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THE IMPACT OF FOREIGN DIRECT INVESTMENT ON INCOME INEQUALITY IN VIETNAM: A SPATIAL REGRESSION APPROACH

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ABSTRACT

Vietnam has experienced strong growth in foreign direct investment; however, income inequality remains at a high level. Therefore, this study utilizes data from 63 provinces and cities in Vietnam over the period 2010 – 2023 and employs a spatial regression model to analyze the impact of foreign direct investment and socio-economic factors on income inequality. The results indicate that foreign direct investment, population, domestic private investment, and public investment are negatively correlated with income inequality, while unemployment rate, institutional quality, and public expenditure contribute to increased income inequality. Urbanization rate and technological capacity show no significant impact. The study recommends directing foreign direct investment towards poorer regions and labor-intensive sectors, as well as strengthening vocational training. Policies for attracting and utilizing foreign direct investment should be designed to promote inclusive growth and reduce income disparities across regions.

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1. Introduction

In the context of the modern economy, globalization is increasingly becoming an inevitable and irreversible development trend. Integrating the national economy with the global market is considered essential to ensure long-term and stable growth. Therefore, Vietnam cannot stand apart from this integration process. A key factor that plays an important role in international integration is capital flows. While domestic capital remains central to driving economic growth, FDI also holds a particularly significant position in enhancing production capacity and national development (Yao & Wei, 2007). FDI not only provides substantial financial resources but also serves as a bridge for the transfer of advanced technologies, improvement of management efficiency, and enhancement of human resource quality, thereby creating favorable conditions for countries to develop more effectively (Hayat, 2018; Ezeoha & Cattaneo, 2012). The benefits that FDI brings to host countries are evident, especially in today's era of deep international integration. As the world struggles with the severe consequences of the COVID-19 pandemic, the need for recovery and renewed growth has become increasingly urgent. At the same time, the behavior and responses of international investors have been significantly affected, making FDI attraction a top priority in the strategies of both researchers and policymakers. In addition to considering the practical contributions that FDI has brought, we must also pay attention to the negative consequences this capital flow may cause, particularly income inequality.

Based on practical realities and the existing gaps in the literature *(see Appendix 1 online)*, this paper aims to analyze the relationship between FDI inflows and income inequality, while also considering the spatial interactions among provinces and cities in Vietnam. The research team employed a spatial panel data model to analyze data from 63 localities over the period 2010-2023 to address the research question. The study is expected to contribute to the academic field and support policymaking by enhancing the effective utilization of FDI, ensuring fair resource distribution, and promoting sustainable development in both economic and social dimensions.

2. Literature review

2.1. Overview of income inequality

According to the Organisation for Economic Co-operation and Development (OECD), income refers to a household's disposable income within a given year, including earnings from labor, business, capital, and government transfers, after deducting income taxes and social security contributions. Household income is adjusted to account for differences in household size and needs. Income inequality, therefore, represents the disparity in the distribution of income, where a significant portion of a nation's total income is concentrated among a small segment of the population, creating a clear gap in wealth and living standards among social groups.

The International Monetary Fund (IMF) defines income inequality as the unequal distribution of income across the population. Similarly, the General Statistics Office of Vietnam defines it as the difference in income and assets among individuals or groups within a society or between countries. Hence, income inequality reflects the uneven distribution of income among individuals and population groups within a country.

Kuznets (1955) described the relationship between economic development and income inequality through an inverted U-shaped curve, known as the Kuznets Curve. This model suggests that income inequality initially

increases as per capita income rises during the early stages of economic growth but eventually decreases once a country reaches a higher level of development.

In the context of globalization, inflows of foreign direct investment (FDI) accelerate economic growth and, in turn, influence income inequality, consistent with the Kuznets hypothesis (Kaulihowa & Adjasi, 2018). While FDI may initially benefit skilled elites and lead sectors, long-term growth in these sectors tends to promote a more equitable income distribution (Pan-Long, 1995).

The model can be expressed as:

$$GINI_{it} = \beta_0 + \beta_1 Y_{it} + \beta_2 Y^2{}_{it} + \varepsilon_{it}$$

Where:

- i represents cross-sectional units (1 to n);
- t represents time (1 to t);
- $GINI_{(it)}$ is the income inequality index;
- $Y_{(it)}$ is GDP per capita;
- $Y^2_{(it)}$ is the square of GDP per capita;
- $\varepsilon_{(it)}$ is the error term capturing unobserved factors affecting inequality.

Expected signs:

- $\beta_1 > 0 \rightarrow$ income inequality increases at early stages of growth;
- $\beta_2 < 0 \rightarrow$ after reaching a certain income level, further GDP growth reduces inequality.

2.2. The relationship between FDI and income inequality

The relationship between FDI and income inequality is still a controversial topic with many different research results, reflecting the diversity in arguments, research time, quantitative techniques, as well as the measurement methods used. The overall picture shows that, with the difference in the level of development, institutional quality, technology absorption capacity and socio-economic characteristics of each country or region, the impact of FDI on income inequality will be positive, negative or insignificant.

From a global perspective, Lin et al. (2013) employed a threshold regression model to investigate 73 developed and developing countries over the period 1970-2005. The study concluded that the impact of foreign direct investment (FDI) on income inequality depends on the level of human capital, represented by the average years of schooling. When this figure is below 6.7 years, FDI contributes to reducing income inequality; however, once it exceeds this threshold, FDI becomes a factor that exacerbates inequality. Neagu et al. (2016) analyzed data from 10 Central and Eastern European countries for the period 2000-2014 using Fixed Effects Model (FEM) and Random Effects Model (REM) regression techniques. The results showed that FDI tends to aggravate income inequality in these countries. In a similar study, Wu and Hsu (2012) found that in countries with low levels of technological access and absorption, FDI has a negative impact on income inequality, whereas in countries with stronger absorptive capacities, the effect is less pronounced or insignificant. Nguyen (2021) analyzed data from 24 developed and 37 developing countries between 2005 and 2018 and concluded that FDI increases income inequality in developed countries but helps reduce it in developing ones. Building on this research, Nguyen (2023) incorporated digitalization into the regression model and found that digital technologies can reduce income inequality in both groups of countries, although the bidirectional effects of FDI observed in the previous study remain consistent. Wang and Lee (2023) examined the issue from a country risk perspective and found that in high-risk countries, FDI tends to intensify income inequality, while in low-risk countries, it contributes to improving income

distribution. Soto et al. (2024) focused on 46 low-tax countries during the 2000-2021 period. They found that FDI helps reduce income disparities in the context of limited tax revenue. However, in cases where GDP grows rapidly without redistribution mechanisms, inequality tends to worsen. On the other hand, Tabash et al. (2024) emphasized that the combination of trade globalization and FDI inflows in 18 developing countries from 1991-2021 has helped reduce income inequality by creating jobs, promoting technology transfer, and accelerating economic development.

At the regional level, numerous studies have highlighted significant variations in the effects of foreign direct investment (FDI) on income inequality. Herzer et al. (2014) examined Latin America during the 1980-2000 period and concluded that FDI increases income inequality. In contrast, a similar study by the same group in Europe (2013) found an opposite pattern, with FDI reducing income inequality. In Southeast Asia, Cho and Ramirez (2016) observed that FDI increases income inequality in the short term, but brings clear benefits in the long run. In transition economies, Zulfiu Alili and Adnett (2018) analyzed the period 1993-2008 and found that FDI widened wage gaps, though the overall effect was limited. Kaulihowa and Adjasi (2018), focusing on Africa, found that FDI initially improves income distribution, but as capital inflows become excessive, income inequality deteriorates. Xu et al. (2021) studied 37 African countries from 2000 to 2015 and found a negative correlation between FDI/income and income inequality—suggesting that as FDI and income increase, inequality decreases. Khan and Nawaz (2019) also found that FDI contributes to income equity in transition economies. In sub-Saharan Africa, Osode et al. (2022) demonstrated that institutional quality moderates the impact of FDI on inequality: in countries with low inequality, strong institutions help reduce it; but in highly unequal societies, institutional improvements alone are insufficient to close the gap. In Asia, Huynh (2021), analyzing 36 countries, found that FDI increases income inequality, but once institutional quality reaches a certain threshold, this negative effect weakens, and FDI starts playing a more positive role. Hossain et al. (2022), studying 25 Asian countries, also identified an inverted U-shaped relationship between economic growth and income inequality. Additionally, both FDI and trade were found to increase inequality during the early stages of development. In the ASEAN region, Pham et al. (2023) showed that FDI exacerbates income inequality in 9 countries from 1990 to 2020. Conversely, Yuldashev et al. (2023) demonstrated that FDI can reduce inequality if the country possesses high levels of human capital. Gam et al. (2023) used a Bayesian-Monte Carlo regression and confirmed a nonlinear (U-shaped) relationship between FDI and income inequality. Yang et al. (2024) concluded that in middle-income countries, FDI may increase income inequality in the early stages but holds potential to improve equity through reinvestment and the creation of economic opportunities—if properly managed.

At the individual country level, studies also provide diverse findings: Jensen and Rosas (2007) showed that FDI liberalization in Mexico during the 1990s helped reduce income inequality across its 32 states. In Iran, Rafsanjani et al. (2014) found that FDI increased inequality and confirmed the Kuznets hypothesis via a nonlinear relationship between growth and income distribution. Vezentan and Neagu (2022) observed similar results in Romania. In South Africa, Ngwakwe and Dzomonda (2018) found an insignificant but rising trend in inequality associated with FDI. Teixeira and Loureiro (2019), analyzing Portugal, indicated that income inequality negatively impacts long-term FDI attraction, with human capital acting as a regulatory factor. In Indonesia, Esquivias

et al. (2021) supported the Kuznets hypothesis and emphasized that human capital mitigates inequality amid rising FDI. Teeramungcalanon and Chiu (2020) found that in Thailand, FDI in manufacturing reduces inequality, while FDI in agriculture and services helps alleviate poverty. In Egypt, Rezk et al. (2022) showed that a 1% increase in FDI reduces the Gini coefficient by 0.0188 points. In South Korea, Kim (2022) demonstrated that democracy reduces income inequality, whereas FDI tends to increase it. Rej et al. (2024) emphasized that democracy reduces inequality both directly and indirectly, while FDI only delivers inclusive benefits when democratic institutions reach a sufficient threshold.

In Vietnam, although the number of studies is limited, several notable works have yielded significant findings. The pioneering research in this field was conducted by Duong et al. (2017), in which the authors investigated the impact of FDI on income inequality in key economic regions from 2007 to 2015. The results showed that the increase in FDI capital in provinces is closely associated with a rise in income inequality within those regions. Subsequently, Nguyen Thi Thai Hung & Nguyen Quynh Tho (2019) applied a Fixed Effects Regression Model (FEM) to examine the period from 2006 to 2015, aiming to determine the relationship between FDI and income inequality nationwide. The results revealed a nonlinear inverted U-shaped relationship, suggesting that in the early stages—when FDI had not yet spread widely or was concentrated in capital-intensive sectors—the inflow of capital could exacerbate income inequality. However, once FDI reached a certain threshold and began to expand into labor-intensive sectors, or when institutional and redistribution mechanisms improved, the impact of FDI tended to reverse and contribute to narrowing income inequality.

In a synthesis study, Nguyen Thi Thai Hung (2020) analyzed FDI and income inequality in Vietnam from 2007 to 2018. The author examined the issue from three dimensions: (1) differences in the level of contribution between the FDI sector and other economic sectors; (2) the varying distribution of FDI across industries; and (3) disparities in access to FDI among socio-economic regions. From these perspectives, the study concluded that geographical and sectoral disparities in attracting FDI are key drivers of increasing income inequality in income distribution.

A data-intensive study by Ho Dinh Bao et al. (2020) used panel data from 63 provinces and cities between 2010 and 2018, assessing both the direct impact of FDI on income inequality and the indirect effect via spatial influence—that is, the spillover effects from one province to another through economic and social linkages. The results indicated that FDI tends to increase income inequality in localities, particularly in areas with a high concentration of FDI enterprises. Moreover, the significant wage gap between foreign-invested enterprises and domestic firms further reflects income inequality among different segments of the labor force.

Le et al. (2021) approached the issue from the perspective of institutional quality and educational attainment, employing the GMM (Generalized Method of Moments) estimation technique. Their findings suggest that the relationship between FDI and income inequality in Vietnam also follows an inverted U-shaped pattern. Furthermore, the impact of FDI on income inequality varies depending on the educational level and quality of the education system across provinces. Specifically, in areas with higher levels of education, FDI tends to create more high-quality job opportunities, thereby reducing income inequality.

Phan (2022) explored FDI within the broader context of globalization,

simultaneously analyzing the effects of both FDI and international trade on income inequality in Vietnam during the period 2006-2016. The author found that while FDI tends to exacerbate income inequality, trade liberalization contributes to mitigating this disparity. Consequently, the study concluded that globalization's impact on inequality in Vietnam is twofold, necessitating regulatory policies aimed at maximizing the advantages of globalization while effectively managing its associated risks.

Most recently, Do et al. (2024) utilized micro-level data from 2010 to 2018 to examine the effects of FDI on income inequality across localities in Vietnam. Their findings revealed that FDI not only increases inequality among labor groups, but also induces spatial spillover effects, whereby neighboring provinces of FDI-concentrated areas also suffer from increased income inequality.

Although the aforementioned studies have partially clarified the relationship between FDI and income inequality in Vietnam, limitations remain—particularly the incomplete integration of spatial dimensions in quantitative modeling. Moreover, many studies are still confined to identifying direct or nonlinear effects, without clearly disentangling spillover impacts, such as local effects, influences from neighboring areas, and interdependencies across regions.

To address these gaps, the authors employed spatial regression models, including SEM (Spatial Error Model), SAR (Spatial Autoregressive Model), SAC (Spatial Autoregressive Combined), SDM (Spatial Durbin Model), and GSPRE (Generalized Spatial Panel Random Effects), to more objectively and comprehensively assess the impacts of FDI on income inequality across Vietnam's 63 provinces. The selection of an appropriate regression model was based on statistical criteria such as the Hausman test, Akaike Information Criterion (AIC), and Bayesian Information Criterion (BIC). The ultimate goal is to provide policy recommendations that ensure sustainable, equitable, and efficient FDI attraction nationwide.

3. Research model and methodology

3.1. Model and data

To analyze the impact of FDI on income inequality across 63 provinces and municipalities in Vietnam, this study builds upon a synthesis of existing empirical research to propose the following new regression model:

$$GINI_{i,t} = \beta_1 + \beta_2 FDI_{i,t} + \beta_3 X_{i,t} + \mu_i + e_{i,t} \quad (1)$$

In which: $X_{i,t}$ are control variables, the measurement of variables and data sources are described in Table 1. Data from 63 provinces/cities in Vietnam are collected annually during the period 2010-2023.

Table 1. Description of variables in the research model

Symbol	Variable	Expected sign	Measurement	Study	Source
GINI	Income inequality		Gini coefficient of the prov-ince/city	Soto et al. (2024), Gossel (2024), Tabash et al. (2024), Nguyen (2023), Phan (2022).	General Statistics Office, Provincial/City Statistics Offices, Vietnam Chamber of Commerce and Industry, Ministry of Finance, and Provincial Departments of Finance
FDI	Foreign direct investment	–	Capital inflows by prov-ince/GRDP	Soto et al. (2024), Gossel (2024), Tabash et al. (2024), Nguyen (2023), Phan (2022).	

Symbol	Variable	Expected sign	Measurement	Study	Source
UNE	Unemployment rate	+	Total unem-ployed labor force of the province as a percentage of the total labor force of the province (%)	Wang and Lee (2023), Le et al. (2021), Esquivias et al. (2021), Zul-fiu Alili and Ad-nett (2018).	
URB	Urbanization rate	–	Urban popula-tion / total population of the province (%)	Soto et al. (2024), Rezk et al. (2022), Le et al. (2021).	
IQ	Institutional quality	+	Provincial Competitiveness Index (PCI) (%)	Osode et al. (2022), Le et al. (2021), Huynh (2021), Chong and Gradstein (2007).	
PI	Public invest-ment	–	Public invest-ment of the province / GRDP of the province (%)	Hakim and Rosini (2022), Ho Dinh Bao et al. (2020).	
PE	Public ex-penditure	+	Public expendi-ture of the prov-ince / GRDP of the province (%)	Zerihun (2023), Lin et al. (2013), Okuno and Yagi (1990).	
TC	Technological capacity	–	Technology bal-ance of pay-ments of the province for modern ma-chinery and equipment	Nguyen (2023), Khan and Nawaz (2019), Jaumotte et al. (2013), Clark et al. (2011).	General Statistics Office, Provincial/ City Statistics Offices, Vietnam Chamber of Commerce and Industry, together with Provincial Departments of Finance
PINV	Domestic private investment	+	Domestic pri-vate investment capital in the province / GRDP of the province (%)	Rezk et al. (2022), Hakim and Rosini, (2022), Le and Tran (2022).	
POP	Population	–	Natural loga-rithm of the population by province	Wang and Lee (2023), Phan (2022), Teera-mungcalanon and Chiu (2020), Lundqvist (2014).	

3.2. Research Methodology

3.2.1. Panel Data Models

In panel data analysis, two popular regression models are FEM and REM. Unobservable factors that are constant over time for each observation unit are well controlled in the FEM regression model, which overcomes the limitation of the pooled OLS model, which assumes that all units are exactly the same. FEM uses each unit as its own control, thereby eliminating unmeasured fixed characteristics. Although FEM can make the model more complicated and is prone to multicollinearity, it is still appropriate when the data have characteristics that do not change over time.

In contrast, REM is appropriate when the unobservable characteristics are random and uncorrelated with the independent variables. One advantage of REM is that it allows for the estimation of time-invariant variables, such as fixed factors by industry or by location.

To select the appropriate regression model, Hausman test (1978) is applied. If p-value < 5%, FEM is more suitable because REM is not reliable. If p-value > 5%, there is not enough evidence to reject REM, and REM will be more suitable.

3.2.2. Spatial weight matrix

The spatial weight matrix (W) plays a core role in reflecting the relationship and interaction between geographical areas. According to (Ghemawat, 2001), W can be constructed based on four types of distance: economic, administrative, cultural and geographical. In practice, two common types of matrices are often applied: the adjacent weight matrix (based on direct neighbor relationships) and the exponential distance weight matrix (based on decreasing influence with geographical distance) *(see Appendix 2 online)*. Spatial model selection tests *(see Appendix 3 online)*.

4. Research results and discussion

4.1. Multicollinearity test

To ensure that the regression model does not suffer from multicollinearity among the independent variables, the research team evaluated the degree of internal correlation using the Variance Inflation Factor (VIF). According to theoretical recommendations, when a variable's VIF value exceeds the threshold of 10, it indicates the presence of multicollinearity. According to the results presented in Appendix 4 *(see Appendix 4 online)*, the proposed regression model satisfies the requirement of no multicollinearity.

4.2. Regression results

Within the framework of quantitative analysis, this study applied various spatial regression models to assess the impact of FDI on income inequality, including SEM, GSPRE, SAC, SAR, and SDM. Our findings indicate that FDI is negatively correlated with the GINI coefficient, implying that FDI inflows tend to reduce income inequality in the recipient provinces. However, the influence of the control variables is not consistent across the different regression models, demonstrating that the analytical results vary depending on the model applied. This highlights the importance of selecting an appropriate spatial regression model to ensure accuracy and consistency in drawing conclusions.

The model selection process was carried out systematically. First, the authors used the Hausman test to distinguish and determine the most suitable model among the three regression models SAR, SEM and SDM. Then, the AIC and BIC indices were used to make a choice between the three models SEM, SAC and GSPRE.

In addition, to verify the suitability of specific spatial regression models, the research team applied the Log-Likelihood Ratio (LR) test when comparing model pairs such as SAR-FE versus SDM-FE and SEM-FE versus SDM-FE. The results presented in Appendix 5 *(see Appendix 5 online)* show that, for the SAR–SDM pair, the LR test returned a statistically significant value at the 1% level, indicating that SDM-FE is the optimal choice. In contrast, for the SEM–SDM pair, the test did not show statistical significance, so SEM-FE was the preferred choice.

Notably, the statistical significance of the lambda coefficient (SEM model) and the rho coefficient (SAR model) suggests that the observation units are not completely independent, but instead spatially interdependent. In other words, income inequality in a given locality is related to the corresponding situation in its neighboring areas. These findings demonstrate that spatial effects play a crucial role in explaining income inequality among provinces and cities within the study scope.

The results in Appendix 5 *(see Appendix 5 online)* indicate that the SEM-FE model is the most appropriate regression model, as it has the lowest AIC and BIC values. Therefore, all subsequent analyses and policy recommendations will be based on the SEM-FE model.

Table 2. Summary of regression results for variables in the SEM-FE model

Variable		SEM-FE	Effect	Expected sign
Income inequality	**GINI**	**Main**		
Foreign direct investment	FDI	-0.000276***	-	-
Urbanization rate	URB	0.00000197	No	-
Population	POP	-0.00191***	-	-
Unemployment rate	UNE	0.000776**	+	+
Institutional quality	IQ	0.00684**	+	+
Public investment	PI	-0.01966***	-	-
Public expenditure	PE	0.00115***	+	+
Technological capacity	TC	-0.00091	No	-
Domestic private investment	PINV	-0.0798***	-	+

Overall, FDI inflows are shown to have a positive impact on reducing income inequality between localities in Vietnam during the period 2010-2023. Based on Table 2, the SEM-FE model shows that the regression coefficient of the FDI variable is -0.000276 and is statistically significant at the 1% level, implying that FDI plays a key role in reducing income inequality. In other words, provinces that attract large amounts of FDI often record a significant reduction in intra-provincial income inequality. This can be partly explained by the fact that FDI promotes job creation, improves technology levels, and promotes local industrialization. When multinational corporations invest in developing economies, they not only bring capital but also create more job opportunities, thereby improving the skills and professional capabilities of domestic workers. As a result, labor income is improved, contributing to narrowing the income gap. Furthermore, FDI also promotes the expansion and growth of manufacturing, processing and supporting industries, helping low-income workers gradually improve their living standards. Thus, the positive impact of FDI is not only limited to economic growth but also extends to the aspect of improving social equity, consistent with the studies of Soto et al. (2024), Gossel (2024), Tabash et al. (2024), Nguyen (2023) and Phan (2022).

Additionally, the analysis of population (POP) shows a negative relationship with income inequality, with a regression coefficient of -0.00191 and 1% significance level. This indicates that rapid population growth, especially in urban or underdeveloped areas lacking synchronized infrastructure and social services, increases pressure on resource and opportunity allocation, thereby exacerbating income inequality. Higher population densities raise the demand for education, healthcare, housing, and employment, while the public service capacity often lags behind, leading to unequal access to opportunities. Workers with low educational attainment or limited skills are more likely to face labor market disadvantages, worsening income inequality. These adverse effects of population on inequality have been documented in prior studies such as Wang and Lee (2023), Phan (2022), Teeramungcalanon and Chiu (2020), and Lundqvist (2014).

The results in Table 2 indicate a positive correlation between the unemployment rate

(UNE) and income inequality (GINI), with an estimated coefficient of 0.000776, statistically significant at the 5% level. An increase in the unemployment rate not only reduces the quality of life for workers but also exacerbates income inequality. This phenomenon is evident in the context of uneven regional development across Vietnam. It can be explained by labor migration associated with foreign direct investment (FDI) flows. Provinces with strong FDI attraction, such as Bac Ninh, Binh Duong, and Hai Phong, tend to attract large numbers of migrant workers, creating employment opportunities but also widening income disparities between skilled and unskilled laborers. Meanwhile, localities with high unemployment rates or limited FDI inflows often experience "labor outflows," which further deepen regional income gaps. Thus, the relationship between unemployment, FDI, and income inequality is not only direct but also reflects labor mobility across regions, highlighting the need for labor and social welfare policies to be adjusted toward greater inclusiveness and fairness. These findings align with the results of Wang and Lee (2023), Le et al. (2021), Esquivias et al. (2021), and Zulfiu Alili and Adnett (2018).

Regarding institutional quality (IQ), the results show that IQ is positively related to income inequality, with a coefficient of 0.00684 and significant at the 5% level. In areas with poor governance, income inequality tends to increase, while when institutions are improved, transparent and fairer, the income gap can be narrowed. Moreover, IQ is closely related to the ability to attract FDI. Provinces with ineffective, unstable legal systems that do not protect investors' rights will have difficulty attracting high-quality FDI inflows, thereby limiting the ability to create jobs and increase income for local people. This reinforces the role of institutions as a transmission channel between FDI and income distribution, which is supported by studies by and Osode et al. (2022), Le et al. (2021), Huynh (2021), and Chong and Gradstein (2007).

For public investment (PI), the regression model shows a negative relationship with income inequality, with a coefficient of -0.01966 and significant at the 1% level, indicating that public investment, if effectively implemented, will help reduce income inequality. Investment in transportation, health, education, and essential public services not only improves the quality of life but also promotes more balanced development between regions. Moreover, public investment can also help attract FDI by improving regional connectivity and the business environment. Provinces with well-developed infrastructure are often able to absorb higher investment flows, promoting economic growth and reducing income inequality. This result is consistent with the studies of Hakim and Rosini (2022) and Ho Dinh Bao et al. (2020).

Contrary to the initial expectation, public expenditure (PE) exhibits a positive association with income inequality, with a regression coefficient of 0.00115, statistically significant at 1%. This suggests that inefficient allocation of public spending—for instance, focusing on programs that do not directly benefit low-income groups or neglect underdeveloped areas—may widen income disparities rather than narrow them. Moreover, inefficient budget allocation can lead to imbalances in the distribution of FDI benefits. Specifically, if public spending does not support infrastructure development or workforce skill enhancement in lagging regions, FDI will continue to concentrate in developed provinces, worsening regional disparities. This perspective is supported by Zerihun (2023), Lin et al. (2013), and Okuno and Yagi (1990).

Finally, private domestic investment (PINV) shows a negative relationship with income inequality, with a coefficient of -0.0798 and is statistically significant at the 1% level. This implies that increasing private investment

can be an effective tool in reducing income inequality, especially when it is allocated to disadvantaged provinces or underserved sectors. Private investment creates jobs and stimulates growth in areas outside the economic center, which typically receive less FDI. At the same time, domestic investment can also benefit indirectly from FDI through spillovers in technology, skills development, and governance capacity building. However, if FDI continues to be concentrated mainly in developed regions without the complementarity of domestic investment in lagging regions, income inequality may persist. Thus, PINV acts as an equalization mechanism, helping to offset the uneven distribution of FDI and promote more equitable regional development. This finding goes against the initial expectations, but opens up a new policy perspective that is worth considering.

5. Conclusions and policy implications

This paper analyzes and evaluates the impact of FDI on income inequality in Vietnam in the period 2010-2023, covering all 63 provinces and cities nationwide. Through the application of spatial regression models to capture the spatial linkages between localities, the results show that FDI contributes to reducing income inequality among population groups. In addition, factors such as POP, PINV and PI are also identified as having an impact on reducing income inequality, thereby improving income distribution and minimizing social polarization.

In contrast, the study also found that unemployment rates, institutional quality and public spending levels tend to increase income inequality. This suggests that when the labor market is difficult, institutions are ineffective or public spending is not allocated properly, income inequality among population groups may be pushed higher. These results reflect the complexity and multidimensionality of the relationship between FDI and inequality, and show the importance of combining socio-economic and governance factors in designing development policies. Therefore, to increase the effectiveness of attracting FDI and reducing inequality among provinces and cities in Vietnam, policies need to aim at a more even distribution of capital flows, not only focusing on developed regions but also creating opportunities for disadvantaged regions. For FDI to truly contribute to reducing inequality, it is necessary to focus on attracting capital to high-intensity labor sectors, rural areas, low-income provinces and cities, as well as sectors that directly affect the quality of life such as health, education, high-tech agriculture and renewable energy. At the same time, strengthening the training of local human resources, especially low-skilled labor groups, also needs to be promoted to take advantage of opportunities from FDI. In addition, management agencies need to closely monitor and evaluate the impact of FDI projects to ensure that the goal of reducing income inequality is effectively implemented. In addition, factors such as POP, UNE, IQ and PI also need to be taken into account in the long-term strategy to promote comprehensive growth. FDI attraction policies should be designed to ensure fairness in the allocation of opportunities, resources and development benefits, thereby aiming at a stable and sustainable economy.

The limitations and further research suggestions

Socio-demographic factors, such as gender and education, have a direct impact on income inequality. However, limitations in data collection prevent this paper from fully analyzing these aspects. This also opens a promising avenue for more comprehensive future research, by incorporating socio-demographic factors into the assessment of FDI's effects on income inequality.

References

Akaike, H. (1973). Information theory and an extension of the maximum likelihood principle. In B. N. Petrov, & F. Csaki (Eds.), *Proceedings of the 2nd International Symposium on Information Theory* (pp. 267-281). Budapest: Akademiai Kiado.

Anselin, L. (2013). *Spatial econometrics: Methods and models* (Vol 4). Springer Science & Business Media.

Balasubramanyam, V. N. (2002). Foreign direct investment in developing countries: Determinants and impact. *OECD Global Forum on International Investment New Horizons for Foreign Direct Investment* (pp. 187-208). OECD Publishing.

Cho, H. C., & Ramirez, M. D. (2016). Foreign Direct investment and income inequality in Southeast Asia: A panel unit root and panel cointegration analysis, 1990–2013. *Atlantic Economic Journal*, *44*, 411–424. https://doi.org/10.1007/s11293-016-9521-7

Chong, A., & Gradstein, M. (2007). Inequality and institutions. *The review of Economics and Statistics*, *89*(3), 454–465. https://doi.org/10.1162/rest.89.3.454

Clark, D. P., Highfill, J., de Oliveira Campino, J., & Rehman, S. S. (2011). FDI, technology spillovers, growth, and income inequality: A selective survey. *Global Economy Journal*, *11*(2). https://doi.org/10.2202/1524-5861.1773

Cardoso, F. H. (1982). Dependency and development in Latin America. In H. Alavi, T. Shanin (Eds.), *Introduction to the sociology of "developing societies"* (pp. 112-127). Macmillan Education UK.

Coughlin, C. C., & Segev, E. (2000). Location determinants of new foreign-owned manufacturing plants. *Journal of Regional Science*, *40*(2), 323–351. https://doi.org/10.1111/0022-4146.00177

Do, Q. A., Do, A. D., Doan, M. H., Le, Q. H., Le, A. D., & Nguyen, T. T. D. (2024). Spatial effects of foreign direct investment on wage inequality in Vietnam. *Cogent Economics & Finance*, *12*(1). https://doi.org/10.1080/23322039.2023.2293297

Duong Quynh Nga, Nguyen Phan Hanh Nguyen, & Cao Minh Tri (2017). Tác động của đầu tư trực tiếp nước ngoài đến bất bình đẳng thu nhập [The impact of foreign direct investment on income inequality in Vietnam. *Tạp chí Công Thương*. https://tapchicongthuong.vn/tac-dong-cua-dau-tu-truc-tiepnuoc-ngoai-den-bat-binh-dang-thu-nhap-49595.htm

Esquivias, M. A., Sethi, N., & Iswanti, H. (2021). Dynamics of income inequality, investment, and unemployment in Indonesia. *Journal of Population and Social Studies [JPSS]*, *29*, 660–678.

Ezeoha, A. E., & Cattaneo, N. (2012). FDI flows to sub-Saharan Africa: The impact of finance, institutions, and natural resource endowment. *Comparative Economic Studies*, *54*, 597-632. https://doi.org/10.1057/ces.2012.18

Frank, A. G. (1967). *Capitalism and underdevelopment in Latin America* (Vol. 93). NYU Press.

Gam, T. T. H., Oanh, D. L. K., & Dang, N. M. B. (2023). The impact of foreign direct investment on income inequality in developing countries: The Bayesian approach. *Jurnal Ekonomi & Studi Pembangunan*, *24*(1), 127–143. https://doi.org/10.18196/jesp.v24i1.18164

Ghemawat, P. (2001). *Distance still matters: The hard reality of global expansion.* Harvard Business Review. https://faculty.washington.edu/pathaksd/BBUS549/Required%20Readings/Distance%20Still%20Matters.pdf

Gossel, S. (2024). FDI and inequality in Sub-Saharan Africa: Does democracy matter? *International Journal of Emerging Markets*, *19*(1), 33–55. https://doi.org/10.1108/IJOEM-03-2021-0321

Hakim, D. R., & Rosini, I. (2022). Regional income inequality in Indonesia: The role of public and private investment. *Jurnal Ekonomi Malaysia*, *56*(3), 87–101. http://dx.doi.org/10.17576/JEM-2022-5603-05

Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica: Journal of The Econometric Society*, *46*(6), 1251-1271. https://doi.org/10.2307/1913827

Hayat, A. (2018). FDI and economic growth: the role of natural resources? *Journal of Economic Studies*, *45*(2), 283-295. https://doi.org/10.1108/JES-05-2015-0082

Herzer, D., Hühne, P., & Nunnenkamp, P. (2014). FDI and income inequality—Evidence from Latin American economies. *Review of Development Economics*, *18*(4), 778–793. https://doi.org/10.1111/rode.12118

Ho Dinh Bao, Nguyen Phuc Hai, Do Quynh Anh, & Tran Toan Thang (2020). Tác động của đầu tư trực tiếp nước ngoài tới bất bình đẳng thu nhập ở Việt Nam [Impacts of foreign direct investment on income inequality in Vietnam]. *Tạp chí Quản lý và Kinh tế quốc tế*, *131*, 50–64. https://drive.google.com/file/d/1Z8FBw6BJ8sXwMXKkDzvLw_sG5FRWVnao/view

Hossain, R., Roy, C. K., & Akter, R. (2022). Economic growth, FDI, trade openness, and inequality: Standing of Asian economies. *Asian Development Policy Review*, *10*(4), 317–330. https://doi.org/10.55493/5008.v10i4.4691

Huynh, C. M. (2021). Foreign direct investment and income inequality: Does institutional quality matter? *The Journal of International Trade & Economic Development*, *30*(8), 1231–1243. https://doi.org/10.1080/09638199.2021.1942164

Jaumotte, F., Lall, S., & Papageorgiou, C. (2013). Rising income inequality: Technology, or trade and financial globalization? *IMF Economic Review*, *61*, 271–309. https://doi.org/10.1057/imfer.2013.7

Jensen, N. M., & Rosas, G. (2007). Foreign direct investment and income inequality in Mexico, 1990–2000. *International Organization*, *61*(3), 467–487. https://doi.org/10.1017/S0020818307070178

Kaulihowa, T., & Adjasi, C. (2018). FDI and income inequality in Africa. *Oxford Development Studies*, *46*(2), 250–265. https://doi.org/10.1080/13600818.2017.1381233

Khan, I., & Nawaz, Z. (2019). Trade, FDI and income inequality: Empirical evidence from CIS. *International Journal of Development Issues*, *18*(1), 88–108. https://doi.org/10.1108/IJDI-07-2018-0107

Kim, H. (2022). The Effects of Globalization and Democratization on Inequality in South Korea. *Korea Observer*, *53*(3), 471 - 494. https://doi.org/10.29152/KOIKS.2022.53.3.471

Kuznets, S. (1955). Economic growth and economic inequality. *American Economic Review*, *45*(1), 1-28. https://assets.aeaweb.org/asset-server/files/9438.pdf

Lall, S., & Narula, R. (2004). Foreign direct investment and its role in economic development: Do we need a new agenda? *The european journal of development research*, *16*, 447-464. https://doi.org/10.1080/0957881042000266589

Le, Q. H., Do, Q. A., Pham, H. C., & Nguyen, T. D. (2021). The impact of foreign direct investment on income inequality in Vietnam. *Economies*, *9*(1). https://doi.org/10.3390/economies9010027

Le, V. D., & Tran, T. Q. (2022). Does the private sector increase inequality? Evidence from a transitional country. *Structural Change and Economic Dynamics*, *62*, 451–466. https://doi.org/10.1016/j.strueco.2022.06.005

Lin, S.-C, Kim, D.-H, & Wu, Y.-C. (2013). Foreign direct investment and income inequality: Human capital matters. *Journal of Regional Science*, *53*(5), 874–896. https://doi.org/10.1111/jors.12077

Lundqvist, J. (2014). *Foreign aid's impact on income inequality* (Bachelor's thesis, Lund University, Department of Economics). LUP Student Papers. https://lup.lub.lu.se/student-papers/search/publication/4394169

Mihalache-O'Keef, A., & Li, Q. (2011). Modernization vs. dependency revisited: Effects of foreign direct investment on food security in less developed countries. *International Studies Quarterly*, *55*(1), 71-93. https://doi.org/10.1111/j.1468-2478.2010.00636.x

Neagu, O., Dumiter, F., & Braica, A. (2016). Inequality, economic growth and trade openness: A case study for Central and Eastern European countries (ECE). *Amfiteatru Economic Journal*, *18*(43), 557–574. https://hdl.handle.net/10419/169021

Nguyen Thi Thai Hung (2020). *Tác động của đầu tư trực tiếp nước ngoài đến bất bình đẳng thu nhập ở Việt Nam: Thực trạng và khuyến nghị* [The impact of foreign direct investment on incom inequality in Vietnam: Current situation and policy recommendation]. *Tạp chí Công Thương*. https://tapchicongthuong.vn/tac-dong-cua-dau-tu-truc-tiep-nuoc-ngoai-den-bat-binh-dang-thu-nhap-o-viet-nam--thuc-trang-va-khuyen-nghi-67703.htm

Nguyen Thi Thai Hung, Nguyen Quynh Tho (2019). Đánh giá tác động của đầu tư trực tiếp nước ngoài đến bất bình đẳng thu nhập ở Việt Nam [Assessing the impact of foreign direct investment on income inequality in Vietnam]. *Tạp chí Thị trường Tài chính Tiền tệ*. https://thitruongtaichinhtiente.vn/danh-gia-tac-dong-cua-dau-tu-truc-tiep-nuoc-ngoai-den-bat-binh-dang-thu-nhap-o-viet-nam-23266.html

Nguyen, V. B. (2021). The difference in the FDI inflows – Income inequality relationship between developed and developing countries. *The Journal of International Trade & Economic Development*, *30*(8), 1123–1137. https://doi.org/10.1080/09638199.2021.1925331

Nguyen, V. B. (2023). The role of digitalization in the FDI – Income inequality relationship in developed and developing countries. *Journal of Economics, Finance and Administrative Science*, *28*(55), 6–26. https://doi.org/10.1108/JEFAS-09-2021-0189

Ngwakwe, C. C., & Dzomonda, O. (2018). Foreign direct investment inflow and inequality in an emerging economy–South Africa. *Acta Universitatis Danubius. Œconomica*, *14*(2), 462-473. https://www.ceeol.com/search/article-detail?id=731578

Okuno, N., & Yagi, T. (1990). Public investment and interregional output-income inequalities. *Regional Science and Urban Economics*, *20*(3), 377–393. https://doi.org/10.1016/0166-0462(90)90017-W

Osode, O. E., Iheonu, C. O., & Dauda, R. (2022). On the relationship between globalization and income inequality: Does institution matter? *Journal of Public Affairs, 22*(2). https://doi.org/10.1002/pa.2433

Pan-Long, T. (1995). Foreign direct investment and income inequality: Further evidence. *World development*, *23*(3), 469-483. https://doi.org/10.1016/0305-750X(95)00136-Z

Pham, D. M., Nguyen, T. H. K., & Phan, T. T. (2023). The impact of FDI and trade openness on income inequality in the ASEAN region. *VNUHCM Journal of Economics - Law and Management*, *7*(3), 4523–4533. https://doi.org/ https://doi.org/10.32508/stdjelm.v7i3.1215

Phan, P. V. (2022). Does globalization affect inequality? *Journal of Southeast Asian Economies*, *39*(1), 96–108. https://www.jstor.org/stable/27130823

Rafsanjani, H. K., Zeinolabedini, M., Mir, M., & Far, I. M. (2014). Studying the effect of education, trade, and FDI on income inequality in Iran. *Management and Administrative Sciences Review*, *3*(4), 733–745.

Rej, S., Nag, B., & Hossain, M. E. (2024). Foreign direct investment, income inequality and pollution reduction: Policy trilemma for India. *Social Indicators Research*, *174*), 221–248. https://doi.org/10.1007/s11205-024-03390-z

Rezk, H., Amer, G., Fathi, N., & Sun, S. (2022). The impact of FDI on income inequality in Egypt. *Economic Change and Restructuring*, *55*, 2011–2030. https://doi.org/10.1007/s10644-021-09375-z

Schwarz, G. (1978). Estimating the dimension of a model. *The Annals of Statistics*, *6*(2), 461–464. https://www.jstor.org/stable/2958889

Soto, G., Jardon, C. M., & Martinez-Cobas, X. (2024). FDI and income inequality in tax-haven countries: The relevance of tax pressure. *Economic Systems*, *48*(1). https://doi.org/10.1016/j.ecosys.2023.101172

Tabash, M. I., Elsantil, Y., Hamadi, A., & Drachal, K. (2024). Globalization and income inequality in developing economies: A comprehensive analysis. *Economies*, *12*(1). https://doi.org/10.3390/economies12010023

Teeramungcalanon, M., & Chiu, E. M. P. (2020). The effects of foreign direct investment on income inequality of Thailand. *Southeast Asian Journal of Economics*, *8*(1), 107–138. https://so05.tci-thaijo.org/index.php/saje/article/view/241872

Teixeira, A. A. C., & Loureiro, A. S. (2019). FDI, income inequality and poverty: A time series analysis of Portugal, 1973–2016. *Portuguese Economic Journal*, *18*, 203–249. https://doi.org/10.1007/s10258-018-00152-x

Vezentan, B., & Neagu, O. (2022). Analysis of the relationship between gross domestic product, foreign direct investments and income inequality in romania over the period 1990-2020. *The Annals of the University of Oradea. Economic Sciences*, *31*(1), 139-149.

Wang, E.-Z, & Lee, C.-C. (2023). Foreign direct investment, income inequality and country risk. *International Journal of Finance & Economics*, *28*(3), 2415–2435. https://doi.org/10.1002/ijfe.2542

Wei, K., Yao, S., & Liu, A. (2009). Foreign direct investment and regional inequality in China. *Review of Development Economics*, *13*(4), 778–791. https://doi.org/10.1111/j.1467-9361.2009.00516.x

Wu, J.-Y., & Hsu, C.-C. (2012). Foreign direct investment and income inequality: Does the relationship vary with absorptive capacity? *Economic Modelling*, *29*(6), 2183–2189. https://doi.org/10.1016/j.econmod.2012.06.013

Xu, C., Han, M., Dossou, T. A. M., & Bekun, F. V. (2021). Trade openness, FDI, and income inequality: Evidence from sub-Saharan Africa. *African Development Review*, *33*, 193-203. https://doi.org/10.1111/1467-8268.12511

Yang, R., Ryu, Y., & Oet, M. V. (2024). Assessing the foreign direct investment performance of middle-income countries using data envelopment analysis with translation invariance. *Economies*, *12*(11). https://doi.org/10.3390/economies12110314

Yao, S., & Wei, K. (2007). Economic growth in the presence of FDI: The perspective of newly industrialising economies. *Journal of Comparative Economics*, *35*(1), 211-234. https://doi.org/10.1016/j.jce.2006.10.007

Yuldashev, M., Khalikov, U., Nasriddinov, F., Ismailova, N., Kuldasheva, Z., & Ahmad, M. (2023). Impact of foreign direct investment on income inequality: Evidence from selected Asian economies. *Plos one*, *18*(2). https://doi.org/10.1371/journal.pone.0281870

Zerihun, M. F. (2023). *Empirical Analysis of Public Expenditures and Income Inequality among developing economies*. *Research Square*. https://doi.org/10.21203/rs.3.rs-2968285/v1

Zulfiu Alili, M., & Adnett, N. (2018). Did FDI increase wage inequality in transition economies? *International Journal of Social Economics*, *45*(9), 1283–1304. https://doi.org/10.1108/IJSE-09-2017-0373