

THE EFFECT OF E-GOVERNMENT (SPBE) AND INVESTMENT ACROSS CENTRAL JAVA REGENCIES/CITIES

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Article Information: Received --- June 25, 2026, Published --- August 10, 2026

Abstract

Investment plays a crucial role in driving regional economic growth by expanding productive capacity, creating employment, and strengthening regional competitiveness. Although Central Java Province is among Indonesia's leading investment destinations, significant disparities in investment realization remain evident across its regencies and municipalities. This study aims to examine the effects of the Electronic-Based Government System (SPBE), Gross Regional Domestic Product (GRDP), Regency/Municipalities Minimum Wage (UMK), and road infrastructure on investment realization in regencies and municipalities of Central Java Province during 2022–2024.

The study uses secondary panel data covering 35 regencies and municipalities, sourced from Statistics Indonesia (BPS) and the Ministry of Administrative and Bureaucratic Reform (KemenPANRB), analyzed through panel data regression with the Random Effect Model (REM) using EViews 12. The results show that SPBE and road infrastructure have no significant effect on investment, whereas GRDP and UMK have positive and significant effects.

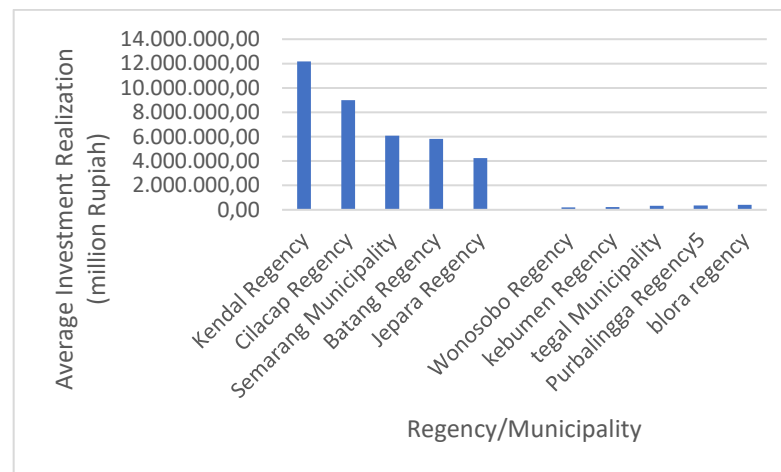
These findings imply that local governments should not only focus on improving SPBE index scores but also ensure that digital governance implementation genuinely enhances licensing services, ease of doing business, and bureaucratic efficiency as perceived by investors. Furthermore, strengthening productive sectors and regional leading industries, improving labor productivity and human capital quality, and directing road infrastructure development toward better economic connectivity, access to industrial areas, and logistics efficiency are essential to sustaining a favorable and competitive regional investment climate.

Keywords: Investment; Electronic-Based Government System (SPBE); Gross Regional Domestic Product; Minimum Wage; Road Infrastructure

INTRODUCTION

Investment plays a pivotal role in promoting regional economic development by expanding productive capacity, generating employment opportunities, facilitating technology transfer, and enhancing regional competitiveness. As one of the key drivers of long-term economic growth, investment not only stimulates economic activity but also strengthens the productive sectors that support sustainable regional development (Todaro & Smith, 2020; Barro & Sala-i-Martin, 2003). Consequently, attracting investment has become a strategic priority for local governments seeking to accelerate economic growth and improve community welfare.

Central Java Province has experienced a steady increase in investment realization, rising from IDR 68.4 trillion in 2022 to IDR 88.4 trillion in 2024 (Kementerian Investasi/BKPM, 2025). Despite this positive trend, investment has not been distributed evenly across its regencies and municipalities. **Figure 1** presents the average investment realization of the five highest- and five lowest-performing regencies/municipalities during the 2022–2024 period, illustrating substantial disparities in regional investment performance.



Source : Kementerian Investasi/BKPM, 2025

Figure 1. Average Investment Realization of the Top Five and Bottom Five Regencies/Municipalities in Central Java Province, 2022–2024

As shown in Figure 1, Kendal Regency, Semarang City, and Batang Regency consistently recorded the highest average investment realization, whereas Purworejo Regency, Kebumen Regency, and Magelang City remained among the lowest. These disparities indicate considerable differences in regional investment attractiveness despite the province's overall investment growth. Such conditions suggest that investment opportunities and economic benefits are not distributed evenly across regions, highlighting the importance of identifying the factors that influence local investment performance and support a more balanced pattern of regional development.

Besides economic conditions, institutional quality has become an increasingly important factor influencing investors' location decisions. One of Indonesia's major governance reforms is the implementation of the Electronic-Based Government System (Sistem Pemerintahan Berbasis Elektronik/SPBE), introduced through Presidential Regulation No. 95 of 2018. SPBE aims to improve the effectiveness, efficiency, transparency, and accountability of public administration by integrating digital technology into government services. Through more efficient licensing procedures, simplified administrative processes, and improved public service delivery, SPBE is expected to reduce bureaucratic barriers and create a more favorable business environment, thereby increasing regional investment attractiveness (Martins & Veiga, 2022; World Bank, 2024).

Although digital governance is theoretically expected to encourage investment, empirical findings remain inconclusive. Previous studies have reported mixed evidence regarding the relationship between e-government implementation and investment performance, suggesting that the effectiveness of digital governance depends not only on technological adoption but also on institutional readiness, policy implementation, and the integration of digital systems within government organizations (Cordella & Tempini, 2015). Consequently, whether improvements in digital governance lead to higher regional investment remains an empirical question. In Central Java Province, the SPBE Index has shown continuous improvement in recent years; however, empirical evidence regarding whether better SPBE implementation contributes to higher investment across regencies and municipalities is still limited.

Regional investment is also influenced by broader economic and structural conditions. Gross Regional Domestic Product (GRDP) reflects the scale of regional economic activity and market potential, making economically stronger regions more attractive to investors (Firdaus, 2010; Sihombing et al., 2023). Meanwhile, the Regency/Municipalities Minimum Wage (UMK) represents labor costs that influence firms' production expenses and investment location decisions (Bellak et al., 2008; Hou et al., 2021). Road infrastructure also plays an important role in improving accessibility, reducing transportation costs, and increasing logistics efficiency, all of which

contribute to regional competitiveness and investment attractiveness (Calderón & Servén, 2004; Aschauer, 1989). Therefore, these variables should be considered alongside digital governance when examining the determinants of regional investment.

Despite growing interest in SPBE as a key component of Indonesia's digital government transformation, empirical studies examining its relationship with investment at the district and municipal level remain limited, as previous studies have predominantly focused on national or provincial analyses. The novelty of this study lies in examining SPBE as a determinant of investment across regencies and municipalities in Central Java Province using panel data while simultaneously incorporating GRDP, Regency/ Municipalities Minimum Wage (UMK), and road infrastructure into a unified analytical framework. Therefore, this study aims to analyze the effects of SPBE, GRDP, UMK, and road infrastructure on investment across 35 regencies and municipalities in Central Java Province during the 2022–2024 period.

The findings reveal that GRDP and UMK have a positive and significant effect on investment, whereas SPBE and road infrastructure do not significantly influence investment realization. These results suggest that improving digital governance alone may not be sufficient to attract investment unless it is accompanied by stronger regional economic performance and more effective public service delivery. Theoretically, this study enriches the literature on digital governance and regional investment by providing district-level empirical evidence on the relationship between SPBE implementation and investment. Practically, the findings provide evidence-based recommendations for local governments to strengthen digital public services, improve the business environment, and formulate policies that encourage a more balanced distribution of investment across Central Java Province.

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

A. Investment

In general, investment is the allocation of resources with the aim of obtaining profits in the future. One form of investment that significantly influences economic development is project investment. Project investment is a type of investment focused on planting limited production factors in a specific project (Manopo et al., 2013). When viewed together, investment can be influenced by future expectations, interest rates, economic conditions, and innovation. Changes in investor expectations will shift the demand curve, while changes in interest rates can cause an overall shift in the investment curve. Movements in interest rates and investor expectations will result in changes to investment plans. This indicates that investment is influenced not only by interest rates.

According to Keynes in macroeconomics, the real business cycle theory occurs due to fluctuations in economic activities that affect the investment decisions of capital owners (Wahyuningsih, 2022). Referring to the Keynesian framework, business cycles can be influenced by changes in aggregate demand and aggregate supply. Changes in aggregate demand and supply affect the flow of investment into a region. From this arises the concept of Marginal Efficiency of Capital (MEC). MEC is a benchmark measure of the expected return by investors from capital investment in a project or productive asset, considering aspects beyond interest rates. Meanwhile, the interest rate is the price paid for borrowing capital for investment. The interest rate is defined as the additional percentage that must be paid as a return on loaned funds or the sacrifice of current consumption. In relation to investment decision-making, MEC and interest rates are two key variables closely related.

B. Electronic-Based Government System (SPBE)

The Electronic-Based Government System (Sistem Pemerintahan Berbasis Elektronik/SPBE) is Indonesia's digital government initiative aimed at improving governance quality through the integration of information and communication technology into government administration and public service delivery. By digitalizing administrative procedures, integrating government services, and improving public service quality, SPBE is expected to create a more efficient, transparent, and predictable business environment that supports investment activities.

The relationship between SPBE and investment can be explained by **New Institutional Economics**, which emphasizes that institutional quality plays a fundamental role in shaping economic performance and investment decisions. According to North (1990), well-functioning institutions reduce uncertainty by establishing clear rules, improving governance quality, and increasing the predictability of economic transactions. Within this perspective, SPBE represents an institutional reform that strengthens governance through digital transformation. More efficient licensing procedures, integrated public services, and greater administrative transparency improve government effectiveness while reducing transaction costs, administrative delays, and regulatory uncertainty faced by investors. Consequently, stronger institutional quality is expected to encourage investment by creating a more conducive business environment.

Empirical evidence generally supports this theoretical argument. Al-Sadiq (2021) found that improvements in e-government significantly increase foreign direct investment by enhancing government effectiveness, strengthening transparency, and reducing bureaucratic inefficiencies. Similarly, Martins and Veiga (2022) reported that digital government facilitates business activities by simplifying administrative procedures and improving public service quality, thereby creating a more favorable investment climate. In addition, Inusah et al. (2024) demonstrated that e-government contributes to higher government effectiveness and better public service delivery, which strengthen the institutional environment supporting economic activities. Nevertheless, the effectiveness of digital government depends on the quality of its implementation. Digitalization alone does not necessarily improve economic outcomes unless it is accompanied by adequate institutional capacity, organizational readiness, and effective policy implementation. Therefore, although SPBE is theoretically expected to improve the investment climate, its effect on investment may vary across regions depending on the quality of its implementation.

Collectively, the theoretical arguments and empirical evidence suggest that better SPBE implementation strengthens institutional quality, enhances government effectiveness, and reduces administrative barriers encountered by businesses. Consequently, regions with higher SPBE performance are expected to provide a more conducive investment environment and attract greater investment. Therefore, the following hypothesis is proposed:

H₁: The Electronic-Based Government System (SPBE) has a positive effect on investment across regencies and municipalities in Central Java Province.

C. Gross Regional Domestic Product (GRDP)

Gross Regional Domestic Product (GRDP) reflects the scale of economic activity, regional income, and market potential within a region. Regions with higher GRDP generally exhibit stronger purchasing power, more dynamic business activities, and larger consumer markets, creating favorable conditions for business expansion and investment (Todaro & Smith, 2020).

The relationship between GRDP and investment can be explained by Dunning's Eclectic Paradigm (OLI Framework), particularly the concept of location advantages. According to Dunning (1993), firms undertake market-seeking investment by locating their operations in regions that offer favorable location-specific advantages, including large market size, strong

economic performance, and high consumer demand. These characteristics enable firms to maximize expected returns, achieve economies of scale, and reduce market uncertainty. Consequently, regions with stronger economic fundamentals are more likely to attract investment because they provide broader business opportunities and greater profit potential.

Empirical evidence also supports this theoretical argument. Meivitanwanli (2021) found that market size was the only determinant that consistently and significantly affected foreign direct investment across Indonesian provinces, indicating that economically stronger regions are more attractive to investors. Furthermore, Islam and Beloucif (2024), through a systematic review of 112 empirical studies, concluded that market size is the most robust determinant of foreign direct investment because most multinational firms undertake market-seeking investment. These findings reinforce Dunning's Eclectic Paradigm, suggesting that firms consistently prefer locations with larger market potential because they offer broader business opportunities and higher expected returns.

Collectively, the theoretical arguments and empirical evidence indicate that regions with higher GRDP possess stronger market potential and economic capacity, increasing their ability to attract investment and support business expansion. Therefore, the following hypothesis is proposed:

H₂: Gross Regional Domestic Product (GRDP) has a positive effect on investment across regencies and municipalities in Central Java Province.

D. Minimum Wage (UMK)

The Regency/ Municipalities Minimum Wage (Upah Minimum Kabupaten/Kota/UMK) is the minimum wage established by the government as the lowest level of remuneration that employers are required to pay workers (Government Regulation No. 51 of 2023). As a major component of labor costs, the minimum wage influences firms' production costs and expected profitability, making it an important consideration in investment decisions.

The relationship between minimum wages and investment can be explained by Dunning's Eclectic Paradigm (OLI Framework), particularly the concept of location advantages. According to Dunning (1993), firms choose investment locations by evaluating location-specific characteristics that influence the expected profitability of investment. Among these characteristics, labor cost is widely recognized as an important determinant because it directly affects firms' operating expenses and expected returns. Consequently, regions with relatively higher labor costs may become less attractive for investment, particularly in labor-intensive industries that are more sensitive to changes in wage levels. This perspective is supported by Bellak et al. (2008), who identify labor costs as one of the principal determinants of firms' investment location decisions.

Empirical evidence generally supports this theoretical argument. Hou et al. (2021) found that rising labor costs significantly reduce foreign direct investment by lowering firms' expected profitability and weakening regional competitiveness. Likewise, Bellak et al. (2008) concluded that labor costs play an important role in firms' location decisions, particularly in industries where labor constitutes a substantial share of production costs. These findings reinforce the argument that labor costs remain an important determinant of investment because they directly influence firms' production efficiency and expected returns.

Collectively, the theoretical arguments and empirical evidence indicate that higher minimum wages increase labor costs and reduce the expected profitability of investment, particularly in labor-intensive industries. Therefore, the following hypothesis is proposed:

H₃: Regency/Municipality Minimum Wage (UMK) has a negative effect on investment across regencies and municipalities in Central Java Province.

E. Road Infrastructure (Inf)

Road infrastructure is a fundamental component of transportation infrastructure that facilitates the movement of goods, services, and production factors across regions. By improving regional accessibility and connectivity, road infrastructure supports the efficient functioning of economic activities and creates favorable conditions for business and investment (Rosik & Wójcik, 2023).

The relationship between road infrastructure and investment can be explained by Dunning's Eclectic Paradigm (OLI Framework), particularly the concept of location advantages. According to Dunning (1993), firms select investment locations by evaluating location-specific characteristics that influence the expected profitability of investment. Among these characteristics, transportation infrastructure is recognized as an important location-specific advantage because it improves accessibility, reduces logistics and transportation costs, and enhances operational efficiency. Consequently, regions with better road infrastructure are expected to attract more investment by providing a more competitive business environment.

Empirical evidence generally supports this theoretical argument. Kuang et al. (2025) found that improvements in road transportation infrastructure significantly increase foreign direct investment by enhancing regional accessibility and reducing logistics costs. Similarly, Hernández Soto and Martínez-Cobas (2024) reported that transportation infrastructure positively influences foreign direct investment by improving business efficiency and increasing the attractiveness of investment locations. These findings reinforce Dunning's Eclectic Paradigm, suggesting that well-developed transportation infrastructure constitutes an important location-specific advantage that encourages firms to invest.

Collectively, the theoretical arguments and empirical evidence indicate that better road infrastructure improves regional accessibility, enhances business efficiency, and reduces logistics costs, thereby encouraging investment. Therefore, the following hypothesis is proposed:

H₄: Road infrastructure has a positive effect on investment across regencies and municipalities in Central Java Province.

RESEARCH METHODS

A. Research Design

This study employed a quantitative research design using panel data to examine the effect of the Electronic-Based Government System (SPBE), Gross Regional Domestic Product (GRDP), Regency/ Municipality Minimum Wage (UMK), and road infrastructure on investment across regencies and municipalities in Central Java Province. Panel data combine cross-sectional and time-series observations, enabling researchers to capture both regional differences and changes over time while improving estimation efficiency (Gujarati & Porter, 2013). The study covered all 35 regencies and municipalities in Central Java Province with annual observations from 2022 to 2024.

B. Population and Sample

The study included all 35 regencies and municipalities in Central Java Province. Therefore, no sampling procedure was employed, and the analysis covered all regencies and municipalities in the province. Using annual observations from 2022 to 2024, the study constructed a balanced panel consisting of 105 observations.

C. Data Collection and Variable Measurement

This study utilized secondary data collected through documentation from official statistical reports and government publications issued by the Ministry of Investment/Investment Coordinating Board (BKPM), the Ministry of Administrative and Bureaucratic Reform (KemenPANRB), and Statistics Indonesia (BPS). The variables used in this study are measured as follows:

1. Investment (INV). Investment is measured using total investment realization in each regency and municipality in Central Java Province during the 2022–2024 period. The variable is expressed in million Indonesian Rupiah (IDR).
2. Electronic-Based Government System (SPBE). SPBE is measured using the SPBE Index, which reflects the level of electronic-based government implementation in each regency and municipality during the 2022–2024 period.
3. Gross Regional Domestic Product (GRDP). In this study, GRDP is measured using Gross Regional Domestic Product at constant prices (2010 base year) for each regency and municipality in Central Java Province during the 2022–2024 period. The variable is expressed in million Indonesian Rupiah (IDR).
4. Regency/ Municipality Minimum Wage (UMK). UMK is measured using the officially established Regency/ Municipality Minimum Wage applicable in each regency and municipality during the 2022–2024 period. The variable is expressed in Indonesian Rupiah (IDR) per month.
5. Road Infrastructure (INF). Road infrastructure is proxied by the total length of roads in good and moderate condition in each regency and municipality during the 2022–2024 period. The variable is expressed in kilometers.

D. Data Analysis Techniques

Panel data regression analysis was employed to estimate the effect of SPBE, GRDP, Regency/ Municipality Minimum Wage (UMK), and road infrastructure on investment. A semi-logarithmic specification was adopted because the variables are measured using different scales and units. In addition, logarithmic transformation reduces data dispersion and allows the estimated coefficients of the transformed variables to be interpreted as elasticities (Gujarati & Porter, 2013). The SPBE variable was retained in its original form because it is measured as a composite index rather than a monetary or physical variable. The estimated regression model is specified as follows:

$$\ln INV_{it} = \beta_0 + \beta_1 SPBE_{it} + \beta_2 \ln GRDP_{it} + \beta_3 \ln UMK_{it} + \beta_4 \ln INF_{it} + \varepsilon_{it}$$

where:

- INV_{it} : Investment in district/ Municipality i at time t
- i : Districts/cities in Central Java Province
- t : Observation period (2022-2024)
- β_0 : Constanta
- $\beta_1 - \beta_4$: Regression coefficients
- $SPBE_{it}$: Electronic-Based Government System (SPBE)
- $GRDP_{it}$: Gross Regional Domestic Product (GRDP)
- UMK_{it} : District/ Municipality Minimum Wage (UMK)
- INF_{it} : Road infrastructure
- ε_{it} : Error term

The appropriate estimation model was selected sequentially using the Chow test, Hausman test, and Lagrange Multiplier (LM) test to determine the most appropriate model among the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM), following the panel data estimation procedure proposed by Baltagi (2021).

Diagnostic tests were subsequently conducted to evaluate the reliability of the estimated model. Multicollinearity was assessed using the correlation matrix, where a correlation coefficient greater than 0.90 indicates the presence of multicollinearity (Ghozali, 2018). Heteroskedasticity was examined using the Glejser test, in which a probability value greater than 0.05 indicates homoskedastic residuals (Gujarati & Porter, 2013).

The estimated model was further evaluated using the coefficient of determination (R^2), F-test, and t-test to assess the explanatory power of the model and to examine the simultaneous and partial effects of the independent variables on investment. All statistical analyses were performed using EViews 12.

RESULTS AND DISCUSSION

RESULTS

A. Panel Data Regression Analysis

This study is conducted to examine the influence of independent variables on the dependent variable. The data were collected from 35 regencies/cities, covering the period from 2018 to 2024. The following are the panel data regression results, with the Fixed Effects Model (FEM) identified as the best model for this study.

Tabel 1. Panel Data Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-64.07113	18.89504	-3.390897	0.0010
SPBE	-0.364431	0.202737	-1.797556	0.0753
Ln_GRDP	0.716471	0.254630	2.813776	0.0059
Ln_UMK	4.930324	1.372845	3.591318	0.0005
Ln_INF	-0.019714	0.195648	-0.100760	0.9199

Source: *Eviews 12*, Processed Data (2026)

This study uses a regression model which can be expressed by the following equation :

$$\ln INV_{it} = -64.071 - 0.364 SPBE_{it} + 0.716 \ln GRDP_{it} + 4.930 \ln UMK_{it} - 0.020 \ln INF_{it}$$

B. Multicollinearity Test

From the test results, it shows that the correlation values among the independent variables in this study are less than 0,90. This means that there is no multicollinearity detected among the independent variables in this research. This test is used to determine whether there is a relationship between the independent variables in the regression model.

Table 2. Multicollinearity Test Results

Variable	X1	X2	X3	X4
SPBE	1.000000	0.192428	0.328617	-0.052512
Ln_GRDP	0.192428	1.000000	0.489257	0.458928
Ln_UMK	0.328617	0.489257	1.000000	-0.105170
Ln_INF	-0.052512	0.458928	-0.105170	1.000000

Source: *Eviews 12*, Processed Data (2026)

C. Heteroscedasticity Test

The results of the Glejser test show that the probability values for all independent variables exceed 0.05. Therefore, the regression model is free from heteroskedasticity,

indicating that the residual variance is constant across observations and that the estimated coefficients can be considered reliable for statistical inference.

Tabel 3. Heteroscedasticity Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.528614	11.26769	-0.313162	0.7548
SPBE	-0.215760	0.114786	-1.879666	0.0631
Ln_GRDP	-0.090896	0.153899	-0.590620	0.5561
Ln_UMK	0.402876	0.820693	0.490897	0.6246
Ln_INF	0.002979	0.110270	0.027012	0.9785

Source: *Eviews 12*, Processed Data (2026)

D. coefficient of determination (R^2)

Based on the data analysis, the R-squared value is 0.321, indicating that approximately 32.1% of the variation in investment realization across regencies and municipality in Central Java Province can be explained by the Electronic-Based Government System (SPBE), Gross Regional Domestic Product (GRDP), Regency/Municipality Minimum Wage (UMK), and road infrastructure. The remaining 67.9% is explained by other factors outside the regression model.

E. F-test

Based on the regression results, show that the F-statistic is 11.830 with a probability value of 0.0000, which is lower than the 0.05 significance level. Therefore, the null hypothesis is rejected, indicating that SPBE, GRDP, UMK, and road infrastructure jointly have a statistically significant effect on investment realization across regencies and municipality in Central Java Province.

F. t-test

The t-test was conducted to examine the partial effect of each independent variable on investment realization. The results are summarized as follows:

1. Electronic-Based Government System (SPBE). The probability value of SPBE is 0.0753, which exceeds the 0.05 significance level. Therefore, SPBE does not have a statistically significant effect on investment realization across regencies and municipality in Central Java Province.
2. Gross Regional Domestic Product (GRDP). The probability value of GRDP is 0.0059, which is lower than 0.05. Therefore, GRDP has a positive and statistically significant effect on investment realization across regencies and municipality in Central Java Province.
3. Regency/Municipality Minimum Wage (UMK). The probability value of UMK is 0.0005, which is lower than 0.05. Therefore, UMK has a positive and statistically significant effect on investment realization across regencies and municipality in Central Java Province.
4. Road Infrastructure. The probability value of road infrastructure is 0.9199, which exceeds the 0.05 significance level. Therefore, road infrastructure does not have a statistically significant effect on investment realization across regencies and municipality in Central Java Province.

DISCUSSION

A. The Effect of Electronic-Based Government System (SPBE) on Investment in Central Jawa

The insignificant effect of the Electronic-Based Government System (SPBE) indicates that improvements in digital government implementation were not directly associated with investment realization across regencies and municipalities in Central Java Province during the study period. This finding suggests that the implementation of digital government alone may not be sufficient to immediately stimulate investment.

In the perspective of institutional economics, improvements in institutional quality are expected to reduce transaction costs, improve governance, and create a more conducive business environment, thereby supporting investment decisions (North, 1990). Consistent with this perspective, the OECD Digital Government Policy Framework explains that digital government primarily aims to enhance public sector efficiency, transparency, service quality, and institutional coordination rather than directly increasing investment (OECD, 2020). Therefore, the contribution of SPBE to investment is likely to operate indirectly through improvements in governance and the overall business environment.

The insignificant result may also reflect the nature of digital government reforms, whose economic benefits generally emerge gradually as improvements in public administration and institutional quality are translated into a more favorable investment climate. Consequently, improvements in SPBE may require a longer period before their effects are reflected in investment realization.

The findings differ from those of Al-Sadiq (2021), who found that e-government significantly promotes foreign direct investment by strengthening institutional quality and improving government services. One possible explanation for this difference is that Al-Sadiq (2021) employed cross-country data with substantial variation in e-government development, whereas the present study focuses on regencies and municipalities within a single province where institutional and administrative conditions are relatively more comparable. Differences in the units of analysis and research context may therefore contribute to the contrasting findings.

B. The Effect of Gross Regional Domestic Product on Investment in Central Java

The positive and statistically significant effect of GRDP suggests that regional economic performance plays an important role in attracting investment across regencies and municipalities in Central Java Province. The estimated elasticity indicates that a 1% increase in GRDP is associated with an approximately 0.716% increase in investment realization, *ceteris paribus*. This finding implies that regions with stronger economic activity tend to provide more favorable conditions for business expansion and investment.

The positive and statistically significant effect of GRDP suggests that regional economic performance plays an important role in attracting investment across regencies and municipalities in Central Java Province. The estimated elasticity indicates that a 1% increase in GRDP is associated with an approximately 0.716% increase in investment realization, *ceteris paribus*. This finding implies that regions with stronger economic activity tend to provide more favorable conditions for business expansion and investment.

This result is consistent with market-seeking investment theory, which argues that investors are more likely to allocate capital to regions with larger market potential because stronger demand increases the expected return on investment. Likewise, endogenous growth theory (Romer, 1986) suggests that sustained economic activity promotes capital accumulation and investment expansion. In the context of Central Java Province, higher GRDP reflects stronger economic activity and productive capacity, making regions more attractive to investors.

The findings are consistent with those of Choirunnisa and Khoirudin (2024), who found that GRDP positively affects foreign direct investment in Central Java, and Putra and Hidayah (2023), who reported a positive effect of GRDP on domestic investment across regencies and municipalities in the province. However, the findings differ from Dewo,

Kumaat, and Mandei (2023), who found that GRDP did not significantly affect foreign direct investment in North Sulawesi Province. This difference may be explained by variations in investment measures, units of analysis, and regional economic characteristics. While Dewo et al. (2023) examined only foreign direct investment using provincial time-series data, this study analyzes total investment realization using panel data at the regency and municipality levels.

C. The Effect of Minimum Wage on Investment in Central Jawa

The positive and statistically significant effect of the Regency/Municipalities Minimum Wage (UMK) suggests that increases in minimum wages are associated with higher investment realization across regencies and municipalities in Central Java Province. This finding indicates that higher labor costs do not necessarily discourage investment, particularly when they are accompanied by favorable regional economic conditions.

This finding is consistent with efficiency wage theory, which argues that higher wages may improve worker productivity, reduce labor turnover, and enhance production efficiency, thereby partially offsetting the increase in labor costs (Mankiw, 2018). In the context of Central Java Province, the manufacturing industry has consistently been the largest contributor to regional economic output, indicating that productive industrial activities play a central role in the regional economy. Consequently, moderate increases in minimum wages may not substantially reduce regional investment attractiveness, particularly when supported by productivity improvements and a favorable business environment.

The findings are consistent with those reported by Putra and Hidayah (2023), who found that district/ municipalities minimum wages have a positive and significant effect on domestic investment (PMDN) across regencies and municipalities in Central Java. They are also broadly consistent with the findings of Sugiharto and Kurnia (2014), who showed that the impact of minimum wages on investment depends on firms' adjustment processes, with positive effects emerging over the longer term as firms adapt to higher labor costs through productivity improvements. However, the findings differ from those of Sirait (2020), who reported that provincial minimum wages have a negative and significant effect on investment across Indonesian provinces. One possible explanation for this difference is that Sirait (2020) examined investment at the provincial level, whereas the present study focuses on regencies and municipalities in Central Java. Differences in units of analysis, regional economic characteristics, and investment measures may therefore contribute to the contrasting findings.

D. The Effect of Road Infrastructure on Investment in Central Jawa

The insignificant effect of road infrastructure indicates that the length of roads in good and moderate condition was not associated with investment realization across regencies and municipalities in Central Java Province during the study period. This finding suggests that the road infrastructure indicator employed in this study may not fully capture the aspects of transportation infrastructure that are most relevant to investment activities.

Road infrastructure in this study is measured by the length of roads in good and moderate condition, which primarily reflects the physical condition of road networks. However, this indicator does not necessarily represent regional accessibility, connectivity, or transportation efficiency. Limao and Venables (2001) argue that the economic benefits of transportation infrastructure arise from its ability to reduce transport costs and improve market accessibility. Therefore, improvements in road conditions alone may not be sufficient to explain variations in investment realization if they are not accompanied by better connectivity and more efficient transportation networks.

The findings are consistent with those of Safitri et al. (2025), who also found that road infrastructure does not significantly affect investment across regencies and municipalities in Central Java Province. However, the results differ from those of Sumadiasa et al. (2016), who reported that road infrastructure positively and significantly affects foreign direct investment in Bali Province. This discrepancy may be attributed to differences in regional characteristics, investment measures, and infrastructure indicators used in each study.

CONCLUSION

This study examined the effects of the Electronic-Based Government System (SPBE), Gross Regional Domestic Product (GRDP), Regency/City Minimum Wage (UMK), and road infrastructure on investment realization across regencies and municipalities in Central Java Province during the 2022–2024 period using panel data regression analysis. The results indicate that GRDP and UMK have a positive and statistically significant effect on investment realization, whereas SPBE and road infrastructure do not have a statistically significant effect.

These findings imply that regional economic capacity remains a key determinant of investment attractiveness. Higher GRDP reflects stronger market potential and economic activity, while the positive effect of UMK suggests that investors consider not only labor costs but also regional productivity and market prospects. In contrast, improvements in digital government and road infrastructure alone may not be sufficient to directly stimulate investment without broader institutional improvements and supportive economic conditions. Therefore, policies aimed at attracting investment should not rely solely on digital transformation or physical infrastructure development but should also promote regional economic growth, improve the overall investment climate, and strengthen policy coordination across sectors.

This study has several limitations. First, the observation period is relatively short, covering only 2022–2024, which may not fully capture the long-term effects of institutional reforms such as SPBE on investment. Second, the study focuses only on regencies and municipalities in Central Java Province, limiting the generalizability of the findings to other regions. Third, road infrastructure is measured only by the length of roads in good and moderate condition, which may not fully reflect regional accessibility and transportation connectivity relevant to investment decisions.

Future research is encouraged to employ longer observation periods and broader geographical coverage to better capture the dynamic relationship between governance and investment. In addition, future studies may incorporate alternative infrastructure indicators, such as transportation connectivity, logistics performance, or digital infrastructure, which may better reflect regional accessibility than road length alone. Considering that regional investment decisions are influenced by various economic, institutional, and socio-political factors, future research may also include additional explanatory variables, such as human capital, industrial agglomeration, fiscal capacity, ease of doing business, political stability, and investment incentives. The inclusion of these variables is expected to provide a more comprehensive explanation of regional investment performance and improve the explanatory power of the empirical model.

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