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Research Article

The Mediating Role of Institutional Quality in FDI Attractiveness: Evidence from Tay Ninh, Vietnam

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Abstract

This study examines the determinants of Foreign Direct Investment (FDI) attractiveness in Tay Ninh, Vietnam, emphasizing the mediating role of Institutional Quality alongside Investment Incentives and Infrastructure Quality. Employing the endogenous growth model and Investment Climate Framework, the research investigates how policies and infrastructure directly enhance FDI inflows, with Institutional Quality mediating through improved workforce skills. Data from 437 respondents across 250 FDI enterprises were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). Findings indicate that Investment Incentives and Institutional Quality exert the strongest direct effects on FDI attractiveness, followed by Infrastructure Quality. Institutional Quality significantly mediates the relationships between Infrastructure Quality, Investment Incentives, and FDI attractiveness. Despite Tay Ninh's strategic location near Ho Chi Minh City and the Cambodian border, its limited skilled workforce, with only 14.7% formally trained, poses challenges. The study recommends extending investment incentives, accelerating infrastructure development, and prioritizing workforce training to enhance FDI attractiveness and promote sustainable economic growth. These findings offer policymakers actionable insights to strengthen Tay Ninh's competitiveness in attracting high-value FDI within Vietnam's Southern Key Economic Region.

Keywords

Foreign Direct Investment, Investment Incentives, Infrastructure Quality, Institutional Quality, Tay Ninh

1. Introduction

Foreign Direct Investment (FDI) plays a critical role in fostering economic development in emerging economies like Vietnam by driving capital accumulation, technology transfer, employment generation, and integration into global markets. In Tay Ninh, a province strategically located in Vietnam's Southern Key Economic Region, FDI has been instrumental in shifting the economic structure from agriculture to industrial and service-based sectors. With over 600 FDI projects and a registered capital of nearly 9 billion USD by 2023, Tay Ninh has leveraged its proximity to Ho Chi Minh City and the Cambodian border to attract investments in manufacturing, renewable energy, and high-tech agriculture [12]. However, despite these achievements, the province faces challenges such as inadequate infrastructure, limited skilled labor, and less competitive investment policies compared to neighboring provinces like Binh Duong and Dong Nai, which collectively underscore the need to examine the determinants of FDI attractiveness in this context [20].

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The attractiveness of a region for FDI is shaped by a confluence of factors, including investment incentives, infrastructure quality, and institutional quality, which collectively create a conducive environment for foreign investors. Investment incentives, such as tax exemptions and streamlined administrative processes, reduce financial and operational barriers, making a region more appealing to multinational enterprises [10]. Similarly, robust infrastructure—encompassing transportation networks, utilities, and logistics—lowers operational costs and enhances market connectivity, significantly influencing investor decisions [17]. IInstitutional Quality, defined as the caliber of human capital (e.g., workforce skills and education) and governance structures (e.g., transparent and efficient policy implementation), serves as a pivotal mediator in enhancing FDI attractiveness by improving workforce productivity and innovation capacity. In Tay Ninh, infrastructure projects like the Ho Chi Minh City-Moc Bai Expressway and industrial zones such as Trang Bang and Phuoc Dong have bolstered its FDI appeal, yet gaps in institutional quality, particularly the limited availability of a skilled workforce, hinder its ability to fully capitalize on these advantages [23].

Institutional quality, defined by the caliber of human capital and governance structures, serves as a pivotal mediator in enhancing FDI attractiveness by improving workforce productivity and innovation capacity. A skilled and educated workforce is essential for absorbing advanced technologies and fostering research and development, both of which are critical for attracting high-value FDI [18]. In Tay Ninh, despite a labor force of over 692,000 workers, only 14.7% possess formal training, posing a significant challenge for industries requiring technical expertise [12]. By addressing this skills gap through targeted educational and vocational training programs, Tay Ninh can amplify the effectiveness of its investment policies and infrastructure, creating a synergistic effect that enhances its competitiveness as an FDI destination [6].

This study aims to investigate the determinants of FDI attractiveness in Tay Ninh, with a specific focus on the mediating role of institutional quality in the relationships between investment incentives, infrastructure quality, and FDI inflows. Drawing on the endogenous growth model and the Investment Climate Framework, the research posits that strategic policies and robust infrastructure directly enhance FDI attractiveness, while institutional quality mediates these effects by fostering a capable workforce [10, 19]. By employing Partial Least Squares Structural Equation Modeling (PLS-SEM) with data from 437 respondents across 250 FDI enterprises, this study seeks to provide empirical evidence on these interrelationships, offering actionable insights for policymakers to optimize Tay Ninh's FDI strategies and address both immediate and long-term economic needs.

The significance of this research lies in its localized focus on Tay Ninh, a province with unique geographical and economic attributes, including its role as a gateway to Cambodia via the Moc Bai border economic zone. By examining the interplay of investment incentives, infrastructure, and institutional quality, this study contributes to the broader literature on FDI determinants while providing practical recommendations for enhancing Tay Ninh's competitiveness in a highly competitive regional investment landscape. The findings are expected to guide policymakers in balancing short-term incentives with long-term investments in human capital and infrastructure, ensuring sustainable economic growth and positioning Tay Ninh as a regional hub for high-quality FDI, as explored in the following literature review [14].

2. Literature Review

2.1. Review Previous Studies

The attraction of Foreign Direct Investment has been a focal point of economic development research, particularly in emerging economies. A substantial amount of literature underscores the interdependence between government policies, infrastructure development, and the quality of human resources as vital components influencing FDI inflows.

2.1.1. Government Policies and FDI

Government policies shape the investment landscape by establishing a conducive environment for foreign investors. Studies emphasize the impact of strategic policy frameworks on attracting FDI. For instance, improving transportation infrastructure significantly enhances FDI inflows, advocating for state investment in infrastructure as a means to foster economic growth [22]. This insight is crucial for regions like Tay Ninh, where localized efforts in improving essential infrastructure can translate into increased foreign investment. Similarly, investments in communication and transportation infrastructure are foundational for attracting modern businesses to Kenya, highlighting the essential role of effective policies in infrastructure development [21].

Transformative policies not only enhance infrastructure but also help align local conditions with investor expectations. In Tay Ninh, human resources and infrastructure policies significantly correlated with FDI, advocating for a merger of educational reforms and infrastructure investments to create a holistic investment environment [20]. This reflects the necessity of integrating policy frameworks that respond to local competencies while also appealing to foreign investors.

2.1.2. Infrastructure Development

The role of infrastructure as a determinant of FDI is well-documented. Transportation infrastructure, encompassing highways, railways, and telecommunications, acts as both a facilitator and attractor for foreign investment. Enhanced transportation networks can significantly elevate FDI levels, suggesting that state-mandated improvements can further boost economic prospects [22]. The necessity of infrastructural readiness is echoed through multiple studies, indicating that effective infrastructure positively influences new greenfield investments, thereby underscoring the importance of initial investment conditions in attracting FDI [13].

Moreover, the framework of internal economic geography establishes that well-developed infrastructure correlates with enhanced economic growth prospects. Effective financial mechanisms accompanying infrastructure development further stimulate FDI by ensuring that local investments and foreign funds can coexist beneficially [1].

2.1.3. Institutional Quality as a Mediator

Institutional quality, encompassing the caliber of human capital and governance structures, is a critical mediator in the relationship between investment policies, infrastructure, and Foreign Direct Investment (FDI) attractiveness. A skilled workforce enhances a region's ability to absorb advanced technologies and drive innovation, which are key considerations for foreign investors seeking long-term value creation [15]. In Tay Ninh, despite a labor force exceeding 692,000 workers, only 14.7% have formal training, limiting the province's capacity to attract high-tech FDI [12]. Vietnam's national upskilling initiatives, such as the National Vocational Training Program (2021-2030), aim to enhance workforce skills through technical education and industry partnerships, providing a framework that Tay Ninh can leverage to address this skills gap [6]. These national efforts, combined with local training programs, can boost human capital, enabling regions to meet the technological and operational demands of FDI firms. Investments in education and vocational training programs significantly boost human capital, enabling regions to meet the technological and operational demands of FDI firms, thus amplifying the impact of supportive policies and infrastructure [6].

The mediating role of institutional quality is further evidenced by its ability to bridge infrastructure development and FDI outcomes. Well-developed infrastructure, such as transportation and communication networks, facilitates access to educational institutions and training centers, thereby enhancing workforce skills and productivity [21]. In Tay Ninh, the need to integrate infrastructure improvements with human resource development to create a competitive investment environment is emphasized [20]. By fostering a skilled labor pool, institutional quality ensures that infrastructure investments translate into sustainable FDI inflows, as firms benefit from both operational efficiency and a capable workforce [14].

Governance quality, another facet of institutional quality, reinforces the effectiveness of investment incentives by ensuring transparent and efficient policy implementation. Policies that promote collaboration between FDI firms and local educational institutions, such as subsidized training programs, enhance workforce capabilities and align local competencies with investor needs [19]. In Tay Ninh, such initiatives are vital to address the skills gap and support industries like renewable energy and advanced manufacturing. By mediating the effects of policies and infrastructure, institutional quality creates a synergistic environment that maximizes FDI attractiveness, positioning Tay Ninh as a compelling destination for high-value investments [3].

2.2. Theoretical Framework

The theoretical framework underpinning this study builds upon the synergistic relationship between infrastructure, investment policies, and Institutional Quality as mediators in enhancing FDI attractiveness. The foundational theory is centered on the endogenous growth model, positing that economic growth results from investment in human capital and infrastructure, which in turn attract FDI.

In this framework, the "Investment Climate Framework" highlights that institutional and policy environments significantly influence FDI outcomes [10]. This model posits that stable governance structures and effective regulatory policies directly affect the efficiency of infrastructure systems, which together improve the competitive advantage of a region, making it more attractive for foreign investors.

Additionally, the "Human Capital Theory" is integral to understanding the mediatory role played by Institutional Quality. According to this theory, investments in education and skills significantly enhance productivity and innovation, essential factors that attract high-quality FDI [19]. Specifically, Human Capital Theory underscores Institutional Quality's mediating role by emphasizing how a skilled workforce enhances the effectiveness of investment incentives and infrastructure in attracting FDI, as educated labor enables firms to leverage technological advancements and innovate efficiently. Moreover, firms with a skilled workforce are better positioned to develop and absorb new technologies, thereby creating a more conducive environment for foreign investors seeking value creation through local partnerships [16].

By combining these frameworks, the study analyzes how Tay Ninh can bolster its attractiveness for FDI through targeted policies that enhance infrastructure and human capital. Recognizing the mediating quality of human resources can guide local policymakers in making informed decisions that align with both immediate and long-term economic objectives.

2.3. Hypotheses Development and Research Model

2.3.1. Investment Incentives

Investment incentives, including tax exemptions, land lease subsidies, and streamlined administrative procedures, are pivotal in enhancing a region's appeal to foreign investors and fostering local economic development. These incentives reduce financial burdens on Foreign Direct Investment (FDI) enterprises, signaling a supportive business environment that encourages long-term commitments. In Tay Ninh, such policies have driven FDI growth, particularly in industrial zones like Trang Bang and Phuoc Dong, where tax holidays and reduced land rents have spurred investments in manufacturing and renewable energy sectors [11]. Additionally, incentives promoting skill development programs enhance institutional quality by facilitating vocational training and technology transfer, crucial for meeting FDI firms' demands. Policies incentivizing firms to invest in local workforce training improve labor productivity and innovation capacity, supporting the hypothesis that investment incentives positively impact institutional quality (H1) [19].

The direct impact of investment incentives on FDI attractiveness is well-established, as they lower entry barriers and operational costs, positioning a region competitively in the global investment landscape. In Tay Ninh, measures like corporate tax reductions for up to 10 years and import duty exemptions for high-tech equipment have significantly boosted FDI inflows, with registered capital reaching nearly 9 billion USD by 2023 [12]. These align with arguments that a favorable regulatory environment, characterized by macroeconomic stability and investment-friendly policies, directly enhances FDI attractiveness [10]. By mitigating financial risks and improving returns, such incentives make Tay Ninh an attractive destination, supporting the hypothesis that investment incentives have a positive direct impact on FDI attractiveness (H2).

Institutional quality mediates the relationship between investment incentives and FDI attractiveness, as a skilled workforce amplifies the effectiveness of these incentives in sustaining investor confidence. Incentives encouraging FDI firms to collaborate with local educational institutions or fund training programs elevate workforce capabilities, enabling firms to leverage advanced technologies and innovate efficiently [6]. In Tay Ninh, where only 14.7% of the labor force is formally trained, such initiatives are critical to bridging the skills gap and enhancing appeal for high-value FDI projects [12]. By fostering a competent workforce, investment incentives indirectly strengthen FDI attractiveness through improved productivity and innovation, supporting the hypothesis that institutional quality mediates the relationship between investment incentives and FDI attractiveness (H3) [14].

H1: Investment Incentives have a positive impact on Institutional Quality.

H2: Investment Incentives have a positive direct impact on FDI Attractiveness.

H3: Institutional Quality mediates the relationship between Investment Incentives and FDI Attractiveness.

2.3.2. Infrastructure Quality

High-quality infrastructure, including transportation networks, utilities, and communication systems, is a cornerstone of economic development and a key determinant of Foreign Direct Investment (FDI) attractiveness. In Tay Ninh, infrastructure advancements such as the Ho Chi Minh City-Moc Bai Expressway and modern industrial zones like Trang Bang and Phuoc Dong have significantly improved connectivity and operational efficiency for FDI enterprises, contributing to nearly 9 billion USD in registered capital by 2023 [12]. Beyond direct economic benefits, infrastructure quality enhances institutional quality by improving access to educational institutions, vocational training centers, and technology hubs, facilitating skill development and knowledge dissemination [21]. This supports the hypothesis that infrastructure quality has a positive impact on institutional quality (H4), as robust infrastructure fosters an environment conducive to workforce training in Tay Ninh.

Infrastructure quality directly boosts FDI attractiveness by reducing operational costs and improving market access, making a region more appealing to foreign investors. In Tay Ninh, investments in logistics infrastructure, such as the Moc Bai border economic zone and upgraded road networks, have lowered transportation costs and strengthened trade links with Cambodia, aligning with findings that reliable infrastructure enhances FDI competitiveness [17]. These developments support the hypothesis that infrastructure quality has a positive direct impact on FDI attractiveness (H5). Note that the original manuscript appears to contain a duplication error, listing H5 as identical to H4; based on context, H5 is interpreted here as infrastructure quality's direct effect on FDI attractiveness, consistent with the study's framework and empirical results.

Institutional quality mediates the relationship between infrastructure quality and FDI attractiveness, as a skilled workforce enhances a region's ability to leverage infrastructural advantages. In Tay Ninh, where only 14.7% of the labor force is formally trained, infrastructure improvements supporting educational and training facilities are critical to addressing this skills gap [12]. A well-educated workforce, supported by robust infrastructure, amplifies a region's competitiveness by facilitating innovation and technology absorption, key for high-value FDI [9]. This supports the hypothesis that institutional quality mediates the relationship between infrastructure quality and FDI attractiveness (H6), as infrastructure-driven workforce improvements indirectly enhance Tay Ninh's appeal to foreign investors. Consequently, the following hypotheses are constructed:

H4: Infrastructure Quality has a positive impact on Institutional Quality.

H5: Infrastructure Quality has a positive impact on FDI Attractiveness.

H6: Institutional Quality mediates the relationship between Infrastructure Quality and FDI Attractiveness.

2.3.3. Institutional Quality and FDI Attractiveness

Institutional quality, characterized by a skilled and educated workforce and effective governance, is a pivotal driver of Foreign Direct Investment (FDI) attractiveness, as it enhances a region's capacity to meet the technological and operational demands of foreign investors. In Tay Ninh, despite a labor force of over 692,000 workers, only 14.7% possess formal training or qualifications, limiting the province's appeal for high-tech and knowledge-intensive FDI projects [12]. Regions with high-quality human capital, marked by advanced education and vocational skills, attract greater FDI inflows due to their ability to support innovation and productivity [15]. By investing in education and training programs, Tay Ninh can elevate workforce capabilities, making it more appealing to investors seeking long-term value creation, thus supporting the hypothesis that institutional quality has a positive impact on FDI attractiveness (H7).

Effective governance, another critical component of institutional quality, ensures transparent policy implementation and fosters investor confidence, further enhancing FDI attractiveness. Policies that streamline administrative processes and promote collaboration between FDI firms and local educational institutions can bridge the skills gap, aligning workforce competencies with investor needs [14]. In Tay Ninh, targeted initiatives such as subsidized training programs for advanced manufacturing and renewable energy sectors are essential to address the low proportion of formally trained workers. These efforts enable regions to absorb advanced technologies, creating a competitive edge in attracting high-value FDI projects and reinforcing the direct positive relationship between institutional quality and FDI attractiveness, thus supporting the hypothesis (H7) as the following:

H7: Institutional Quality has a positive impact on FDI Attractiveness.

From the above discussions, the the research model was developed as:

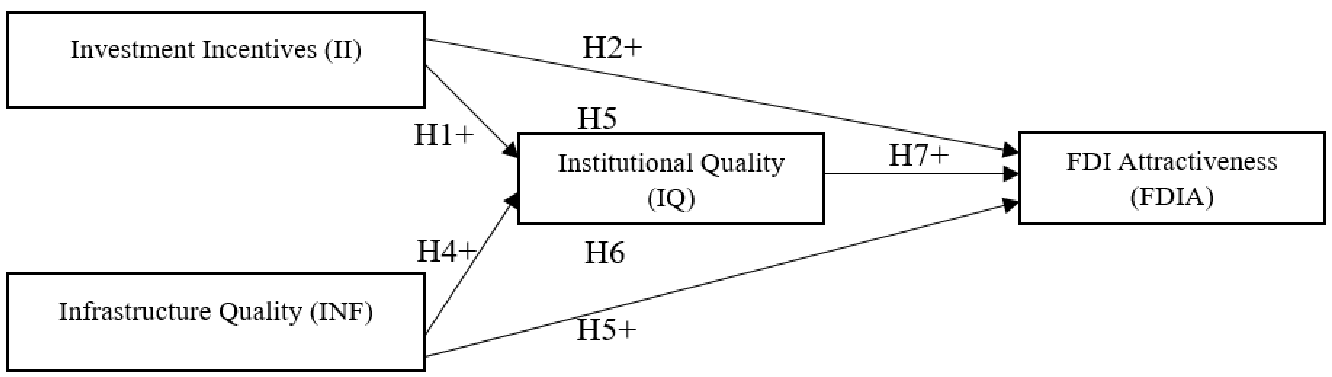


Figure 1. *Research model.*

3. Data and Research Method

3.1. Data Collection and Sampling

Data collection employs a mixed-method approach, combining primary and secondary data to ensure comprehensive insights. Primary data was gathered between March and August 2023, through structured surveys and in-depth interviews targeting two key groups: FDI enterprise representatives and local government officials involved in investment policy and infrastructure development. The survey, conducted in two phases—a pilot phase in March 2023 with 30 enterprises to test questionnaire reliability using Cronbach's Alpha and Exploratory Factor Analysis (EFA), followed by the main survey from April to August 2023—assesses perceptions of investment incentives, infrastructure quality, Institutional Quality, and FDI attractiveness, using a 5-point Likert scale for quantitative analysis. Interviews with 6-10 officials from the Tay Ninh Department of Planning and Investment and the Industrial Zones Management Board, conducted concurrently during June to August 2023, provide qualitative insights into policy implementation and infrastructural challenges. Secondary data is sourced from official reports, such as the Tay Ninh Statistical Yearbook (2023), government publications, and academic studies, to contextualize FDI trends, infrastructure investments, and human resource statistics [12]. This dual approach ensures robust data triangulation, capturing both empirical and contextual dimensions of the research problem.

The sample size for the survey is determined using a formula for finite populations to ensure statistical reliability:

$$n = \frac{N}{1+N(e^2)}$$

Where (n) is the sample size, (N) is the population size, and (e) is the margin of error.

In Tay Ninh, with approximately 566 active FDI projects as of 2023 [12], and assuming a 5% margin of error (e = 0.05) with a 95% confidence level, the minimum required sample size is calculated as approximately 235 enterprises. To account for potential non-responses and ensure representativeness, the study targets 200 FDI enterprises for the survey. The sample is selected using stratified random sampling, with strata based on industry (e.g., manufacturing, renewable energy, agriculture), enterprise size (small, medium, large), and geographic location (e.g., Trang Bang, Phuoc Dong, Gò Dầu), ensuring coverage of diverse FDI profiles in Tay Ninh.

Table 1. *Demographic Profile of FDI Enterprise Respondents in Tay Ninh.*

Variable	Category	Frequency	Percentage (%)
Position	CEO, GM	228	52.2
	Member of Board of Directors (BOM)	209	47.8
Source of Company (Country/Region of Origin)	East Asia (South Korea, Japan, China, Taiwan (Territory))	69	15.8
	Southeast Asia (Singapore, Thailand, Malaysia)	134	30.7
	Western Europe (Germany, France, Netherlands)	98	22.4
	North America (United States, Canada)	100	22.9
	Middle East (United Arab Emirates (UAE), Israel)	23	5.3
	Other	13	3.0
Years of Commitment to Invest in Tay Ninh	< 5 years	55	12.6
	5 - 10 years	237	54.2
	Over 10 years	117	26.8
	Undecided / Project-based only	15	3.4
TOTAL		437	100.0

(Source: From the authors' data analysis results)

The sample comprises 250 FDI enterprises, with 437 respondents, including CEOs, general managers (52.2%), and board members (47.8%), as detailed in the manuscript's demographic table. The enterprises originate from various regions, with 30.7% from Southeast Asia (e.g., Singapore, Thailand), 22.9% from North America, 22.4% from Western Europe, and 15.8% from East Asia, reflecting Tay Ninh's diverse investor base. Additionally, 54.2% of respondents represent firms with 5-10 years of investment commitment, indicating a focus on established investors. The survey is conducted in two phases: a pilot phase with 30 enterprises to test questionnaire reliability using Cronbach's Alpha and Exploratory Factor Analysis (EFA), followed by the main survey. This sampling strategy, combined with rigorous data collection methods, ensures the study's findings are representative and reliable for analyzing the interplay of investment incentives, infrastructure, Institutional Quality, and FDI attractiveness in Tay Ninh.

3.2. Data Analysis

The study employs a rigorous data analysis approach, utilizing Partial Least Squares Structural Equation Modeling (PLS-SEM) to test the hypothesized relationships among Investment Incentives (II), Infrastructure Quality (INF), Institutional Quality (IQ), and FDI Attractiveness (FDIA) in Tay Ninh. Primary data, collected from 437 respondents across 250 FDI enterprises via a structured survey with a 5-point Likert scale, were analyzed to assess the direct and mediating effects outlined in the research model. The measurement model was validated through reliability and discriminant validity tests using Cronbach's Alpha ($\alpha > 0.7$), Composite Reliability (CR > 0.7), Average Variance Extracted (AVE > 0.5), and Heterotrait-Monotrait (HTMT) ratios (< 0.85), ensuring robust construct reliability and distinctiveness [4, 5, 7, 8]. A pilot survey with 30 enterprises was conducted to refine the questionnaire, employing Cronbach's Alpha and Exploratory Factor Analysis (EFA) to confirm scale reliability, thereby enhancing the quality of the main survey data used in the PLS-SEM analysis [8].

Qualitative data from 6-10 interviews with local government officials from the Tay Ninh Department of Planning and Investment and the Industrial Zones Management Board were analyzed using thematic analysis with an inductive coding approach. Audio-recorded interviews, conducted between June and August 2023, were transcribed verbatim. Two researchers independently coded the transcripts to identify recurring themes related to policy implementation, infrastructure challenges, and workforce development. These themes were iteratively refined and triangulated with quantitative findings to provide contextual insights into the interplay of investment incentives, infrastructure, and Institutional Quality, enhancing the robustness of the mixed-method approach.

The structural model was tested using PLS-SEM, which is well-suited for complex models with mediating relationships and smaller sample sizes, as it maximizes the explained variance of dependent variables. Path coefficients, T-statistics, and p-values were calculated to evaluate the significance of direct (H1-H5) and indirect (H3, H6) effects. The bootstrap method with 5,000 resamples was applied to ensure the stability and significance of the results, confirming all hypotheses with p-values of 0.000. Qualitative data from 6-10 interviews with local government officials complemented the quantitative findings, providing contextual insights into policy and infrastructure challenges. This mixed-method approach, combining PLS-SEM's statistical rigor with qualitative depth, ensures a comprehensive analysis of the interplay between investment incentives, infrastructure, Institutional Quality, and FDI attractiveness in Tay Ninh, offering robust empirical evidence for policy recommendations.

Table 2. *Reliability and Discriminant Validity of Constructs for FDI Attractiveness Model.*

	α	CR (rho_a)	CR (rho_c)	AVE	INF	IQ	FDIA	II
INF	0.935	0.942	0.950	0.792				
IQ	0.918	0.920	0.939	0.754	0.453			
FDIA	0.925	0.927	0.943	0.770	0.596	0.691		
II	0.940	0.941	0.954	0.807	0.425	0.484	0.686	

(Source: From the authors' data analysis results)

Table 2 presents the results of reliability and discriminant validity tests using the Heterotrait-Monotrait (HTMT) ratio, a critical step in validating the measurement model for the study on enhancing FDI attractiveness in Tay Ninh with Institutional Quality as a mediator. The table includes key constructs: Infrastructure Quality (INF), Institutional Quality (IQ), FDI Attractiveness (FDIA), and Investment Incentives (II). Reliability is assessed through Cronbach's Alpha (α), Composite Reliability (CR) measures (rho_a and rho_c), and Average Variance Extracted (AVE). All constructs demonstrate high reliability, with Cronbach's Alpha values ranging from 0.918 (IQ) to 0.940 (II), exceeding the recommended threshold of 0.7, indicating strong internal consistency [4]. Similarly, CR (rho_a) values range from 0.920 to 0.942, and CR (rho_c) values from 0.939 to 0.954, confirming robust composite reliability. The AVE values, ranging from 0.754 (IQ) to 0.807 (II), surpass the 0.5 benchmark, demonstrating that each construct explains a substantial portion of its indicators' variance, thus supporting convergent validity.

The HTMT ratios in Table 2 assess discriminant validity, ensuring that constructs are distinct from one another. The HTMT values, which measure the correlation between constructs relative to their internal item correlations, are all below the conservative threshold of 0.85, with the highest being 0.691 (between IQ and FDIA) and the lowest 0.425 (between INF and II). This indicates that the constructs are empirically distinct, as recommended by Henseler et al. (2015), who suggest HTMT values below 0.85 or 0.90 to confirm discriminant validity [5]. The low HTMT ratios suggest that Infrastructure Quality, Institutional Quality, FDI Attractiveness, and Investment Incentives are unique constructs, avoiding issues of multicollinearity in the structural model. This is particularly important for the study's hypotheses, which propose direct and mediated relationships among these constructs, requiring clear differentiation to accurately test their interrelationships.

The results from Table 2 provide a solid foundation for proceeding with structural equation modeling (SEM) to test the hypothesized relationships, such as the mediating role of Institutional Quality between Infrastructure Quality, Investment Incentives, and FDI Attractiveness. The high reliability and convergent validity ensure that the measurement scales are robust and accurately capture the intended constructs. The confirmed discriminant validity further strengthens the study's methodological rigor, as it verifies that the constructs are not overly correlated, allowing for precise estimation of their direct and indirect effects. These findings align with the study's objective to explore how infrastructure and investment policies, mediated by Institutional Quality, enhance Tay Ninh's FDI attractiveness, providing confidence in the measurement model's suitability for further analysis.

3.3. Structural Equation Modelling

Table 3. Direct Path Coefficients in PLS-SEM for FDI Attractiveness in Tay Ninh.

Hypothesis	Relationship	Original sample	Mean	STDEV	T statistics	P values	Result
H1	INF -> IQ	0.293	0.293	0.036	8.183	0.000	Accepted
H2	INF -> FDIA	0.256	0.255	0.037	6.860	0.000	Accepted
H3	IQ -> FDIA	0.359	0.360	0.039	9.118	0.000	Accepted
H4	II -> IQ	0.333	0.335	0.045	7.360	0.000	Accepted
H5	II -> FDIA	0.375	0.374	0.040	9.446	0.000	Accepted

(Source: From the authors' data analysis results)

The structural equation modeling (SEM) analysis, utilizing Partial Least Squares (PLS-SEM), was conducted to test the hypothesized relationships among Investment Incentives (II), Infrastructure Quality (INF), Institutional Quality (IQ), and FDI Attractiveness (FDIA) in Tay Ninh. The analysis leveraged primary data from 437 respondents across 250 FDI enterprises, collected via a 5-point Likert scale survey, to evaluate both direct and mediating effects outlined in the research model. The structural model was assessed using path coefficients, T-statistics, and p-values, with a bootstrap method (5,000 resamples) to ensure result stability and significance. All hypotheses were supported with p-values of 0.000, indicating statistical significance at the 99% confidence level, as detailed in Tables 3 and 4 [4].

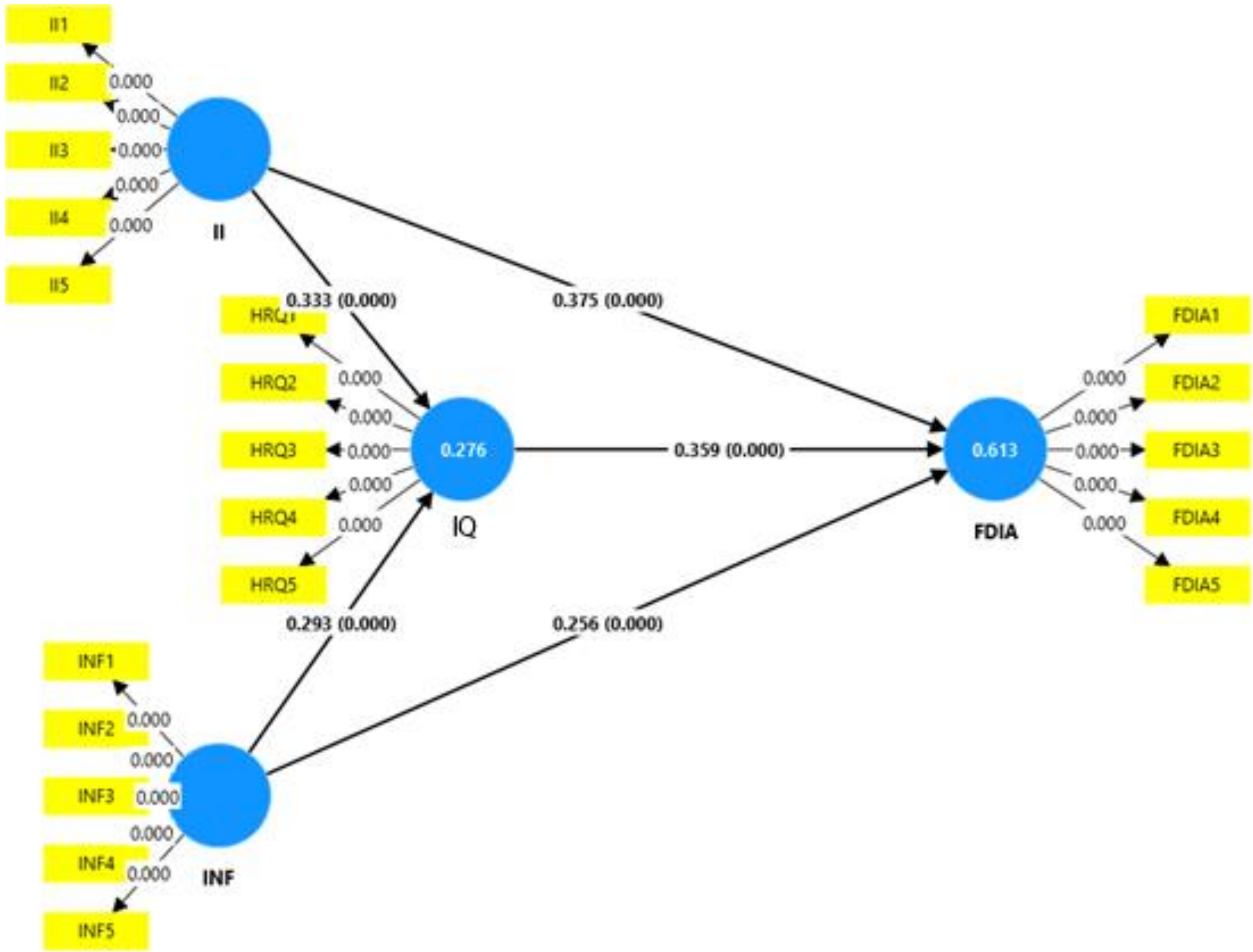
Table 3 presents the direct path coefficients, confirming significant relationships. Investment Incentives (II -> FDIA, $\beta = 0.375$, $T = 9.446$) exhibited the strongest direct impact on FDI Attractiveness, followed by Institutional Quality (IQ -> FDIA, $\beta = 0.359$, $T = 9.118$) and Infrastructure Quality (INF -> FDIA, $\beta = 0.256$, $T = 6.860$). Additionally, Infrastructure Quality (INF -> IQ, $\beta = 0.293$, $T = 8.183$) and Investment Incentives (II -> IQ, $\beta = 0.333$, $T = 7.360$) positively influenced Institutional Quality, supporting hypotheses H1-H5. These results align with prior studies, emphasizing the critical roles of policy incentives, infrastructure, and skilled labor in enhancing FDI appeal [10, 14].

Table 4. Indirect Effects of Institutional Quality Mediation in FDI Attractiveness Model.

Relationship	Original sample	Sample mean	STDEV	T statistics	P values	Result
INF -> IQ -> FDIA	0.105	0.106	0.018	5.696	0.000	Supported
II -> IQ -> FDIA	0.120	0.121	0.023	5.260	0.000	Supported

(Source: From the authors' data analysis results)

Table 4 details the indirect effects, confirming the mediating role of Institutional Quality. The path INF -> IQ -> FDIA ($\beta = 0.105$, $T = 5.696$) supported H6, indicating that infrastructure improvements enhance FDI Attractiveness indirectly by fostering a skilled workforce. Similarly, II -> IQ -> FDIA ($\beta = 0.120$, $T = 5.260$) supported H3, highlighting that investment incentives amplify FDI appeal through human capital development. The slightly stronger mediating effect of incentives suggests their immediate impact on workforce quality, aligning with findings that a well-educated workforce amplifies a region's competitiveness [9]. These findings underscore the importance of integrating infrastructure and policy initiatives with workforce training to maximize FDI inflows in Tay Ninh.



Source: From the author's data analysis results

Figure 2. *PLS-SEM Structural Model Results: Path Coefficients for FDI Attractiveness in Tay Ninh (specifying the significance levels of path coefficients (e.g., *p < 0.001).*

Figure 2 visually depicts the PLS-SEM results, illustrating significant path coefficients and reinforcing the model's robust fit. The strong influence of Investment Incentives and Institutional Quality, coupled with Infrastructure Quality's direct and indirect effects, provides a clear framework for policymakers. The results advocate for a balanced strategy in Tay Ninh, combining competitive incentives, accelerated infrastructure projects, and targeted human resource development to enhance and sustain FDI attractiveness in a competitive regional landscape [17].

4. Findings Discussion

The Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis provides robust empirical support for the hypothesized relationships influencing FDI attractiveness in Tay Ninh, with Institutional Quality as a mediator. The direct effects reveal that Investment Incentives (II -> FDIA, β = 0.375, T = 9.446) exert the strongest influence on FDI Attractiveness, followed by Institutional Quality (IQ -> FDIA, β = 0.359, T = 9.118) and Infrastructure Quality (INF -> FDIA, β = 0.256, T = 6.860). These findings align with arguments emphasizing the pivotal role of favorable regulatory environments and the importance of skilled labor [10, 14]. In Tay Ninh, policies offering tax exemptions for up to 10 years and land lease subsidies have driven FDI inflows, reaching nearly 9 billion USD by 2023, though the significant role of Institutional Quality underscores the need for sustained workforce development to support high-tech industries [12].

The positive effects of Infrastructure Quality (INF -> IQ, β = 0.293, T = 8.183) and Investment Incentives (II -> IQ, β = 0.333, T = 7.360) on Institutional Quality validate hypotheses H1 and H4. Infrastructure projects like the Ho Chi Minh City-Moc Bai Expressway enhance access to educational and training facilities, improving workforce skills, as supported by findings on the role of infrastructure in skill development [21]. Similarly, incentives encouraging FDI firms to fund vocational training address Tay Ninh's skills gap, where only 14.7% of the labor force is formally trained [12]. These results argue that policy-driven training fosters human capital, indirectly boosting FDI attractiveness through enhanced productivity and innovation capacity [19].

The mediation analysis confirms Institutional Quality's pivotal role, with significant indirect effects for INF -> IQ -> FDIA (β = 0.105, T = 5.696) and II -> IQ -> FDIA (β = 0.120, T = 5.260), supporting H3 and H6. These findings indicate that infrastructure and incentives enhance FDI attractiveness not only directly but also indirectly by improving workforce capabilities, enabling firms to leverage advanced technologies [9]. The stronger indirect effect of Investment Incentives suggests that policy-driven training programs have a more immediate impact on workforce quality, critical for Tay Ninh's competitiveness against provinces like Binh Duong, which boast more advanced labor pools.

Comparing direct and indirect effects, Investment Incentives have the strongest immediate impact, but Institutional Quality's combined direct and mediated effects highlight its long-term significance. This supports the study's theoretical framework, integrating the Investment Climate Framework and Human Capital Theory, which posit that infrastructure and policies create an enabling environment amplified by skilled labor [10, 19]. These findings lay the foundation for actionable policy recommendations, which are detailed in the following section to guide Tay Ninh's strategies for enhancing FDI attractiveness.

5. Implications

This study's findings on enhancing FDI attractiveness in Tay Ninh, with Institutional Quality as a mediator, offer critical insights for policymakers aiming to position the province as a competitive investment destination. Investment Incentives emerged as the most influential factor, underscoring the importance of policies like tax exemptions and land lease subsidies in attracting foreign investors. To strengthen this, Tay Ninh should extend tax breaks beyond the current 10-year period and introduce targeted subsidies for high-tech and sustainable industries, aligning with global trends toward green investment [10]. Streamlining administrative processes through one-stop investment service centers can further reduce bureaucratic barriers, drawing lessons from provinces like Binh Duong to enhance regional competitiveness.

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Infrastructure Quality significantly enhances FDI appeal by improving connectivity and reducing operational costs. Prioritizing projects like the Ho Chi Minh City-Moc Bai Expressway and upgrading rural utilities, such as electricity and water, will make Tay Ninh more attractive to investors in sectors like e-commerce and technology-driven manufacturing [17]. Investments in digital infrastructure, including high-speed internet, are essential to support emerging industries. By ensuring infrastructure projects facilitate access to educational and training facilities, Tay Ninh can amplify workforce skills, indirectly boosting FDI attractiveness.

The pivotal role of Institutional Quality, particularly through a skilled workforce, highlights the need to address Tay Ninh's skills gap, where only 14.7% of the labor force is formally trained [12]. To address this, Tay Ninh should establish industry-academia partnerships, such as collaborations between FDI firms and Tay Ninh University, to develop vocational training programs in advanced manufacturing, renewable energy, and digital technologies. These programs, supported by national initiatives like the National Vocational Training Program (2021-2030), can enhance workforce capabilities and align with investor needs [6]. Incentive policies offering tax credits for firms investing in local training will accelerate these efforts, while promoting STEM education will build a skilled labor pipeline. These initiatives align with the Human Capital Theory, ensuring a workforce capable of meeting investor demands for innovation and productivity [19].

The interplay of these factors advocates for a holistic strategy, balancing immediate financial incentives with long-term investments in human capital and infrastructure. To compete with provinces like Binh Duong, which benefit from advanced labor pools and established industrial zones, Tay Ninh should leverage its strategic location near the Cambodian border and the Moc Bai economic zone to attract high-value FDI in sectors like renewable energy and high-tech agriculture. Tailored incentives and infrastructure investments, combined with workforce upskilling, will position Tay Ninh as a regional FDI hub, distinguishing it in a competitive landscape [14]. Regular policy evaluations and stakeholder consultations will ensure responsiveness to investor needs. A dedicated FDI task force and public-private partnerships can coordinate these efforts, ensuring alignment with global trends and local needs.

This study extends prior research, such as Tran et al. (2020), by incorporating the mediating role of Institutional Quality, which was not explicitly modeled in their analysis of FDI factors in Tay Ninh [20]. While Tran et al. (2020) identified human resources and infrastructure as significant FDI drivers, our use of PLS-SEM provides a more robust examination of direct and indirect effects, particularly highlighting how workforce skills amplify the impact of incentives and infrastructure. Additionally, our focus on Tay Ninh's unique context, including its proximity to Cambodia and the Moc Bai economic zone, offers a localized perspective that complements broader studies, contributing novel insights into how regional advantages can be leveraged to enhance FDI attractiveness in emerging economies [14].

6. Limitations and Future Research

This study on enhancing FDI attractiveness in Tay Ninh, with Institutional Quality as a mediator, provides significant insights but faces certain limitations. The sample of 200 FDI enterprises, though statistically adequate, may not fully capture the diversity of investor perspectives, particularly in underrepresented sectors such as agriculture and services, which constitute a minor portion of Tay Ninh's FDI portfolio [12]. The use of cross-sectional data limits the ability to analyze temporal trends and the long-term effects of investment incentives and infrastructure improvements on FDI attractiveness. Furthermore, the study's focus on Tay Ninh restricts its applicability to other regions with distinct economic and geographic characteristics. Lastly, while Institutional Quality was confirmed as a mediator, other potential mediators, such as environmental sustainability policies or digital innovation, were not examined, possibly overlooking additional drivers of FDI decisions.

To address these limitations, future research should broaden the sample to encompass a wider range of FDI sectors, including agriculture and services, to ensure a more comprehensive representation of investor views. Employing longitudinal data would allow for an analysis of how infrastructure, incentives, and Institutional Quality influence FDI attractiveness over time, offering deeper insights into dynamic relationships [2]. Conducting comparative studies across other Vietnamese provinces or ASEAN nations could improve generalizability and provide a clearer picture of regional competitiveness. Investigating additional mediators, such as green investment frameworks or technological advancements, would enrich the understanding of FDI dynamics. Additionally, qualitative methods, such as detailed case studies of successful FDI initiatives in Tay Ninh, could complement quantitative findings by highlighting practical challenges and effective policy strategies, thereby guiding policymakers toward context-specific solutions.

Abbreviations

FDI	Foreign Direct Investment
PLS-SEM	Partial Least Squares Structural Equation Modeling
II	Investment Incentives
INF	Infrastructure Quality
IQ	Institutional Quality
FDIA	FDI Attractiveness
EFA	Exploratory Factor Analysis
α	Cronbach's Alpha
CR	Composite Reliability
AVE	Average Variance Extracted
HTMT	Heterotrait-Monotrait Ratio
CEO	Chief Executive Office
GM	General Manager
BOM	Board of Directors
STEM	Science, Technology, Engineering, and Mathematics

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Author Contributions

Ngo Quoc Cuong: Conceptualization, Data curation, Methodology, Investigation, Project administration, Writing - original draft

Nguyen Thi Xuan Huong: Conceptualization, Methodology, Supervision, Validation, Writing - review and editing

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Conflicts of Interest

The authors declare no conflicts of interest.

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