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The Influence of Political Stability, Money Supply, and Trade Deficit on Inflation in ASEAN Countries

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Abstract

This paper examines the long-run and short-run effects of money supply, trade deficit, and political stability on inflation across nine ASEAN countries from 2000 to 2019. Using a panel ARDL framework, we estimate the Pooled Mean Group (PMG) estimator for both the upper-middle-income subgroup (N = 5) and the full panel (N = 9). All variables are transformed using the inverse hyperbolic sine (ASINH) function to accommodate negative values. Unit root tests confirm I (1) integration for all variables, while Pedroni and Kao cointegration tests establish a stable long-run relationship. In the long run, the trade deficit exerts a positive and significant effect on inflation, whereas political stability consistently reduces inflation across all estimated groups. Additionally, money supply is positively and significantly associated with inflation in both groups. We also conducted Granger causality tests, which revealed primarily a unidirectional causal relationship from money supply to inflation, along with a bidirectional relationship between political stability and inflation. These findings underscore the importance of institutional quality and trade balance management for achieving inflation stability in ASEAN economies.

Keywords

Inflation, Trade Deficit, Money Supply, Political Stability, Panel ARD, ASEAN

1. Introduction

Inflation is a key macroeconomic indicator that reflects price stability and the purchasing power of an economy. Monetary factors, especially money supply, have long been recognized as major drivers of inflation (Friedman, 1963). Beyond monetary channels, trade imbalances can also push up prices through higher im-

port costs and currency depreciation (Corsetti & Dedola, 2005; McCarthy, 2007).

Political stability is another factor that has drawn increasing attention in the inflation literature. When political conditions are unstable, governments may lose monetary credibility, face fiscal pressure, and experience greater inflation volatility (Paldam, 1987; Aisen & Veiga, 2008). This is especially true in ASEAN, where countries differ significantly in income levels, institutional quality, and how they conduct monetary policy.

Against this backdrop, this paper investigates how money supply, trade deficit, and political stability affect inflation across nine ASEAN countries from 2000 to 2019. We use a panel ARDL model with the PMG estimator, and further divide countries into income-based subgroups to capture the heterogeneity that exists across the region. The study contributes to the literature in three ways. First, it brings together monetary, trade, and institutional factors in a single empirical framework. Second, the PMG approach allows us to distinguish long-run relationships from short-run dynamics. Third, the sample covers both high-income and lower-income ASEAN members, with PMG applied only where the sample size is sufficient for reliable estimation.

2. Literature Review

The relationship between money supply and inflation is well-established in monetary economics. Friedman (1963) established that sustained growth in money supply is a primary driver of inflation. This view has been supported by empirical evidence from developing and emerging economies, which confirms a long-run positive relationship between broad money and price levels (Nguyen, 2015). However, the strength and direction of this relationship may vary with the level of financial development and monetary policy credibility.

Trade balance is another important determinant of inflation. A trade deficit can push up domestic prices through higher import demand and exchange rate depreciation (Corsetti & Dedola, 2005; McCarthy, 2007). In ASEAN economies, which are highly open to international trade, external imbalances can have significant inflationary consequences through import price transmission.

Political stability has been linked to inflation through several channels: fiscal discipline, monetary credibility, and investor confidence (Aisen & Veiga, 2008; Telatar et al., 2010; Baklouti & Boujelbene, 2019). Countries with stable political environments tend to exhibit lower and more predictable inflation because governments face reduced pressure to monetise deficits. Political instability, on the other hand, is often associated with greater inflation volatility and weaker monetary anchoring.

Motivated by this literature, this study employs the panel ARDL model estimated by the PMG estimator of Pesaran et al. (1999, 2001). PMG allows short-run dynamics to differ across countries while imposing long-run slope homogeneity, making it well-suited for panels with heterogeneous country characteristics. This approach is preferred over static panel estimators that cannot distinguish long-

run equilibrium from short-run adjustment dynamics.

3. Data

This study uses annual panel data for nine ASEAN countries over 2000-2019 (T = 20): Brunei, Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam. Laos is excluded due to data unavailability over the full sample period. Data are sourced from the World Bank World Development Indicators (WDI) and the World Governance Indicators (WGI) database.

Income group classification. Following World Bank income classifications, countries are assigned to three groups. The low-income group comprises Cambodia and Myanmar (N = 2). The upper-middle-income group comprises Indonesia, Malaysia, Philippines, Thailand, and Vietnam (N = 5). The high-income group comprises Singapore and Brunei (N = 2). PMG estimation requires at least three cross-sections for stable identification of pooled mean-group coefficients; accordingly, PMG is estimated for the upper-middle-income group (N = 5) and the full panel (N = 9). Summary statistics are reported for the low-income and high-income groups for descriptive purposes. The income-based subgroup design is motivated by three considerations. First, the nine ASEAN countries exhibit substantial heterogeneity in income levels, financial development, and monetary policy frameworks—ranging from Singapore's highly developed financial system and exchange-rate-based monetary regime to Myanmar's nascent financial sector and limited monetary transmission capacity. Applying a single pooled estimator across all nine countries without acknowledging this heterogeneity risks producing coefficients that are economically uninterpretable averages. Second, comparing results between the upper-middle-income subgroup (N = 5) and the total panel (N = 9) provides a direct test of the robustness of the long-run coefficients to the composition of the sample: consistent signs and magnitudes across both groups strengthen confidence in the findings, while divergences reveal income-conditioned heterogeneity of policy relevance. Third, income-based classification follows the World Bank framework widely used in the ASEAN macroeconomic literature, facilitating comparability with related studies.

Variable construction and transformation. Four variables are constructed as follows. Inflation (LNCPI) is measured as the annual CPI inflation rate (%) from WDI (FP.CPI.TOTL growth), transformed using ASINH. Trade deficit (LNTD) is the difference between imports and exports as a share of GDP (%), sourced from WDI (NE.IMP.GNFS. ZS and NE. EXP. GNFS. ZS), transformed using ASINH. Political stability (LNPS) is the WGI Political Stability and Absence of Violence/Terrorism sub-indicator (PV.EST), transformed using ASINH. Money supply (LNMS) is broad money growth (annual %) from WDI (FM. LBL. BMNY. KD. ZG), transformed using ASINH.

The ASINH transformation is applied to all four variables because inspection of the raw data reveals that CPI inflation rates, broad money growth rates, and WGI political stability scores all contain negative values across several ASEAN

country-year observations. Direct log transformation would be undefined for these values. The ASINH function, defined as ASINH(x) = ln(x + √(x² + 1)), maps the entire real line symmetrically to itself and closely approximates ln(2|x|) for large |x|, preserving the logarithmic interpretation while accommodating zero and negative values. It is applied uniformly across all four variables for methodological consistency. Year 2001 is missing for all countries in the LNPS series due to non-publication of WGI data for that year; the resulting unbalanced panel is accommodated in estimation.

4. Methodology

4.1. Panel ARDL/PMG Model

Based on the previous literature, we model the impact of macroeconomic factors on inflation as follows:

$$\Pi_{jt} = f\left(TD_{jt}; MS_{jt}, PS_{jt}\right) \tag{1}$$

where Π_{jt} is the inflation rate in country j at time t; TD_{jt} is the trade deficit; MS_{jt} is the broad money supply; and PS_{jt} is political stability. This study employs the Pooled Mean Group (PMG) estimator developed by Pesaran et al. (1999, 2001) to estimate the long-run and short-run dynamics among these variables. The PMG estimator is preferred over the fully heterogeneous Mean Group (MG) estimator—which is unreliable when T is small relative to the number of parameters (T = 20 in this study)—and over the Dynamic Fixed Effects (DFE) estimator, which imposes implausible homogeneity on both short-run and long-run parameters. PMG occupies an intermediate position by imposing long-run slope homogeneity while allowing short-run dynamics and error variances to differ across countries, a theoretically defensible assumption for the highly interconnected ASEAN economies. Because MG is unreliable when $N \leq 5$, a formal Hausman test is not conducted due to insufficient degrees of freedom; the choice of PMG is justified on these theoretical grounds. The panel ARDL/PMG equation is specified as:

$$\begin{aligned}\Delta \ln \Pi_{jt} &= \alpha_{j1} + \sum_{i=1}^{m} \mu_{1i} \ln \Pi_{jt-i} + \sum_{i=0}^{n} \mu_{2i} \Delta \ln TD_{jt-i} \\ &+ \sum_{i=0}^{k} \mu_{3i} \Delta \ln MS_{jt-i} + \sum_{i=0}^{r} \mu_{4i} \Delta \ln PS_{jt-i} \\ &+ \gamma_1 \ln \Pi_{jt-1} + \gamma_2 \ln TD_{jt-1} + \gamma_3 \ln MS_{jt-1} + \gamma_4 \ln PS_{jt-1} + \omega_{jt} \\ j &= 1,2,3,\cdots,N; t = 1,2,3,\cdots,T\end{aligned} \tag{2}$$

where μ is the short-run coefficient of inflation, trade deficit, money supply, and political stability in time t; they are presented respectively, $\mu_{1i}, \mu_{2i}, \mu_{3i}, \mu_{4i}$ γ_1 - γ_4 are the long-run level coefficients; ω_{jt} is the error term; and i denotes the lag order. The symbol Δ denotes first differences, and m, n, k, r denote the lag lengths of each variable respectively. For each cross-section, the long-run coefficients of Π, TD, MS, and PS are derived as $\frac{\gamma_{2j}}{\gamma_{1j}}; \frac{\gamma_{3j}}{\gamma_{1j}}; \frac{\gamma_{4j}}{\gamma_{1j}}$. The lag order is selected by the Akaike Information Criterion (AIC) with a maximum of 1 lag, yielding the specification ARDL (1, 1, 1, 1) for both estimated groups. The error correction coeffi-

cient on COINTEQ01 reflects the speed of adjustment to long-run equilibrium and is expected to be negative and statistically significant.

Estimator choice. The PMG estimator (Pesaran et al., 1999) imposes long-run slope homogeneity across countries while allowing short-run dynamics and error variances to differ. This is preferable to the fully heterogeneous Mean Group (MG) estimator, which is unreliable when T is small relative to the number of parameters (T = 20 in this study), and to the Dynamic Fixed Effects (DFE) estimator, which imposes implausible homogeneity on both short-run and long-run parameters. Because MG is unreliable when N ≤ 5, a formal Hausman test comparing PMG against MG is not conducted; the choice of PMG is justified on theoretical and practical grounds as described above.

4.2. Unit Root and Cointegration Tests

Panel stationarity is assessed using the Levin, Lin and Chu (LLC) test and the ADF-Fisher chi-squared test, with lag length set to 2 and individual intercepts included. Tests are conducted at both level and first difference. Panel cointegration is tested using the Pedroni (1999, 2004) residual-based tests under no deterministic trend, and the Kao (1999) test.

4.3. Causality Test

Pairwise panel Granger causality tests are conducted using the standard stacked F-test (common coefficients) with lag length 2, consistent with the ARDL specification. F-statistics are reported for each directional hypothesis pair across all variable combinations, for the total group (N = 9).

5. Results

5.1. Unit Root Test Results

Table 1 reports ADF-Fisher chi-squared test results at level and first difference. All four variables fail to reject the null hypothesis of a unit root at level but reject it at first difference, confirming that LNCPI, LNTD, LNPS, and LNMS are all integrated of order I (1). This result satisfies the preconditions for ARDL estimation (Pesaran et al., 1999). LLC test results are consistent across the total panel.

Table 1. Panel unit root test results (ADF-Fisher, Total Group N = 9).

Variable	Level Chi-sq	Level Prob.	1st Diff Chi-sq	1st Diff Prob.	Order
LNCPI	—	—	60.737	0.000***	I (1)
LNTD	—	—	46.920	0.000***	I (1)
LNPS	—	—	60.363	0.000***	I (1)
LNMS	—	—	74.405	0.000***	I (1)

Note: ***, **, * denote significance at 1%, 5%, 10%. Level results not available for display; all variables stationary only at first difference. Lag = 2, individual intercept.

5.2. Cointegration Test Results

Table 2 reports Pedroni and Kao cointegration test results for the total group. The Panel PP-Statistic (−4.463, $p = 0.000$) and Group PP-Statistic (−5.244, $p = 0.000$) strongly reject the null hypothesis of no cointegration. The Kao ADF test corroborates this finding (−2.570, $p = 0.005$). These results confirm a stable long-run cointegrating relationship among LNCPI, LNTD, LNMS, and LNPS.

Table 2. Panel cointegration test results (Total Group, N = 9).

Test	Statistic	Prob.	Conclusion
Pedroni: Panel v-Statistic	−0.438	0.669	—
Pedroni: Panel rho-Statistic	−0.922	0.178	—
Pedroni: Panel PP-Statistic	−4.463	0.000***	**Cointegrated**
Pedroni: Panel ADF-Statistic	−0.850	0.198	—
Pedroni: Group rho-Statistic	0.273	0.608	—
Pedroni: Group PP-Statistic	−5.244	0.000***	**Cointegrated**
Pedroni: Group ADF-Statistic	−1.021	0.154	—
Kao: ADF	−2.570	0.005***	**Cointegrated**

Note: Pedroni test assumes no deterministic trend. Lag = 1. ***, **, * denote significance at 1%, 5%, 10%.

5.3. Cross-Section Dependence Test

Table 3 reports cross-sectional dependence test statistics. For the total group (N = 9), the Breusch-Pagan LM statistic is 27.109 ($p = 0.932$) and the Pesaran CD statistic is 0.281 ($p = 0.779$). Both fail to reject the null hypothesis of no cross-sectional dependence at conventional significance levels. These results support the validity of the PMG estimation without requiring additional cross-sectional dependence corrections.

Table 3. Cross-section dependency tests.

Test	Statistic	*p*-value	Statistic	*p*-value	Statistic	*p*-value
	Low-income		**Upper-middle**		**Total (N = 9)**	
Breusch-Pagan LM	10.006	0.265	5.916	0.433	27.109	0.932
Pesaran scaled LM	0.002	0.999	−0.024	0.981	−1.048	0.852
Bias-corrected LM	−0.156	0.876	−0.149	0.881	−1.329	0.816
Pesaran CD	0.023	0.982	−0.634	0.526	0.281	0.779

Note: H_0: No cross-sectional dependence. All statistics fail to reject H_0 at 10% level.

6. Estimation Results

6.1. Panel ARDL/PMG Results

Table 4 reports PMG long-run and short-run coefficients for the upper-middle-

income group (N = 5) and the total panel (N = 9). The selected model is ARDL (1, 1, 1, 1) based on AIC. The error-correction term (COINTEQ01) is negative and statistically significant in both groups, confirming convergence to long-run equilibrium at a speed of adjustment of approximately 76% - 78% per year.

Trade deficit (LNTD) is positive and statistically significant in both the upper-middle-income group (0.197, $p = 0.003$) and the total panel (0.144, $p = 0.092$). This result is consistent with import price pass-through and exchange rate depreciation channels (Corsetti & Dedola, 2005; McCarthy, 2007): a widening trade deficit depreciates the domestic currency and raises the cost of imported goods, transmitting to higher domestic inflation.

Money supply (LNMS) is positive and significant in both the upper-middle-income group (0.721, $p = 0.000$) and the total panel (0.619, $p = 0.000$). This is consistent with monetary theory: growth in broad money relative to output is associated with higher inflation (Friedman, 1963; Nguyen, 2015). The result is consistent across both estimated groups, providing robust support for the monetary transmission channel in ASEAN economies.

Political stability (LNPS) is negative and highly significant in both groups (upper-middle: −1.366, $p = 0.000$; total: −1.236, $p = 0.000$). This confirms that higher political stability is associated with lower inflation, consistent with the fiscal discipline and monetary credibility channels identified by Aisen and Veiga (2008) and Telatar et al. (2010). Countries with stable political environments are better able to maintain credible monetary policy anchors, limiting inflationary pressures.

Table 4. PMG estimation results (ARDL (1, 1, 1, 1), AIC-selected).

	Upper-middle (N = 5)			Total Group (N = 9)		
Variable	Coeff.	t-stat	Prob.	Coeff.	t-stat	Prob.
Long-Run Equation						
LNTD	0.197	3.074	0.003***	0.144	2.552	0.011**
LNMS	0.721	5.151	0.000***	0.619	5.620	0.000***
LNPS	−1.366	−6.018	0.000***	−1.236	−5.956	0.000***
Short-Run Equation						
COINTEQ01	−0.778	−7.881	0.000***	−0.757	−10.855	0.000***
D(LNTD)	−0.294	−1.147	0.255	−0.068	−0.144	0.886
D(LNMS)	−0.209	−0.866	0.390	−0.268	−2.117	0.036**
D(LNPS)	0.316	1.414	0.162	0.444	0.740	0.461
C	−0.562	−1.806	0.076*	−0.116	−0.408	0.684

Note: ***, **, * indicate significance at 1%, 5%, 10%. t-statistics in parentheses. Model: ARDL (1, 1, 1, 1) selected by AIC. Upper-middle group: Indonesia, Malaysia, Philippines, Thailand, Vietnam. PMG not estimated for low-income (N = 2) and high-income (N = 2) groups.

6.2. Granger Causality Results

Table 5 presents pairwise panel Granger causality test results for the total group (N = 9, lag = 2). Several noteworthy findings emerge. First, money supply Granger-causes inflation (F = 23.364, p = 0.000), and inflation weakly Granger-causes money supply (F = 2.386, p = 0.095), suggesting a predominantly unidirectional but partially bidirectional relationship consistent with monetary transmission. Second, political stability Granger-causes inflation (F = 4.210, p = 0.017), and inflation weakly Granger-causes political stability (F = 2.771, p = 0.066), consistent with the feedback mechanism between macroeconomic instability and political risk. Third, political stability Granger-causes trade deficit (F = 3.547, p = 0.032) and money supply (F = 2.614, p = 0.077), suggesting that institutional stability shapes external balance and monetary conditions. Trade deficit has a weak effect on inflation (F = 2.425, p = 0.092), while the reverse is not significant, consistent with a predominantly unidirectional pass-through from external imbalance to prices.

Table 5. Pairwise panel granger causality tests (Total Group, N = 9, Lag = 2).

Null Hypothesis	Obs	F-Statistic	Prob.	Decision
LNTD → LNCPI	162	2.425	0.092*	Reject*
LNCPI → LNTD	162	0.315	0.730	Accept
LNMS → LNCPI	162	23.364	0.000***	Reject
LNCPI → LNMS	162	2.386	0.095*	Reject*
LNPS → LNCPI	144	4.210	0.017**	Reject
LNCPI → LNPS	144	2.771	0.066*	Reject*
LNTD → LNMS	162	3.845	0.023**	Reject
LNMS → LNTD	162	1.500	0.226	Accept
LNPS → LNTD	144	3.547	0.032**	Reject
LNTD → LNPS	144	0.072	0.930	Accept
LNPS → LNMS	144	2.614	0.077*	Reject*
LNMS → LNPS	144	0.282	0.755	Accept

Note: F-statistics reported. ***, **, * denote significance at 1%, 5%, 10%. "Reject" = reject H_0 of no Granger causality. Lag = 2, stacked test (common coefficients).

6.3. Discussion

The results paint a consistent picture: trade deficit, money supply, and political stability all play a meaningful role as long-run determinants of inflation across ASEAN. With regard to trade deficit, we find that a wider trade deficit is associated with higher inflation, which reflects the importance of import price pass-through in these open economies—when the trade balance deteriorates, import costs rise and domestic price levels are pushed upward. Similarly, the positive effect of money supply on inflation holds across both estimated groups, suggesting

that as ASEAN's financial systems have become more integrated, growth in broad money tends to translate more directly into price pressures.

Perhaps the most striking result we find, however, concerns political stability. Across both the upper-middle-income group and the total panel, we observe that higher political stability is consistently associated with lower inflation. This finding sits well with the theoretical prediction that stable political environments reinforce monetary credibility, reduce the incentive for deficit monetisation, and help keep inflation expectations anchored (Aisen & Veiga, 2008). Moreover, the magnitude of the political stability coefficient is notably larger in the upper-middle-income group, suggesting that the inflation-dampening effect of governance quality tends to be stronger in more financially developed economies.

Turning to the causality results, we find that money supply predominantly drives inflation, with only a weak reverse channel—indicating that monetary policy remains the primary lever for price management in the region. We also note that political stability and inflation influence each other: while stable governance helps bring inflation down, persistently high inflation can itself erode political stability over time. Taken together, these findings underscore the importance of addressing both monetary and governance dimensions when designing inflation stabilisation strategies in ASEAN.

7. Conclusion

This study examines the effects of money supply, trade deficit, and political stability on inflation in nine ASEAN countries over 2000–2019 using a panel ARDL/PMG framework. All variables are transformed using ASINH to handle negative values in the raw data. PMG estimation is conducted for the upper-middle-income group (N = 5) and the full panel (N = 9).

Three main findings emerge. First, trade deficit exerts a positive and significant long-run effect on inflation in all estimated groups, confirming the importance of external balance management for price stability. Second, money supply is positively and significantly associated with inflation, consistent with monetary transmission theory. Third, political stability reliably reduces inflation, suggesting that strong institutions play a meaningful role in keeping prices in check. Granger causality tests show that the influence runs primarily from money supply and political stability to inflation, though some feedback in the opposite direction is also present.

These findings carry several policy implications. Maintaining trade balance through export promotion and import substitution policies, strengthening political and institutional stability, and implementing prudent monetary policy are complementary strategies for inflation management in ASEAN economies. The heterogeneity observed between income groups suggests that these policy prescriptions may require calibration to country-specific conditions.

Several limitations of this study should be acknowledged. First, the sample period is restricted to 2000-2019. Extending the analysis beyond 2019 would require

including Myanmar in the dataset; however, Myanmar's macroeconomic data become increasingly incomplete and unreliable after 2019, particularly following the military coup in February 2021, which severely disrupted official statistical reporting. Excluding Myanmar from a post-2019 extension would reduce the low-income subgroup to a single country (Cambodia, N = 1), rendering the income-based subgroup design infeasible. Retaining 2000-2019 as the sample period therefore preserves both the completeness of the Myanmar data and the integrity of the subgroup structure. Second, the use of annual data may not fully capture short-run price dynamics; higher-frequency data, where available, could provide richer short-run estimates. Third, Laos is excluded throughout due to data unavailability over the full sample period. Future research could address these limitations by employing higher-frequency data, incorporating additional governance dimensions such as rule of law or government effectiveness, or exploring non-linear inflation dynamics using threshold panel models.

Conflicts of Interest

The authors declare no competing financial interests or personal relationships that could have influenced the work reported in this paper.

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