



# IMPACT OF FOREIGN DIRECT INVESTMENT AND ENVIRONMENTAL FACTOR ON VIET NAM'S ECONOMIC GROWTH

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## Summary

*This study examines the impact of foreign direct investment and environmental factor on Viet Nam's economic growth over the period 1986–2023, based on 38 observations collected from the World Bank. The regression method employed is the Autoregressive Distributed Lag model, with data analysis conducted using Stata software. The findings indicate that foreign direct investment plays a positive role in fostering GDP growth through capital accumulation and technology transfer. Moreover, government efforts in pollution control contribute to enhancing foreign direct investment inflows in the long run. Accordingly, the study suggests that Viet Nam should prioritize the attraction of high-quality foreign direct investment linked to clean technologies, strengthen environmental governance, and promote sustainable development strategies, thereby achieving the dual objectives of economic growth and environmental protection in the long term.*

**Keywords:** GDP, FDI, environment, Viet Nam

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## INTRODUCTION

The relationship between foreign direct investment (FDI) and economic growth has long been a central topic in macroeconomic research. FDI is viewed as a key driver of development, contributing capital, technology transfer, managerial expertise, and international competitiveness. Empirical evidence generally supports a positive link between FDI and growth in developing economies (Nguyen Thu Hien et al., 2024). However, other studies highlight potential downsides, including competitive pressures on domestic firms and dependency on foreign capital (Rashid et al., 2023), underscoring the complexity of the FDI-growth nexus, particularly in integrated economies such as Viet Nam (Sultanuazzaman et al., 2018).

At the same time, climate change and sustainable development have become global imperatives, with environmental regulations increasingly shaping international investment decisions. Following the United Nations' Sustainable Development Goals (SDGs), many countries, including major economies, have committed to carbon neutrality by 2050, making environmental considerations a new benchmark in attracting FDI.

In Southeast Asia, rising FDI inflows have supported growth but also raised concerns about "pollution haven" effects under weak environmental standards (Nguyen Thu Hien et al., 2024; Thoan et al., 2025). While some research finds that FDI can align with green growth, others confirm its association with higher CO<sub>2</sub> emissions, supporting the Pollution Haven Hypothesis (PHH).

Against this backdrop, the study "The impact of FDI, environment, and economic growth in Viet Nam" aims to provide empirical evidence on the interlinkages among FDI, environmental factors, and economic growth, offering policy

insights for promoting sustainable development in Viet Nam.

## THEORETICAL FRAMEWORK

### The relationship between FDI and economic growth

FDI has long been regarded as one of the key drivers of economic growth in developing countries, including Viet Nam. FDI not only provides supplementary capital but also serves as an important channel for technology transfer, thereby positively contributing to growth when the host country possesses an adequately skilled labor force. However, the magnitude and direction of this impact vary depending on the development conditions and historical context of each country.

According to Sustainable Development Theory, this relationship should be viewed in terms of balance among the three pillars: economy, society, and environment (Purvis, Mao, & Robinson, 2019). When appropriately directed, FDI can act as a catalyst for sustainable growth by promoting clean technology transfer, enhancing social welfare, and fostering transparent governance. Nevertheless, empirical research also highlights that when FDI is concentrated in labor-intensive, low-cost, or polluting industries, its long-term contribution to sustainable growth may be constrained.

Within the framework of Endogenous Growth Theory, FDI functions as a mechanism for the transmission of technology, knowledge, and managerial skills, thereby enhancing productivity and innovation (Romer, 1990). Carkovic and Levine (2005) argue that once endogeneity is controlled for, the direct effect of FDI on growth is not always statistically significant. In contrast, Hassen and Anis (2012) emphasize the positive role of FDI in improving productivity and fostering technological innovation. Nguyen (2020) provides evidence of a statistically significant positive relationship between FDI,

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exports, and economic growth, reflecting FDI's potential to diffuse knowledge and innovation, though the extent of this effect remains contingent upon the host country's absorptive capacity.

Empirical evidence from Viet Nam reveals a bidirectional relationship between FDI, exports, and economic growth. However, given that FDI has historically been concentrated in labor-intensive processing industries, its contribution to sustainable growth has been limited (Nguyen, 2020). In Sri Lanka, FDI has shown positive effects both in the short and long run (Sultanuazzaman et al., 2018), whereas in India and Albania (Hobbs et al., 2021), the impact of FDI on growth has not always been direct or significant. Interestingly, evidence from Peru (Bazán Navarro & Alvarez-Quiroz, 2022) suggests that FDI plays a more critical role than exports in explaining short-term variations in economic growth.

**The relationship between environment and economic development**

Sustainable Development Theory posits that achieving balance across the three pillars (economic, social, and environmental) is essential to sustaining long-term growth (Purvis, Mao, & Robinson, 2019). Within this framework, the environmental dimension not only safeguards natural resources but also strengthens competitiveness in attracting FDI, thereby indirectly influencing economic growth. A cleaner environment enhances public health and quality of life, creates a healthier labor force, and facilitates the transition toward clean technologies and efficient resource utilization. When integrated with the principles of sustainable development, FDI can serve as a critical channel for Viet Nam to simultaneously acquire capital and foster green technological innovation, thereby ensuring long-term economic development.

From the perspective of Endogenous Growth Theory, FDI is viewed as a medium through which technology, knowledge, and human capital spillovers occur (Romer, 1980). Recent research indicates that the impact of environmental factors on FDI, and consequently on growth, is multidimensional. Gao and Geng (2024) demonstrate that compliance with global environmental standards enhances a country's credibility, thereby attracting green and responsible investment. Thoan et al. (2025) further reveal that a cleaner environment is positively associated with long-term FDI inflows, contributing to the development of green industries. Thus, from the endogenous growth perspective, this relationship can be explained through the mechanism of FDI-driven knowledge transfer and technological innovation, which fosters sustainable economic growth.

Nevertheless, empirical evidence is not entirely consistent. Thoan et al. (2025) also identify a positive relationship between environmental degradation (higher CO<sub>2</sub> emissions) and FDI, suggesting that certain capital inflows gravitate toward countries with looser environmental regulations to exploit lower costs, consistent with the PHH. Evidence from ASEAN+3 shows that rising CO<sub>2</sub> emissions are positively correlated with

TABLE 1: DESCRIPTIVE STATISTICS OF VARIABLES

Variable	Observations	Mean	Standard Deviation	Min	Max
GDP	38	8.01906	1.44956	5.0830	11.340
FDI	38	4.88073	6.76965	-32.955	31.620
E	38	1.51850	1.16161	-0.7300	3.9702

Source: Author's calculations using Stata 17

FDI inflows, implying that weaker regulatory environments may attract investment, especially in developing economies that prioritize growth and employment over environmental protection (Shaari et al., 2022).

These divergences underscore the paradox inherent in the environment-FDI nexus: (i) on the one hand, a cleaner environment and stricter regulations enhance long-term competitiveness and attract green investment; (ii) on the other hand, developing countries may compromise environmental standards to attract FDI, thereby fostering short-term growth at the expense of sustainable development. Integrating Sustainable Development Theory and Endogenous Growth Theory provides a more comprehensive framework for explaining the multidimensional nature of this relationship in the case of Viet Nam.

**RESEARCH MODEL AND METHODOLOGY**

To examine the relationship between economic growth, exports, and FDI, this study employs the Autoregressive Distributed Lag (ARDL) model developed by Pesaran, Shin, and Smith (2001). The analytical framework is grounded in Sustainable Development Theory, Endogenous Growth Theory, and the Theory of Sustainable Competitive Advantage. In addition, the study integrates recent empirical evidence regarding the impacts of FDI and environmental factors (E) on FDI inflows (Shaari et al., 2022).

Based on these theoretical foundations and empirical insights, the research proposes a conceptual model to explain the relationship between FDI, the environmental factor (E), and Viet Nam's economic growth (GDP) as follows:

$$GDP_t = \beta_0 + \sum_{i=1}^{p_0} \beta_{i0} GDP_{t-i} + \sum_{j=1}^{p_1} \beta_{j1} FDI_{t-j} + \sum_{k=0}^{p_2} \beta_{k2} E_{t-k} + \epsilon_t$$

Where: Economic growth (GDP growth, annual %), measured as the annual percentage change in GDP at market prices; FDI: expressed as a percentage of GDP, using the natural logarithm; Environmental factor (E\_t), measured by the logarithm of per capita CO<sub>2</sub> emissions;  $\beta_0$ ;  $\beta_{j1}$ ;  $\beta_{k2}$ : regression coefficients of the lagged variables GDP, FDI, and E;  $\epsilon_t$ : error term.

This study employs time-series data for Viet Nam covering the period 1986-2023. The dataset, collected from the World Bank, includes FDI, environmental factor (E), and economic growth (GDP). Data analysis is performed using Stata 17, applying the Autoregressive Distributed Lag (ARDL) model.

The methodological procedure involves several sequential steps: Stationarity tests using the Augmented Dickey-Fuller

(ADF) and Phillips-Perron (PP) tests; Optimal lag length determination based on the Akaike Information Criterion (AIC); Bound testing for cointegration relationships; Model diagnostic tests, including the Breusch-Godfrey LM test for serial correlation and the Breusch-Pagan/Cook-Weisberg test for heteroscedasticity; Normality of residuals assessed through the Shapiro-Wilk test and skewness-kurtosis statistics; Model stability assessment using the Cumulative Sum of Recursive Residuals (CUSUM) test.

**RESEARCH RESULTS**

**Descriptive statistics**

Table 1 presents the descriptive statistics based on 38 observations. The results show that GDP has an average value of 8.02 with a standard deviation of 1.44, ranging from 5.08 to 11.34. This indicates a relatively stable growth trend with some fluctuations. FDI exhibits the highest degree of volatility, with a mean of 4.88 and a standard deviation of 6.76, ranging from -32.95 to 31.62. This reflects periods of net capital withdrawal as well as phases of strong capital inflows. The environmental factor has an average of 1.51 with a standard deviation of 1.16, ranging from -0.73 to 3.97, highlighting the gradual changes associated with economic development and environmental policies.

**Correlation and stationarity tests**

The results of the correlation matrix analysis indicate that all correlation coefficients between the independent variables are below 0.7, confirming the absence of multicollinearity in the model.

The stationarity test results reveal that the variables in the model exhibit mixed integration orders. Specifically, GDP and FDI are identified as stationary at level I(0), while the environmental variable (E) becomes stationary only after first differencing, thus classified as I(1). No variable is found to be integrated of order two I(2). Hence, the application of the ARDL model is entirely appropriate, as ARDL is capable of handling a combination of I(0) and I(1) variables (Gujarati, 2021).

**Bounds test for cointegration**

The results of the bounds test (Table 2) show that the calculated F-statistic = 10.126 is significantly greater than the upper bound critical values at the 1%, 5%, and 10% significance levels. This provides strong evidence of a long-run cointegration relationship among the variables in the model. Accordingly, there is sufficient basis to further investigate the long-term relationships between GDP, FDI, and environmental factors (E) using the ARDL framework.

**Optimal lag selection**

The AIC was employed to determine the optimal lag

F statistic	Bounds Test					
	90%		95%		99%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
10.126	3.346	4.412	4.127	5.363	6.632	7.245

Source: Author's calculations using Stata 17

Variable	Coefficient	Standard Error	t-Statistic	P-value
FDI	1.20151***	0.23242	3.62	0.001
E	-1.8069***	0.48397	-3.65	0.002

Notes: \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Source: Results from Stata 17

length for the ARDL model, ensuring the best forecasting performance while avoiding model over-parameterization. The results indicate that the ARDL(2,1,1) specification yields the lowest AIC value and, therefore, is selected as the optimal model.

Subsequently, a series of diagnostic tests were conducted to assess potential model misspecifications. The Breusch-Godfrey LM test for serial correlation produced a p-value = 0.2162 (> 0.05), indicating the absence of autocorrelation in the residuals. The Breusch-Pagan/Cook-Weisberg test for heteroskedasticity yielded a p-value = 0.4102 (> 0.05), suggesting homoskedastic residuals. Additionally, both the Shapiro-Wilk (p-value = 0.7617) and the Skewness-Kurtosis test (p-value = 0.6472) exceeded the 0.05 threshold, confirming the normality of residuals (Gujarati, 2021).

The stability of the ARDL model was further examined through the CUSUM test, which revealed that the cumulative sum of residuals consistently remained within the 5% confidence interval. This outcome confirms the stability of the model and the absence of structural breaks over time. Hence, the ARDL model is robust, reliable, and suitable for analytical purposes, forecasting, and policy formulation.

**Long-run coefficient estimation of the ARDL model**

The estimation results at Table 3 indicate that FDI has a positive coefficient of 1.20151, statistically significant at the 1% level (p = 0.001). This finding reaffirms the pivotal role of FDI in fostering Viet Nam's long-run economic growth, consistent with previous studies highlighting FDI as a channel for capital supplementation, technology transfer, managerial know-how, and export capacity expansion. However, this positive impact also entails potential risks of dependency on foreign capital and the crowding-out of domestic investment (Rashid et al., 2023), underscoring the dualistic nature of the FDI-growth nexus in the context of globalization.

For the environmental variable, the empirical results show a negative coefficient of -1.8069, statistically significant at the 1% level (p = 0.002). This suggests that an increase in per capita CO<sub>2</sub> emissions tends to reduce GDP. Such evidence is in line with Sustainable Development Theory, which emphasizes the balance between economic growth and environmental preservation. The results further suggest that environmental degradation is not a driver of growth but may instead hinder long-term development through social costs, declining labor productivity, and compliance pressures with international standards.



In sum, the study reinforces the argument that to attract high-quality FDI and achieve sustainable growth, Viet Nam must align with stricter environmental standards comparable to those in advanced economies. This approach would enable the country to selectively attract capital inflows associated with clean technologies and higher productivity.

## POLICY IMPLICATIONS

Based on the quantitative findings, this study proposes several policy implications as follows:

### Policies for attracting and orienting FDI

The empirical results confirm that FDI exerts a significant and positive impact on Viet Nam's long-run economic growth. This finding implies that policymakers in Viet Nam should continue to pursue an open-door policy that promotes foreign investment, particularly in key sectors such as manufacturing, renewable energy, digital technology, and high-value-added services. At the same time, it is essential to enhance institutional quality, improve the business environment, and upgrade infrastructure in order to attract strategic investors, rather than focusing solely on the volume of FDI inflows. A "selective FDI policy" is therefore necessary to ensure that capital inflows generate technological spillovers, managerial expertise, and skill enhancement for the domestic economy.

### Environmental policy and sustainable development

The Vietnamese government should adopt a selective approach to FDI attraction, encouraging green investment

while restricting polluting industries. This requires the implementation of tax incentives, green credit schemes, and land support for projects aligned with ESG standards, alongside stricter monitoring and enforcement mechanisms against enterprises that violate environmental regulations. Concurrently, Viet Nam must strengthen its capacity to absorb clean technologies by investing in human capital, fostering an innovation ecosystem, and promoting stronger linkages between FDI and domestic firms. Only through harmonizing capital attraction with environmental protection can the economy achieve sustainable growth, to avoid becoming a "pollution haven" and to align with Viet Nam's Net Zero 2050 commitment.

### Policies to strengthen domestic capacity and technology absorption

One limitation of FDI-led growth lies in the potential risk of dependency and the crowding out of domestic investment. To address this challenge, Viet Nam should improve its absorptive capacity through investments in high-quality human capital, the development of an innovation-driven ecosystem, and the promotion of partnerships between foreign and domestic enterprises. Establishing industrial clusters will foster knowledge spillovers, strengthen supply chain linkages, and reduce the risk of being "locked in" to labor-intensive and low-value-added sectors. In addition, reforms should focus on supporting small and medium-sized enterprises to enhance their participation in global value chains, thereby maximizing the long-term benefits of FDI.

## REFERENCES:

1. Bazán Navarro, C. E., & Álvarez-Quiroz, V. J. (2022). *Foreign direct investment and exports stimulate economic growth? Evidence of equilibrium relationship in Peru. Economies*, 10(10), 234.
2. Carkovic, M., & Levine, R. (2005). *Does foreign direct investment accelerate economic growth*. In: T. H. Moran, E. M. Graham and M. Blomstrom, Eds., *Does Foreign Direct Investment Accelerate Economic Growth*, Institute for International Economics and Center for Global Development, Washington DC.
3. Gao, M., & Geng, X. (2024). *The role of ESG performance during times of COVID-19 pandemic. Scientific Reports*, 14(1), 2553.
4. Gujarati, D. N. (2021). *Essentials of econometrics (5th ed.)*. Thousand Oaks, CA: Sage Publications.
5. Hassen, S., & Anis, O. (2012). *Foreign direct investment (FDI) and economic growth: an approach in terms of cointegration for the case of Tunisia. Journal of Applied Finance and Banking*, 2(4), 193.
6. Hobbs, S., Paparas, D., & AboElsoud, M. E. (2021). *Does foreign direct investment and trade promote economic growth? Evidence from Albania. Economies*, 9(1), 1.
7. Nguyen, C. H. (2020). *The impact of foreign direct investment, aid and exports on economic growth in Viet Nam. The Journal of Asian Finance, Economics and Business*, 7(10), 581–589.
8. Nguyen Thu Hien et al. (2024). *A Study on the Impact of ESG on Foreign Direct Investment (FDI) in Selected Developing Countries in the Asia–Pacific Region during 2002–2022. Working Paper 2024.3.3.6*.
9. Purvis, B., Mao, Y., & Robinson, D. (2019). *Three pillars of sustainability: in search of conceptual origins. Sustainability science*, 14(3), 681.
10. Rashid, M., Ansari, S., Khan, A., & Amir, M. (2023). *The impact of FDI and export on economic growth in India: An empirical analysis. Asian Journal of Economics, Finance and Management*, 9(2), 33–41.
11. Romer, P. M. (1990). *Endogenous technological change. Journal of Political Economy*, 98(5), 71–102.
12. Shaari, M. S., Esquivias, M. A., Ridzuan, A. R., Zainal, N. F., & Sugiharti, L. (2022). *The impacts of corruption and environmental degradation on foreign direct investment: New evidence from the ASEAN+3 countries. Cogent Economics & Finance*, 10(1), 2124734. <https://doi.org/10.1080/23322039.2022.2124734>.
13. Sultanuazzaman, M. R., Fan, H., Akash, M., Wang, B., & Shakij, U. S. M. (2018). *The role of FDI inflows and export on economic growth in Sri Lanka: An ARDL approach. Cogent Economics & Finance*, 6(1), 1518116.
14. Thoan, N. T., Nghiem, X. H., Tram, N. T. H., Chau, T. D. B., & Trang, D. T. (2025, April). *The impact of foreign direct investment on environmental quality in some Asian countries. In Proceedings of the International Conference on Emerging Challenges: Sustainable Strategies in the Data-Driven Economy (ICECH 2024)*. Springer Nature.
15. World Bank. (2023). *Worldwide Governance Indicators: Methodology & data*. <https://info.worldbank.org/governance/wgi>.