FOREIGN DIRECT INVESTMENT, TRADE OPENNESS, GOVERNANCE AND GROWTH IN 25 ASIA-PACIFIC COUNTRIES: EVIDENCE FROM FIXED-EFFECTS AND PANEL ARDL MODELS

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Abstract: ***This study investigates the joint impact of Foreign Direct Investment (FDI), trade openness, political stability, and control of corruption on economic growth in 25 Asia-Pacific economies over the period 1996-2019. The analysis addresses a critical gap regarding how governance conditions shape the growth benefits derived from external integration within this diverse region. Utilizing an unbalanced panel dataset, the research employs both static two-way fixed-effects models and dynamic Panel Autoregressive Distributed Lag (ARDL) models with a Pooled Mean Group (PMG) estimator to differentiate between short-run and long-run relationships. Empirical results consistently demonstrate that FDI inflows, measured as a share of GDP, are a robust and statistically significant positive correlate of real GDP growth across all specifications297, serving as a meaningful long-run growth driver. Conversely, the direct effects of trade openness (trade-to-GDP ratio) and the selected governance indicators (political stability and control of corruption) are found to be weaker and highly sensitive to model specification. The findings underscore the strategic importance of policies focused on attracting and retaining productive FDI, supported by a stable domestic environment.***

• Keywords: *Asian-pacific; FDI; governance; growth; trade openness.*

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Introduction

Foreign direct investment (FDI) is widely viewed as an important engine of growth for developing and emerging economies. It can bring new technologies, management skills and access to global value chains that may be difficult to build domestically. Early cross-country studies such as Borensztein et al. (1998) and Alfaro et al. (2004) find that FDI can raise long-run growth, especially where human capital and financial systems are sufficiently developed. More recent work shows that the impact of FDI on growth is not uniform: it varies across regions and depends on local absorptive capacity and macroeconomic conditions (Iamsiraroj & Ulubaşoğlu, 2015; Mahembe, 2014).

Trade openness is another key channel through which countries integrate into the world economy. The classic contribution by Frankel and Romer (1999) documents that higher trade shares are associated with higher income per capita, suggesting that openness can support growth by allowing countries to exploit comparative advantage and scale effects. For Asia-Pacific developing economies, Dinh and Bui (2015) report that both FDI and trade openness contribute positively to income growth, but the size of the effect depends on domestic conditions such as macroeconomic stability and infrastructure. These findings support the idea that external openness can be growth-enhancing, but only when combined with supportive domestic policies.

The institutional economics literature stresses that the quality of governance can shape both the volume of external flows and their impact on growth. Acemoglu et al. (2001) argue that persistent differences in political and economic institutions explain much of the cross-country variation in income levels. The Worldwide Governance Indicators (WGI) developed by Kaufmann et al. (2010) allow researchers to measure dimensions such as political stability and control of corruption in a consistent way across countries and over time. Empirical work shows that better institutional quality and lower political risk tend to attract more FDI (Busse & Hefeker, 2007; Kurul & Yalta, 2017; Sabir et al., 2019). Yet there is still limited evidence on how these governance dimensions jointly influence economic growth in Asia-Pacific economies once FDI and trade openness are taken into account.

Existing empirical studies on Asia-Pacific can be grouped into two broad strands. The first focuses on the growth effects of FDI and trade openness, often using panel data methods. For example, Dinh and Bui (2015) and Su et al. (2019) show that openness and capital inflows support growth in developing Asian economies, with results that depend on the choice of indicators and model specification. More recent work by Nguyen and Pham (2025) employs a Pooled Mean Group (PMG) panel autoregressive distributed lag (ARDL) model for ASEAN-5 countries and finds that FDI and trade

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openness have positive long-run effects on growth, with heterogeneous short-run dynamics. The second strand explains FDI inflows using political stability, governance and trade variables; for example, Rashid et al. (2017) and Le (2023) analyse how political stability and openness influence FDI in Asia-Pacific economies.

Literature review and hypotheses

Research on foreign direct investment (FDI) and growth generally finds that FDI can support long-run economic performance by transferring technology, management skills and access to international markets. Early cross-country studies such as Borensztein et al. (1998) and Alfaro et al. (2004) show that the growth effect of FDI is stronger when human capital and financial systems are more developed. More recent panel evidence, including Mahembe (2014) and Iamsiraroj and Ulubaşoğlu (2015), confirms that FDI is often growth-enhancing but stresses that the impact is heterogeneous across regions and income groups, and can be weak or negative when FDI crowds out domestic investment or is intermediated through weak institutions and unstable macroeconomic conditions. Overall, this literature supports a conditional FDI-growth nexus, which is consistent with our empirical finding that FDI is the most robust positive correlate of growth in Asia-Pacific once country and time effects are controlled for.

Trade openness has also been widely examined as a driver of income and growth. Frankel and Romer (1999) argue that countries with higher trade shares tend to have higher income per capita because openness allows specialisation, scale economies and technology diffusion. Many panel studies for developing and emerging economies report positive openness-growth links, particularly for economies that liberalize trade and integrate into global value chains. However, later work shows that these results are sensitive to how openness is measured, the controls used and the treatment of crisis periods. For Asian economies, studies such as Dinh and Bui (2015) and Su et al. (2019) find that export expansion, trade liberalization and FDI inflows can support growth, but that poor infrastructure and macroeconomic volatility reduce the gains. This mixed evidence aligns with our results: once FDI, fixed effects and dynamics are taken into account, trade openness (measured by the trade-to-GDP ratio) has at best a weak and sometimes negative conditional association with growth, suggesting that openness alone is not a reliable proximate driver of annual growth in the region.

Institutional quality and governance now feature prominently in both growth and FDI research. Acemoglu et al. (2001) emphasise that differences in political and economic institutions explain much of the variation in income levels, while Kaufmann et al. (2010) provide the Worldwide Governance Indicators used to measure political stability, control of corruption and related dimensions. Empirical studies typically find that weaker institutions and higher political risk reduce FDI inflows (Busse & Hefeker, 2007; Kurul & Yalta, 2017; Sabir et al., 2019), and that corruption and instability can hinder investment and distort resource allocation. At the same time, governance indicators are highly persistent and strongly correlated with income, which complicates identification of their independent effect on growth in panel regressions with fixed effects.

Within the Asia-Pacific region, the interaction between external integration and governance is especially relevant. The region combines large emerging markets and small very open economies, with wide variation in institutional quality. Rashid et al. (2017) show that FDI into competitive Asia-Pacific economies responds to both macro fundamentals and political risk, while Le (2023) finds that trade openness can moderate the effect of political stability on FDI inflows in 25 Asia-Pacific countries. These and related studies mainly treat FDI as the dependent variable and devote less attention to how FDI, trade openness and governance jointly shape economic growth itself.

Taken together, the literature suggests that FDI and trade openness can support growth in favorable domestic environments and that governance shapes both external flows and long-run development paths.

Based on this literature, we formulate the following hypotheses for our empirical analysis:

• H1: Higher FDI inflows, measured as a share of GDP, are associated with higher economic growth in Asia-Pacific countries.

• H2: Trade openness, measured by the trade share of GDP, has a statistically significant association with economic growth in Asia-Pacific countries after controlling for FDI and country and time effects.

• H3: Political stability has a statistically significant association with economic growth in Asia-Pacific countries after controlling for FDI, trade openness and unobserved heterogeneity.

• H4: Control of corruption has a statistically significant association with economic growth in Asia-Pacific countries after controlling for FDI, trade openness and unobserved heterogeneity.

Data and methodology

This study uses an unbalanced panel dataset for 25 Asia-Pacific countries over the period 1996-2019. The sample includes both large emerging economies and smaller, highly open economies in the region. Country coverage is determined by the joint availability of data for real GDP growth, foreign direct investment, trade openness and governance indicators. Annual observations are taken from standard international sources: mainly the World Development Indicators (WDI) and the Worldwide Governance Indicators (WGI) compiled by the World

Bank (Kaufmann et al., 2010). These databases provide internationally comparable series over a long period, which is suitable for panel analysis. After merging all series and checking basic consistency, the final dataset contains 463 usable country-year observations for 25 Asia-Pacific economies. The full country list is reported in an online appendix.

The dependent variable is real GDP growth (GDP_GROWTH), measured as the annual percentage change in real gross domestic product. This indicator captures year-to-year changes in economic activity and is widely used in empirical growth studies. The main explanatory variable of interest is foreign direct investment (FDI), defined as net FDI inflows as a percentage of GDP, using the WDI series BX.KLT.DINV.WD.GD.ZS. This ratio reflects the scale of external capital inflows relative to the size of the host economy. Trade openness (TO) is measured as the sum of exports and imports of goods and services as a percentage of GDP, using NE.TRD.GNFS.ZS, and is used to capture the degree of integration into international trade.

To represent governance and institutional quality, we use two indicators from the WGI. The political stability and absence of violence/terrorism index (POL) measures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, with higher values indicating greater stability. The control of corruption index (COC) reflects perceptions of the extent to which public power is exercised for private gain, with higher values indicating stronger control of corruption (Kaufmann et al., 2010). Both indices are standardized around zero and typically range from approximately -2.5 to +2.5. All governance indicators are treated as continuous variables in levels. A consumer price index series is also available and is used to construct an inflation measure in robustness checks, but the core empirical specifications focus on GDP_GROWTH, FDI, TO, POL and COC.

The empirical strategy combines a static two-way fixed-effects model with a dynamic panel autoregressive distributed lag (ARDL) approach. As a baseline, we estimate a fixed-effects model of economic growth on FDI, trade openness and governance indicators with both country and year effects:

$$GDP_{Growth_{it}} = \alpha + \beta_1 FDI_{it} + \beta_2 TO_{it} + \beta_3 POL_{it} + \beta_4 COC_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

where i indexes countries and t indexes years. The term μ_i captures unobserved, time-invariant country-specific factors such as geography, culture and deep institutional traits, while λ_t captures common time shocks that affect all countries in a given year, such as global crises or broad changes in the external environment. The error term ε_it is allowed to be heteroskedastic and to differ across countries. The model is estimated using the within-group transformation with country and year dummy variables, and robust standard errors based on a White cross-section covariance matrix. This covariance estimator adjusts for heteroskedasticity and contemporaneous correlation across countries, and is consistent with standard panel data practice (Baltagi, 2008). The two-way fixed-effects framework helps control for omitted variables that are constant within countries and for shocks that are common across all countries in a particular year.

Economic growth is likely to exhibit persistence, and FDI, trade openness and governance may be jointly determined with growth. To address these issues and to distinguish between short-run and long-run relationships, we also estimate a panel ARDL model. In this framework, GDP growth is allowed to depend on its own past values and on current and lagged values of FDI, trade openness, political stability and control of corruption. A convenient way to express the panel ARDL model is in error-correction form:

$$\Delta GDP_{Growth_{it}} = \theta_i\left(GDP_{Growth_{it-1}} - \theta_1 FDI_{it-1} - \theta_2 TO_{it-1} - \theta_3 POL_{it-1} - \theta_4 COC_{it-1}\right) + \sum_j \psi_{1ij}\,\Delta GDP_{Growth_{it-j}} + \sum_j \psi_{2ij}\,\Delta FDI_{it-j} + \sum_j \psi_{3ij}\,\Delta TO_{it-j} + \sum_j \psi_{4ij}\,\Delta POL_{it-j} + \sum_j \psi_{5ij}\,\Delta COC_{it-j} + \mu_i + \lambda_t + \varepsilon_{it}$$

where Δ denotes first differences, θ_1 to θ_4 are the long-run coefficients linking GDP growth to FDI, trade openness and governance, φ_i is the country-specific error-correction coefficient, and the ψ coefficients describe short-run dynamics. A negative and statistically significant φi indicates that GDP growth adjusts back towards a long-run equilibrium relationship with FDI, trade openness and governance after a shock.

The panel ARDL model is estimated using the Pooled Mean Group (PMG) estimator proposed by Pesaran et al. (1999). This estimator allows the long-run coefficients (θ_1 to θ_4) to be common across countries, while permitting the short-run coefficients, error-correction speeds and intercepts to differ across countries. This structure is appropriate for a group of Asia-Pacific economies that share some regional characteristics but may adjust at different speeds. The ARDL-PMG framework is suitable for panels where variables are a mixture of stationary and non-stationary series, provided there is evidence of cointegration among them, and has been widely used in recent work on FDI and growth (Appiah et al., 2019; Pesaran et al., 1999; Wehncke et al., 2022).

Before implementing the ARDL-PMG approach, we apply panel unit root tests to assess the order of integration of each variable and panel cointegration tests to check for the existence of a stable long-run relationship. The lag length for each variable in the ARDL specification is selected using standard information criteria, taking into account the time dimension of the panel and the need to avoid over-parameterization (Baltagi, 2008). In cases

where the main variables appear stationary, the ARDL specification can still be interpreted as a flexible dynamic model of growth with lagged levels and differences. The panel ARDL estimates distinguish long-run elasticities from short-run responses and provide an explicit error-correction term that summarizes the speed at which growth returns to its long-run path after disturbances. Together, these methods help address concerns about unobserved heterogeneity, dynamic adjustment and potential endogeneity, and offer a more reliable basis for discussing the roles of FDI, trade openness and governance in shaping economic growth in Asia-Pacific economies (Appiah et al., 2019; Wehncke et al., 2022).

Empirical results

Descriptive statistics and correlations: Table 1 shows average real GDP growth in the full sample is 4.40% per year, with a median of 4.46% and a standard deviation of 3.33 percentage points. The minimum growth rate is about -2.05% and the maximum about 10.68%, indicating substantial variation in annual growth across countries and over time.

Table 1. Descriptive statistics (1996-2019, 25 Asia-Pacific countries, 463 observations)

	GDP_GROWTH	TO	FDI	POL	COC
Mean	4.398521	105.9835	4.940453	0.308172	0.198544
Median	4.461609	86.00175	2.920942	0.477436	-0.125844
Maximum	10.67680	359.6492	22.79922	1.350247	2.207466
Minimum	-2.053518	0.460368	0.054606	-1.244970	-1.133364
Std. Dev.	3.330728	85.51455	5.925125	0.810395	1.024986
Skewness	-0.050175	1.781564	1.974524	-0.529644	0.714446
Kurtosis	2.435875	5.839885	6.020917	2.020793	2.292178
Jarque-Bera	6.333586	400.5110	476.9077	40.14476	49.05373
Probability	0.042139	0.000000	0.000000	0.000000	0.000000
Sum	2036.515	49070.38	2287.430	142.6836	91.92574
Sum Sq. Dev.	5125.311	3378485.	16219.49	303.4139	485.3754
Observations	463	463	463	463	463

Table 2. Correlation matrix

	GDP_GROWTH	TO	FDI	POL	COC
GDP_GROWTH	1.000	-0.005	0.169	-0.266	-0.277
TO	-0.005	1.000	0.748	0.324	0.449
FDI	0.169	0.748	1.000	0.277	0.327
POL	-0.266	0.324	0.277	1.000	0.719
COC	-0.277	0.449	0.327	0.719	1.000

Table 2 presents the correlation matrix. GDP growth is positively correlated with FDI (about 0.17) and essentially uncorrelated with trade openness (-0.005). By contrast, growth is negatively correlated with both political stability (-0.27) and control of corruption (-0.28). This pattern likely reflects level differences: countries with very strong institutions tend to be richer and grow more slowly, whereas several fast-growing economies in the region still have weaker governance scores.

Among the explanatory variables, the correlations are much stronger. Trade openness and FDI are highly correlated (around 0.75), and both are positively correlated with the governance indicators. Political stability and control of corruption are strongly correlated with each other (about 0.72), indicating that they capture related aspects of institutional quality. These strong correlations suggest that multicollinearity may inflate standard errors for some coefficients, and they underline the value of using panel regressions with fixed effects to separate the roles of FDI, trade and governance.

Robustness: Cross-section weighted GLS

As a robustness check to the baseline fixed-effects specification, we estimate an alternative model using panel EGLS with cross-section weights and White cross-section robust standard errors. This approach allows for country-specific heteroskedasticity and reweights the observations accordingly, while still controlling for unobserved, time-invariant country characteristics through cross-section fixed effects (shown in Table 3).

Table 3. Panel EGLS

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.092106	0.564105	7.254160	0.0000
FDI	0.155891	0.035487	4.392903	0.0000
TO	-0.003349	0.004025	-0.832086	0.4058
POL	0.598372	0.610990	0.979348	0.3280
COC	-1.476916	0.422628	-3.494598	0.0005
	Effects Specification			
Cross-section fixed (dummy variables)				
	Weighted Statistics			
R-squared	0.637362	Mean dependent var		6.522388
Adjusted R-squared	0.613966	S.D. dependent var		6.645672
S.E. of regression	2.631397	Sum squared resid		3005.124
F-statistic	27.24237	Durbin-Watson stat		1.660094
Prob(F-statistic)	0.000000			
	Unweighted Statistics			
R-squared	0.408533	Mean dependent var		4.398521
Sum squared resid	3031.452	Durbin-Watson stat		1.692646

In Table 3, the dependent variable remains real GDP growth, and the regressors are FDI, trade openness, political stability and control of corruption. The weighted R-squared is 0.64 and the adjusted weighted R-squared is 0.61, indicating a reasonably good fit for annual growth data. The F-statistic (27.24 with p-value 0.0000) confirms that the regressors and country effects are jointly significant. The Durbin-Watson statistic of 1.66 suggests moderate residual persistence but no severe serial correlation.

FDI continues to have a positive and statistically significant association with economic growth. The coefficient on FDI is 0.1559 with a standard error of 0.0355 and a t-statistic of 4.39 ($p < 0.01$). This estimate is very close to the fixed-effects result and reinforces the conclusion that higher FDI inflows are linked to faster growth in Asia-Pacific economies, even when the model allows for heteroskedasticity and cross-sectional weighting.

The coefficient on trade openness is negative but statistically insignificant in this robustness specification. The estimate is -0.0033 with a standard error of 0.0040 and a t-statistic of -0.83 ($p \approx 0.41$). This suggests that, once the model is reweighted and only country fixed effects are included, trade openness does not show a clear conditional relationship with growth.

The governance variables show mixed results. Political stability remains positive but statistically insignificant (coefficient 0.5984, $p \approx 0.33$), indicating that short-run changes in political stability do not have

a clearly identifiable direct effect on annual growth in this specification. By contrast, the coefficient on control of corruption is negative and statistically significant (-1.4769 with a standard error of 0.4226 and a t-statistic of -3.49, $p < 0.01$). This sign is counter-intuitive and most likely reflects sample composition and multicollinearity rather than a genuine negative effect of controlling corruption on growth.

Dynamic panel ARDL results: This subsection reports estimates from a dynamic panel ARDL(1,0,0,0,0) model with country and year fixed effects. Real GDP growth depends on its own lag, contemporaneous FDI, trade openness, political stability and control of corruption, plus country and year dummies. Because of the lagged dependent variable, the usable sample is 438 observations for 25 countries over 1997-2019. The model explains about 59% of the variation in annual growth (R-squared ≈ 0.59), which is slightly higher than in the static fixed-effects specification.

Long-run coefficients: Long-run coefficients are obtained by dividing each short-run slope by one minus the coefficient on lagged GDP growth. Table 4 summarizes the implied long-run relationships between growth and the explanatory variables.

Table 4. Dynamic panel ARDL long-run coefficients (ARDL(1,0) with country and year fixed effects)

Variable	Coefficient	Std. error	t-statistic	p-value
FDI (% of GDP)	0.192	0.049	3.90	0.0001
Trade openness (TO)	-0.015	0.007	-2.03	0.0427
Political stability (POL)	0.563	0.756	0.74	0.4567
Control of corruption (COC)	0.021	0.763	0.03	0.9778

The dynamic long-run estimates confirm the central role of FDI. The coefficient on FDI is positive and statistically significant at the 1% level. It implies that, in the long run, an increase in net FDI inflows by 1 percentage point of GDP is associated with roughly 0.19 percentage points higher annual real GDP growth, holding other factors constant. This result is consistent with Hypothesis H1 and with the static fixed-effects estimates.

Trade openness has a small negative long-run coefficient, which is statistically significant at the 5% level. Conditional on FDI and governance, higher trade shares are associated with slightly lower long-run growth. This suggests that, in this sample, the direct contribution of openness to growth is limited once FDI and fixed effects are taken into account, and that the openness-growth relationship may be driven by indirect channels or by differences in country income levels and vulnerability to external shocks.

The long-run coefficients on political stability and control of corruption are small and not statistically different from zero. This indicates that, in the dynamic specification, governance indicators do not show an independent long-run effect on annual growth once FDI, trade openness, country heterogeneity and common time shocks are controlled for. These results provide only weak direct support for Hypotheses H3 and H4, although governance may still matter indirectly through its impact on FDI and trade patterns.

Conclusion

This paper examined how foreign direct investment, trade openness and governance relate to economic growth in 25 Asia-Pacific countries over 1996-2019, using two-way fixed-effects regressions, cross-section weighted GLS and a dynamic panel ARDL model with country and year effects. Across all specifications, FDI inflows emerge as a robust and economically meaningful driver of real GDP growth, in both the short run and the long run. This supports H1 and is consistent with the view that FDI transmits technology, management skills and access to global production networks when host economies have sufficient absorptive capacity.

By contrast, the evidence for H2-H4 is weak. Trade openness, measured by the trade-to-GDP ratio, shows a small negative or statistically insignificant conditional association with growth once FDI and fixed effects are controlled for. Political stability and control of corruption do not display strong independent effects on annual growth in the main models. These results suggest that, in this regional panel, openness and governance operate mainly as background conditions and determinants of the level and quality of FDI and structural development, rather than as strong direct regressors in year-to-year growth equations. The dynamic ARDL estimates confirm a stable long-run relationship between growth, FDI, openness and governance, with a fast speed of adjustment back to equilibrium, but they underline that FDI is the most reliable predictor within this system.

The study contributes by providing updated panel evidence for a broad group of Asia-Pacific economies, placing growth (rather than FDI inflows) at the center of the analysis, and combining static fixed-effects and dynamic ARDL approaches to separate short-run and long-run effects.

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