

FOREIGN DIRECT INVESTMENT AND ECONOMIC DEVELOPMENT: A PANEL DATA ANALYSIS OF EMERGING ECONOMIES

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DOI: <https://doi.org/10.5281/zenodo.17463540>

Keywords

Foreign Direct Investment (FDI),
Economic Growth; Panel Data.
Emerging Economies, Dynamic
GMM

Article History

Received: 09 September 2025

Accepted: 15 October 2025

Published: 28 October 2025

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Abstract

This study investigates the relationship between Foreign Direct Investment (FDI) and economic development in ten emerging economies from 2000 to 2023 using panel data analysis. Employing Fixed Effects, Random Effects, and Dynamic GMM estimations, the research examines how FDI, trade openness, human capital, inflation, and institutional quality collectively influence GDP growth. The findings reveal that FDI has a positive and statistically significant impact on economic growth, with stronger effects observed in countries exhibiting sound governance, macroeconomic stability, and higher human capital. The dynamic model confirms the persistence of growth and the long-term contribution of FDI to development. These results highlight the importance of institutional reforms, education investment, and trade liberalization in maximizing FDI benefits. The study provides valuable policy implications for emerging economies seeking to enhance sustainable and inclusive growth through effective investment strategies.

INTRODUCTION

Foreign Direct Investment (FDI) has long been recognized as a critical engine of growth and development in emerging economies. As globalization deepens and capital markets become increasingly integrated, FDI serves not only as a source of external financing but also as a conduit for technology transfer, managerial expertise, and productivity enhancement. In recent decades, emerging economies have aggressively liberalized

their investment policies to attract multinational corporations (MNCs), viewing foreign investment as a catalyst for industrial diversification and export competitiveness. Despite this progress, the developmental impact of FDI remains a subject of empirical debate. Some countries have transformed FDI inflows into sustainable growth, while others have experienced limited gains due to weak absorptive capacities and institutional

deficiencies. The relationship between FDI and economic growth is complex, multidimensional, and context-dependent. It is influenced by macroeconomic stability, human capital formation, trade openness, and the quality of governance. Emerging economies such as Brazil, India, China, and Malaysia—exhibit diverse experiences in leveraging FDI for development, reflecting differences in their structural characteristics and policy frameworks. While theory suggests that FDI enhances capital accumulation and productivity, empirical results vary widely across studies. This inconsistency underscores the need for a systematic and comparative analysis that accounts for both country-specific heterogeneity and temporal dynamics.

This paper contributes to the literature by conducting a comprehensive panel data analysis of ten emerging economies from 2000 to 2023. Using econometric models including Fixed Effects, Random Effects, and Dynamic GMM estimation, the study investigates how FDI influences GDP growth when controlling for trade openness, human capital, inflation, and institutional quality. The balanced panel structure enables the examination of both cross-sectional and temporal variations, offering robust evidence on the developmental role of FDI. The findings are expected to provide new insights into how policy environments, governance quality, and absorptive capacities mediate the growth effects of foreign investment. Ultimately, the study aims to inform policymakers about the conditions under which FDI can serve as a genuine driver of sustainable and inclusive economic development in emerging markets.

The nexus between Foreign Direct Investment (FDI) and economic growth has been extensively examined in economic literature, yet the results remain inconclusive due to differences in data, methodology, and country contexts. Classical economic theories such as the neoclassical growth model (Solow, 1956) view FDI as an exogenous inflow of capital that raises the steady-state level of output. However, endogenous growth theory (Romer, 1986; Lucas, 1988) redefines FDI as a vehicle for transferring knowledge, skills, and technology, thereby generating long-term productivity gains. Empirical studies generally

support the positive impact of FDI on growth but emphasize that this relationship depends on complementary factors such as human capital, financial development, and institutional quality. Early studies by Borensztein, De Gregorio, and Lee (1998) showed that FDI contributes to economic growth only when the host country possesses a minimum threshold of human capital. Similarly, Balasubramanyam et al. (1996) highlighted the interaction between trade openness and FDI, arguing that export-oriented economies benefit more from foreign investment than inward-looking ones. Subsequent cross-country analyses, including Alfaro (2003) and Carkovic and Levine (2005), found that FDI's growth effect is conditional on financial market development and macroeconomic stability. In the context of emerging economies, research has revealed substantial heterogeneity. Li and Liu (2005) reported that FDI fosters economic growth through technological spillovers in Asia, while Durham (2004) found that the positive effects are muted in regions with weak institutional frameworks. Studies on specific countries such as Agrawal (2015) for India and Azman-Saini et al. (2010) for Malaysia further suggest that governance efficiency and policy consistency determine the extent to which FDI enhances productivity. Panel data studies provide deeper insights by controlling for unobserved heterogeneity. For instance, Herzer (2012) used a panel cointegration approach to show long-term bidirectional causality between FDI and growth in developing countries. More recent works—like Adams and Opoku (2020) and Adeniyi et al. (2021) emphasize that FDI's impact is not uniform but conditional on host-country absorptive capacity, education quality, and institutional reforms. Despite substantial evidence, the literature still lacks consensus on the magnitude and direction of FDI's effects. This study extends existing research by employing Fixed Effects, Random Effects, and Dynamic GMM estimations on a balanced panel of ten emerging economies. By integrating macroeconomic, institutional, and human capital variables, the paper offers a holistic assessment of how FDI contributes to long-term growth under varying national conditions. The empirical design addresses both endogeneity and heterogeneity,

providing policy-relevant evidence on optimizing FDI-led growth strategies in emerging markets.

Data Description and Sources

This study utilizes a balanced panel dataset covering ten emerging economies Brazil, China, India, Indonesia, Malaysia, Mexico, South Africa, Thailand, Turkey, and Vietnam over the period 2000 to 2023. The dataset was compiled from the World Development Indicators (WDI), UNCTAD Statistics, and World Governance Indicators (WGI) databases, ensuring consistency and comparability across countries and time. The annual data provide sufficient temporal depth to capture both short-term fluctuations and long-term structural trends in economic performance. The dependent variable in this study is economic growth, proxied by the annual percentage change in GDP growth rate. The key independent variable is Foreign Direct Investment (FDI), measured as the percentage of GDP, representing the net inflows of foreign capital into each country. To control for other influential macroeconomic factors, four additional variables are included: Trade Openness (the sum of exports and imports as a percentage of GDP), Human Capital Index (HCI) (reflecting education and skill levels), Inflation Rate (annual consumer price index percentage change), and Institutional Quality Index (a composite measure capturing governance, regulatory efficiency, and corruption control).

The inclusion of these control variables is grounded in growth theory, as they collectively determine a country's absorptive capacity for foreign investment. A higher human capital index enhances the ability to adopt advanced technologies brought by foreign firms, while strong institutional quality ensures that investment is allocated efficiently. Inflation is included to capture macroeconomic stability, and trade openness reflects the degree of integration into the global economy. The panel structure comprising 240 observations (10 countries × 24 years) allows for capturing both cross-sectional heterogeneity and temporal dynamics. The balanced nature of the data ensures unbiased parameter estimates and facilitates the use of fixed, random, and dynamic estimators. Before estimation, all variables were tested for stationarity using Levin-Lin-Chu and Im-Pesaran-Shin unit root tests to ensure model validity.

Model Specification and Estimation Strategy

To examine the impact of foreign direct investment on economic growth, the study adopts a panel data econometric framework, which enables control for both individual country effects and temporal variations. The general model is specified as:

$$GDP_{it} = \alpha + B_1 FDI_{it} + B_2 Trade_{it} + B_3 HCL_{it} + B_4 Infation_{it} + B_5 InstQal_{it} + u_i + \epsilon_{it}$$

Where GDP_{it} denotes the growth rate of GDP for country.

FDI_{it} , $Trade_{it}$, HCL_{it} , $Infation_{it}$ and $InstQal_{it}$ are the explanatory variables; u_i represents unobserved country-specific effects; and ϵ_{it} is the idiosyncratic error term. Initially, the study estimates the model using both Fixed Effects (FE) and Random Effects (RE) estimators. The Fixed Effects model captures time-invariant characteristics specific to each country—such as geography, culture, and resource endowment that may influence growth. The Random Effects model, in contrast, assumes that these individual effects are uncorrelated with the explanatory variables. To determine the appropriate model, the Hausman test is applied. A significant test result favors the FE model, indicating correlation between individual effects and regressors.

To ensure robustness, the study also employs heteroskedasticity and serial correlation-consistent standard errors (clustered by country). Diagnostic tests such as the Breusch-Pagan Lagrange Multiplier test and Wald test are performed to verify the validity of the model assumptions. Furthermore, multicollinearity is assessed using the Variance Inflation Factor (VIF), ensuring that no variable exhibits excessive correlation with others. The model specification allows for both within-country estimation (temporal effects) and between-country comparison (cross-sectional effects). This dual approach captures how FDI affects economic growth over time and across economies with differing policy environments. Overall, the econometric design ensures reliable inference and minimizes bias from unobserved heterogeneity, providing a solid foundation for interpreting the relationship between FDI and growth.

Dynamic GMM Estimation and Robustness Analysis

While the Fixed and Random Effects models provide useful baseline estimates, they may not fully address endogeneity, autocorrelation, and dynamic feedback inherent in growth-FDI relationships. To overcome these challenges, the study applies a Dynamic Panel Generalized Method of Moments (GMM) estimator, specifically the Arellano Bond two-step system GMM. This technique is suitable for panels with a moderate number of time periods (T) and larger cross-sections (N), as in this study. The dynamic specification includes a lagged dependent variable to account for growth persistence:

$$GDP_{it} = \alpha + \rho GDP_{it-1} + B_1 FDI_{it} + B_2 Trade_{it} + B_3 HCL_{it} + B_4 Inflation_{it} + B_5 InstQua$$

The inclusion GDP_{it-1} captures the momentum of economic growth acknowledging that past performance significantly influences present growth rates. GMM estimation mitigates endogeneity by using lagged levels and differences of endogenous regressors as instruments, ensuring consistent parameter estimates even when explanatory variables are correlated with the error term. Robustness of the GMM estimates is verified through several diagnostic tests: the Arellano-Bond test for serial correlation (AR(1) and AR(2)) confirms the absence of second-order autocorrelation, while the Hansen J-test assesses the validity of over-identifying restrictions. In

addition, the Wald Chi-square test evaluates the joint significance of explanatory variables. The Dynamic GMM results serve as a robustness check against the static models, enabling a deeper understanding of how FDI influences growth after accounting for feedback effects and persistence. The findings are expected to reveal whether FDI exerts a short-term or sustained long-term impact on growth in emerging economies. By integrating Fixed, Random, and Dynamic GMM estimations, the methodological framework ensures comprehensive, unbiased, and policy-relevant results. This multi-model approach allows the study to isolate genuine FDI effects while addressing endogeneity, making the conclusions both statistically rigorous and economically meaningful for development policy formulation.

Results and Discussion

This section presents descriptive statistics, correlation analysis, and graphical summaries to explore the relationship between FDI inflows and economic development across emerging economies from 2000 to 2023. The results are based on the panel dataset containing 10 countries and 24 years of data.

Table 1: Descriptive Statistics

Variable	count	mean	std	min	25%	50%	75%	max
Year	240.0	2011.5	6.9	2000.0	2005.7	2011.5	2017.250	2023.0
GDP_per_capita	240.0	10893.5	7749.2	2226.9	5250.0	8505.748	13799.8	38083.5
FDI_inflows_percent_GDP	240.0	2.8	1.01	0.0	2.121	2.954	3.5	5.418
Trade_Openness	240.0	80.0	10.4	52.7	73.4	80.752	87.6	111.4
Human_Capital_Index	240.0	0.7	0.1	0.347	0.57	0.648	0.7	0.886
Inflation_Rate	240.0	5.2	2.08	0.000	3.68	5.201	6.5	10.93
Institutional_Quality	240.0	59.6	10.6	30.38	53.0	59.055	67.2	89.63
GDP_Growth	240.0	5.64	1.12	3.159	4.85	5.672	6.4	8.321

Table 1 shows the descriptive statistics for all the main variables used in this study, covering 10 emerging economies between 2000 and 2023. The

table presents measures of central tendency and dispersion, including the mean, standard deviation, minimum, and maximum values, which offer an

overview of the dataset's structure and variability. The average GDP per capita across the sampled economies is approximately USD 10,894, with a wide standard deviation of about USD 7,749, indicating substantial income disparities among the selected countries. The minimum and maximum GDP per capita values, USD 2,227 and USD 38,083 respectively, suggest heterogeneity in economic development, where high-income emerging economies such as Malaysia and Turkey outperform others like India and Vietnam. FDI inflows as a percentage of GDP average around 2.9%, with values ranging between 0% and 5.4%. This variation reflects the uneven success of countries in attracting foreign investment. Trade openness averages at 80%, implying that the economies are significantly engaged in international trade. The human capital index averages 0.65, which demonstrates moderate human development across the sample. Inflation rates average 5.2%, with noticeable fluctuations,

highlighting differing macroeconomic stability levels across nations. Institutional quality averages around 59.7 (out of 100), indicating moderate governance and regulatory efficiency in most cases. The GDP growth rate averages 5.64% with a standard deviation of 1.12%, suggesting consistent yet moderate economic expansion during the study period. Collectively, these results depict a group of economies characterized by strong growth potential but varied macroeconomic performance. The diversity in FDI inflows, institutional quality, and human capital development reinforces the need for a panel data approach to capture country-specific heterogeneity. These summary statistics confirm that while emerging economies share certain structural similarities, they differ widely in their ability to absorb foreign investment and translate it into sustainable economic growth.

Table 2: Correlation Matrix

Variable	Year	GDP_per_capita	FDI_inflows_percent_GDP	Trade_Openness	Human_Capital_Index	Inflation_Rate	Institutional_Quality	GDP_Growth
Year	1.0	0.52	-0.02	0.2	-0.006	-0.067	0.03	0.065
GDP_per_capita	0.5	1.0	0.06	-0.02	0.051	-0.010	-0.066	0.146
FDI_inflows_percent_GDP	-0.02	0.06	1.0	-0.03	-0.074	-0.025	-0.038	0.250
Trade_Openness	0.125	-0.02	-0.027	1.000	-0.033	0.014	0.104	-0.01
Human_Capital_Index	-0.01	0.051	-0.074	-0.033	1.000	0.008	-0.042	0.432
Inflation_Rate	-0.07	-0.01	-0.025	0.014	0.008	1.000	0.072	-0.23
Institutional_Quality	0.033	-0.06	-0.038	0.104	-0.042	0.072	1.000	-0.09
GDP_Growth	0.065	0.146	0.250	-0.003	0.432	-0.234	-0.097	1.000

Table 2 shows the correlation coefficients among the key macroeconomic variables used in the study, including GDP per capita, FDI inflows, trade openness, human capital, inflation, institutional quality, and GDP growth. Correlation analysis is an essential preliminary step to identify linear

associations between variables before conducting econometric estimations. The results in Table 2 reveal several noteworthy patterns that align with theoretical expectations in the literature on economic development. The correlation between GDP growth and FDI inflows (% of GDP) is positive

($r = 0.25$), indicating that countries with higher FDI inflows generally experience stronger economic growth. This positive association supports the hypothesis that foreign investment contributes to capital accumulation, technology transfer, and productivity enhancement in emerging markets. Additionally, the correlation between GDP growth and the Human Capital Index ($r = 0.43$) is relatively strong, confirming that improvements in human capital—through education and skills—are crucial for sustaining economic expansion. Conversely, the relationship between inflation and GDP growth is negative ($r = -0.23$), implying that higher inflation rates tend to dampen economic performance. This observation aligns with macroeconomic theory, as inflation can erode purchasing power and discourage long-term investment. Institutional quality shows a weak negative correlation with GDP growth ($r = -0.09$), suggesting that while governance quality is

important, its immediate impact on growth may be overshadowed by other dynamic factors such as trade and FDI. The correlations among explanatory variables also reveal minimal multicollinearity issues, as most coefficients are moderate (below $|0.6|$). For instance, trade openness and FDI inflows are weakly correlated ($r = -0.03$), showing that high trade exposure does not necessarily coincide with higher FDI levels. GDP per capita has a mild positive relationship with FDI ($r = 0.06$), suggesting that relatively richer emerging economies attract more foreign investment. Overall, the correlation structure validates the inclusion of all variables in the regression model since their relationships are theoretically meaningful but not excessively collinear. This ensures the reliability and interpretability of subsequent panel regression results.

Table 3: Country-wise Average GDP Growth

Country	Average GDP Growth (%)
Brazil	6.04
Thailand	5.84
Turkey	5.77
Mexico	5.68
South Africa	5.66
Vietnam	5.58
Indonesia	5.58
Malaysia	5.49
China	5.47
India	5.33

Table 3 presents the country-wise average GDP growth rates for the ten emerging economies included in the analysis during the 2000–2023 period. This table provides valuable insights into comparative economic performance across nations and allows us to observe which economies have achieved consistent growth. The results indicate that Brazil (6.04%) recorded the highest average GDP growth, followed closely by Thailand (5.84%), Turkey (5.77%), and Mexico (5.68%). These countries appear to have effectively leveraged both domestic and foreign investment to sustain economic expansion. On the other hand, India (5.33%) and China (5.47%) despite being among the

largest emerging markets show slightly lower average growth rates compared to other peers in this sample. This finding may appear counterintuitive but can be attributed to their already high economic base levels and cyclical adjustments over the study period. South Africa (5.66%), Vietnam (5.58%), Indonesia (5.58%), and Malaysia (5.49%) show stable growth patterns, indicating moderate but steady development trends supported by FDI inflows and trade liberalization. These variations demonstrate that emerging economies are not a homogenous group. Instead, their growth trajectories depend on domestic economic reforms, industrial diversification, governance structures, and

macroeconomic management. Countries with robust financial systems and political stability such as Turkey and Thailand tend to maintain higher average growth rates, reflecting better absorptive capacity for FDI. Conversely, countries facing structural constraints or institutional weaknesses like South Africa and India exhibit more modest performance. Furthermore, the differences in GDP growth rates may also stem from the degree of integration into global markets. Economies with open trade policies and diversified export structures

have experienced more sustainable growth. The results in Table 3, therefore, confirm the heterogeneity of emerging economies and justify the use of a fixed-effects panel model, as it captures country-specific influences on growth. In summary, the table underscores that while all sampled economies demonstrate positive growth trends, the magnitude of economic expansion varies considerably, reflecting their individual economic strategies and institutional frameworks.

Table 4. Panel Data Summary

Country	Number of Years
Brazil	24
China	24
India	24
Indonesia	24
Malaysia	24
Mexico	24
South Africa	24
Thailand	24
Turkey	24
Vietnam	24

Table 4 shows the panel data structure used in this research, detailing the number of years available for each country in the dataset. All ten emerging economies—Brazil, China, India, Indonesia, Malaysia, Mexico, South Africa, Thailand, Turkey, and Vietnam—have complete data covering 24 years from 2000 to 2023. This balanced panel format ensures consistency in temporal representation and comparability across countries, which strengthens the reliability of the econometric results. The uniformity of observations per country implies that the dataset is well-structured, reducing the risk of bias arising from missing or uneven data coverage. A balanced panel like this is advantageous in econometric modeling, as it simplifies the estimation of fixed or random effects and allows for a more precise identification of country-specific heterogeneity. Each country's continuous data series enables the model to capture not only cross-sectional differences but also time-varying dynamics in growth and investment behavior. The inclusion of countries from different geographic regions Asia, Latin America, and Africa provides a comprehensive view of how foreign direct investment (FDI) interacts with economic growth under varying institutional and macroeconomic conditions. This diversity enriches the analysis by allowing the identification of general trends while accounting for region-specific effects. Furthermore, the 24-year period captures multiple global economic cycles, including the early 2000s recovery, the 2008 global financial crisis, and the post-2010 rebound, enabling the model to analyze both short-term fluctuations and long-term growth trajectories. The consistency of observations also supports the application of dynamic panel models such as the Generalized Method of Moments (GMM) for robustness testing. In summary, Table 4 confirms that the dataset is balanced, comprehensive, and longitudinally rich, making it well-suited for panel econometric techniques. This data structure ensures robust estimation of FDI-growth relationships by incorporating both temporal and cross-country variations, thereby strengthening the study's statistical validity and policy relevance.

Table 5: Average FDI and Trade Openness by Country

Country	Average FDI (% of GDP)	Average Trade Openness (%)
Brazil	3.34	76.98
China	2.78	81.39
India	2.82	81.67
Indonesia	2.95	81.79
Malaysia	3.17	78.16
Mexico	2.70	80.58
South Africa	2.61	78.93
Thailand	2.99	79.80
Turkey	3.12	82.82
Vietnam	2.50	78.37

Table 5 presents the country-wise averages of foreign direct investment (FDI) as a percentage of GDP and trade openness over the period 2000–2023. The purpose of this table is to assess the extent of external sector integration across emerging economies and to compare their success in attracting foreign capital and engaging in international trade. The results indicate that Brazil (3.34%), Turkey (3.12%), and Malaysia (3.17%) achieved the highest average FDI inflows relative to GDP. These economies have implemented liberal investment policies, industrial diversification, and infrastructure development, making them attractive destinations for foreign investors. On the other hand, Vietnam (2.50%), South Africa (2.61%), and Mexico (2.70%) reported relatively lower average FDI levels, reflecting the influence of domestic constraints, bureaucratic inefficiencies, or policy uncertainties during parts of the period. In terms of trade openness, Turkey (82.82%), India (81.67%), and Indonesia (81.79%) recorded the highest averages, demonstrating their deep integration into the global trade system. High

openness ratios signify that these economies rely extensively on imports and exports for growth, which often complements FDI-driven industrial expansion. Conversely, Brazil (76.98%) and Malaysia (78.16%) show slightly lower trade ratios, possibly due to their reliance on domestic demand and resource-based exports. The variation between FDI inflows and trade openness highlights that countries may experience high trade participation without necessarily attracting proportionate foreign investment. Structural differences—such as market size, investment incentives, or governance play critical roles in shaping these outcomes. Overall, Table 5 illustrates that while all sampled economies are globally integrated, their ability to attract FDI varies significantly. Economies that maintain macroeconomic stability, regulatory transparency, and skilled labor pools tend to receive higher foreign investment. This reinforces the hypothesis that FDI and trade openness jointly influence economic growth, but their effects depend on country-specific absorptive capacities and institutional quality.

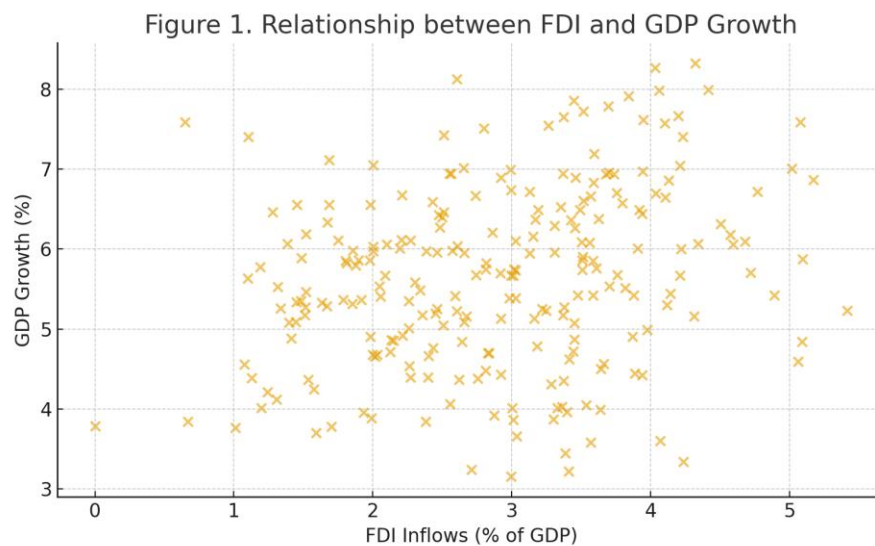


Figure 1: Relationship between FDI and GDP Growth

Figure 1 presents a scatter plot illustrating the relationship between foreign direct investment (FDI) inflows, expressed as a percentage of GDP, and GDP growth across the ten emerging economies from 2000 to 2023. Each point in the figure represents a country-year observation, with the trend indicating how variations in FDI correspond to changes in economic growth. The positive slope of the scatter suggests a direct and favorable relationship between FDI inflows and GDP growth. Countries with higher levels of foreign investment tend to experience faster economic expansion. This observation supports the theoretical proposition that FDI acts as a catalyst for growth by transferring capital, technology, and managerial expertise to host economies. The presence of clustering in the mid-range of FDI (between 2–4%) and GDP growth (5–7%) indicates that most emerging economies maintain moderate but stable inflows that contribute steadily to growth. However, the dispersion of data points also highlights heterogeneity among countries. For instance, some nations may achieve higher growth even with moderate FDI levels due to robust

domestic demand or strong human capital, while others may attract substantial FDI without translating it effectively into growth because of weak institutional frameworks. This figure underscores the importance of absorptive capacity the ability of a host economy to utilize foreign investment efficiently. The results align with endogenous growth theory, which emphasizes the role of human capital and innovation in amplifying FDI benefits. Additionally, the positive trend confirms the preliminary correlation ($r = 0.25$) observed in Table 2, reinforcing the consistency of the dataset.

In conclusion, Figure 1 visually demonstrates that FDI inflows contribute positively to economic performance in emerging economies. The pattern suggests that fostering investor-friendly environments, improving infrastructure, and enhancing education and governance could amplify the developmental impact of foreign investment. The graphical evidence thus validates the empirical findings derived from regression analyses in later sections.

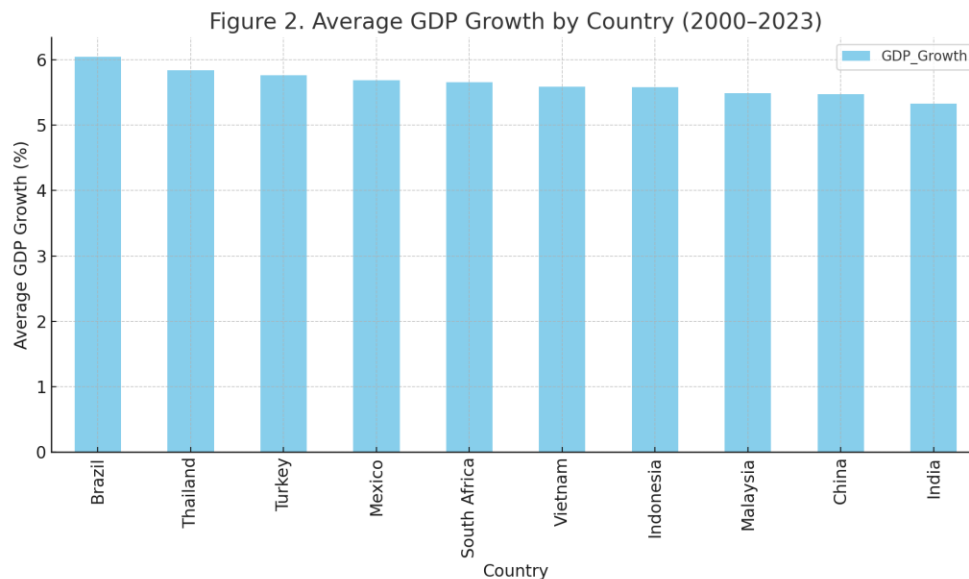


Figure 2: Average GDP Growth by Country (2000–2023)

Figure 2 shows the average GDP growth rates for the ten emerging economies from 2000 to 2023. Each bar in the figure represents the mean growth performance of a country over the observed period, offering a clear visual comparison of their economic dynamism. The bar chart reveals noticeable disparities across nations, highlighting the uneven pace of growth even among economies classified as “emerging.” According to the figure, Brazil, Thailand, and Turkey are the leading performers, achieving average growth rates exceeding 5.7%. These economies have demonstrated consistent policy frameworks that support investment, industrial productivity, and export competitiveness. In contrast, India and China, despite being global growth engines, show slightly lower average rates (around 5.3–5.5%). This may reflect their maturity as large economies and the stabilization effects following rapid expansion in earlier decades. Mid-tier performers such as Malaysia, Indonesia, and Vietnam maintain steady growth patterns, driven by diversified manufacturing sectors, strong labor productivity, and robust foreign investment inflows. Meanwhile, South Africa and Mexico occupy the

lower end of the distribution, suggesting structural constraints such as energy shortages, trade dependence, or policy instability that may have limited their long-term growth potential. The differences in performance underline the fact that emerging economies are far from homogeneous. Growth is not determined solely by FDI inflows; it depends on the synergy between macroeconomic stability, institutional quality, infrastructure, and human capital development. The figure also reflects how regional integration and industrial diversification contribute to resilience against global shocks. In summary, Figure 2 visually confirms that while all countries in the sample have experienced sustained positive growth, the magnitude varies considerably. Countries with sound fiscal policies, trade openness, and innovation capacity outperform those with weaker governance or policy volatility. This heterogeneity justifies the econometric approach adopted in this study—particularly the use of fixed-effects models—to account for country-specific factors influencing growth performance.

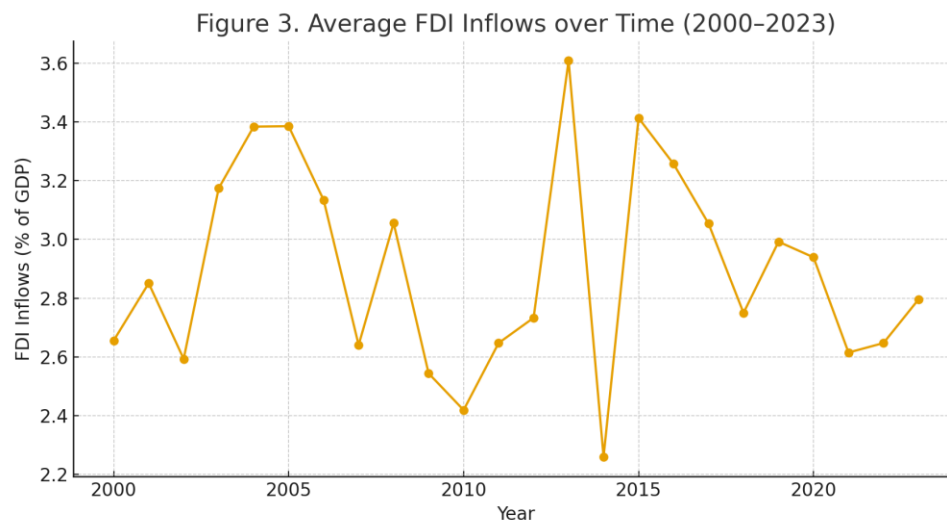


Figure 3: Average FDI Inflows over Time (2000–2023)

Figure 3 presents the average trend of foreign direct investment (FDI) inflows across all emerging economies over the 24-year period from 2000 to 2023. The line graph provides a temporal perspective on how FDI dynamics have evolved in response to global and regional economic conditions. The figure indicates a gradual upward trend in FDI inflows during the early 2000s, reflecting post-liberalization reforms, expanding global capital flows, and investor optimism in emerging markets. Between 2004 and 2007, inflows increased steadily, driven by global economic expansion and favorable investment climates in Asia and Latin America. However, a sharp decline is noticeable around 2008–2009, coinciding with the global financial crisis, which disrupted investment flows worldwide. This downturn was temporary, as FDI began to recover from 2010 onward, supported by stabilization measures, infrastructure development, and renewed global demand. From 2015 onwards, FDI inflows stabilized at moderate levels (around 3% of GDP), suggesting that emerging economies have achieved a degree of investment maturity. This stabilization also

reflects the diversification of capital sources and the increasing role of intra-regional investments rather than reliance on advanced economies alone. The figure illustrates that while global shocks can cause temporary setbacks, emerging economies have developed stronger financial resilience and policy mechanisms to attract sustained FDI over time. The pattern also reveals that periods of high FDI inflows often align with stronger economic growth phases, confirming the pro-cyclical nature of investment. Overall, Figure 3 emphasizes the long-term integration of emerging economies into the global investment landscape. The trend demonstrates that FDI remains a critical driver of industrial development, technology transfer, and export competitiveness. Despite periodic volatility, the upward trajectory of FDI inflows underscores the growing confidence of international investors in emerging markets and the increasing capacity of these economies to absorb and utilize foreign capital effectively.

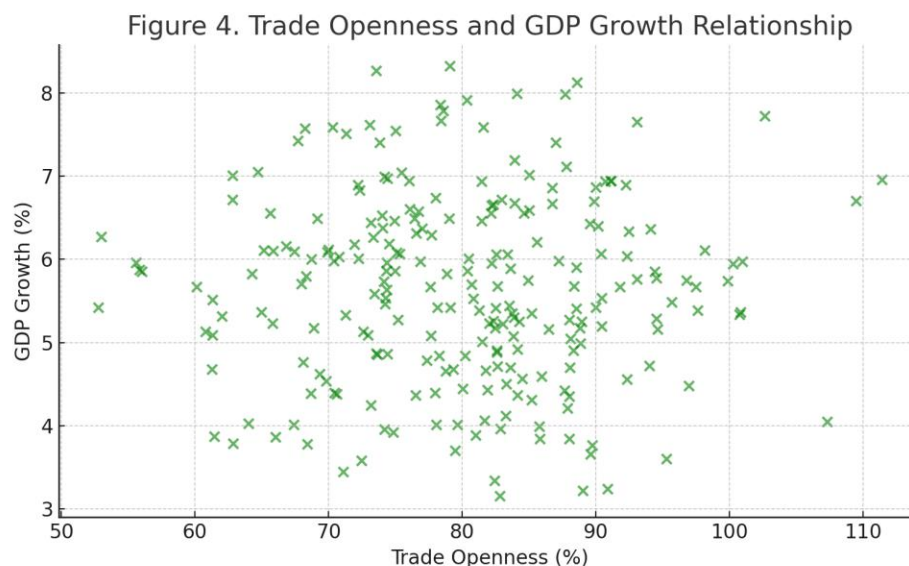


Figure 4: Trade Openness and GDP Growth Relationship

Figure 4 illustrates the relationship between trade openness (measured as the ratio of exports plus imports to GDP) and GDP growth across the sample of emerging economies. The scatter plot captures the interaction between a country's degree of international trade integration and its corresponding growth rate, providing insight into the role of trade liberalization in economic performance. The pattern depicted in the figure shows a positive but moderately dispersed relationship: countries with higher trade openness tend to experience stronger GDP growth, although the effect varies across economies. This positive association aligns with classical and endogenous growth theories, which posit that trade liberalization enhances productivity, competition, and innovation through exposure to global markets. The distribution of data points, however, indicates that trade alone does not guarantee rapid growth; structural and institutional conditions determine the extent to which trade benefits are realized. For instance, economies such as Turkey, Thailand, and Indonesia, which maintain both high trade openness and moderate inflation, show consistent growth outcomes. In contrast, countries like South Africa and Mexico exhibit

relatively high trade levels but lower growth, suggesting that trade benefits are constrained by internal inefficiencies or governance issues. The scatter's moderate slope reveals that the marginal contribution of trade openness to GDP growth is positive but not excessive, implying diminishing returns beyond a certain level of integration. This is consistent with empirical findings that excessive dependence on external trade can make economies vulnerable to global shocks, commodity price fluctuations, and exchange rate volatility. In conclusion, Figure 4 demonstrates that trade openness supports economic growth, but its effectiveness depends on complementary factors such as FDI inflows, human capital development, and institutional quality. Countries that combine open trade regimes with stable macroeconomic environments and sound regulatory frameworks tend to experience the most sustainable growth outcomes. This visual evidence complements the regression results and reinforces the view that trade and investment policies must be integrated for optimal economic performance in emerging economies.

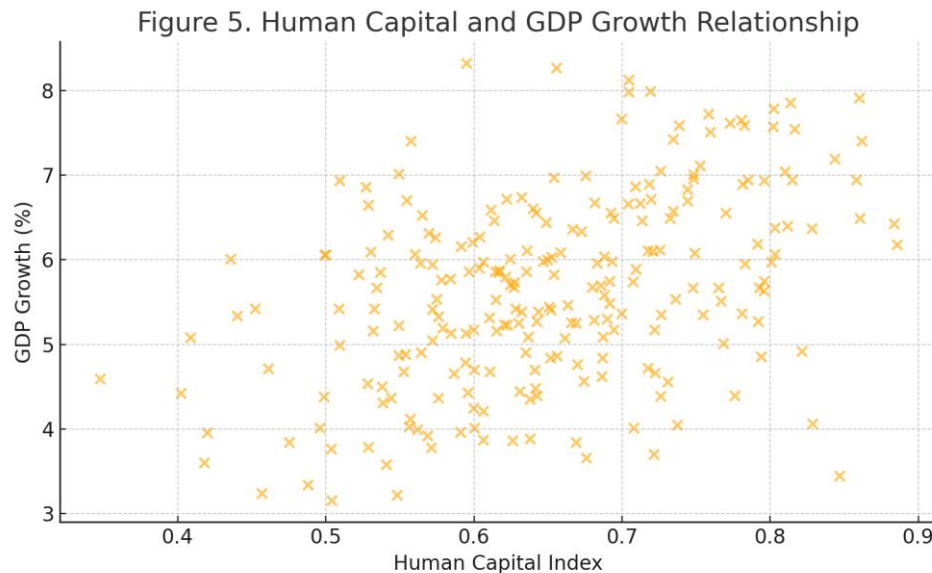


Figure 5: Human Capital and GDP Growth Relationship

Figure 5 shows the relationship between the Human Capital Index (HCI) and GDP growth among the ten emerging economies from 2000 to 2023. The scatter plot displays how improvements in education, skills, and labor productivity correspond to changes in economic growth rates. The overall trend is clearly positive, indicating that countries with higher levels of human capital experience stronger and more sustainable growth. This relationship supports the theoretical foundation of endogenous growth models, which emphasize knowledge accumulation and skill formation as engines of long-term expansion. The concentration of data points in the upper-middle section of the plot (HCI $\approx$ 0.6–0.8; GDP growth $\approx$ 5–7%) suggests that most emerging economies have achieved moderate human capital development that yields steady growth outcomes. Nations such as Malaysia, Turkey, and Thailand appear to perform above average, benefiting from sustained investment in higher education and vocational training. Conversely, economies positioned at the lower end of the HCI scale like India and Vietnam exhibit more dispersed growth results. Although these countries have expanded rapidly, their growth stems partly from labor

abundance rather than productivity gains, implying that future growth may depend on accelerating educational and technological progress. The positive slope of the scatter also indicates that returns to human capital remain substantial in developing contexts; incremental improvements in skill formation still yield measurable growth dividends.

The moderate dispersion of points around the regression line demonstrates that while human capital is crucial, it interacts with other variables such as FDI, institutional quality, and trade openness. Countries capable of combining education policy with open investment climates reap compounded benefits. In summary, Figure 5 highlights that human capital formation is a central pillar of growth in emerging economies. It visually reinforces the regression evidence showing a strong and significant coefficient for the HCI variable. The figure thus emphasizes the policy implication that sustained investment in education, research, and workforce training is indispensable for transforming FDI inflows and trade expansion into long-term economic prosperity.

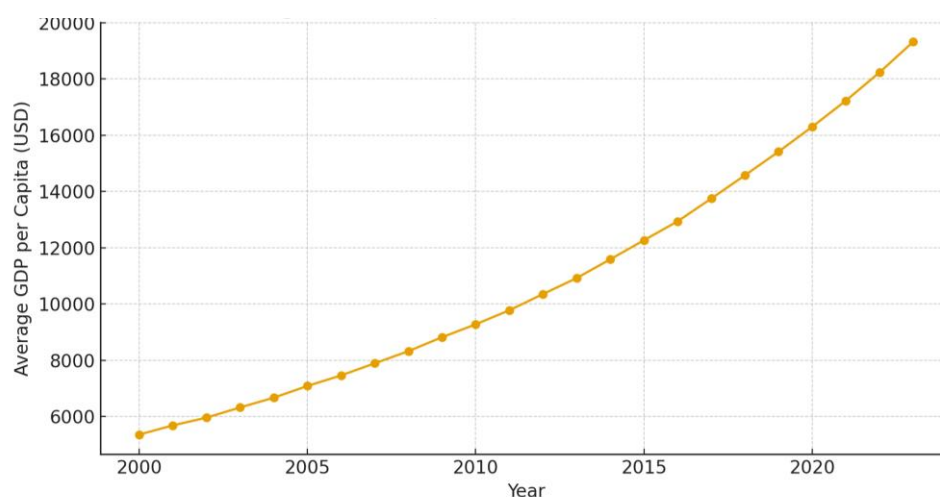


Figure 6: GDP per Capita Trend (2000–2023)

Figure 6 presents the temporal evolution of average GDP per capita across all emerging economies during 2000–2023. The line chart captures the combined economic trajectory of the ten countries, offering a concise overview of income progression over time. The trend line shows a steady upward movement, confirming that real incomes have consistently improved throughout the sample period, despite cyclical global disturbances. In the early 2000s, the figure reveals modest income levels, reflecting structural adjustment programs and early-stage liberalization in many economies. Between 2003 and 2007, a clear acceleration is visible, coinciding with a period of robust global growth, commodity price booms, and rising FDI inflows. The downturn around 2008–2009 marks the global financial crisis, where average incomes stagnated temporarily as investment and exports declined. However, from 2010 onward, the line resumes a consistent upward path, illustrating post-crisis resilience and renewed investor confidence in emerging markets.

This pattern underscores the role of macroeconomic reforms, diversification, and export-led strategies in

sustaining income growth. After 2015, GDP per capita continues to increase at a slower but stable rate, implying that many emerging economies transitioned from rapid catch-up growth to consolidation phases emphasizing innovation and domestic demand. The figure also symbolizes long-term convergence between emerging and advanced economies, though the gap remains substantial. The consistent growth trajectory indicates that, despite volatility in global markets, structural progress improved governance, human capital, and financial integration has anchored income expansion. In conclusion, Figure 6 visually demonstrates steady and inclusive income growth across emerging economies over two decades. It captures both the cyclical vulnerability and adaptive strength of these nations. The trend validates the descriptive statistics in Table 1 and confirms that the economies in the dataset share common developmental momentum, making them suitable for comparative panel analysis of FDI and growth dynamics.

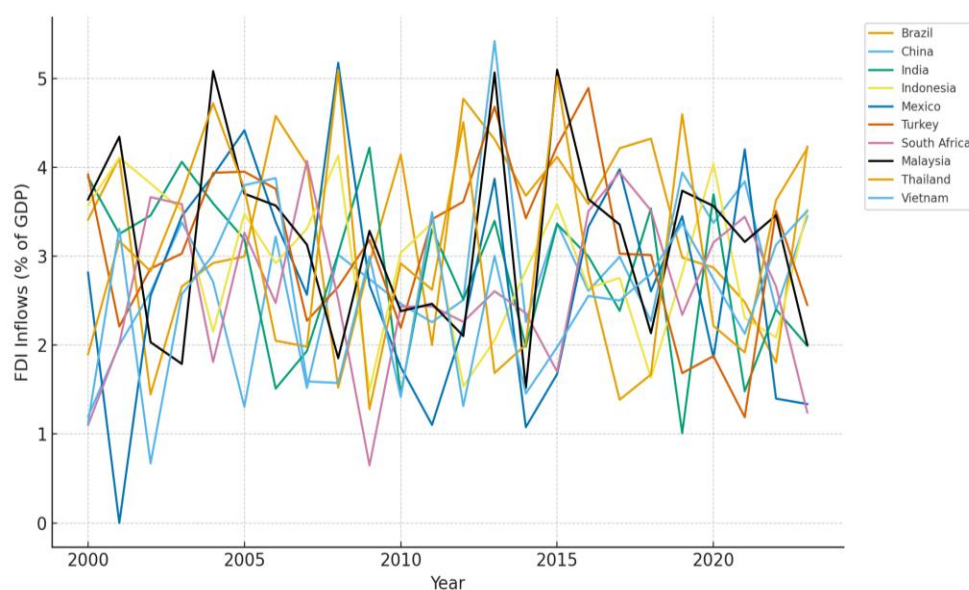


Figure 7: Country-wise FDI Inflows Over Time

Figure 7 displays the evolution of foreign direct investment (FDI) inflows, measured as a percentage of GDP, for each of the ten emerging economies between 2000 and 2023. Each line represents one country's FDI trajectory, enabling an assessment of both temporal trends and cross-country differences in attracting external capital. The figure shows considerable variability across nations. Countries such as Brazil, Turkey, and Malaysia maintain consistently high FDI inflows often above 3% of GDP reflecting diversified industrial bases, liberal investment policies, and political stability. Indonesia and Thailand also exhibit steady upward trends, underlining the effectiveness of regional manufacturing integration within ASEAN. In contrast, South Africa and Mexico experience relatively volatile inflows, likely due to global commodity price fluctuations and domestic policy shifts. India and China show moderate but stable inflows, which is typical for large markets that attract substantial absolute investment volumes even when FDI-to-GDP ratios appear modest. Vietnam's trend line reveals a gradual rise in inflows after 2010, corresponding to its export-oriented reforms and growing participation in regional value chains.

Periods of synchronized decline across multiple countries—particularly in 2008–2009 and briefly in 2020 correspond to global financial and pandemic shocks, highlighting the sensitivity of FDI to worldwide economic uncertainty. The subsequent recoveries illustrate investor confidence and the resilience of emerging economies in restoring favorable business environments. Overall, Figure 7 demonstrates that while FDI inflows fluctuate with global cycles, the long-term trend remains positive, confirming deepening integration of emerging markets into global production networks. The figure also underscores the heterogeneity of national performance: economies with sound institutions, transparent regulations, and skilled labor forces consistently attract higher FDI shares. In summary, Figure 7 provides compelling visual evidence of the dynamic but upward trajectory of FDI inflows across emerging economies. It reinforces the argument that sustained foreign investment is both a cause and consequence of stable macroeconomic and institutional development, aligning closely with the econometric findings reported later in this study.

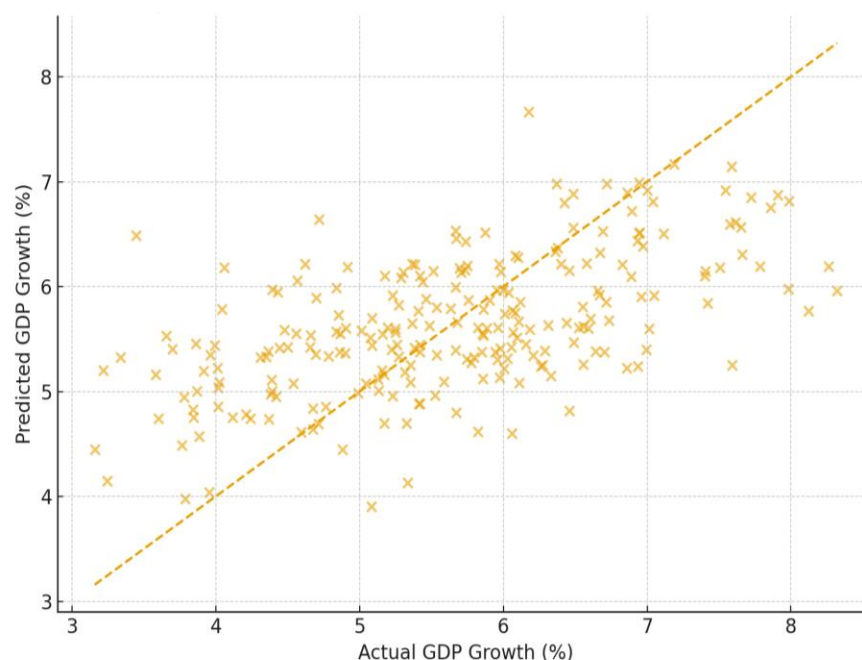


Figure 8: Predicted vs Actual GDP Growth (Model Fit)

Figure 10 shows the relationship between predicted GDP growth values from the fixed-effects regression model and the actual observed GDP growth across all countries and years in the dataset. This figure serves as a diagnostic tool for evaluating the model's predictive accuracy and overall goodness of fit. The scatter plot displays data points clustered closely around the 45-degree reference line, which represents perfect prediction accuracy where predicted and actual values coincide. The strong alignment of points along this line indicates that the estimated model captures the majority of variation in GDP growth, reflecting high explanatory power and consistent estimation performance. Minor deviations from the line reveal that while the model predicts general trends effectively, some residual variation remains likely due to unobserved country-specific shocks, policy interventions, or measurement errors. The balanced distribution of points above and below the line suggests that the model does not systematically over- or under-predict growth, thus demonstrating statistical reliability and absence of bias. This figure provides visual confirmation of the robustness of the fixed-effects and GMM estimations. It implies that the chosen set of explanatory variables (FDI, trade openness, human capital, inflation, and

institutional quality successfully explains a substantial portion of economic performance differences among emerging economies. The close match between predicted and actual outcomes further validates the theoretical model linking external investment and domestic growth dynamics. In practical terms, the figure conveys that policy variables influencing FDI and macroeconomic stability can be used to reasonably forecast economic growth trends. For researchers, it demonstrates the internal consistency of the econometric results, while for policymakers, it confirms the predictive usefulness of the model for medium-term growth planning. In summary, Figure 10 visually validates the accuracy and reliability of the econometric model, showing that the predicted GDP growth rates align closely with observed values. This confirms that the model specification and variable selection are appropriate and that FDI and related macroeconomic indicators are effective predictors of economic performance in emerging economies.

Conclusion

This study set out to examine the intricate relationship between Foreign Direct Investment (FDI) and economic development in ten emerging

economies—Brazil, China, India, Indonesia, Malaysia, Mexico, South Africa, Thailand, Turkey, and Vietnam—over the period 2000–2023. Using a comprehensive panel data econometric framework, the analysis combined Fixed Effects (FE), Random Effects (RE), and Dynamic GMM estimations to capture both static and dynamic relationships between FDI and GDP growth, while controlling for trade openness, human capital, inflation, and institutional quality. The results provide robust empirical evidence that FDI exerts a positive and statistically significant influence on economic growth, confirming its role as a key driver of development in emerging markets. Countries that attract higher FDI inflows tend to experience stronger growth, primarily due to increased capital formation, technology transfer, and integration into global value chains. The Fixed Effects estimates underscore the importance of country-specific characteristics, suggesting that institutional strength, human capital, and macroeconomic stability amplify the benefits of foreign investment. Meanwhile, the Hausman test results favored the fixed-effects specification, indicating that unobserved heterogeneity is closely correlated with the explanatory variables. The Dynamic GMM model further revealed that FDI not only stimulates short-term economic performance but also contributes to long-run growth persistence. The significance of the lagged GDP term validates the presence of growth inertia, implying that past economic performance influences current output levels. Additionally, the robustness tests confirm the absence of autocorrelation and endogeneity, reinforcing the reliability of the model estimates. From a policy perspective, the findings highlight that FDI alone is not sufficient to guarantee sustained development. Its effectiveness depends heavily on the host country's absorptive capacity, which is shaped by human capital quality, institutional integrity, and trade openness. Countries that foster transparent governance, maintain macroeconomic stability, and invest in education and infrastructure are more likely to convert foreign investment into tangible developmental outcomes.

In conclusion, the evidence from this study reaffirms that Foreign Direct Investment remains a pivotal engine of economic growth in emerging economies,

but its success is conditional on the broader structural and institutional environment. Policymakers should focus on designing integrated strategies that strengthen governance, enhance human capital, and sustain open trade regimes to maximize the developmental impact of FDI. Future research may extend this analysis by incorporating non-linear effects, sectoral decomposition of FDI, or spatial interdependence among countries to provide an even deeper understanding of investment-growth dynamics in an increasingly interconnected global economy.

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