largest and most precisely estimated effect, and the two-year lag remains positive and significant. The cumulative coefficient of 0.436 has an approximate 95% confidence interval of 0.176 to 0.696 and is statistically significant ($p \approx .0012$). A 10% depreciation is therefore associated with an accumulated 4.36-percentage-point increase in the annual inflation responses summed across the current and two subsequent years, conditional on the model. This should not be interpreted as 43.6% of the exchange-rate change mechanically becoming inflation.

4.3 Robustness to Trade Openness

Replacing the nonstationary level of trade openness with its annual change leaves the central dynamic result almost unchanged. The cumulative coefficient is approximately 0.437 ($p < .001$), and the one-year lag remains highly significant. The near identity of the cumulative estimates indicates that the main result is not driven by the treatment of trade openness.

4.4 Asymmetric Pass-Through

Table 4. Asymmetric and Country-Specific ERPT

Estimate	Coefficient	p	Inference
Depreciation magnitude	0.361	<.001	Positive and significant
Appreciation magnitude	0.108	.579	Not significant
Symmetry restriction: $\beta_D = -\beta_A$	—	.044	Rejected
Indonesia	0.087	.437	Not significant
Malaysia	0.237	<.001	Significant
Philippines	0.214	<.001	Significant
Singapore	0.201	.181	Not significant
Thailand	0.161	.049	Significant
Viet Nam	0.660	.055	Marginal
Joint country equality test	$F \approx 1.23$	.298	Equality not rejected

Depreciation is positively and significantly associated with inflation, whereas appreciation does not produce a statistically detectable reduction in inflation. The formal symmetry restriction is rejected at the 5% level. The evidence therefore supports directional asymmetry and is consistent with incomplete downward price adjustment, although the aggregate data cannot identify the underlying firm-level pricing mechanism directly.

4.5 Cross-Country Heterogeneity

Country-specific coefficients differ numerically, with Viet Nam displaying the largest point estimate and Indonesia the smallest. However, the joint equality test yields $F(5,113) \approx 1.23$ with $p = .298$. The null hypothesis of equal country coefficients cannot therefore be rejected. The correct conclusion is not that the six economies have identical structural pass-through, but that the available annual panel does not establish statistically significant differences among their contemporaneous ERPT slopes.

4.6 Inflation-Persistence Sensitivity

A sensitivity model including lagged inflation produces a persistence coefficient of approximately 0.443 ($p < .001$). Current depreciation remains significant at approximately 0.166 ($p < .001$), and lagged depreciation remains significant at approximately 0.149 ($p = .015$). Thus, the ERPT relationship survives explicit control for inflation persistence, although this dynamic fixed-effects specification is treated as robustness evidence because of potential finite-T bias.

Table 5. Summary of Hypothesis Tests

Hypothesis	Decision	Empirical basis
H1: Depreciation is positively associated with inflation	Supported	Baseline FE depreciation coefficient positive and significant
H2: ERPT exhibits delayed transmission	Supported	One-year and two-year lag coefficients significant
H3: Cumulative ERPT is greater than zero	Supported	Cumulative coefficient 0.436, $p \approx .001$
H4: ERPT differs significantly across ASEAN-6	Not supported	Joint country equality test $p = .298$
H5: Depreciation and appreciation effects are asymmetric	Supported	Symmetry restriction rejected, $p = .044$

5. Discussion

5.1 Depreciation and Consumer-Price Inflation

The baseline results confirm that nominal depreciation is associated with higher consumer-price inflation in ASEAN-6. This finding is consistent with the wider Asian literature showing incomplete but economically meaningful pass-through to final consumer prices (Ito & Sato, 2008; Vö et al., 2021; Beirne et al., 2023). The coefficient should nevertheless be interpreted as an average conditional relationship rather than a structural constant applicable to every exchange-rate episode.

The incomplete nature of transmission is economically plausible. Importers and producers can temporarily compress margins, substitute inputs, or delay repricing; domestic distribution costs are not necessarily exchange-rate sensitive; and

monetary-policy responses can offset part of the initial shock. ERPT to CPI therefore represents the endpoint of a multi-stage transmission process rather than a direct one-for-one mapping from the exchange rate to household prices.

5.2 Delayed Transmission as the Principal Result

The strongest empirical result is that pass-through is predominantly delayed. Once distributed lags are included, the contemporaneous coefficient loses statistical significance, while the one-year lag becomes the dominant term and the two-year lag remains positive. This pattern is compatible with contracts, inventories, staggered price setting, and sequential transmission through production and distribution chains.

The finding also helps reconcile apparently different results across studies and price measures. Producer and import prices can respond rapidly to exchange-rate shocks, while final consumer prices respond more gradually (Võ et al., 2021; Beirne et al., 2023). For annual data, such multi-quarter adjustment naturally appears as transmission extending into subsequent calendar years.

5.3 Cumulative Pass-Through

The cumulative coefficient of approximately 0.44 is substantially larger than the contemporaneous dynamic coefficient, indicating that a narrow focus on same-year depreciation would understate the total inflation response. The estimate is also stable when changes in trade openness are added, strengthening confidence that the central finding is not an artifact of one control specification.

This result aligns with evidence that longer-horizon ERPT in emerging Asia can exceed short-run responses (Beirne et al., 2023) and with ASEAN evidence distinguishing short-run from long-run effects (Pham et al., 2023).

5.4 Asymmetry Between Depreciation and Appreciation

The asymmetric model indicates that depreciation raises inflation significantly, whereas appreciation does not produce an equivalent statistically significant reduction. This result closely matches the ASEAN evidence of Widarjono et al. (2023) and the broader meta-analytic evidence that depreciation and appreciation can generate unequal price responses (Iornigurum, 2024).

The direction of asymmetry is not universal in the literature. Kassi et al. (2019), for example, found stronger appreciation pass-through in some longer-run Asian estimates. The present finding should therefore be understood as evidence specific to the ASEAN-6 panel and period rather than as a universal law. It is consistent with, but does not prove, downward price rigidity or margin-restoration behavior.

5.5 Cross-Country Heterogeneity

Previous literature provides strong reasons to expect cross-country variation in ERPT, including inflation history, policy credibility, openness, invoicing practices, and exchange-rate arrangements (Pham et al., 2022; Kurnia & Sugiyanto, 2023; Apaitan et al., 2024). The present estimates also differ numerically. However, the formal joint test fails to reject equality across the six country slopes. Related ASEAN studies using WDI indicators likewise document substantial cross-country heterogeneity in macroeconomic relationships (Quinto & Atento, 2025; Balingit et al., 2026).

This is an important result rather than a null finding to be hidden. It suggests that visually or numerically large differences in country coefficients are not sufficient evidence of structural heterogeneity in a small regional panel. The annual ASEAN-6 sample provides stronger support for a common regional transmission mechanism than for statistically distinguishable country-specific slopes.

5.6 Inflation Persistence and the Policy Environment

Inflation persistence is significant, but exchange-rate coefficients remain significant after lagged inflation is introduced. The ERPT relationship is therefore not reducible to simple inflation inertia. At the same time, the wider literature warns that pass-through depends on the inflation and policy environment. Choudhri and Hakura (2006), Gagnon and Ihrig (2004), and Ha et al. (2020) associate lower pass-through with more stable inflation and stronger policy credibility, while Naqvi et al. (2024) show that commodity-price shocks can dominate exchange-rate shocks in some Asian settings. Recent Philippine evidence likewise treats dollar strength and oil prices as important external forces (R. G. O. Atento, Quinto, et al., 2026), and oil-price shocks linked to geopolitical conflict have also been associated with

disrupted global equity performance (R. G. Atento, Atento, et al., 2026). ASEAN panel evidence further indicates that inflation can be secondary to structural factors in explaining some macro-level outcomes (R. G. Atento, 2026).

The results are therefore best interpreted as evidence that exchange-rate depreciation is one important component of ASEAN inflation dynamics, operating alongside global commodity conditions, domestic demand, expectations, and monetary-policy responses.

6. Policy Implications

The delayed and cumulative pattern of ERPT implies that monetary authorities should not assess the inflationary consequences of depreciation solely through contemporaneous inflation. A currency movement can leave a pipeline of cost pressures that continues to affect prices after the initial year.

The asymmetric result also implies that subsequent appreciation should not automatically be expected to reverse earlier inflation. If price increases are more readily transmitted than price reductions, the disinflationary benefit of currency strengthening may be limited or delayed.

These findings do not imply that exchange-rate stabilization should dominate all other monetary objectives. The appropriate response depends on the source and persistence of the exchange-rate movement. Depreciation caused by global risk shocks, commodity-price changes, monetary-policy divergence, or domestic demand conditions may require different policy responses. The results instead support forward-looking inflation assessment that incorporates the recent history of exchange-rate movements and their likely transmission through import and production costs. Survey evidence from the Philippines indicates that monetary policy is generally perceived as effective in controlling inflation, although awareness of it is only moderate (Espelita et al., 2025).

For firms with substantial imported inputs or foreign-currency obligations, the results likewise reinforce the importance of hedging, supplier diversification, inventory planning, and pricing strategies because cost pressures can persist beyond the initial depreciation period. Comparative policy work on external cost-push shocks in the Philippines likewise emphasizes coordination between crisis-response instruments and macroeconomic policy through the inflation and enterprise-cost channel (A. G. Atento et al., 2026).

7. Limitations

First, annual data cannot identify monthly or quarterly transmission. A coefficient appearing at $t-1$ can represent adjustment occurring over several months rather than literally one full year after depreciation.

Second, the official bilateral LCU/USD rate is economically important but does not capture the full trade-weighted exchange-rate environment. Future research can incorporate nominal effective exchange rates where consistent data are available.

Third, consumer inflation reflects food, energy, fiscal, administered-price, supply, and expectation shocks in addition to exchange rates. Year fixed effects absorb common shocks but cannot identify every country-specific time-varying disturbance.

Fourth, exchange rates are endogenous. Inflation expectations, interest-rate decisions, capital flows, and domestic macroeconomic conditions can influence both exchange rates and prices. The coefficients are therefore interpreted as conditional associations rather than causal structural parameters. Capital-market depth and cross-border investment flows have also diverged across ASEAN economies (Chen et al., 2026), illustrating how financial conditions can differ across the panel.

Fifth, ASEAN-6 contains only six cross-sectional units. The 25-year time dimension is useful, but statistical power for detecting differences among country slopes remains limited. Failure to reject coefficient equality is not proof of structural identity.

Finally, aggregate data cannot identify whether the observed asymmetry is generated by market power, contracts, inventory behavior, menu costs, or other firm-level mechanisms. Sectoral and microeconomic data would be needed to test those channels directly.

8. Conclusion

This study examined exchange-rate pass-through to consumer-price inflation in six ASEAN economies over 2000–2024 using a harmonized annual WDI panel and two-way fixed-effects models with panel-robust inference.

The findings indicate that nominal depreciation is associated with higher inflation, but the principal transmission is not contemporaneous. The largest estimated response occurs one year after depreciation, an additional effect remains in the second year, and the cumulative coefficient across the current and two subsequent years is approximately 0.44. The pass-through process is therefore better described as delayed and cumulative than instantaneous.

The study also finds directional asymmetry. Depreciation is significantly inflationary, whereas appreciation does not produce an equivalent statistically significant decline in inflation. Country-specific estimates differ numerically, but a formal equality test does not establish statistically significant heterogeneity across ASEAN-6.

Taken together, the results imply that ASEAN inflation analysis should treat depreciation as a dynamic process whose domestic-price consequences can remain in the pipeline after the initial exchange-rate movement. The empirical contribution of the study is therefore summarized as follows: in ASEAN-6, exchange-rate pass-through to consumer inflation is incomplete, delayed, cumulative, and asymmetric rather than instantaneous and mechanically proportional.

Data Availability

The underlying macroeconomic indicators are publicly available from the World Bank World Development Indicators. The constructed panel, exchange-rate transformations, and regression code can be archived with the final article materials.

References

- Alexius, A., & Holmberg, M. (2023). Pass-through with volatile exchange rates and inflation targeting. *Review of World Economics*. <https://doi.org/10.1007/s10290-023-00502-8>
- Apaitan, T., Manopimoke, P., Nookhwun, N., & Pattararangrong, J. (2024). Heterogeneity in exchange rate pass-through to import prices in Thailand: Evidence from micro data. *Journal of International Money and Finance*. <https://doi.org/10.1016/j.jimonfin.2024.103196>
- Atento, A. G., Quinto, L. F., & Atento, R. G. O. (2026). Relief or Recovery? A Comparative Policy Assessment of Household Cash Transfers and MSME Credit Support as Crisis-Response Instruments in the Philippines. *Asian Financial Economics and Policy*, 1(1). <https://doi.org/10.65166/p4hr6f59>
- Atento, R. G. (2025). The Credibility Imperative 2025: Governance Integrity, Economic Resilience, and Strategic Adaptability in Philippine Diplomacy. *International Journal of Health & Business Analytics*, 1(2). <https://doi.org/10.65166/6amaz997>
- Atento, R. G. (2026). Macroeconomic and Structural Determinants of Formal Business Entry in ASEAN: Evidence from a Linear Mixed-Effects Model Using World Development Indicators. *Journal of Enterprise Strategy and Management Innovation*, 1(1). <https://doi.org/10.65166/bh0gx302>
- Atento, R. G., & Quinto, L. (2026). SDG 8 Dynamics and SDG 3 Outcomes in ASEAN: Two-Way Fixed Effects Evidence on Under-5 and Neonatal Mortality (2000–2023). *International Journal of Health & Business Analytics*, 2(1). <https://doi.org/10.65166/4qvazm02>
- Atento, R. G., Atento, A. G., & Espelita, C. A. M. (2026). Below the Trendline: Oil Price Shocks, the Strait of Hormuz Crisis, and the Disrupted Growth Trajectory of Global Health Sector Equities (2024–2026). *International Journal of Health & Business Analytics*, 2(1). <https://doi.org/10.65166/emmhmm48>
- Atento, R. G. O., Quinto, L. F., Espelita, C. A. M. H., Atento, A. G., Teodosio, G. M., Feng, T., Tan, Q., & Chen, S. (2026). Global Shocks, Local Ventures: Oil Prices, Dollar Strength, and China's Economic Shifts as Determinants of Entrepreneurial Activity in the Philippines, 2006–2022. *Journal of Enterprise Strategy and Management Innovation*, 1(3). <https://doi.org/10.65166/dyv5eh53>
- Balingit, F. G., Atento, R. G. O., & Espelita, C. A. M. H. (2026). PPP Income Convergence in Asia: Evidence from ASEAN-10 and Selected Asian Comparators, 1995–2019. *Asian Financial Economics and Policy*, 1(1). <https://doi.org/10.65166/ym2vt625>
- Beirne, J., Renzhi, N., & Panthi, P. (2023). Exchange rate pass-through in emerging Asia and exposure to external shocks. *Economic Analysis and Policy*. <https://doi.org/10.56506/pbfd5799>

- Caselli, F., & Roitman, A. (2019). Nonlinear exchange-rate pass-through in emerging markets. *International Finance*. <https://doi.org/10.1111/inf.12344>
- Chen, S., & Atento, R. G. O. (2026). Nonlinear Inflation Regimes and Per-Capita Growth: Comparative Evidence from China and the Philippines (1987-2024). *Asian Financial Economics and Policy*, 1(1). <https://doi.org/10.65166/t70qvn52>
- Chen, S., Atento, R. G. O., Feng, T., Tan, Q., Refozar, R. F., & Manalo, L. (2026). Capital Depth and Entrepreneurial Vitality: Market Capitalization Growth and Cross-Border Investment Flows in the Philippines and ASEAN. *Journal of Enterprise Strategy and Management Innovation*, 1(3). <https://doi.org/10.65166/b4vrds73>
- Choudhri, E. U., & Hakura, D. S. (2006). Exchange rate pass-through to domestic prices: Does the inflationary environment matter? *Journal of International Money and Finance*, 25, 614–639. <https://doi.org/10.1016/j.jimonfin.2005.11.009>
- Dang, A., & Pham, A. (2024). Exchange rate pass-through and inflation: Policy insights for Vietnam based on comparative analyses across Asia. *Asian Academy of Management Journal*, 29(1). <https://doi.org/10.21315/aamj2024.29.1.4>
- Dela Cruz, W., & Atento, R. G. (2026). Public Education Spending and Primary-Level Exclusion in ASEAN: Policy Insights from a Two-Way Fixed Effects Panel Analysis. *Asian Journal of Educational Leadership, Management and Pedagogy*, 1(1). <https://doi.org/10.65166/d6mfr779>
- Driscoll, J. C., & Kraay, A. C. (1998). Consistent covariance matrix estimation with spatially dependent panel data. *Review of Economics and Statistics*, 80(4), 549–560. <https://doi.org/10.1162/003465398557825>
- Espelita, C. A. M., Atento, R. G., Rao, L. J., & Tian, Y. (2025). Understanding Monetary Policy: Student Awareness, Perceptions, and Financial Behaviors in the Philippine Context. *International Journal of Health & Business Analytics*, 1(1). <https://doi.org/10.65166/f7eayj47>
- Gagnon, J. E., & Ihrig, J. (2004). Monetary policy and exchange rate pass-through. *International Journal of Finance & Economics*, 9(4), 315–338. <https://doi.org/10.1002/ijfe.253>
- Ha, J., Stocker, M. M., & Yilmazkuday, H. (2020). Inflation and exchange rate pass-through. *Journal of International Money and Finance*, 105, 102187. <https://doi.org/10.1016/j.jimonfin.2020.102187>
- Iorngurum, T. (2024). The exchange rate pass-through to domestic prices: A meta-analysis. *Journal of Economic Surveys*. <https://doi.org/10.1111/joes.12647>
- Ito, T., & Sato, K. (2008). Exchange rate changes and inflation in post-crisis Asian economies: Vector autoregression analysis of the exchange rate pass-through. *Journal of Money, Credit and Banking*, 40, 1407–1438. <https://doi.org/10.1111/j.1538-4616.2008.00165.x>
- Kassi, D. F., Sun, G., Ding, N., Rathnayake, D. N., & Assamoi, G. R. (2019). Asymmetry in exchange rate pass-through to consumer prices: Evidence from emerging and developing Asian countries. *Economic Analysis and Policy*, 62, 357–372. <https://doi.org/10.1016/j.eap.2018.09.013>
- Kurnia, A., & Sugiyanto, F. X. (2023). Exchange rate pass-through and economic openness under inflation targeting framework in Asian ITF economies. *ETIKONOMI*. <https://doi.org/10.15408/etk.v22i2.30967>
- Lantin-Magana, L. M., & Atento, R. G. O. (2026). Digital Reach, Consumption, and Equity Market Deepening: Evidence from ASEAN-5. *Asian Financial Economics and Policy*, 1(1). <https://doi.org/10.65166/nxnfqv94>
- Naqvi, B., Rizvi, S. R., Mirza, N., & Kazi, I. (2024). Exchange rate pass-through in Asia: Assessing the relevance of the inflation targeting framework. *The World Economy*. <https://doi.org/10.1111/twec.13668>
- Patron, A. C., Quinto, L., & Atento, R. G. (2026). Universal Health Coverage and Labor Productivity in ASEAN: A Lagged Panel Analysis of Health Systems as Economic Infrastructure, 2000–2023. *International Journal of Health & Business Analytics*, 2(1). <https://doi.org/10.65166/p3v11r43>
- Pham, T. A. T., Nguyen, T. T., Nasir, M. A., & Huynh, T. L. D. (2023). Exchange rate pass-through: A comparative analysis of inflation targeting & non-targeting ASEAN-5 countries. *The Quarterly Review of Economics and Finance*, 87, 158–167. <https://doi.org/10.1016/j.qref.2020.07.010>
- Pham, T., Nguyen, H., Nguyen, D.-N., & Vu, L. M. (2022). Exchange rate pass-through and its heterogeneity under the pegged regime: A case of Vietnam. *Journal of the Asia Pacific Economy*, 29, 612–633. <https://doi.org/10.1080/13547860.2022.2035093>
- Quinto, L., & Atento, R. G. (2025). Economic Growth and Developmental Equity in Four ASEAN Economies: Linking Macroeconomic Trends to Employment and Child Nutrition (1999–2024). *International Journal of Health & Business Analytics*, 1(1). <https://doi.org/10.65166/nq75nv94>

- Refozar, R. F., Atento, R. G. O., Atento, A. G., & Espelita, C. A. M. H. (2026). Foreign Direct Investment and Manufacturing Performance in the Philippines: Evidence from WDI, 2000–2024. *Asian Financial Economics and Policy*, 1(1). <https://doi.org/10.65166/qasnh058>
- Taylor, J. B. (2000). Low inflation, pass-through, and the pricing power of firms. *European Economic Review*, 44(7), 1389–1408. [https://doi.org/10.1016/S0014-2921\(00\)00037-4](https://doi.org/10.1016/S0014-2921(00)00037-4)
- Võ, A. T., Le, Q. T. T., Nguyen, P. V., Ho, C. M., & Vo, D. H. (2021). Exchange rate pass-through in ASEAN countries: An application of the SVAR model. *Emerging Markets Finance and Trade*, 57(1), 21–34. <https://doi.org/10.1080/1540496X.2018.1474737>
- Wanasilp, M. (2021). The exchange rate pass-through under the inflation targeting framework in Indonesia, the Philippines, and Thailand. *Advances in Pacific Basin Business, Economics and Finance*. <https://doi.org/10.1108/S2514-465020210000009013>
- Widarjono, A., Alam, M. M., Atmadji, E., Suseno, P., & Artiani, L. E. (2023). The asymmetric exchange rate pass-through to inflation in the selected ASEAN countries. *Bulletin of Monetary Economics and Banking*. <https://doi.org/10.59091/1410-8046.2047>
- World Bank. (2026). World Development Indicators [Data set]. World Bank.