

The Impact of Government Road Infrastructure Development on Regional Economic Growth in West Java

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ABSTRACT:

Infrastructure development is a key driver of economic growth, particularly in developing countries where transportation networks support production, distribution, and market integration. Among various forms of infrastructure, road networks play a strategic role in improving regional connectivity, reducing logistics costs, increasing factor mobility, and expanding access to economic opportunities. In Indonesia, road infrastructure development has been prioritized within the national development agenda since 2015 to promote balanced economic growth and reduce regional disparities. Although the total road network has expanded, differences in road quality and accessibility continue to create unequal economic opportunities across regions. In West Java Province, one of Indonesia's primary economic hubs, substantial contributions to the national economy are accompanied by significant disparities in economic performance among districts and cities. These differences are closely associated with variations in infrastructure availability and quality. This study examines the relationship between road infrastructure development and regional economic growth in West Java by analyzing the role of road availability in supporting economic performance. The findings are expected to provide empirical evidence on the contribution of transportation infrastructure to regional development and offer policy recommendations for improving infrastructure investment strategies to achieve more equitable and sustainable economic growth.

Keywords: Road infrastructure; Regional economic growth; Transportation infrastructure; West Java; Regional development; Indonesia.

1. Introduction

Infrastructure development is one of the main determinants in driving economic growth, especially in developing countries. Road

infrastructure has a strategic role because it functions as the main link for production, distribution, and consumption activities. From the perspective of regional economic growth theory, improving connectivity through

infrastructure can reduce logistics costs, increase the mobility of production factors, and expand market access (World Bank, 2022). Globally, countries with good infrastructure quality tend to have a more stable and inclusive economic growth rate. Therefore, government investment in road construction is a crucial policy instrument to increase regional competitiveness (Hilman et al., 2026).

In Indonesia, road infrastructure development has become a top priority in the national development agenda, especially since the 2015 period until now. The government has consistently increased its infrastructure budget to accelerate economic growth and reduce the gap between regions. According to data from the Central Statistics Agency, road lengths in Indonesia continue to increase, but the distribution and quality are still uneven. This has an impact on the inequality of economic access between regions, especially between urban and rural areas. Empirical studies show that uneven road infrastructure can hinder regional economic integration (Prasetyo & Firdaus, 2021). West Java Province specifically, as one of the centres of national economic growth has an important role in supporting industrial and trade activities. West Java contributes significantly to

the national Gross Regional Domestic Product (GDP). However, economic growth in this region still shows disparities between districts and cities. Some areas are experiencing rapid growth, while others are lagging behind due to the limitations of adequate road infrastructure. This phenomenon shows that road construction has not been fully optimal in encouraging economic equity (Siregar et al., 2023).

Besides road infrastructure, regional economic growth is also influenced by investment and labor. Investment increases production capacity, encourages business expansion, and creates employment opportunities. Meanwhile, labor represents a key production factor that determines the productivity of regional economic activities (Hanoteau et al., 2026). Data from West Java show that districts and cities with higher investment realization and larger labor force participation rates generally experience stronger economic performance. Therefore, investment and labor are important control variables to be included when examining the effect of road infrastructure development on regional economic growth.

The following is an overview of the data on the development of road length and economic growth in West Java.

Table 1: Road length and economic growth in West Java

Year	Road Length (km)	Economic Growth (%)
2020	28.450	-2,52
2021	28.900	3,74
2022	29.300	5,45
2023	29.750	5,00
2024	30.100	4,95

Source: Central Statistics Agency (<https://www.bps.go.id>), processed (2025)

A number of previous studies have examined the relationship between infrastructure development and economic growth. Studies by Calderón and Servén (2021) show that transportation infrastructure has a positive impact on long-term economic growth. Another study by Setiawan (2022) in Indonesia found that road construction has a significant effect on

increasing regional GDP. However, different research results are shown by Zhang et al. (2023) who state that the infrastructure effect is highly dependent on implementation efficiency and governance quality. These findings suggest that the relationship between infrastructure and economic growth is not always linear

1.1.1 Limitations of Previous Research

Road infrastructure development is one of the main instruments in encouraging regional economic growth. Factually, the Indonesian government continues to increase investment in the infrastructure sector to strengthen regional connectivity and reduce logistics costs. However, data from the Central Statistics Agency shows that although road lengths in Indonesia, including in West Java, are increasing every year, the distribution and quality

of roads are still uneven. Some regions have good road access and support economic activities, while other areas still experience limited access that hinders the mobility of goods and services. This condition has an impact on the difference in economic growth rates between regions. This fact shows that increasing the quantity of infrastructure is not necessarily in line with improving its quality and effectiveness in driving economic growth.

The core problem in this study lies in the lack of optimal utilization of road infrastructure development in encouraging regional economic growth. In the field, roads are still found with damaged conditions, limited access to economic centers, and development inequality between districts and cities. This causes distribution costs to remain high and reduces regional competitiveness. If this condition is not addressed immediately, the economic gap between regions will widen, economic growth will become uneven, and regional investment potential will not be able to develop optimally. The long-term impact is low economic efficiency and inhibition of sustainable development at the regional level.

Previous research shows that road infrastructure development has a positive relationship with economic growth, but these findings have not been consistent. Some studies affirm that infrastructure improvement is able to drive regional GDP growth, while other studies show that the impact is highly dependent on infrastructure quality, implementation efficiency, as well as

supporting factors such as investment and labor (Calderón & Servén, 2021; Zhang et al., 2023). In addition, most of the research still uses national aggregate data

and has not specifically examined conditions in West Java with the latest data. This shows that there are research gaps that need to be filled through a more contextual and comprehensive approach.

Based on this description, the main problems in this study can be formulated as follows:

- There is an inequality in the development of road infrastructure between regions in West Java which has the potential to affect regional economic growth.
- The increase in the quantity of road infrastructure has not fully reflected the improvement in quality and accessibility.
- It is not clear the magnitude and significance of the influence of road infrastructure development on regional economic growth.
- The limitations of previous research in including control variables such as investment and labor.
- The lack of recent quantitative research that specifically analyzes the relationship in West Java for the 2015–2024 period.

The formulation of this problem shows that research has high relevance in the development of business administration science, especially in the study of public policy and regional economic development based on empirical data.

1.1.2 Problem Identification

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2 Literature Review

The theory of regional economic growth describes how a region experiences an increase in economic activity through the accumulation of capital, labor, technology, and infrastructure. In this study, the theory of regional economic growth is used as a grand theory to explain the relationship between road infrastructure development and regional economic growth in West Java.

One of the main theories used is Solow's neoclassical growth model which states that economic growth is influenced by capital, labor, and technological advances. Road infrastructure is seen as a form of public capital that is able to increase regional economic productivity. Good infrastructure can accelerate the distribution of goods, increase labor mobility, and expand market access, thereby driving regional economic growth (Barro, 2021).

According to (OECD, 2022), regional economic growth is reflected in an increase in the Gross Regional Domestic Product (GRDP), regional productivity, and an increase in people's economic activities. In addition, (Rodríguez-Pose, 2022) explained that infrastructure quality is one of the important factors in reducing growth inequality between regions. (McCann, 2021) also states that regional connectivity has a significant influence on regional economic competitiveness. Furthermore, (World Bank, 2023) emphasized that the development of transportation infrastructure is able to create more inclusive and sustainable economic growth.

Infrastructure development theory explains that infrastructure is physical capital that supports economic activity and increases

production efficiency. Road infrastructure is one of the important elements because it functions to connect production, distribution, and consumption areas.

Infrastructure development has a direct influence on economic growth through increasing transportation efficiency and reducing logistics costs. (Calderón & Servén, 2022) also explains that the quality of transportation infrastructure contributes to increased productivity and regional investment. In addition, (Banerjee, Duflo, & Qian, 2022) found that road construction increases market access and local trade activity. Road infrastructure connectivity is able to increase economic integration between regions. Meanwhile, (Donaldson, 2022) shows that better transportation access can significantly increase regional trade and economic growth.

2.1 The Concept of Public Investment and the Multiplier Effect

The concept of public investment explains that government spending on infrastructure can create a *multiplier effect* on economic growth. Road infrastructure not only improves connectivity, but also encourages investment, labor absorption, and new economic activity.

According to (Jorgenson, 2021), public investment increases capital productivity and economic output. (Aschauer, 2021) also explains that infrastructure investment has a long-term effect on regional economic growth. In addition, (UNCTAD, 2022) states that good infrastructure is able to attract domestic and foreign investment (Chatterjee & Turnovsky, 2021) shows that public investment can accelerate economic growth through increased productivity.

2.2 Research Gap

Previous studies have consistently highlighted the importance of transportation infrastructure in promoting regional economic growth. Road infrastructure improves connectivity, facilitates the movement of goods and services, reduces transportation costs, and enhances market accessibility, thereby supporting productivity

and regional competitiveness. Calderón and Servén (2004) demonstrated that both the quantity and quality of infrastructure significantly contribute to long-term economic growth and income distribution across countries. Likewise, Percoco (2021) emphasized that transport infrastructure plays an important role in strengthening regional development

by improving accessibility and supporting economic activities. These findings indicate that infrastructure investment generally contributes positively to economic performance.

However, empirical findings regarding the relationship between road infrastructure and regional economic growth remain inconclusive. While many studies report a positive contribution of transportation infrastructure, Sawitri (2023) found that road construction in Indonesia had only a limited contribution to regional economic development after accounting for spatial dependence among provinces. The study further reported that the spatial spillover effect of road construction was statistically negligible, suggesting that improvements in road infrastructure do not always generate significant

economic benefits across regions. These inconsistent findings indicate that the relationship between road infrastructure and regional economic growth may vary depending on the geographical context, regional characteristics, and analytical approach employed.

In addition to the empirical inconsistency, a contextual gap remains in the existing literature. Most previous studies have examined the relationship between infrastructure and economic growth at the international, national, or provincial level. Calderón and Servén (2004) analyzed cross-country data, while Percoco (2021) focused on regional development in Europe.

Similarly, Sawitri (2023) investigated road construction using panel data from 34 provinces in Indonesia, whereas Mahardika and Hayati (2024) examined the influence of infrastructure on Gross Regional Domestic Product in Eastern

Indonesia. Although these studies provide valuable insights, limited research has specifically examined the impact of government road infrastructure development at the regency and city level in West Java. Considering that West Java is one of Indonesia's largest economic contributors with substantial differences in infrastructure development, investment realization, labor conditions, and economic performance across its 27 regencies and cities, further investigation within this regional context is necessary.

3 Research Methodology

This study employs a quantitative research approach using secondary data obtained from the Statistics Indonesia (Badan Pusat Statistik/BPS). The analysis focuses on the impact of government road infrastructure development on regional economic growth across regencies and municipalities in West Java. Secondary data are collected from official BPS publications and statistical databases, including indicators related to road infrastructure (such as road length, road condition, and infrastructure expenditure where available) and regional economic performance, measured by Gross Regional Domestic Product (GRDP) growth.

The use of secondary data ensures the reliability and consistency of the dataset, as the information is compiled and validated by the national statistical authority. The collected data are analyzed using appropriate quantitative techniques to examine the relationship between government road infrastructure development and regional economic growth, thereby providing empirical evidence to support policy recommendations for sustainable regional development in West Java.

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The unit of analysis in this study consists of regencies and municipalities in West Java Province over a specified observation period. A panel dataset is constructed by combining cross-sectional data from each region with annual time-series data, allowing the study to capture both regional differences and changes over time. The selected variables include regional economic growth as the dependent variable, while government road infrastructure development serves as the primary independent variable.

To improve the robustness of the analysis, several control variables—such as population size, labor force participation, investment, government expenditure, and educational attainment—may also be incorporated depending on data availability. These variables are expected to account for other factors that influence regional economic performance.

To analyze the relationship between government road infrastructure development and regional economic growth, this study applies panel data regression analysis, which is appropriate for datasets containing both cross-sectional and time-series dimensions.

Prior to estimating the regression model, descriptive statistical analysis is conducted to summarize the characteristics of the data, followed by classical assumption tests and model selection procedures, including the Chow

test, Hausman test, and Lagrange Multiplier test, to determine the most suitable estimation model among the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). The selected model is then used to estimate the magnitude and significance of the impact of road infrastructure development on regional economic growth. Statistical analyses are performed using appropriate econometric software to ensure accurate estimation and reliable interpretation of the empirical findings.

4. Result and Discussion

The West Java election is also based on the inequality of economic growth between districts and cities that still occurs even though road infrastructure development continues to be carried out by the local government and the central government. Some areas in West Java have high levels of economic growth and accessibility, while others still face limited transportation and economic distribution infrastructure.

This condition makes West Java a relevant location to analyze how road infrastructure development can affect regional economic growth in a more empirical and measurable manner. In addition, the availability of secondary data from the Central Statistics Agency (BPS), local governments, and related ministries is also an important reason in supporting the process of collecting and analyzing research data.

The data sources in this study come from various official government agencies that provide statistical data related to road infrastructure development and regional economic growth. The main source of research data comes from the Central Statistics Agency of West Java Province which provides data on Gross Regional Domestic Product (GDP), labor, investments, and other regional economic indicators.

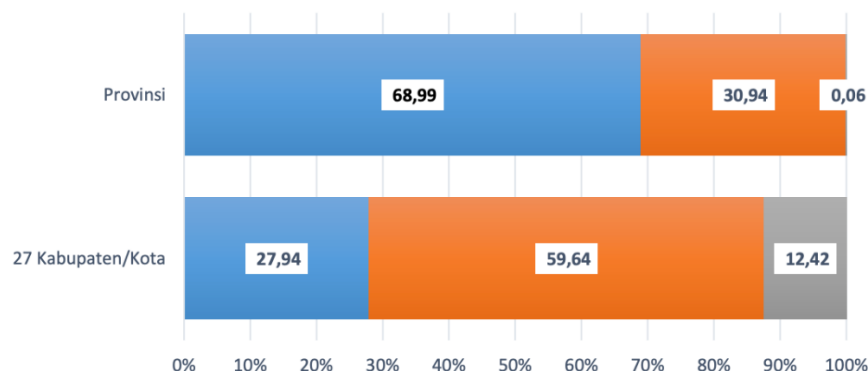
Figure 1: Growth 2023-2025

This research also uses data from local government reports, regional development documents, and official publications of relevant ministries that have relevance to the research variables. Regional investment data is obtained from the Investment Coordinating Board and regional investment reports issued by the government. Meanwhile, labor and urbanization data are obtained from the annual publication of the Central Statistics Agency. All of these data are used because they are directly related to the research variable, namely road infrastructure development as a factor that affects regional economic growth.

The use of official government data sources is carried out to ensure the validity, reliability, and

accuracy of research data. According to (Hair et al., 2022), data quality is an important factor in quantitative research because it will affect the accuracy of statistical analysis results and research conclusions. In addition, the use

of official data from government agencies helps research obtain standardized and scientifically accountable data. Thus, the data sources used in this study are considered to be able to support the analysis process objectively and produce empirical findings that are relevant to the research objectives regarding the influence of road infrastructure development on regional economic growth in West Java.

Figure 2: Distribution of Economic Growth

In addition to documentation, this study also uses literature study techniques to obtain theoretical foundations and results of previous research that are relevant to the research topic. Literature studies are carried out by collecting

various scientific references such as research methodology books, national and international journals, academic articles, research reports, and government policy documents related to road infrastructure

development and regional economic growth. According to (Sekaran & Bougie, 2021), literature studies help researchers understand theoretical concepts, identify research gaps, and systematically construct a research conceptual framework. This technique is also used to strengthen theoretical arguments regarding the relationship between road infrastructure development and regional economic growth so that the research model has a strong scientific basis.

The data collection process is carried out systematically starting from the stage of identifying research data needs, determining data sources, collecting statistical documents, verifying data, to processing research data. In the initial stage, the researcher determines the type of data needed according to the research variables. Furthermore, data is collected from official government sources that have high credibility so that the quality of the data can be maintained. After the data is

obtained, the researcher conducts a data checking and verification process to ensure the suitability of the data with the needs of the research. According to (Hair et al., 2022), the validity of data in quantitative research can be improved through the use

of official data sources and a systematic data verification process. In addition, the reliability of the data is also maintained by using statistical data that is published periodically and has consistent measurement standards.

4 Conclusion

The findings of this study are expected to provide practical contributions to several stakeholders. For the regional government, the results offer empirical evidence that can support the formulation of more effective, efficient, and targeted road infrastructure development

policies to promote sustainable economic growth in West Java. For public policy planners, the study serves as a valuable reference in designing data-driven infrastructure development strategies aimed at reducing regional economic disparities and enhancing balanced development across regencies and municipalities. Furthermore, for academics and researchers, this research contributes to the existing body of knowledge on the relationship between transportation infrastructure and regional economic growth, providing a foundation for future studies and encouraging the development of more comprehensive analytical models and methodologies in this field..

Research Limitations

This research is focused on analyzing the influence of road infrastructure development on regional economic growth in West Java with a quantitative approach. The main variables analyzed include road infrastructure development as an independent variable and regional economic growth as a dependent variable. This study also included control variables in the form of investment and labor to increase the accuracy of the analysis. The research analysis unit is all districts and cities in West Java using secondary data in a certain period of time that reflects the latest conditions. The determination of this limit is based on considerations so that research is more directed, measurable, and able to produce specific findings. Focusing on a single region allows for a more in-depth analysis of regional characteristics, while the use of selected variables aims to avoid excessive model complexity while still maintaining the relevance of the analysis. In addition, the use of data from the latest period is carried out so that the research results reflect actual empirical conditions and are relevant to current policy needs.

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