

Unveiling the Anomalous Effect of Foreign Investment on Yogyakarta's Regional Economy: A Spatial Durbin Model Approach

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Abstrak

Pengaruh penanaman modal asing terhadap perekonomian tidak perlu diragukan dan diperdebatkan, namun tetap perlu dibuktikan dalam kehidupan nyata. Penelitian ini menggunakan data 4 kabupaten dan 1 kota di Provinsi Daerah Istimewa Yogyakarta dari tahun 2018-2022 dengan variabel dependen adalah produk domestik regional bruto (PDRB), yang merupakan representasi ekonomi regional masing-masing kabupaten/kota dan variabel independen realisasi penanaman modal asing (PMA). Model ini diestimasi menggunakan Ordinary Least Squares (OLS) dan Spatial Durbin Model untuk menguji pengaruh investasi asing terhadap PDRB. Penggunaan spatial econometrics menggarisbawahi pentingnya mempertimbangkan ketergantungan spasial dalam analisis investasi regional. Hasilnya menunjukkan bahwa PMA memiliki efek negatif terhadap PDRB baik dalam estimasi OLS maupun Spatial Durbin Model.

Kata Kunci: Penanaman Modal Asing; Pembangunan Daerah; Analisis Spasial; Spatial Durbin Model.

Abstract

The impact of foreign investment on economic growth is widely acknowledged; however, its tangible effects require empirical validation. This study utilizes data from four regions and one city within the Special Region of Yogyakarta Province, spanning the period from 2018 to 2022. The dependent variable is the Gross Regional Domestic Product (GRDP), representing the economic performance of each region/city, while the key independent variable is the realization of foreign investment (FI). The model is estimated using both Ordinary Least Squares (OLS) and the Spatial Durbin Model to examine the influence of foreign investment on GRDP. The use of spatial econometric techniques underscores the importance of considering spatial dependencies in regional investment analysis. The results indicate that foreign investment exhibits a negative effect on GRDP in both the OLS and Spatial Durbin Model estimations.

Keyword: Foreign Investment; Regional Development; Spatial Analysis; Spatial Durbin Model.

1. Introduction

If we think about aggregate output theory in macroeconomics, we would say that investment has a straight positive relationship with GDP. But, in real life is it true? It could be yes, since the advocates of using foreign investment as an economic development strategy argue that it promotes production and consumption, introduces new technologies, and thus stimulates economic growth (Kehl, 2009). Or it could be no, foreign investment can also increase economic inequality within a country (Bornschier, 1978) and between countries (Kehl, 2009). Since 2013 Special Region of Yogyakarta Province always welcomed investment with joy, it is shown in the Regional Regulation of the Special Region of Yogyakarta Number 4 of 2013 Concerning the Provision of Incentives and Facilities for Investment and Regional Regulation of the Special Region of Yogyakarta Number 8 of 2014 Concerning the General Investment Plan. Regional Regulation of the Special Region of Yogyakarta Number 4 of 2013 has been revised in 2019 and the Regional Regulation of the Special Region of Yogyakarta Number 8 of 2 has been revised in 2020, and those revisions are still being used today. The Special Region of Yogyakarta Province has experienced significant fluctuations in foreign investment between 2013 and 2022. From 2013 to 2021, foreign investment in the region nearly doubled, increasing from IDR 5.2 trillion in 2013 to approximately IDR 9.8 trillion in 2021. However, in 2022, foreign investment declined sharply to around IDR 1.6 trillion. In contrast, the province's economic growth has generally shown a positive trend, with the exception of 2020, which was likely impacted by the COVID-19 pandemic. These contrasting patterns raise important questions about the relationship between foreign investment and economic growth in the Special Region of Yogyakarta. The purpose of this study is to examine the relationship between foreign investment and regional economic performance through the application of spatial econometric techniques. Utilizing data from 2018 to 2022 across four regencies and one city, this research employs the Spatial Durbin Model (SDM) to derive meaningful insights. Previous research utilizing the Spatial Durbin Model to examine the relationship between government investment and regional economic performance found significant spatial spillover effects, demonstrating that government investment not only influences its own region but also neighboring areas, highlighting spatial interdependence in economic development (Wang & Liu, 2023). However, this study focused exclusively on government investment and did not explore the effects of foreign investment which may have different spatial dynamics and economic impacts. Moreover, the role of foreign investment in sub-national regions such as the Special Region of Yogyakarta remains underexplored, particularly when considering proximity through distance-based spatial weight matrices. Therefore, there is a clear gap in understanding how foreign investment affects both local and neighboring regional economies in this specific context, which this study seeks to address.

Foreign investment is a matter of capital accumulation and the international flow of privately owned capital. International capital flows consist of three types: foreign bank lending, loans extended by commercial banks or multilateral institutions; foreign portfolio investment (FPI/PI), purchase of stocks, bonds, derivatives and other financial instruments issued by the private sector; foreign direct investment (FDI), purchase of a 'controlling interest' in a foreign business enterprise (Moosa, 2002; Wells and Ahmed, 2006; Razin and Sadka, 2007). There are different motivations for FDI: resource-seeking; market-seeking; efficiency-seeking; strategic asset-seeking investment (Lundan, 2016). The vast majority of FDI flows since 1985 have gone from one developed country to another developed country, just a little FDI has flowed from capital-rich countries to the developing world (Graham, 2005). The role of investment in the economy has been broadly known as one of the components of GDP as shown in the eq. 1 where: Y stands for GDP; C stands for consumption; I stands for investment; G stands for government purchases; NX stands for net export (export minus import) (Mankiw, 2016). From this equation, we know that investment (I) has a positive correlation with GDP (Y), as investment increases so does the GDP and vice versa.

$$Y=C+I+G+NX$$

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Foreign investment in previous studies has both positive and negative effects. For over a hundred years capital accumulation has been the fundamental driving force of economic growth (Moosa, 2002). Foreign investment can be one of many factors that contribute to the widening wealth disparity within a country (Bornschieer, 1978) and between countries (Kehl, 2009). Even has an ambiguous result, the initial level of foreign investment has no consistent effect on the economic growth of third-world countries (Jackman, 1982). Foreign investment has a positive effect on the economy (Bornschieer et al., 1978; Zhang, 2001; Ahmad and Hamdani, 2003; Hermes and Lensink, 2003; Khawar, 2005; Baharumshah and Almasaied, 2009; Batten and Vo, 2009; Anwar and Sun, 2011; Nistor, 2014; Rahman, 2015; John, 2016). It may affect economies through advanced technology transfer (Borenztein et al., 1998; Dimelis, 2005; Schneider, 2005; Baharumshah & Almasaied, 2009; Wan, 2010), human capital (Borenztein et al., 1998; Schneider, 2005; Baharumshah & Almasaied, 2009), and even financial development (Hermes & Lensink, 2003; Baharumshah & Almasaied, 2009). Foreign investment can also have negative effects on the economy (Vissak & Roolah, 2005; Saqib et al., 2013). There are some potential problems of foreign investment: (1) the possible withdrawal of investments; (2) uneven regional development; (3) fiscal and balance of payments deficits; (4) increased unemployment (Vissak & Roolah, 2005). Foreign investment can also increase economic inequality within a country (Bornschieer, 1978) and between countries (Kehl, 2009). And the other negative effect is the strong dependency on foreign investment and the economy of its country (Kentor, 1998; Vissak and Roolah, 2005).

Previous research utilizing the Spatial Durbin Model to examine the relationship between government investment and regional economic performance found significant spatial spillover effects, particularly highlighting the influence of government investment behavior on the quality of regional economic development. These effects were not only limited to the originating region but also extended to neighboring areas, demonstrating the spatial interdependence of economic outcomes (Wang & Liu, 2023). Similarly, Thang, Pham, & Barnes (2016) emphasized the critical role of physical proximity in foreign direct investment (FDI) spillovers. Their findings indicated that intra-regional spillovers are substantially greater than inter-regional ones, with positive backward spillovers for supplier sectors within close distances, but negative forward and horizontal spillovers for customer sectors and same-sector firms, respectively. Interestingly, while the presence of foreign firms in neighboring provinces generated uniformly positive spillover effects across sectors, these effects diminished sharply with increasing distance. These results support the notion that FDI externalities are highly localized, reinforcing the importance of spatial factors in evaluating regional economic impacts. Domestic investment also has a straight positive relationship with GDP as of eq. 1. As I increase so does the GDP. Some previous studies support that domestic investment positively affects the economy (Adams, 2009; Alfa & Garba, 2012; Bakari, 2017). Government expenditure or G in the eq. 1 also has a straight positive relationship between G and Y, as the G increases so does the GDP. Some previous studies have found government expenditure has a negative effect on the economy (Landau, 1983; Grir & Tullock, 1989; Mitchell, 2005) or even does not have evidence of government expenditure effect on the economy (Hsieh & Lai, 1994; Ghali, 1997). Small enterprises have different effects on the economy, it can be positive (Akingunola & Oreoluwa, 2011; Christine, 2014; Obi et al., 2018; Erdin & Ozkaya, 2020; Manzoor, Wei, & Siraj, 2021) or it may not have a significant role (Taiwo, Ayodeji & Yusuf, 2018). The human development index (HDI) is defined as a summary of average achievement in key dimensions of human development, it has three dimensions: (1) a long and healthy life; (2) being knowledgeable; (3) having a decent standard of living (UNDP, 2025). Some previous studies agree HDI has a positive effect on the economy (Tridico, 2007; Ulas & Keskin, 2016; Elistia, & Syahzuni, 2018; Tagi et al., 2021).

2. Research Methods

Table 1 shows the description of all variables used. This paper used 4 regencies and 1 city data in the Special Region of Yogyakarta Province from 2018-2022 that were collected from the Special Region of Yogyakarta Province's Central Bureau of Statistics. The dependent variable is a gross domestic regional

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product at a constant price, it represents how each regency and city economic output each year at a constant price of 2010.

Table 1. Variables definition

Variable	Symbol	Meaning	Unit
Dependent variable	GRDP	Gross Regional Domestic Product at a constant price of 2010	Billion Rupiah
Independent variables	FI	Foreign investment realization	Rupiah
Control variables	DI	Domestic investment realization	Rupiah
	GE	Government expenditure	Rupiah
	SE	Small enterprises	Unit
	HDI	Human development index	Index

Using data from 4 regencies and 1 city in the Specia Region of Yogyakarta from 2018-2022, the dependent variable is gross regional domestic product (GRDP) and the independent variable is foreign investment (FI). The control variables are domestic investment (DI), government expenditure (GE), the total of small enterprises (SE), and human development index (HDI).

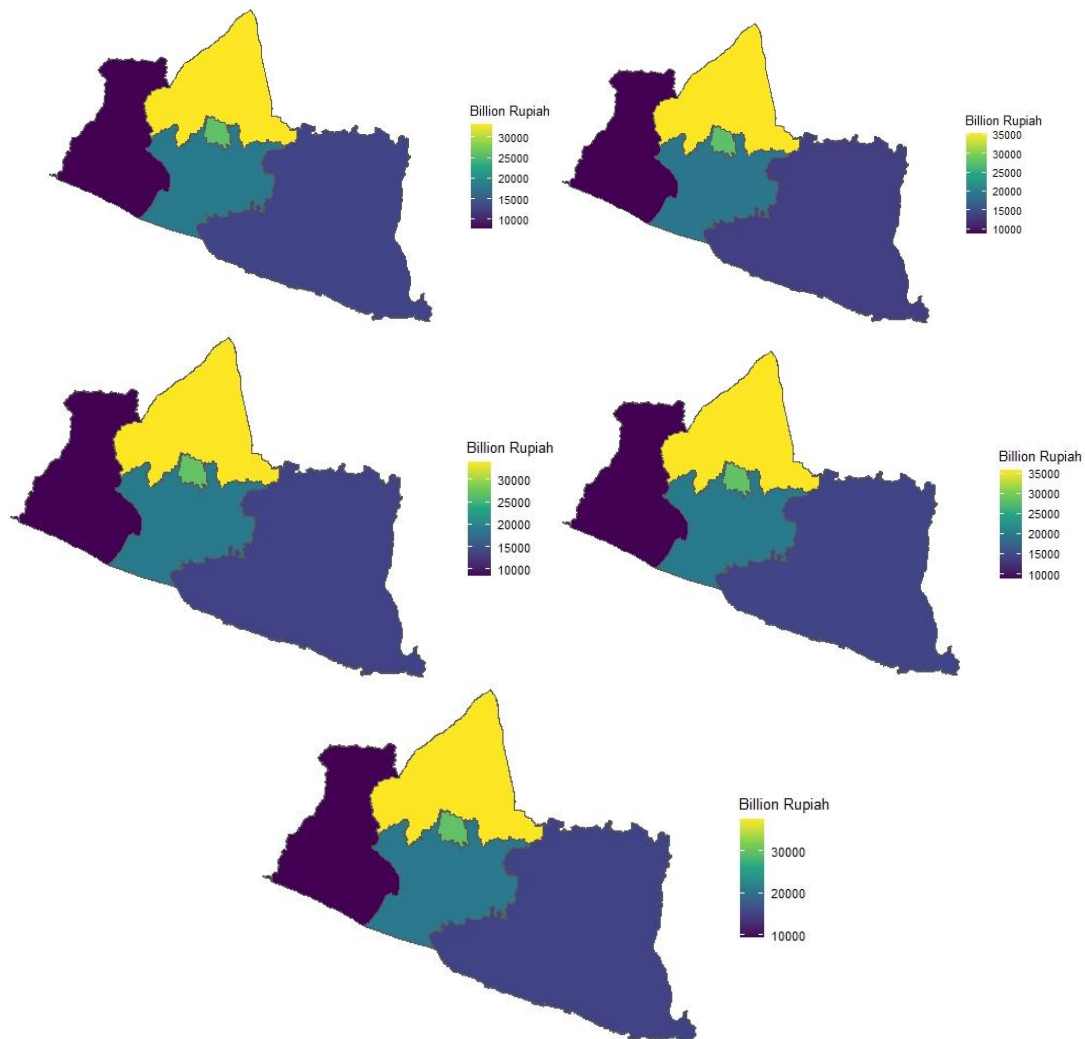


Figure 1. Gross Regional Domestic Product 2018-2022

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Figure 1 shows the gross domestic regional product of each regency and city in the Special Region of Yogyakarta. It shows the order from the lightest to the darkest color: Sleman Regency (yellow); Yogyakarta City (light green); Bantul Regency (dark turquoise); Gunung Kidul Regency (blue); Kulon Progo Regency (dark navy blue).

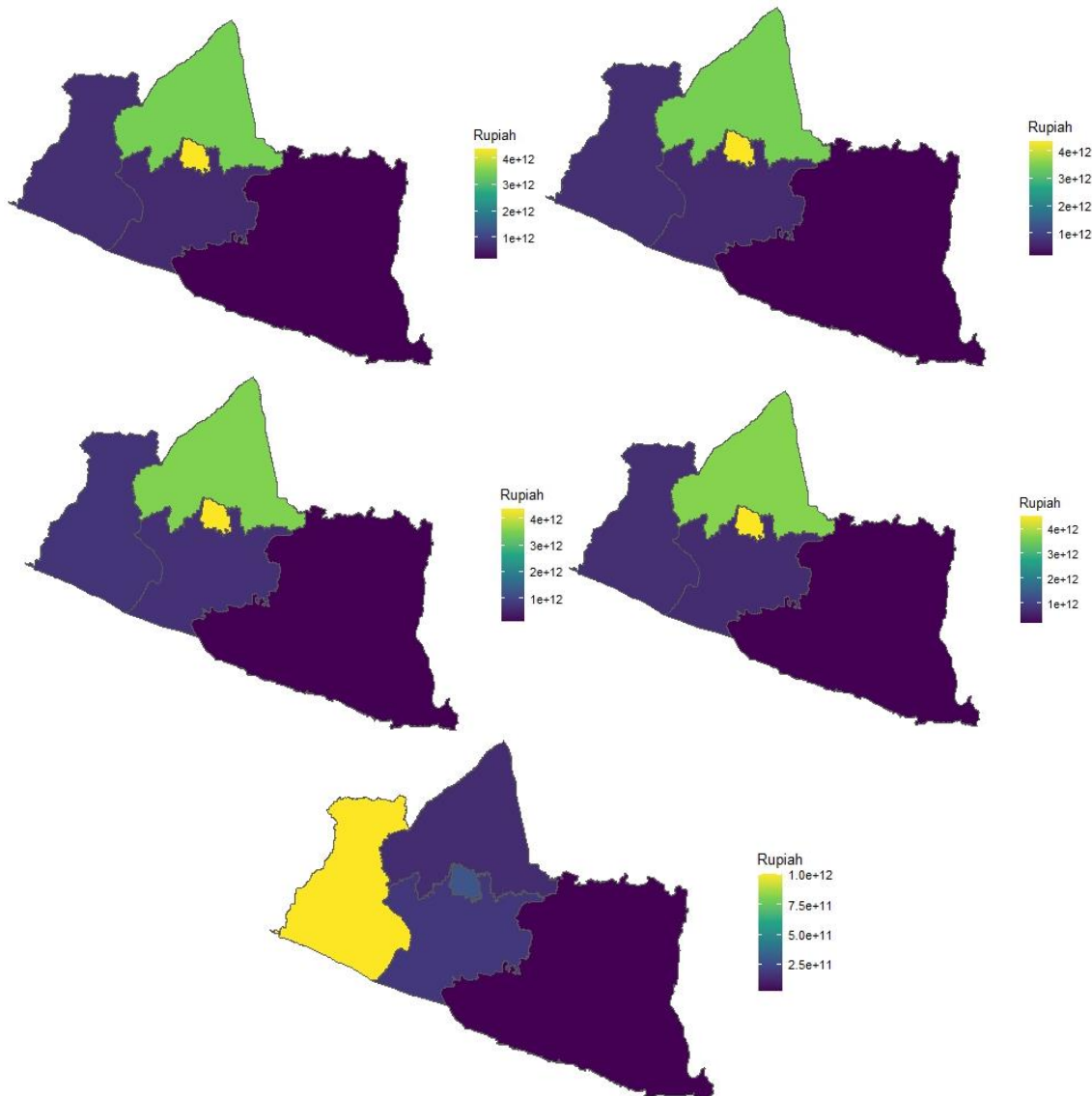


Figure 2. Foreign Investment 2018-2022

Figure 2 shows the foreign investment in the Special Region of Yogyakarta Province. Foreign investment in 2018-2021 shows Yogyakarta City has the brightest color (yellow), Sleman Regency is the second lightest color (green), and the darkest color is Gunung Kidul Regency (dark navy blue). But in 2022, the table has flipped, Kulon Progo Regency had 61% foreign investment in this province, surpassing Yogyakarta City (17%) and Sleman Regency (8%).

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1) Autocorrelation

$$I = \frac{N \sum_{i=1}^N \sum_{j=1}^N w_{ij} (x_i - \bar{x})(x_j - \bar{x})}{S_0 \sum_{i=1}^N (x_i - \bar{x})^2}$$

In eq. 2, N is the number of city/regency; w_{ij} is the weight between city/regency i and j; x_i and x_j are values of the variable of interest in locations i and j, $\bar{x}$ is the mean of the values. Moran's I value range from -1 to 1, with Moran's I < 0 means negative autocorrelation and Moran's I > 0 means positive autocorrelation.

2) Multicollinearity

To test the correlation between independent and control variables, this paper is using the Variance Inflation Factor (VIF). The equation for VIF is below.

$$VIF(X_j) = \frac{1}{1 - R_j^2}$$

In eq. 3, R_j^2 is the R-squared value obtained by regressing predictor X_j on all predictor variables. VIF = 1 means no correlation between the predictor and other variables, $1 < VIF < 5$ moderate multicollinearity, $VIF \geq 5$ indicates high multicollinearity.

3) Ordinary Least Square (OLS)

Besides of Spatial Durbin Model, this paper also uses Ordinary Least Square (OLS) so it shows the difference between using 'ordinary' econometrics and spatial econometrics. The equation for OLS is below.

$$\ln GDRP = \beta_0 + \beta_1 \ln DI + \beta_2 \ln FI + \beta_3 \ln GE + \beta_4 \ln SE + \beta_5 \ln HDI + \epsilon$$

In eq 4. β shows the effect of independent and control variable on GRDP: $\ln DI$, $\ln FI$, and $\ln SE$ are the independent variables; $\ln GE$, and $\ln HDI$ are the control variables. While eq. 5 remove the $\ln HDI$ and add $\ln AYOS$ instead.

4) Spatial Durbin Model

The Spatial Durbin Model (SDM) was selected based on the results of the Lagrange Multiplier (LM) test, which indicated that the available data were appropriate for this modeling approach. Additionally, the SDM allows for the estimation of both direct and indirect effects of foreign investment—capturing not only the impact on the region itself but also on neighboring regions. This capability is particularly relevant in light of Tobler's First Law of Geography, which states that "everything is related to everything else, but near things are more related than distant things" (Tobler, 1970). Thus, incorporating spatial interdependence into the analysis is essential for accurately understanding the regional dynamics of foreign investment. Recognizing the significance of spatial interdependence, this study incorporates a distance-based spatial weight matrix, using a threshold of 80 kilometers to define neighboring regions. This approach aims to enhance the accuracy and robustness of the estimation. The Spatial Durbin Model used in this study is specified as follows:

$$\begin{aligned} \ln GDRP = & \rho \sum_{i=1}^n W_{ij} \ln GDRP_{it} + \beta_1 \ln DI_{it} + \beta_2 \ln FI_{it} + \beta_3 \ln GE_{it} + \beta_4 \ln SE_{it} + \\ & \beta_5 \ln HDI_{it} + \theta_1 \sum_{i=1}^n W_{ij} \ln DI_{it} + \theta_2 \sum_{i=1}^n W_{ij} \ln FI_{it} + \theta_3 \sum_{i=1}^n W_{ij} \ln GE_{it} + \\ & \theta_4 \sum_{i=1}^n W_{ij} \ln SE_{it} + \theta_5 \sum_{i=1}^n W_{ij} \ln HDI_{it} + \epsilon_{it} \end{aligned}$$

In eq. 5, W is n × n order geographical distance-based spatial weights matrix; i denotes the city/regency, t denotes year; ρ and θ represent spatial correlation coefficients; β shows the direct effect of independent and control variables on GRDP; $\ln FI$ is the independent variables; $\ln DI$, $\ln SE$, $\ln GE$ and $\ln HDI$, are the control variables

3. Result and Discussion

3.1 Results

3.1.1 Spatial Dependency

The purpose of the spatial dependency test is to see the spatial autocorrelation, so we can understand how the spatial spillover effects of the variables used. Using Global Moran's I, Table 2 shows the spatial dependency of GRDP and FI from 2018-2022. Firstly, GRDP Moran's I from year to year shows with consistent results that statistically not significant negative with the value always around -0.31 and the p-value always around 0.84. Those results suggest that the negative spatial autocorrelation, or neighbors having dissimilar values of GRDP and statistically not significant.

Table 2. GRDP and FI Spatial Autocorrelation with Global Moran's I

Year	GRDP		FI	
	Moran's I	p-value	Moran's I	p-value
2018	-0.316	0.848	-0.364	0.831
2019	-0.312	0.835	-0.365	0.831
2020	-0.315	0.849	-0.366	0.833
2021	-0.316	0.849	-0.366	0.832
2022	-0.314	0.846	-0.101*	0.011

Secondly, the FI Global Moran's I shows the different result between 2018-2021 period and 2022 period. In the 2018-2021 period, FI Global Moran's I are statistically not significant negative with the value of Moran's I and p-value are consistent in -0.36 and 0.83. While in the 2022 period, it shows statistically significant negative. Those results mean: in the 2018-2021 period the negative spatial autocorrelation is not strong; in the 2022 period the negative spatial autocorrelation is strong, means in 2022 FI has strong evidence that dissimilar values are clustered together.

3.1.2 Multicollinearity

The assessment of multicollinearity among the independent and control variables in this study was conducted using the Variance Inflation Factor (VIF) test. The primary purpose of this test is to evaluate the degree of correlation between predictor variables, which is critical to ensure the reliability and stability of the regression coefficients in the spatial econometric models employed. High multicollinearity can inflate the variance of coefficient estimates and undermine the statistical significance of predictors, potentially leading to misleading conclusions. Table 3 presents the VIF values for each variable used in Model 1 and Model 2. All variables have VIF scores between 1 and 5, indicating a moderate level of multicollinearity. Specifically, Domestic Investment (DI) has a VIF of 2.028, Foreign Investment (FI) 3.425, Government Expenditure (GE) 2.392, Small Enterprises (SE) 3.061, and the Human Development Index (HDI) 3.692. According to common thresholds, VIF values below 5 suggest that multicollinearity is not severe enough to bias the regression estimates significantly. Therefore, while some correlation exists between the independent and control variables, it remains within acceptable limits, ensuring that the model results are robust and interpretable.

Table 3. Multicollinearity Test with VIF

Variables	VIF
DI	2.028
FI	3.425
GE	2.392
SE	3.061
HDI	3.692

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3.1.3 Ordinary Least Square and Spatial Durbin Model

This research uses OLS first before the Spatial Durbin Model to see how the result is without spatial effects. In Table 4, 3 out of 5 variables have positive effects on the GRDP: SE and GE have statistically insignificant negative effects on the GRDP while the HDI has statistically significant positive effect on the GRDP. The rest variables have negative effects on the GRDP, DI and FI have statistically not significant negative effects on the GRDP. It is surprising to find a negative relationship between domestic investment and foreign investment on the GRDP, although they were not significant.

Table 4. OLS and Spatial Durbin Model Results

Variables	OLS		Spatial Durbin Model	
	Coefficient	p-value	Coefficient	p-value
lnDI	-0.081	0.152	0.227*	0.016
lnFI	-0.022	0.761	-0.343	0.093
lnGE	0.229	0.374	1.807**	0.002
lnSE	0.061	0.640	12.53***	0.000
lnHDI	5.950***	0.000	0.156***	0.000
W × lnDI			4.143*	0.034
W × lnFI			-7.582	0.106
W × lnGE			0.353**	0.006
W × lnSE			0.246***	0.000
W × lnHDI			120.3**	0.007
R ²	0.764	0.000		
LM error	1.102	0.293		
LM lag	0.006	0.934		
Robust LM error	15.34	0.000		
Robust LM lag	14.25	0.000		
Rho			-2.007	
LR test value			1.409	0.235

The R² value of 0.764 in the OLS model suggests a good overall fit, indicating that approximately 76.4% of the variation in GRDP is explained by the included variables. However, both the Robust LM Lag (p-value = 0.000) and Robust LM Error (p-value = 0.000) tests are statistically significant, indicating the presence of spatial dependence in the data. These results justify the use of a spatial econometric model. Although the LR test for comparing the SDM to simpler spatial models (e.g., Spatial Lag or Spatial Error) yields an insignificant result (p = 0.235), the SDM is still preferred due to its ability to capture both direct and indirect (spillover) effects, which is central to the aim of this study. The purpose of using the Spatial Durbin Model is to know how the variables affect the GRDP with spatial effects. The first one we can notice in the Spatial Durbin Model result is that all of the independent and control variables have positive direct and indirect effects on the GRDP, except FI. All of the independent and control variables in direct and indirect effect are statistically significant except FI which is statistically insignificant both direct and indirect. So, we conclude that DI, SE, GE, and HDI have statistically significant positive effects on both their region/city's GRDP and neighboring regions. In contrast, FI has a statistically insignificant negative effect on both its own region/city's GRDP and that of neighboring regions. DI has different results on OLS and GRDP, it was statistically insignificant negative on the OLS result but statistically significant positive on both direct and indirect effects of the Spatial Durbin Model. The Spatial Durbin Model's results support the positive relationship between I and Y in eq. 1 and some previous studies found domestic investment positively affects the economy (Adams, 2009; Alfa & Garba, 2012; Bakari, 2017). DI has a greater effect on its neighbor with coefficients of 4.143 than its regency/city's coefficients of 0.227. GE has a consistent positive effect on GRDP in both OLS and Spatial Durbin Model results, although it was not statistically significant in OLS and statistically significant in both direct and indirect effects on the Spatial Durbin

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Model. These results support the positive relationship between G and Y in eq. 1. GE has a greater effect on its regency/city than its neighbors, with a direct effect coefficient of 1.807 and an indirect effect coefficient of 0.353. Same as GE, SE has a consistent positive effect on GRDP both in OLS and the Spatial Durbin Model. This result supports previous studies that government expenditure positively affects the economy (Akingunola & Oreoluwa, 2011; Christine, 2014; Obi et al., 2018; Erdin & Ozkaya, 2020; Manzoor, Wei, & Siraj, 2021). SE has a greater effect on its regency/city with a coefficient of 12.53 than its neighbor with a coefficient of 0.246.

HDI is the only variable with a statistically positive effect in the OLS and Spatial Durbin Model. This result supports previous studies that HDI positively affects the economy (Tridico, 2007; Ulas & Keskin, 2016; Elistia, & Syahzuni, 2018; Tagi et al., 2021). HDI has a greater effect on its neighbor with coefficients of 120.3 than its regency/city's coefficients of 0.156. FI is the only variable with a statistically insignificant negative effect on GRDP in both OLS and the Spatial Durbin Model. This result supports some previous studies that foreign investment has a negative effect on the economy (Vissak & Roolah, 2005; Saqib et al., 2013), although many previous studies prove foreign investment positively affects the economy (Bornschiefer et al., 1978; Zhang, 2001; Ahmad & Hamdani, 2003; Hermes & Lensink, 2003; Khawar, 2005; Baharumshah & Almasaied, 2009; Batten & Vo, 2009; Anwar & Sun, 2011; Nistor, 2014; Rahman, 2015; John, 2016). FI has a greater negative effect on its neighbor with coefficients of -7.582 than its regency/city's coefficients of -0.343. Although it was not significant, it was still negative. As shown in Fig. 2, there is a noticeable difference in FI between the first four images (FI 2018–2021) and the fifth image (FI 2022), where the color changes dramatically. In 2022, foreign investment (FI) in all regencies/city are decreased, except Kulon Progo Regency: Yogyakarta City decreased by 93.5%; Sleman Regency decreased by 96.2%; Bantul Regency decreased by 73.6%; Gunung Kidul Regency decreased by 85.9%; Kulon Progo Regency increase 36%. Kulon Progo Regency is also the only regency/city that has increased FI since 2018-2022. Kulon Progo Regency experienced a consistent increase in foreign investment from 2014 onward. While the cause of this trend is not directly tested in this study, one notable regional development is the construction of Yogyakarta International Airport (YIA), which was announced in 2014 and inaugurated in 2020. The project was intended to enhance international access, tourism, and economic activity in the region. Although no causal link can be established in this research, the timing aligns with the observed increase in foreign investment in the regency. Further studies may consider investigating the potential influence of large-scale infrastructure projects on regional investment dynamics.

While the Spatial Durbin Model provides a nuanced understanding of both direct and indirect effects of foreign investment, this analysis is constrained by several limitations. First, the study covers a relatively short panel period (2018–2022), which may not fully capture long-term spatial and temporal dynamics. Second, the lack of sectoral or firm-level disaggregation in the FI data restricts our ability to identify which industries are primarily contributing to investment patterns. Third, although there are contextual developments such as the construction of Yogyakarta International Airport (YIA) in Kulon Progo Regency that may coincide with increases in foreign investment, this study does not establish a causal link due to the absence of supporting empirical data. Future research could improve robustness by incorporating industry-specific or firm-level datasets, longer time series, and examining the potential mediating roles of institutional quality, infrastructure development, or tourism flows in shaping foreign investment behavior. The results indicate that domestic investment (DI), government expenditure (GE), and small enterprises (SE) have both significant direct and spillover effects, implying that regional economic development strategies should not be formulated in isolation. For example, encouraging DI in one regency can yield broader economic benefits for its neighbors. This calls for greater coordination in planning and investment allocation among neighboring regions to maximize the spatial multiplier effects. Moreover, the strong indirect effect of HDI underscores the importance of human capital investments not only for local development but also for surrounding areas. Conversely, the negative and statistically insignificant effect of FI raises concerns about the absorptive capacity of local economies to benefit from foreign capital, possibly due to a lack of linkages with local firms or mismatched labor market conditions.

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3.2 Discussion

Foreign direct investment (FDI) has a complex impact on the economy, and various studies suggest that its effects can vary depending on local contexts and the type of investment involved. Most literature suggests that FDI has a positive impact on economic growth, but this effect is not always consistent. For instance, Borensztein et al. (1998) showed that FDI can boost economic growth through technology transfer, but such effects are only visible in countries with adequate levels of education and human capital. Similarly, Baharumshah & Almasaied (2009) explained that FDI interacts with factors such as human capital development and financial deepening, which can strengthen its impact on economic growth. However, despite its potential to spur economic development, some studies also highlight the inequality that FDI may exacerbate. Borschier et al. (1978) and Jackman (1982) argued that FDI has the potential to increase inequality between developing and developed countries, as well as heighten the economic dependency of developing nations on foreign investments. Studies by Graham (2005) and Kehl (2009) suggest that although FDI can bring benefits in the form of new technologies and increased production capacity, these effects are often uneven and more beneficial to already economically advanced regions. This can worsen regional disparities, as Kentor (1998) pointed out, stating that long-term dependence on FDI can hinder the development of local sectors and exacerbate uneven growth. Research by Vissak & Roolaht (2005) also indicates that FDI can have negative effects, such as increasing reliance on foreign capital and contributing to social-economic inequality in the host country. On the other hand, other factors such as government expenditure and domestic investment also play a critical role in influencing regional economies. Christie (2014) and Ghali (1997) show that government spending is positively correlated with economic growth, though the results can vary depending on how and where the spending is allocated.

Akingunola (2011) and Alfa & Garba (2012) found that domestic investment can have a more direct and sustainable impact on economic growth because it is more integrated with local needs and less dependent on external factors. This is also reflected in studies by Anwar & Sun (2011) and Bakari (2017), which suggest that the development of domestic sectors, such as small and medium enterprises (SMEs), can contribute significantly to long-term economic growth. In this study, the analysis results show that although FDI has the potential to stimulate certain economic sectors, its overall impact on GRDP in the Special Region of Yogyakarta is not significant. This finding aligns with the work of Saqib et al. (2013), who state that the relationship between FDI and economic growth can be influenced by structural and institutional factors present in each region. Additionally, the spatial effects observed in this study suggest that the impact of FDI on neighboring regions is more limited, indicating that FDI in certain areas tends to remain concentrated and does not spread evenly across other regions. Therefore, more inclusive and strategic policies are needed to leverage FDI, taking into account local capacities and efforts to reduce regional disparities. This study also suggests that further research is needed to examine the long-term effects of FDI on regional economic inequality, given the potential for dependency and its impact on the economic development of regions that are not well-integrated into foreign investment flows.

4. Conclusion

This study set out to examine the relationship between foreign investment and regional economic performance in the Special Region of Yogyakarta, using both Ordinary Least Squares (OLS) and the Spatial Durbin Model (SDM) to capture spatial interactions among five regencies and city over the 2018–2022 period. Contrary to the predominant findings in the literature, which often report a positive association between foreign investment and economic growth, this study finds that foreign investment (FI) exerts a negative, albeit statistically insignificant, effect on gross regional domestic product (GRDP)—both directly within a regency/city and indirectly in its neighboring regions. In contrast, domestic investment (DI), government expenditure (GE), small enterprises (SE), and the Human Development Index (HDI) all demonstrate statistically significant positive effects on GRDP, with both direct and spatial spillover impacts. These findings underscore the importance of strengthening regional collaboration and integrated development strategies, as economic benefits from investments in one area can extend across

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administrative boundaries. While FI's negative impact is not statistically significant, its persistent negative coefficient raises questions about the absorptive capacity of local economies, potential mismatches in labor market needs, or weak linkages between foreign capital and local firms. Given these uncertainties, it would be premature to draw definitive conclusions about the causal relationship between FI and regional economic growth. Further research incorporating sector-specific or firm-level data, institutional quality metrics, and a longer time frame is necessary to unpack the underlying dynamics and identify possible mediating factors. In conclusion, this study highlights the nuanced and regionally contingent effects of investment, suggesting that policy strategies aimed at economic growth should focus not only on attracting foreign capital but also on ensuring local readiness to integrate and benefit from such investments. For future research, the suggestion is to analyze with a longer period, if possible, this research only used 5 years of data due to not availability of some variable data in the previous year. With a longer period, it could be giving more precise and better results.

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