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Analyzing the relationship between foreign direct investment, trade openness and small and medium enterprise growth: Time series evidence from Vietnam (1991–2023)

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ABSTRACT

SMEs (Small and Medium Enterprises), accounting for more than 97% of enterprises in Vietnam, play a pivotal role in driving socio-economic progress. This paper explores how foreign direct investment (FDI) and trade openness (TO) influence SME development, drawing on annual data for the period 1991–2023. Using secondary information from the World Bank, the General Statistics Office, and the Ministry of Planning and Investment, two multiple regression models are constructed to analyze the effects of FDI and TO on the population of SMEs and their aggregate revenue. Results indicate that FDI and TO jointly explain 98.9% of the variation in SME numbers and 98.2% of SME revenue. Specifically, a 1 billion USD increase in FDI is associated with an additional 25,942 SMEs, while a 1 percentage point rise in TO corresponds to 1,832 more SMEs, both confirmed at the 1% significance level. Concerning revenue, each 1 billion USD in FDI raises SME revenue by approximately 8.273 billion USD, and each 1% increase in TO contributes about 1.062 billion USD, also confirmed at the 1% significance margin. These findings underscore the complementary roles of FDI and TO in fostering SME expansion and performance. The study recommends targeted FDI attraction policies, capacity-building programs for SMEs to integrate into global value chains, and balanced trade liberalization to sustain long-term SME growth in Vietnam.

Contribution/Originality: This study provides the first comprehensive time series analysis (1991-2023) of the relationships among foreign direct investment (FDI), trade openness, and small and medium-sized enterprise (SME) development in Vietnam during its entire integration period. It develops an integrated econometric framework that examines dual SME growth dimensions simultaneously, quantifying specific impact magnitudes to support evidence-based policy formulation in transition economies.

1. INTRODUCTION

Since the implementation of the Doi Moi reforms in 1986, Vietnam has undergone substantial economic restructuring. Participation in various bilateral and multilateral trade agreements has further accelerated the country's integration into global markets. An important milestone was the adoption of the 1987 Foreign Investment Law, which marked the formal opening to international capital and helped establish Vietnam as an attractive location for foreign investors. This momentum was strengthened in 1990 with the enactment of the Law on Private Enterprises and the Law on Companies, providing the institutional foundation for private sector development. As in many other developing economies, SMEs in Vietnam quickly expanded and have become a cornerstone of socio-

economic growth. Understanding how these factors interact is therefore crucial for designing strategies that ensure sustainable SME development.

By reviewing prior domestic and international studies, this research identifies three main gaps. First, most existing analyses concentrate on macro-level effects of FDI and trade liberalization, leaving SMEs entities with distinct structures and vital roles in emerging economies largely underexplored. Second, many Vietnamese studies rely on outdated or short time series, without covering the full evolution of FDI, trade openness, and SME development. Third, the majority of prior work treats FDI and trade openness as isolated factors, with little attempt to build an integrated framework to capture their joint and interactive influences.

Addressing these shortcomings, the present study develops a comprehensive analytical model used to examine how FDI and trade openness relate to SME growth from 1991 to 2023. It seeks to answer: (i) whether FDI and trade openness have provided genuine momentum for SME development in Vietnam, (ii) the extent and channels of their impact, and (iii) how these drivers can be harnessed more effectively for supporting the SME sector, which is central to the national economy.

The study makes three key contributions. First, it offers fresh empirical evidence regarding the nexus among FDI, trade openness, and SME development within a transition economy that is increasingly integrated into global markets. Second, by applying time-series data and regression techniques, it clarifies the ways in which these two factors jointly affect SME growth in both scale and performance. Third, while confirming the significant and favorable influence of FDI and trade liberalization, the analysis also draws attention to potential multicollinearity, emphasizing the need for well-coordinated regulation and policy. Together, these contributions advance the literature and provide actionable insights for policymakers in aligning FDI attraction, trade liberalization, and SME development for sustainable growth.

1.1. Research Objectives

- Investigates the long-term nexus between FDI, trade openness (TO), and the development of SMEs in Vietnam over the period 1991–2023.
- Quantify the individual and combined effects of FDI and TO on both the number of SMEs and their total revenue.
- Provide empirical evidence to guide policymakers in designing strategies that enhance SME development through effective FDI attraction and trade integration.
- Contribute to the academic literature by offering a dual-perspective time series analysis, which is rarely applied in the Vietnamese context.

2. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1. Theoretical Background

2.1.1. Theory of Foreign Direct Investment (FDI)

2.1.1.1. Concept and Nature of FDI

FDI refers to a situation in which investors from one nation allocate capital into enterprises in another, with the purpose of creating enduring economic ties and exerting substantial control or influence over business decisions OECD (2008). Unlike portfolio investment, which primarily concerns passive financial flows, FDI typically involves not only capital transfer but also the introduction of advanced technology, managerial know-how, and marketing or distribution systems (Dunning, 1993).

2.1.1.2. FDI Theory

Dunning (1977) and Dunning (1988) developed the OLI theory to explain the motivations and decisions of FDI by multinational corporations. According to this theory, FDI occurs when three conditions are simultaneously

satisfied: 1. Ownership advantages: Enterprises must possess exclusive intangible assets such as advanced technology, strong brands, superior management skills, or the ability to create economies of scale. These advantages help enterprises overcome the costs of operating abroad compared to local competitors. 2. Location advantages: The country receiving FDI must have advantages in natural resources, human resources, market size, infrastructure, preferential policies, or low production costs. These advantages motivate enterprises to invest directly instead of exporting. 3. Internalization advantages: Firms find that internal use of ownership advantages through FDI is more beneficial than licensing technology or exporting products. Such choices are more likely when market transaction costs are elevated or when enterprises seek to safeguard proprietary technologies and intellectual assets.

2.1.1.3. Mechanism of FDI Impact on the Host Economy

FDI affects the host economy through two main avenues.

- Direct effects: It adds to the capital stock, stimulates production, generates employment opportunities, improves the balance of payments, and strengthens overall competitiveness.
- Indirect effects (spillovers): Beyond immediate contributions, FDI fosters technology diffusion, enhances workforce capabilities, intensifies competitive pressure, and encourages linkages with domestic firms.

According to Javorcik (2004), such spillovers can be categorized into three types: horizontal spillovers, backward linkages, and forward linkages.

2.1.2. Trade Openness Theory

2.1.2.1. Concept of Trade Openness

Trade openness (TO) indicates the extent to which an economy participates in cross-border trade activities. It is generally assessed by relating the combined value of international trade to the share of such trade as a component of GDP. A higher TO ratio signifies deeper integration into global markets and participation in international value chains. In empirical applications, this measure is frequently computed as:

$$\text{Trade Openness} = (\text{Export} + \text{Import}) / \text{GDP}.$$

Squalli and Wilson (2011) highlight that this indicator goes beyond measuring trade volume, as it also conveys the extent of liberalization and openness inherent in a nation's trade policy framework.

2.1.2.2. Theoretical Foundations

The foundation of trade openness can be traced back to several classical and modern theories of international trade. Ricardo's theory of comparative advantage (Ricardo, 2004) emphasizes that nations benefit from concentrating on the production of goods in which they are relatively more efficient, while importing those in which they are less competitive. Building on this, Krugman's New Trade Theory Krugman (1980) and Krugman (1985) stresses the significance of cost advantages from large-scale production and product variety, which help explain why countries with similar resource endowments still engage in substantial trade with one another, particularly in intra-industry exchanges. Later, Melitz (2003) introduced the heterogeneous firms model, indicating that only firms with high productivity levels can bear the fixed costs of exporting, whereas less efficient firms are forced to exit under competitive pressure. This dynamic leads to a reallocation of resources from weaker to stronger firms, thereby reshaping the overall structure of industries.

2.1.3. Theory of Small and Medium Enterprises (SMEs)

2.1.3.1. Definition and Characteristics of SMEs

The concept of SMEs is typically delineated varies across countries, often relying on indicators such as workforce size, annual revenue, total assets, or registered capital. In Vietnam, Decree 39/2018/ND-CP stipulates that small firms generally employ between 10 and fewer than 200 workers, while medium-sized enterprises range from 200 to

under 300 employees, with further specifications provided depending on the industry sector. SMEs are typically characterized by their modest scale and constrained resources, yet they demonstrate high adaptability and maintain close connections to local markets. They are also recognized for their capacity to innovate rapidly, though they frequently encounter barriers regarding access to finance and advanced technology (Storey, 1994).

2.1.3.2. Theory of Business Growth

Penrose (1959), in her seminal work The Theory of the Growth of the Firm established the foundations for later theories of corporate expansion, arguing that growth is primarily determined by how effectively firms exploit and develop internal resources, especially managerial and organizational capabilities. Decades earlier, Gibrat (1931) with his Law of Proportionate Effect, posited that a company's growth rate is unrelated to its initial size. Subsequent empirical studies, however, indicate that SMEs tend to expand more rapidly than larger firms, though their growth paths are also more unstable. Extending these ideas, Teece, Pisano, and Shuen (1997) advanced the Dynamic Capabilities framework, which stresses the importance of firms' capacity to adapt, restructure, and innovate under conditions of continuous environmental change. For SMEs in particular, such dynamic capabilities are vital given their smaller scale and greater flexibility.

2.1.4. Impact of FDI and Trade Openness on SMEs Growth

2.1.4.1. Impact of FDI on SMEs Growth

FDI can impact SMEs' growth in two ways:

Positive impact: FDI creates cooperation opportunities for SMEs through participation in the supply chains of FDI enterprises. This helps SMEs access new markets, improve product quality, and learn modern management techniques. The transfer of technology through FDI contributes to enhancing both the efficiency and the competitive capacity of SMEs. In addition, FDI also creates a positive competitive effect, forcing SMEs to improve efficiency to survive.

Negative impact: FDI can create excessive competitive pressure for SMEs, especially when FDI enterprises have superior advantages in capital, technology, and brand. The "crowding out" effect can occur when FDI attracts highly skilled workers away from SMEs, reducing the competitiveness of this group of enterprises.

2.1.4.2. Impact of Trade Openness on SMEs Growth

High trade openness enables SMEs to access export markets, expand their operations, and leverage competitive advantages. Bernard, Jensen, and Lawrence (1995) demonstrate that exporting enterprises tend to experience faster growth and higher productivity.

Trade openness also helps SMEs access affordable inputs to improve business efficiency. Reducing trade barriers enables SMEs to access raw materials, machinery, equipment, and technology from international markets at more competitive prices.

However, trade openness also creates fierce competitive pressure on SMEs. Trade openness increases competition from imports, forcing SMEs to improve operational efficiency to survive. This can lead to the "learning by competing" effect.

2.1.4.3. Interaction between FDI and Trade Openness

FDI and trade openness are inherently interrelated and tend to reinforce one another. Greater openness to global trade generally attracts higher levels of FDI, as international investors seek favorable conditions and easier access to export markets. At the same time, FDI contributes to the expansion of trade, since foreign-invested enterprises are typically active in both imports and exports, thereby deepening the host economy's integration with international

markets. Taken together, these dynamics create a synergistic effect, whereby their combined influence is stronger than the sum of their separate impacts.

2.2. Literature Review

2.2.1. Research on the Impact of FDI on SMEs Growth

Empirical research into the influence of FDI on domestic firms has produced diverse findings across countries and time periods. Aitken and Harrison (1999), using Venezuelan data from 1976 to 1989, demonstrated that while FDI contributed positively to the productivity of large firms, it adversely affected smaller enterprises due to competitive pressures, highlighting that firm size plays a crucial role in determining outcomes. Building on this line of inquiry, Javorcik, Saggi, and Spatareanu (2004), in a study of Lithuania during 1996–2000, revealed evidence of productivity gains for local suppliers through backward linkages, whereas horizontal spillovers were ambiguous and could even turn negative under intense competition.

Further cross-country evidence is provided by Xu and Sheng (2012), who examined data from 20 developing economies and reported that FDI fosters SME growth by raising production efficiency and encouraging innovation, with institutional quality identified as a key factor for maximizing these benefits. Similar conclusions were drawn by Yin, Mohsin, Zhang, Qian, and Cai (2022) in the context of China, where FDI between 1999 and 2005 was shown to enhance revenue growth and labor productivity of SMEs, particularly in consumer goods and textiles, with stronger effects in coastal regions compared to inland provinces.

In Vietnam, empirical work also underscores these dynamics. Hoang, Do, and Trinh (2021), drawing on enterprise survey data from 2010–2015, it was observed that FDI significantly improves productivity, especially among SMEs, through channels of technology transfer and production linkages. Earlier, Nguyen (2008) analyzed Vietnamese manufacturing industries and confirmed strong spillover effects through both horizontal and backward linkages, although large enterprises tended to capture greater benefits than SMEs.

2.2.2. Research on the Impact of Trade Openness on SMEs Growth

Empirical research has long explored the nexus between trade and firm performance. Bernard et al. (1995), Examining U.S. firms during 1976–1987, reported that exporters experienced employment growth about 6% higher than non-exporters, a result that paved the way for subsequent work on trade and firm dynamics. Building on the theoretical front, Melitz (2003) advanced a model demonstrating how trade liberalization intensifies competition, compelling less efficient firms to exit while enabling more productive ones to expand into foreign markets. Complementing this, Pavcnik (2002) analyzed Chilean data from 1979–1986 and showed that liberalization boosted productivity by 3–10%, largely through heightened competition and access to new technologies.

Evidence from emerging economies further illustrates these patterns. Kathuria and Natarajan (2013) highlighted that in India, tariff reductions improved SME productivity by lowering costs of raw materials and machinery, though benefits were concentrated among technologically advanced firms. In Vietnam, Doan, Nguyen, Vu, and Lim (2015) observed that reductions in import tariffs during 2000–2009 enhanced both productivity and exports, particularly in labor-intensive sectors such as textiles and footwear. More recently, Le and Nguyen (2020) documented that trade openness between 2010–2018 supported SME revenue and profitability, although the positive effect weakened over time as competition intensified. Extending the analysis, Dang, Ha, and Nguyen (2024) showed that Vietnamese SMEs engaged in exporting during 2015–2019 achieved revenue growth rates 15–20% higher than counterparts serving only the domestic market.

2.2.3. Research on the Impact of FDI, Trade Openness on SMEs

A large body of literature underscores the interdependence between FDI and trade integration as determinants of growth. Balasubramanyam, Salisu, and Sapsford (1996), analyzing 46 developing countries showed that FDI

stimulates growth primarily in economies pursuing outward-looking trade strategies, thereby highlighting the critical role of openness in realizing the benefits of foreign investment. Similarly, Borensztein, De Gregorio, and Lee (1998), analyzing data from 69 developing countries over the period 1970–1989, it was concluded that although FDI generally enhances economic growth, the extent of its contribution depends on the level of human capital and the degree of trade liberalization. Their findings indicate that economies with greater openness benefit more substantially from foreign investment. Extending this discussion, Alfaro, Chanda, Kalemli-Ozcan, and Sayek (2004) demonstrated that the growth-promoting influence of FDI depends not only on liberal trade regimes but also on the presence of a sufficiently advanced financial sector capable of channeling investment effectively.

Evidence from Vietnam aligns with these broader findings. Nguyen (2017), drawing on enterprise-level data from 2009–2014, highlighted the complementary relationship between FDI and trade openness in promoting productivity through positive interaction effects. Extending this perspective, Ngoc (2019) employed the system GMM approach on data from 2012–2017 and found that the combination of FDI and export participation significantly boosted SME revenue and profitability. Likewise, Pham and Vuong (2020) argued that the joint effects of FDI inflows and trade liberalization have become a key driver of SME development, particularly within supporting industries.

2.2.4. Research on Factors Affecting SME Growth

Research has distinguished between internal and external determinants of SME growth. In terms of internal factors, Davidsson, Kirchhoff, Hatemi-J, and Gustavsson (2002), analyzing Swedish firms demonstrated that enterprise age, initial size, and entrepreneurial motivation significantly shape growth trajectories. Younger firms often expand more rapidly but simultaneously face higher failure risks. Similarly, Wiklund and Shepherd (2005) highlight the positive role of entrepreneurial orientation, especially under dynamic and uncertain market conditions.

External influences have also been widely examined. Beck, Demirgüç-Kunt, and Maksimovic (2005), using data from 54 countries, showed that financial development exerts a favorable effect on SME expansion, particularly in low-income economies where limited access to finance is the most critical barrier. Smallbone, North, and Kalantaridis (1999), focusing on Eastern Europe, emphasized the importance of institutional quality, supportive policies, and infrastructure in enabling SME development.

In Vietnam, recent empirical work supports these global findings. Nguyen and Nguyen (2018) studying SMEs between 2012 and 2016 observed that firm size, age, human capital, and financial access strongly affect performance outcomes. Extending this perspective, Le and Pham (2022) confirmed that both product and process innovation enhance revenue and profitability, though such improvements require sustained investment in technology and workforce skills.

2.3. Research Gaps and Directions

2.3.1. Research Gaps

An examination of prior studies reveals that, although numerous works have explored the influence of FDI, along with trade openness, as drivers of economic growth and firm outcomes, several critical issues remain insufficiently addressed. The first concerns the scope of research subjects. Prior analyses have largely concentrated on macro-level outcomes at the national or industry scale or on large enterprises. In contrast, SMEs, which possess distinct characteristics and operational mechanisms yet play a crucial role in Vietnam's economy as well as in other developing countries, have received far less focused attention.

The second gap relates to data limitations. Many studies on Vietnam rely on outdated or short-term datasets, which fail to capture recent transformations in FDI flows, trade liberalization, and the evolving SME sector.

Finally, there is a methodological gap. Existing research often treats FDI and trade openness as independent drivers, without employing an integrated analytical framework capable of examining their joint and interactive effects on SME growth.

2.3.2. Research Orientation

Drawing on the research gaps identified in the literature, this study pursues several objectives. First, it investigates in depth the ways in which FDI and trade openness shape the development of SMEs in Vietnam, taking into consideration the distinctive features of this sector. Second, it utilizes a comprehensive dataset spanning the entire period from 1991 to 2023, covering the emergence and evolution of FDI, trade openness, and SMEs, thereby ensuring a robust and up-to-date analysis of their interlinkages. Third, the study constructs an integrated econometric model that enables the joint evaluation of both the direct and interactive impacts of FDI and trade openness on SME growth. Finally, drawing on the empirical evidence, the paper advances concrete policy recommendations aimed at maximizing the positive effects of these two factors on SME development in Vietnam.

In addressing these objectives, the research not only extends the scholarly debate on the relationship among FDI, trade openness, and SME expansion but also provides practical insights to support policymaking for sustainable economic development in Vietnam.

2.4. Hypothesis and Research Model

Building on the theoretical foundations and prior empirical evidence concerning the role of FDI and TO in fostering enterprise development, this study introduces an analytical framework to examine how these two factors shape SME sector growth in Vietnam. In this framework, FDI and TO are treated as key explanatory variables, both expected to exert a positive influence on SME development, which is assessed through indicators such as the number of firms and their revenue scale. The overall design of the proposed model is illustrated in Figure 1.

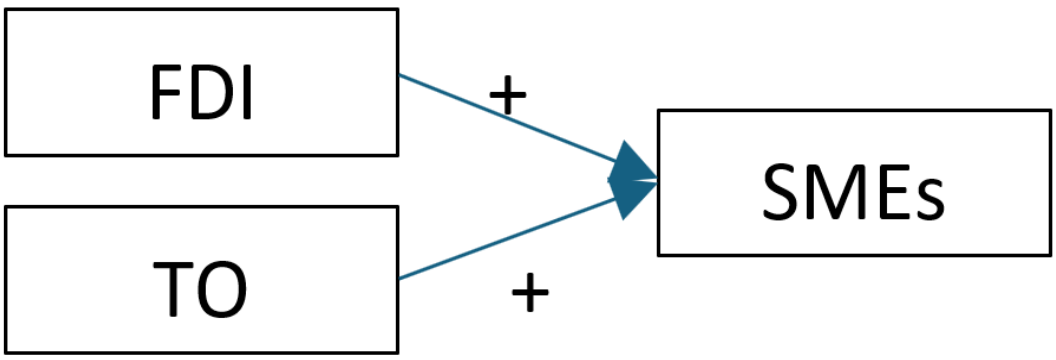

Figure 1. Impact of FDI and TO on Vietnamese SMEs.

Since the growth of SMEs is measured by two indicators: the number of enterprises and total revenue, the study will have two linear regression models as follows:

2.4.1. Model 1: Number of SMEs (Enterprises) as Dependent Variable

Number of SMEst = $\beta_0 + \beta_1 FDI_t + \beta_2 TO_t + \varepsilon_t$. (Model 1: Number of SMEs).

In which:

Number of SMEst is the number of small and medium enterprises at time t.

FDIt is the value of implemented FDI at time t.

TOt is the trade openness at time t.

β_0 is a constant (Intercept).

β_1 is a coefficient reflecting the level of impact of FDI on Number of SMEst.

β_2 is a coefficient reflecting the impact of TO on Number of SMEst.

ε_t is a random error.

2.4.2. Model 2: SME Revenue (Billion USD) as Dependent Variable

SME revenuet = β0 + β1FDIt + β2TOt + εt. (Model 2: SME Revenue).

In which:

SME revenuet is the total revenue of small and medium enterprises at time t.

FDIt is the value of implemented FDI at time t.

TOt is the trade openness at time t.

β0 is the constant (Intercept).

β1 is the coefficient reflecting the level of impact of FDI on SME revenue.

β2 is the coefficient reflecting the impact of TO on SME revenue.

εt is the random error.

3. RESEARCH METHODOLOGY

3.1. Research Data

This paper makes use of secondary data obtained from credible and authoritative institutions, including the World Bank, the General Statistics Office of Vietnam (GSO), and the Ministry of Planning and Investment (MPI). Data on FDI inflows are recorded starting from 1988, following the introduction and enforcement of the Law on Foreign Investment. By contrast, information on SMEs is available only from 1991, following the promulgation of the Law on Private Enterprises together with the Law on Companies, providing the institutional basis for SME development. Consequently, the analysis covers the period 1991–2023, thereby ensuring consistency and completeness across the three core variables of the model. Appendix 1 presents the complete dataset, showing the annual values of SME revenue, the number of SMEs, FDI inflows, and trade openness throughout the entire study period.

3.2. Data Analysis Method

To examine the impact of FDI and trade openness (TO) on SME development, the study employs a multiple linear regression framework. Two indicators are used to capture SME performance: the total number of enterprises and overall revenue. Separate regression models are specified for each measure in order to offer a more comprehensive and balanced assessment of how FDI and TO impact SME growth.

Moreover, multicollinearity issues across the independent variables are evaluated through the Tolerance index and the Variance Inflation Factor (VIF). Following common econometric practice, a VIF threshold of less than 5 is applied, ensuring that correlations among the independent variables remain at an acceptable level and do not compromise the robustness of the regression outcomes.

3.3. Testing Research Hypotheses

Within the research framework, hypotheses are established to test how the two explanatory factors FDI and TO affect the growth of SMEs, specifically as follows.

- *For Model 1 (Number of SMEs).*
- *Null hypothesis (H_0): $\beta_1 = 0; \beta_2 = 0$ – FDI and TO show no significant statistical impact on the quantity of SMEs.*
- *Alternative hypothesis (H_1): $\beta_1 \neq 0; \beta_2 \neq 0$ – Both FDI and TO have statistically significant impacts on the number of SMEs.*
- *For Model 2 (SME revenue).*
- *Null hypothesis (H_0): $\beta_1 = 0; \beta_2 = 0$ – FDI and TO do not have a significant impact on SME revenue.*
- *Alternative hypothesis (H_1): $\beta_1 \neq 0; \beta_2 \neq 0$ – Both FDI and TO have statistically significant impacts on SME revenue.*

In both regression specifications, the statistical significance of the estimated coefficients is assessed through t-tests in conjunction with their associated p-values. The explanatory power of the models is further evaluated using the coefficient of determination (R^2), which indicates how well the models fit the research data and context.

3.4. Data Processing Tools

The data were processed and examined using SPSS software (version 30). All statistical tests were conducted at the standard 5% significance threshold ($\alpha = 0.05$), thus confirming the strength and dependability of the regression results.

Table 1. Correlation matrix between variables (Model 1: Number of SMEs).

		Number of SMEs	FDI (billion USD)	TO (%)
Number of SMEs	Pearson correlation	1	0.969**	0.933**
	Sig. (2-tailed)	—	<0.001	<0.001
	N	33	33	33
FDI (Billion USD)	Pearson correlation	0.969**	1	0.836**
	Sig. (2-tailed)	<0.001	—	<0.001
	N	33	33	33
TO (%)	Pearson correlation	0.933**	0.836**	1
	Sig. (2-tailed)	<0.001	<0.001	—
	N	33	33	33

Note: ** Correlation is significant at the 0.01 level (2-tailed).

4. RESULTS

4.1. Results of Regression Analysis Between FDI, TO, And the Number of SMEs (Model 1: Number of SMEs)

4.1.1. Correlation Analysis Between Variables

Table 1 reports the Pearson correlation matrix, showing the relationships among the model's variables. The findings indicate a very strong correlation between FDI and the number of SMEs ($r = 0.969$, $p < 0.001$), while trade openness (TO) is likewise highly correlated with SME growth ($r = 0.933$, $p < 0.001$). A notable association is also evident between FDI and TO ($r = 0.836$, $p < 0.001$). This result signals a potential risk of multicollinearity between the two independent variables, which must be formally assessed prior to running the regression analysis.

Table 2. Regression diagnostic test results.

Test	Model 1 (Number of SMEs)	Model 2 (SME Revenue)	Threshold	Interpretation
Multicollinearity tests				
Tolerance - FDI	0.302	0.311	>0.1	No serious multicollinearity
Tolerance - TO	0.302	0.311	>0.1	No serious multicollinearity
VIF - FDI	3.313	3.215	<5	Acceptable
VIF - TO	3.313	3.215	<5	Acceptable
Condition index (max)	6.870	6.968	<30	No serious multicollinearity
Residual tests				
Durbin-Watson	1.136	1.764	1.5-2.5	Model 1: Slight concern Model 2: Acceptable
Standard error	29,793.94	16.32	-	Reasonable prediction error

4.1.2. Regression Diagnostic Tests

The diagnostic checks reported in Table 2 assess the robustness and appropriateness of the regression models used to analyze the linkages between FDI, trade openness, and SME development indicators. Appendix 2 provides the complete SPSS output for Model 1, including detailed correlation matrices, collinearity diagnostics, and residual statistics.

Multicollinearity Assessment: Despite the high correlation between FDI and TO (r = 0.836), the multicollinearity diagnostic tests confirm that this does not compromise the model's validity. The tolerance values for both FDI and TO are 0.302, exceeding the critical threshold of 0.1, indicating adequate independence between the predictors. Correspondingly, the Variance Inflation Factor (VIF) for both variables is 3.313, well below the conventional cut-off of 5.0 (Hair, Black, Babin, & Anderson, 2010). The maximum Condition Index of 6.870 is substantially lower than the warning threshold of 30 recommended by Belsley, Kuh, and Welsch (1980), further confirming that multicollinearity does not significantly compromise the model's parameter estimates.

Residual Analysis: The Durbin-Watson statistic of 1.136 falls slightly below the acceptable range of 1.5-2.5, raising a minor concern about potential positive autocorrelation in the residuals. However, visual inspection of the residual scatter plot (Figure 2) reveals a random distribution of data points around the horizontal axis without systematic patterns, suggesting that any autocorrelation effects are not severe enough to invalidate the model's conclusions. The standard error of estimate at 29,793.94 represents a reasonable level of prediction error given the scale of the data, indicating satisfactory model precision.

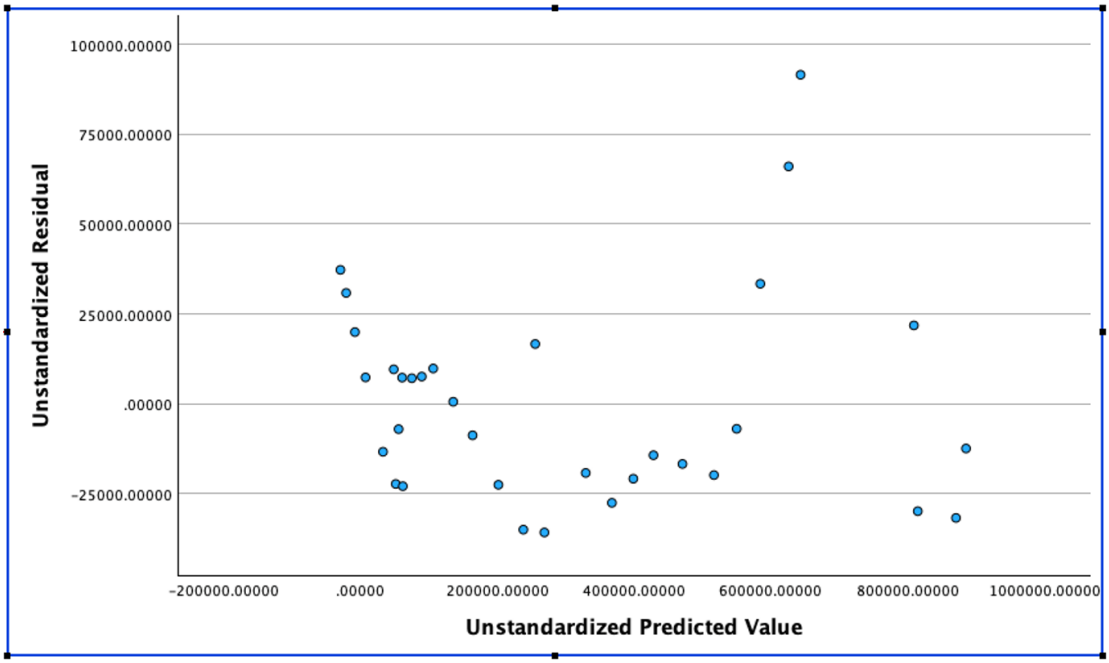

Figure 2. Residual scatter plot (Model 1: Number of SMEs).

Overall Model Validity: The diagnostic tests demonstrate that Model 1 (Number of SMEs) meets the fundamental assumptions required for reliable statistical inference. While the Durbin-Watson statistic warrants cautious interpretation, the combination of adequate multicollinearity control and acceptable residual behavior supports the model's appropriateness for examining the linkage between FDI, trade openness, and the number of SMEs in Vietnam. The diagnostic results confirm that the regression coefficients can be reliably interpreted and used for policy implications.

Table 3. Regression results (Model 1: Number of SMEs).

Value	Unstandardized (B)	Std. Error	Standardized Coefficients Beta	t-Statistic	Sig.	95% CI (Lower–Upper)	Collinearity Tolerance	Statistics VIF
Constant	-54,092.388	9892.2		-5.468	<.001	-74,294.921, -33,889.856		
FDI	25,941.655	1,378.0	0.627	18.826	<.001	23,127.402, 28,755.908	0.302	3.313
TO	1,832.313	148.99	0.410	12.298	<.001	1,528.032, 2,136.593	0.302	3.313
R-Squared	0.990							
Adjusted R-Squared	0.989							
Durbin-Watson Stat	1.136							
Std. Error of Estimate	29,793.94							
F	1478.485							

Note: All coefficients are significant at 1% level ($p < 0.001$).

4.1.3. Linear Regression Model Evaluation (Model 1: Number of SMEs)

Table 3 presents the regression estimates; the model can be evaluated as follows.

4.1.3.1. Model Performance Assessment

The regression results reveal a very high explanatory power, with the R^2 equal to 0.990 and the adjusted R^2 at 0.989. This indicates that approximately 99% of the variation in SME numbers is explained by the two independent variables, FDI and trade openness (TO). The minimal difference between the R-squared and its adjusted value (0.001) suggests that the model avoids overfitting and maintains strong explanatory capacity even after accounting for the set of independent variables.

4.1.3.2. Statistical Significance and Model Validity

The overall regression is highly significant, as evidenced by an F-statistic of 1478.485. Such a large value confirms that the model explains the data much more effectively than a specification without predictors. This offers robust support for rejecting the null hypothesis, which states that all coefficients are simultaneously zero at standard significance levels. When considered alongside the high R-squared value, these findings confirm the model's strong statistical foundation and dependability. The Durbin-Watson statistic is 1.136, indicating positive autocorrelation in the residuals, since values well below 2.0 suggest that successive errors are positively related. Although this does not undermine the predictive usefulness of the regression, it does signal a potential violation of the independence assumption an issue frequently encountered in time-series economic analyses and thus important to consider when interpreting the outcomes. Finally, the standard error of estimate at 29,793.94 indicates the typical magnitude of prediction errors in the model. This provides an indication of the accuracy of the model's predictions.

4.1.3.3. Independent Variables Analysis

The regression results indicate that FDI exhibits a significant positive correlation with the expansion of SME numbers. The estimated coefficient suggests that each additional billion USD in FDI generates approximately 25,942 new SMEs, after controlling for trade openness. The standardized beta of 0.627 highlights the substantial role of FDI, identifying it as the most influential predictor in the model. This effect is strongly supported by a t-value of 18.826 ($p < 0.001$), demonstrating significance at the 0.01 level. The 95% confidence interval, ranging from 23,127.402 to 28,755.908, further indicates that the actual impact of FDI is expected to be between roughly 23,127 and 28,756 SMEs, underscoring the precision of the estimate. Trade openness also exhibits a statistically significant positive link with SME numbers. Specifically, a single percent increase in trade openness leads to the formation of approximately 1,832 new SMEs, conditional on FDI. The standardized beta coefficient of 0.410 reflects a moderate but meaningful effect, smaller in magnitude than that of FDI. The relationship is validated by a t-statistic of 12.298 ($p < 0.001$), and the 95% confidence interval (1,528–2,137) indicates a plausible range for the true parameter estimate.

4.1.3.4. Multicollinearity Assessment

The collinearity diagnostics indicate that multicollinearity remains within acceptable bounds. Both FDI and TO have tolerance values of 0.302, comfortably exceeding the commonly cited cutoff of 0.10 for serious concerns. Their corresponding Variance Inflation Factor (VIF) values, 3.313 in each case, fall significantly below the accepted cutoff value of 10, suggesting that multicollinearity is unlikely to undermine the reliability of the estimated regression coefficients.

4.1.3.5. Regression Equation

The regression equation can be expressed as.

$$\text{Number of SMEs} = -54{,}092.388 + 25{,}941.655(\text{FDI}) + 1{,}832.313(\text{TO}) + \varepsilon \quad (1)$$

The intercept value (-54,092.388) exhibits a standard error of 9,892.183 with a t-value of -5.468 ($p < 0.001$), indicating statistical significance. While the negative intercept suggests that when both FDI and TO equal zero, the baseline number of SMEs would be negative (which is economically implausible), this is statistically necessary for the linear relationship and represents the y-intercept of the regression line.

4.1.3.6. Comparative Impact Analysis

Based on the standardized beta coefficients, Foreign Direct Investment ($\beta = 0.627$) emerges as the dominant predictor, explaining a larger proportion of variance in SME numbers compared to Trade Openness ($\beta = 0.410$), which shows a substantial but secondary impact on SME development. The magnitude difference between these standardized coefficients suggests that FDI has approximately 53% greater influence on SME numbers than trade openness. Both variables contribute significantly and uniquely to the model, as evidenced by their high t-statistics (18.826 for FDI and 12.298 for TO) and consistently low p-values ($p < 0.001$), indicating that each variable provides distinct explanatory value beyond what the other variable contributes.

Table 4. Correlation matrix between variables (Model 2: SME Revenue).

		SME revenue	FDI (Billion USD)	TO (%)
SME Revenue	Pearson correlation	1	0.941**	0.955**
	Sig. (2-tailed)	—	<0.001	<0.001
	N	32	32	32
FDI (Billion USD)	Pearson Correlation	0.941**	1	0.836**
	Sig. (2-tailed)	<0.001	—	<0.001
	N	32	33	33
TO (%)	Pearson correlation	0.955**	0.836**	1
	Sig. (2-tailed)	<0.001	<0.001	—
	N	32	33	33

Note: ** Correlation is significant at the 0.01 level (2-tailed).

4.2. Results of Regression Analysis between FDI, TO, and Total Revenue of SME (Model 2: SME Revenue)

4.2.1. Correlation Analysis between Variables

The Pearson correlation matrix results (Table 4) show a robust and highly significant relationship exists between the variables. Specifically, the total revenue of small and medium enterprises (SME Revenue) has a very strong positive association with foreign direct investment (FDI) ($r = 0.941$, $p < 0.001$) and a robust linkage to trade openness (TO) ($r = 0.955$, $p < 0.001$). Additionally, there is a strong positive correlation between FDI and TO ($r = 0.836$, $p < 0.001$). This indicates the potential for multicollinearity between the two independent variables, so the study proceeds to test for multicollinearity in the next step.

4.2.2. Regression Diagnostic Tests

As presented in Table 2, the diagnostic tests for Model 2 (SME Revenue) demonstrate similar multicollinearity control as Model 1, with marginally improved tolerance values (0.311) and correspondingly lower VIF values (3.215). Appendix 3 displays the complete SPSS output for Model 2, documenting all diagnostic statistics and regression estimates for SME revenue analysis. Notably, Model 2 exhibits superior residual behavior with a Durbin-Watson value of 1.764, suggesting minimal autocorrelation issues and supporting the model's methodological soundness. The enhanced diagnostic performance of Model 2 indicates more robust parameter estimates compared to Model 1 (Number of SMEs), supporting the validity of the regression analysis for examining the impact of FDI and trade openness on SME revenue growth.

Table 5. Regression results (Model 2: SME Revenue).

Value	Unstandardized (B)	Std. Error	Standardized Coefficients Beta	t-Statistic	Sig.	95% CI (Lower, Upper)	Collinearity Tolerance	Statistics VIF
Constant	-28.103	5.669		-4.958	<0.001	-39.696, -16.509		
FDI	8.273	0.756	0.477	10.949	<0.001	6.728, 9.818	0.311	3.215
TO	1.062	0.083	0.559	12.821	<0.001	0.892, 1.231	0.311	3.215
R-Squared	0.983							
Adjusted R-Squared	0.982							
Durbin-Watson	1.764							
Std. Error of Estimate	16.32059							
F	831.694							

Note: All coefficients are significant at 1% level ($p < 0.001$).

4.2.3. Evaluation of the Linear Regression Model

Table 5 presents comprehensive regression statistics that support the following model interpretation.

4.2.3.1. Model Performance Assessment

The regression analysis of SME revenue shows a very strong explanatory capacity, achieving a coefficient of determination of 0.983 and an adjusted R^2 of 0.982. These statistics indicate that approximately 98.3% of SME revenue variance is explained by FDI and trade openness variables. The minimal gap between these coefficients (0.001) demonstrates model stability when accounting for predictor quantity, suggesting no overfitting issues.

4.2.3.2. Statistical Significance and Model Validity

The model demonstrates exceptional statistical validity with an F-statistic of 831.694. This substantial value establishes that the regression model significantly outperforms a baseline model lacking predictors, resulting in a decisive rejection of the null hypothesis regarding zero coefficients at standard significance thresholds. Although this statistic is lower than that reported for Model 1, it still reflects strong explanatory performance and statistical robustness.

The Durbin-Watson statistic is 1.764, which is close to the benchmark value of 2.0, suggesting only minor autocorrelation among residuals. This indicates that the independence assumption is largely satisfied and represents an improvement over Model 1 in terms of diagnostic fit. The result also lies within the generally accepted range, confirming that successive residuals are not meaningfully correlated.

The estimation standard error of 16.32059 represents the typical deviation magnitude between actual and fitted values. This modest error level indicates strong model accuracy in forecasting.

4.2.3.3. Independent Variables Analysis

FDI demonstrates a robust and statistically significant relationship with SME revenue. The regression coefficient indicates that each additional billion USD in FDI generates approximately 8.273 billion USD in SME revenue, holding trade openness constant. The standardized beta value of 0.477 indicates a moderate-to-strong effect, although smaller than its influence on SME numbers in Model 1. This relationship is supported by a t-statistic of 10.949 ($p < 0.001$), with statistical significance at $\alpha = 0.01$. The parameter bounds at 95% confidence interval [6.728, 9.818] further indicate that the true effect of FDI on SME revenue is likely to fall within this range, demonstrating both the plausibility and precision of the estimate.

Trade openness also exhibits a significant positive relationship with SME revenue. Specifically, every percentage increase in trade openness results in an approximate growth of 1.062 units in SME revenue, conditional on FDI. The standardized beta coefficient of 0.559 indicates a moderately strong effect, which in this case exceeds that of FDI. The evidence is supported by a t-statistic of 12.821 ($p < 0.001$), the highest value in this model. The 95% confidence interval [0.892, 1.231] provides a narrow and precise estimate, excluding zero and thereby reinforcing the statistical significance of the relationship.

4.2.3.4. Multicollinearity Assessment

The collinearity diagnostics indicate that multicollinearity is within acceptable bounds. Both FDI and TO record tolerance values of 0.311, comfortably exceeding the usual cut-off of 0.10 that signals serious concerns. Their corresponding Variance Inflation Factor (VIF) values are 3.215, well below the conventional threshold of 10, implying that collinearity is unlikely to compromise the reliability of the regression estimates. Notably, these results are marginally better than those obtained for Model 1.

4.2.3.5. Regression Equation

The regression equation can be expressed as.

$$\text{SME Revenue} = -28.103 + 8.273(\text{FDI}) + 1.062(\text{TO}) + \varepsilon \quad (2)$$

The intercept value (-28.103) exhibits a standard error of 5.604 with a t-value of -5.020 ($p < 0.001$), demonstrating statistical validity. The negative intercept suggests that when both FDI and TO equal zero, the baseline SME revenue would be negative, which represents the theoretical starting point of the linear relationship.

Based on the standardized beta coefficients, Trade Openness ($\beta = 0.559$) emerges as the slightly stronger predictor of SME revenue, explaining a marginally larger proportion of variance compared to Foreign Direct Investment ($\beta = 0.477$). This represents a notable shift from Model 1, where FDI was the dominant predictor. The difference between these standardized coefficients is relatively small (0.082), suggesting that both variables have comparable influence on SME revenue. Both variables contribute significantly and uniquely to the model, as evidenced by their high t-statistics (12.821 for TO and 10.949 for FDI) and consistently low p-values ($p < 0.001$), indicating that each variable provides distinct explanatory value beyond what the other variable contributes.

5. DISCUSSION

The analytical results demonstrate that both FDI and TO contribute significantly and positively to SME advancement in Vietnam, as reflected in both the number of enterprises and aggregate revenue.

For the model 1: Number of SMEs, in which the dependent variable is the number of SMEs, the unstandardized regression coefficient of FDI is 25,941.655 and that of TO is 1,832.313, with statistical significance levels of $p < .001$. The 95% confidence intervals for FDI ([23,127; 28,755]) and TO ([1,256; 2,409]) further confirm the reliability of these coefficients. This shows that, when FDI increases by 1 billion USD, the number of SMEs increases by approximately 25,942 enterprises, with the true effect likely falling between 23,127 and 28,755 enterprises at the 95% confidence level, and when TO increases by 1%, the number of SMEs increases by about 1,832 enterprises, with the true effect likely falling between 1,256 and 2,409 enterprises at the 95% confidence level. The standardized regression coefficient (Beta) of FDI is 0.627, higher than that of TO (0.410), indicating that FDI has a relatively stronger impact on the number of enterprises. The model achieves an adjusted $R^2 = 0.989$, reflecting that 98.9% of the variation in the number of enterprises can be explained by the two variables FDI and TO. The Durbin–Watson index = 1.136, although lower than the recommended level (1.5–2.5), may imply a slight autocorrelation in the residuals, but the study tested the residual distribution assumption. The results show that the data points are distributed quite randomly. This suggests that the residuals do not have serious autocorrelation. Therefore, the regression model still meets the residual independence assumption and can be considered statistically reliable.

For the model 2: SME Revenue, with the dependent variable being total SME revenue, FDI has a coefficient of B = 8.273 and TO has a coefficient of B = 1.062, both with $p < 0.001$, indicating that both factors contribute to increasing business revenue. The 95% confidence intervals for all coefficients do not include zero, further confirming the statistical significance of the relationships. However, in terms of standardized coefficients (Beta), TO has a stronger impact ($\beta = 0.559$) than FDI ($\beta = 0.477$), indicating that international trade plays a more prominent role in promoting business performance. The model also shows a very high level of explanation with adjusted $R^2 = 0.982$ and $F = 864.002$ ($p < 0.001$), reflecting a strong model fit to the research data. Although in both models there is a fairly high correlation between the two independent variables FDI and TO ($r = 0.836$), the results of the multicollinearity test through the Collinearity Diagnostics table show that the Condition Index (the highest in the first model is 6.870; the highest in the second model is 6.968) is still much lower than the warning threshold of 30 (Belsley et al.,1980). Therefore, although the variance ratio of the two independent variables is highly concentrated in Dimension 3 (in the first model FDI: 80%, TO: 98%; in the second model: 78%, TO: 98%), the overall indexes still ensure the reliability of the model.

Furthermore, the study continued to compare the two traditional indexes, Tolerance and Variance Inflation Factor (VIF). These indexes are all within the safe range in both models. In the first model, Tolerance: 0.302, VIF: 3.313, and in the second model, Tolerance: 0.311, VIF: 3.215, both are smaller than the allowable threshold of 5. Therefore, it can be concluded that multicollinearity does not seriously affect the analysis results.

Compared with previous studies, this result is consistent with most, only different from the study of Aitken and Harrison (1999), analyzing the case of Venezuela in the period 1976-1989. For studies on the case of Vietnam, this result is similar in the direction of impact but more comprehensive when considering the combination of both FDI and trade openness affecting the growth of small and medium enterprises, in both aspects of number of enterprises and revenue. The analysis period also covers the entire duration of the presence of both small and medium enterprises, FDI, and trade openness in Vietnam.

This research result is completely consistent with the current reality in Vietnam. Through many different channels of linkage such as production cooperation, processing, technology transfer, and management skills, as well as labor rotation between FDI enterprises and SMEs, workers from FDI enterprises establishing small businesses. FDI has created direct impacts and positive spillover effects on local enterprises.

However, it is also necessary to recognize that the presence of FDI enterprises can create significant competitive pressure, especially in the early stages of integration. However, in the long term, this competitive pressure acts as a catalyst to promote SMEs to increase innovation, improve efficiency, and adaptability thereby moving towards sustainable development. The reality of more than three decades of attracting FDI has shown that the Vietnamese SME sector not only exists but also develops in parallel with the international integration process, reflecting the positive impacts over adverse consequences.

Similarly, trade openness has contributed significantly to expanding access to global markets, sources of raw materials, technology, and modern equipment for SMEs. Although the increasing import trend leads to competitive pressure from foreign goods, in general, international trade integration has become an important driving force for domestic enterprises to improve quality, enhance innovation capacity, and develop in a sustainable direction. Empirical indicators recorded the rapid increase of TO in the context of integration has been positively correlated with the development trend of SMEs in Vietnam.

6. CONCLUSION

6.1. Summary of Key Findings

This study provides comprehensive empirical validation of meaningful positive associations between FDI, trade openness (TO), and small and medium-sized enterprise (SME) advancement in Vietnam throughout 1991–2023. The analysis demonstrates that both external mechanisms serve as crucial drivers of SME expansion, measured through enterprise proliferation and revenue enhancement. The econometric models exhibit exceptional explanatory strength (adjusted $R^2 > 0.98$), confirming the consistency and dependability of these associations across Vietnam's three-decade integration trajectory.

The research addresses critical gaps in the literature by providing the first comprehensive time series analysis covering the entire period of Vietnam's economic integration, developing an integrated econometric framework examining dual dimensions of SME growth, and quantifying the magnitude of external factor impacts to inform evidence-based policy formulation.

6.2. Policy Implications and Recommendations

The empirical findings provide a robust foundation for strategic policy interventions aimed at optimizing SME development through enhanced external economic integration. In this regard, six major policy orientations can be highlighted.

The first: Strategic FDI attraction and management.

Vietnam should transition from quantity-focused to quality-oriented FDI attraction policies. Priority should be given to foreign investors demonstrating a strong commitment to local business integration through formal partnership agreements, technology transfer programs, and supply chain development initiatives. The government should establish FDI performance evaluation frameworks that include metrics for local content utilization, SME partnership formation, and knowledge spillover generation, moving beyond traditional measures of capital inflow and job creation.

The creation of FDI-SME linkage facilitation centers in major industrial zones would provide institutional support for connecting foreign enterprises with qualified local suppliers. These centers should offer matchmaking services, capability assessments, and joint training programs to bridge the technical and managerial gaps between FDI enterprises and domestic SMEs.

The second: SME capacity enhancement for global integration.

The positive relationship between external integration and SME performance necessitates comprehensive capacity-building programs tailored to different stages of SME development. The government should establish SME Excellence Centers, providing technical training, quality certification support, and management skill development specifically designed to meet international standards and FDI enterprise requirements.

Financial support mechanisms should be restructured to prioritize SMEs engaged in export activities or serving as suppliers to FDI enterprises. This encompasses favorable borrowing conditions, export financing assurances, and collaborative risk management mechanisms that promote SME integration into international supply networks while reducing potential hazards from overseas market engagement.

The third: Balanced trade liberalization strategy.

The significant impact of trade openness on SME development suggests that sequential liberalization approaches can maximize benefits while minimizing adjustment costs. Vietnam should implement sector-specific liberalization timelines that allow vulnerable SME sectors adequate preparation time while accelerating opening in areas where domestic enterprises demonstrate competitive advantages.

Import facilitation policies should focus on improving SME access to advanced machinery, raw materials, and intermediate goods that enhance productivity and competitiveness. This includes streamlined customs procedures for SME importers, reduced bureaucratic barriers, and preferential treatment for technology and equipment imports that support SME upgrading.

The fourth: Integrated policy coordination framework.

The complementary effects of FDI and trade openness highlight the critical need for cross-agency policy coordination. Vietnam should establish a National SME Integration Council comprising representatives from investment promotion, trade facilitation, and SME development agencies to ensure policy coherence and avoid contradictory interventions.

Regulatory harmonization across different economic zones and provinces would create a more predictable business environment for both FDI enterprises and SMEs. This includes standardized investment procedures, unified quality standards, and consistent enforcement mechanisms that reduce compliance costs and administrative burdens.

The fifth: Innovation and technology transfer promotion.

Given the positive spillover effects demonstrated in the analysis, policies should actively promote technology transfer mechanisms between FDI enterprises and local SMEs. This includes tax incentives for FDI companies engaging in formal technology sharing agreements, government-sponsored joint research and development programs, and intellectual property protection frameworks that encourage knowledge sharing while respecting commercial interests.

Digital transformation support programs should prioritize SMEs seeking to integrate with international supply chains, providing subsidized access to e-commerce platforms, digital payment systems, and supply chain management technologies that enhance their competitiveness in global markets.

The sixth: Institutional and infrastructure development.

The research findings underscore the importance of supportive institutional frameworks for maximizing external integration benefits. Vietnam should invest in specialized business service providers, including legal firms, accounting services, and consulting companies capable of supporting SME international activities and FDI-local business partnerships.

Infrastructure development priorities should focus on transportation networks, telecommunications systems, and industrial park facilities that reduce the costs of international business operations and enhance the attractiveness of Vietnam as both an FDI destination and an export platform for SMEs.

6.2.1. Concluding Remarks

This research demonstrates that Vietnam's economic integration strategy has successfully created conditions conducive to SME development through external factor leverage. The strong empirical relationships identified provide policymakers with confidence that continued investment in FDI attraction and trade liberalization, coupled with appropriate domestic support measures, will yield sustained benefits for the SME sector.

The policy recommendations presented offer a roadmap for optimizing these external relationships while building domestic capabilities necessary for long-term competitiveness. Success in implementing these recommendations requires continuous governmental dedication, sufficient funding provision, and streamlined inter-agency collaboration across government agencies and private sector stakeholders.

As Vietnam advances toward higher-income status, the SME sector's ability to integrate successfully with global value chains and compete in international markets will be crucial for sustained economic development. The evidence presented in this study provides a solid foundation for policy decisions that can help achieve this integration while guaranteeing that the advantages of globalization are broadly shared within the national business sector.

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APPENDIX

Appendix 1. SMEs, FDI, TO data.

Years	SMEs revenue (Billion USD)	Number of SMEs (Enterprise)	FDI (Billion USD)	TO (%)
1991		7760.00	0.10	12.00
1992	3.50	9700.00	0.21	15.00
1993	5.00	11640.00	0.50	17.90
1994	6.50	14550.00	0.95	20.00
1995	9.00	19400.00	1.80	21.90
1996	11.50	29100.00	2.30	25.00
1997	14.00	38800.00	2.50	27.80
1998	16.00	48500.00	2.10	30.10
1999	20.00	58000.00	1.50	34.70
2000	27.50	68000.00	1.60	40.00
2001	32.50	82000.00	1.80	44.90
2002	40.00	97000.00	2.00	50.00
2003	50.00	116000.00	2.30	54.90
2004	60.00	136000.00	2.70	65.20
2005	70.00	155000.00	3.10	75.00
2006	85.00	179000.00	3.80	85.70
2007	105.00	203000.00	4.50	95.70
2008	120.00	233000.00	5.10	104.00

Years	SMEs revenue (Billion USD)	Number of SMEs (Enterprise)	FDI (Billion USD)	TO (%)
2009	132.50	272000.00	4.30	108.00
2010	152.50	310000.00	6.30	120.00
2011	165.00	340000.00	7.00	131.00
2012	177.50	378000.00	7.50	141.00
2013	192.50	414000.00	8.00	150.00
2014	210.00	454000.00	9.00	159.00
2015	230.00	497000.00	10.00	170.00
2016	260.00	543000.00	10.50	181.00
2017	280.00	618000.00	11.20	190.00
2018	300.00	692000.00	12.30	197.00
2019	320.00	735000.00	15.80	157.00
2020	290.00	785000.00	20.38	185.70
2021	310.00	831000.00	20.38	182.60
2022	345.00	839000.00	23.00	179.10
2023	375.00	873000.00	25.00	158.80

Appendix 2. SPSS output for Model 1: Number of SMEs.

Variables entered/Removed[a]

Model	Variables entered	Variables removed	Method
1	TO (%), FDI (billion USD)[b]	.	Enter

Note: a. Dependent variable: Number of SMEs (enterprise)
b. All requested variables entered.

Model summary[b]

Model	R	R square	Adjusted R square	Std. error of the estimate	Durbin-Watson
1	0.995[a]	0.990	0.989	29793.94480	1.136

Note: a. Predictors: (Constant), TO (%), FDI (billion USD)
b. Dependent Variable: Number of SMEs (enterprise)

ANOVA[a]

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	26248412212496.405	2	13124206062 48.203	1478.485	<0.001[b]
	Residual	266303744 00.564	30	887679146.685		
	Total	2651471586896.969	32			

Note: a. Dependent variable: Number of SMEs (enterprise)
b. Predictors: (Constant), TO (%), FDI (billion USD)

Coefficients[a]

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.	95.0% confidence interval for B
		B	Std. error	Beta			Lower bound
1	(Constant)	-54092.388	9892.183		-5.468	<0.001	-74294.921
	FDI (Billion USD)	25941.655	1378.001	0.627	18.826	<0.001	23127.402
	TO (%)	1832.313	148.991	0.410	12.298	<0.001	1528.032

Coefficients[a]

Model		95.0% confidence interval for B	Collinearity statistics	
		Upper bound	Tolerance	VIF
1	(Constant)	-33889.856		
	FDI (Billion USD)	28755.908	0.302	3.313
	TO (%)	2136.593	0.302	3.313

Note: a. Dependent variable: Number of SMEs (enterprise)

Collinearity Diagnostics[a]						
				Variance Proportions		
Model	Dimension	Eigenvalue	Condition Index	(Constant)	FDI (billion USD)	TO (%)
1	1	2.649	1.000	0.03	0.02	0.01
	2	.295	2.995	0.57	0.19	0.01
	3	.056	6.870	0.40	0.80	0.98

Note: a. Dependent Variable: Number of SMEs (enterprise)

Residuals statistics[a]					
	Minimum	Maximum	Mean	Std. deviation	N
Predicted value	-29510.4688	885420.2500	305680.3030	286402.31824	33
Residual	-35770.57813	91541.14063	0.00000	28847.86301	33
Std. predicted value	-1.170	2.024	0.000	1.000	33
Std. residual	-1.201	3.072	0.000	0.968	33

Note: a. Dependent variable: Number of SMEs (enterprise)

Appendix 3. SPSS output for Model 2: SME revenue.

Variables entered/Removed[a]			
Model	Variables entered	Variables removed	Method
1	TO (%), FDI (Billion usd)[b]	.	Enter

Note: a. Dependent Variable: SME Revenue (billion usd)
b. All requested variables entered.

Model summary[b]					
Model	R	R square	Adjusted R Square	Std. error of the estimate	Durbin-Watson
1	0.991[a]	0.983	0.982	16.32059	1.764

Note: a. Predictors: (Constant), TO (%), FDI (billion usd).
b. Dependent Variable: SME Revenue (billion usd).

Coefficients[a]							
		Unstandardized coefficients		Standardized coefficients			95.0% confidence interval for B
Model		B	Std. error	Beta	t	Sig.	Lower bound
1	(Constant)	-28.103	5.669		-4.958	<0.001	-39.696
	FDI (Billion usd)	8.273	0.756	0.477	10.949	<0.001	6.728
	TO (%)	1.062	0.083	0.559	12.821	<0.001	0.892

ANOVA[a]						
Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	443062.756	2	221531.378	831.694	<0.001[b]
	Residual	7724.486	29	266.362		
	Total	450787.242	31			

Note: a. Dependent variable: SME revenue (Billion usd).
b. Predictors: (Constant), TO (%), FDI (Billion usd).

Coefficients[a]				
		95.0% confidence interval for B	Collinearity statistics	
Model		Upper bound	Tolerance	VIF
1	(Constant)	-16.509		
	FDI (billion usd)	9.818	0.311	3.215
	TO (%)	1.231	0.311	3.215

Note: a. Dependent variable: SME revenue (Billion usd)

Collinearity diagnostics[a]						
				Variance proportions		
Model	Dimension	Eigenvalue	Condition index	(Constant)	FDI (billion usd)	TO (%)
1	1	2.662	1.000	0.03	0.02	0.01
	2	0.283	3.067	0.55	0.20	0.01
	3	0.055	6.968	0.42	0.78	0.98

Note: a. Dependent variable: SME revenue (Billion usd)

Residuals statistics[a]					
	Minimum	**Maximum**	**Mean**	**Std. deviation**	**N**
Predicted value	-10.4388	352.3408	137.9844	119.55060	32
Residual	-47.67316	50.69027	0.00000	15.78534	32
Std. Predicted value	-1.242	1.793	0.000	1.000	32
Std. Residual	-2.921	3.106	0.000	0.967	32

Note: a. Dependent variable: SME revenue (Billion usd)