

Local Government Financial Performance and Road Infrastructure Development: Geographic Accessibility as Moderator

Danar Setyo Utomo^{1*}, Arung Lamba², Agustina Sanggrangbano³

Universitas Cenderawasih, Papua, Indonesia^{1,2,3}

danarsutomo@gmail.com^{1*},



Article History

Received on 27 May 2026

1st Revision on 16 June 2026

2nd Revision on 1 July 2026

Accepted on 21 July 2026

Abstract

Purpose: This study examines the effect of local government financial performance on road infrastructure development in the regencies and municipalities of Papua Province, Indonesia, and tests whether geographic accessibility moderates this relationship.

Research Methodology: The study applies a quantitative panel data approach covering 29 regencies and municipalities in Papua Province prior to the establishment of new autonomous regions, observed over the 2018 to 2022 period, yielding 145 observations. Local government financial performance is measured through the Regional Financial Independence Ratio and the Capital Expenditure Ratio, road infrastructure development is proxied by the Road Density Ratio, and geographic accessibility is proxied by the Construction Cost Index. Panel data regression was estimated using the Random Effect Model, selected through the Chow, Hausman, and Lagrange Multiplier tests, with moderation tested through interaction terms.

Results: The Regional Financial Independence Ratio and the Capital Expenditure Ratio did not have a significant effect on the Road Density Ratio, and the Construction Cost Index was not proven to moderate either relationship. The model explained only 3.60% of the variation in the Road Density Ratio.

Conclusions: Road infrastructure development in Papua cannot be strongly explained by local financial performance and geographic accessibility alone.

Limitations: The study is confined to the pre-division administrative boundaries of Papua Province and uses aggregate capital expenditure rather than road-specific spending.

Contributions: The study offers empirical evidence on the limits of standard financial performance indicators in explaining physical infrastructure outcomes in a geographically extreme setting, informing more targeted budget allocation policy.

Keywords: *Capital Expenditure Ratio, Construction Cost Index, Financial Independence Ratio, Panel Data Regression, Road Density Ratio*

How to Cite: Utomo, D. S., Lamba, A., & Sanggrangbano, A. (2026). Local Government Financial Performance and Road Infrastructure Development: Geographic Accessibility as Moderator. *Advances in Management and Business Studies*, 1(4), 209-227.

1. Introduction

Road infrastructure development in Papua faces persistent structural challenges rooted in low fiscal independence, limited development expenditure, vast administrative territory, and geographic barriers that drive up construction costs. These conditions place Papua in a distinctive position among Indonesian provinces, where the physical task of connecting communities across mountainous and remote terrain competes with an already constrained local revenue base. Understanding whether local government financial capacity translates into measurable improvements in road connectivity is therefore a question with direct bearing on regional development policy in the province.

Public finance theory holds that the capacity of local governments to raise and manage their own revenue should expand the fiscal space available for financing public infrastructure, since capital investment of this kind generates broad social benefits and positive externalities that private markets tend to underprovide ([Musgrave, 1959](#)). Fiscal decentralization scholarship extends this logic by arguing that devolving revenue and expenditure authority to subnational governments should, in principle, improve the responsiveness of public spending to local development needs ([Oates, 1999](#)). Applied to Indonesia, decentralization has granted regencies and municipalities substantial authority over budget composition, yet regional fiscal independence remains structurally low across much of the country, and Papua is no exception ([Negara & Khoirunurrofik, 2021](#); [Ningsih, Frinaldi, & Magriasti, 2023](#)).

Within this fiscal architecture, capital expenditure is often treated as the budgetary channel most directly linked to physical infrastructure outcomes, since it funds the acquisition and construction of fixed assets. Evidence from other Indonesian provinces suggests that capital expenditure and financial performance together play an important role in shaping regional economic outcomes, although the strength and direction of this relationship varies considerably by context and by which specific development indicator is examined ([Zein, Muhtarom, Mulyadi, & Septiani, 2024](#)). Some studies find that regional own-source revenue and specific purpose grants exert a positive influence on capital expenditure allocation, while general transfer funds show a comparatively weaker effect ([Agustina, Pramono, Akbar, & Alma, 2022](#)). Others document that local government financial performance interacts with investment, decentralization, and capital expenditure in shaping economic growth and poverty outcomes in ways that are not always statistically significant across every channel tested ([Miar, Zakiyah, Giovanni, & Cerisma, 2024](#)).

Geography compounds these fiscal constraints in Papua in ways that few other Indonesian regions experience. Construction costs in Papua are consistently among the highest in the country, driven by mountainous terrain, dispersed settlement patterns, and dependence on costly logistics for delivering materials and equipment to remote sites. The Construction Cost Index published by Indonesia's national statistics agency captures this variation directly, expressing the relative cost of construction in each region against a reference city, and Papuan provinces routinely record the highest index values nationally. This cost differential is not a minor friction, it fundamentally changes how far a given rupiah of capital expenditure can travel in expanding physical infrastructure, which is why geographic accessibility is treated in this study as a variable that may condition, rather than simply parallel, the effect of financial performance on infrastructure outcomes.

The relationship between local fiscal capacity and infrastructure provision has attracted growing empirical attention across Indonesia, from studies on regional revenue components and capital spending allocation to analyses of construction sector performance and procurement readiness in government projects ([Al Fath, Herwindiaty, Wibowo, & Sari, 2024](#)). Road infrastructure specifically has been linked to regional connectivity and competitiveness in comparative international research, where road interventions are shown to reshape accessibility and transport costs in ways that extend beyond the immediate budget outlay involved ([Montoya, Escobar, & Galindo, 2021](#)). Yet relatively little of this literature isolates the Papuan context, where fiscal independence, capital expenditure composition, and construction cost differentials interact under conditions more extreme than those found in Java, Sumatra, or Sulawesi.

Financial performance assessments specific to Papuan local governments reinforce this picture. Analysis of a Papuan municipal government's financial ratios shows a pattern of continued dependence on central transfers alongside modest own-source revenue growth, a structural condition that likely recurs across many of the province's 29 regencies and municipalities ([Melmambessy, 2022](#)). Special autonomy transfers intended to accelerate development in Papua have also produced mixed results when evaluated against human development outcomes, suggesting that the channel from fiscal inflows to tangible development gains is neither automatic nor uniform ([Muhtarulloh, 2021](#)). These findings collectively motivate closer scrutiny of whether standard financial performance ratios can explain variation in a physical infrastructure outcome as specific as road density.

Against this background, this study investigates the effect of local government financial performance, measured through the Regional Financial Independence Ratio and the Capital Expenditure Ratio, on road infrastructure development, proxied by the Road Density Ratio, across the 29 regencies and municipalities that constituted Papua Province before the 2022 to 2023 establishment of new autonomous regions. The study further examines whether the Construction Cost Index, as a proxy for geographic accessibility, moderates this relationship. Restricting the sample to the pre-division administrative boundaries preserves consistency and comparability of the panel data across the 2018 to 2022 observation period, before the province's territorial and administrative structure changed.

The remainder of this paper proceeds as follows. Section two reviews the relevant theoretical and empirical literature and develops the study hypotheses. Section three describes the research methodology, including the panel data regression and moderation testing procedures. Section four presents the empirical results and discusses their implications in light of the existing literature and the specific conditions of Papua Province. Section five concludes with the study's contributions, limitations, and directions for future research.

2. Literature Review and Hypotheses Development

2.1 Public Finance and Fiscal Decentralization Theory

Public finance theory provides the foundational rationale for expecting local government financial capacity to influence infrastructure provision. [Musgrave \(1959\)](#) frames the allocation function of government as addressing goods and services that generate collective benefits, including infrastructure that facilitates broader economic activity even where the asset itself, such as a road, is not a pure public good in the strict textbook sense. Government involvement in infrastructure provision is justified on the grounds that market mechanisms alone tend to underprovide assets whose benefits spill over widely across users and future beneficiaries.

Fiscal decentralization theory extends this reasoning to the question of which level of government should undertake this allocation function. [Oates \(1999\)](#) argues that subnational governments are often better positioned than central authorities to match public expenditure to local preferences and conditions, provided they possess adequate revenue-raising authority and administrative capacity. In the Indonesian context, this theoretical expectation has been tested repeatedly against the reality of persistently low regional financial independence. [Negara and Khoirunurrofik \(2021\)](#) find that fiscal decentralization policy has produced uneven convergence in per capita income across Indonesian regencies and cities, while [Ningsih, Frinaldi, and Magriasti \(2023\)](#) document that the practical implementation of fiscal decentralization in Indonesia continues to be constrained by structural dependence on central government transfers. [Lewis \(2023\)](#) offers a critical assessment of Indonesia's most recent fiscal decentralization law and argues that its reforms, while technically extensive, do not resolve the underlying structural drivers of weak regional fiscal capacity, including limited local revenue bases and continued central control over key transfer instruments. These findings collectively suggest that the theoretical promise of decentralization, namely that localities with greater fiscal autonomy make more responsive spending decisions, does not automatically materialize where own-source revenue capacity remains thin.

2.2 Regional Financial Independence and Capital Expenditure

Regional financial independence and capital expenditure are the two indicators most commonly used to operationalize local government financial performance in Indonesian public finance research. [Agustina, Pramono, Akbar, and Alma \(2022\)](#) identify financial autonomy and the degree of fiscal decentralization as key determinants of why many regions continue to record low financial independence, a pattern with direct implications for how much of a region's own budget can be steered toward development priorities such as roads. [Zein, Muhtarom, Mulyadi, and Septiani \(2024\)](#) examine the joint role of financial performance and capital expenditure in shaping economic growth in Banten Province and find that these variables matter for growth outcomes, although the specific composition and targeting of capital expenditure appears to condition how strongly this relationship holds.

Capital expenditure ratio in particular is often treated as a proxy for a government's orientation toward asset formation rather than routine operational spending. However, capital expenditure as conventionally measured is an aggregate category that includes land acquisition, buildings, equipment, and networks alongside roads, which means a rise in the ratio need not correspond to a proportional rise in road construction specifically. [Miar, Zakiyah, Giovanni, and Cerisma \(2024\)](#) analyze fiscal decentralization, investment, and local financial performance jointly in relation to economic growth and poverty in Central Kalimantan Province and find that while some financial and fiscal variables exert direct and significant effects, others, including investment, do not reach statistical significance despite carrying the theoretically expected sign. This pattern of partial and inconsistent significance across financial performance indicators recurs frequently enough in the Indonesian regional finance literature to caution against assuming a uniform, strong relationship between financial ratios and any single development outcome.

[Melmambessy \(2022\)](#) provides evidence specific to the Papuan context, showing that a municipal government's independence, dependency, decentralization, and effectiveness ratios reveal a financial structure still heavily reliant on transfers from the central government. This finding is important because it suggests that the low financial independence documented nationally is, if anything, more pronounced in Papua, which has direct implications for how much fiscal room regencies and municipalities in this province actually have to direct toward road construction from their own revenue base.

Empirical studies on the determinants of capital expenditure in Indonesian local governments consistently point to regional own-source revenue and specific-purpose transfers as more influential drivers than general allocation funds, although the relative strength of each channel varies by region. [Ananta and Erawati \(2024\)](#) find that regional own-source revenue and the revenue-sharing fund significantly shape capital expenditure allocation among city districts in Bali Province, while the general allocation fund shows a comparatively weaker effect. [Purnasari, Sitompul, and Laowo \(2022\)](#) report a similar pattern in North Sumatra, where own-source revenue and specific-purpose transfers, rather than the general allocation fund, are the stronger determinants of capital spending, and [Hadisantoso, Arifuddin, Wawo, and Ridwan \(2023\)](#) reach a comparable conclusion for Southeast Sulawesi. These findings reinforce the view that the composition of a region's revenue base, not merely its aggregate size, shapes how capital expenditure is allocated. [Haq, Wati, and Istianda \(2023\)](#) further show that capital expenditure allocation can mediate the relationship between regional financial performance and economic growth in Aceh Province, suggesting that capital expenditure functions as a transmission channel whose effectiveness depends on how the allocation is targeted rather than on financial performance alone. [Furqan, Wardhani, Martani, and Setyaningrum \(2020\)](#) add an accountability dimension to this picture, finding that audit findings and the follow-up on audit recommendations shape the quality of financial reporting and public service delivery in Indonesian local governments, indicating that financial oversight mechanisms condition how effectively fiscal resources translate into service and infrastructure outcomes.

Recent evidence from the Papuan highlands reinforces this picture in a setting even more resource-constrained than Jayapura. [Gwijjange, Marlissa, and Urip \(2026\)](#) document that Nduga Regency's

regional own-source revenue remains persistently low and unstable, driven by weak local economic capacity and heavy dependence on central transfers, while [Usman, Marlissa, and Urip \(2026\)](#) find that regional development planning in the same regency is similarly constrained by limited institutional and fiscal capacity. [Al, Akbar, and Wijaya \(2021\)](#) report a related pattern in South Sumatra, where balancing funds rather than locally generated revenue remain the dominant driver of regional economic performance, underscoring how dependent many Indonesian regions remain on central transfers regardless of geographic setting.

Beyond Papua, comparable evidence from other resource-dependent and geographically peripheral Indonesian regions reinforces the caution against assuming a strong, uniform link between financial performance and infrastructure outcomes. [Sadaruddin, Manan, and Sriningsih \(2024\)](#) map financial performance and regional capability across regencies and municipalities in Nusa Tenggara Barat Province and find considerable variation in fiscal capacity that does not consistently track with development outcomes, a pattern broadly similar to the variation observed among Papuan regencies and municipalities in the present study. [Redu, Vernanda, and Sumaryadi \(2023\)](#) examine the economic base structure of Jayawijaya Regency, a highland Papuan district bordering the present study's sample, and find that the regency's economic base sectors do not automatically translate into stronger fiscal or infrastructure outcomes, echoing the disconnect between financial capacity and physical development results documented here. [Hummel and Kusumasari \(2025\)](#) compare financial performance measures across Indonesian cities before, during, and after the COVID-19 pandemic and find that decentralization-related indicators, including independence and direct spending ratios, behave inconsistently across localities and time, reinforcing the view that standardized financial ratios capture only part of what determines local development capacity. [Aprianto \(2021\)](#) finds that leverage, legislative measures, and intergovernmental revenue shape regency and city government financial performance in Indonesia to varying degrees, while [Zakaria and Syahputra \(2022\)](#) show that even in a comparatively wealthy province such as West Java, optimizing regional own-source revenue remains an ongoing challenge for achieving fiscal independence, suggesting that the structural constraints documented in Papua are not unique to geographically remote provinces alone. [Afrizal and Khoirunurrofik \(2022\)](#) find that infrastructure development is one of several factors, alongside education, tourism, and agriculture, that jointly shape regional economic growth in Indonesia, implying that infrastructure's contribution to development outcomes is best understood as part of a broader bundle of regional conditions rather than as a standalone function of financial input. [Dellyana, Arina, and Fauzan \(2023\)](#) extend this argument to the domain of digital governance, showing that the effectiveness of governmental digital infrastructure initiatives in Indonesia's creative economy depends on institutional readiness and cross-sector coordination rather than on funding availability alone, a conclusion consistent with the broader pattern that infrastructure outcomes of all kinds depend on more than financial capacity.

Broader governance research reinforces the view that financial performance indicators alone do not fully capture whether local governments translate fiscal capacity into effective outcomes. [Setiawan, Winarna, and Nugroho \(2022\)](#) find that regulatory clarity and internal control conditions, rather than financial capacity in isolation, are central determinants of local government accountability, while [Salomo and Rahmayanti \(2023\)](#) show that Indonesia's national performance accountability reform has produced measurable but uneven improvement across local governments, frequently constrained by administrative formalism rather than by financial capacity per se. [Sudirman and Saidin \(2022\)](#) similarly find that digital governance infrastructure, an increasingly relevant complement to conventional capital expenditure, requires institutional readiness alongside investment to generate development outcomes. [\(Virani & van der Wal, 2023\)](#) further argue that public sector performance regimes function as configurations of governance design choices, implying that financial performance indicators should be read alongside the institutional arrangements that determine how that capacity is deployed. [Muturi \(2023\)](#) reaches a related conclusion in a cross-country context, noting that infrastructure investment supports economic development most reliably when paired with adequate institutional capacity for project execution, rather than functioning as a standalone driver of outcomes.

2.3 Regional Development Theory and Road Infrastructure

Regional development theory offers a complementary lens for understanding why financial capacity alone may not translate into infrastructure outcomes. [Rostow \(1960\)](#) stages-of-growth framework treats infrastructure investment as a precondition for a region's economic take-off, implying that infrastructure gaps constrain subsequent development rather than merely reflecting it. This view is consistent with the broader premise that connectivity, rather than simply financial input, is the proximate driver of regional economic integration.

Road density specifically has been examined as an outcome variable in comparative infrastructure research. [Montoya, Escobar, and Galindo \(2021\)](#) analyze road interventions in a Colombian municipality and find that improved road connectivity reshapes transport costs and the number of feasible trips, reinforcing the idea that road infrastructure operates as an enabler of regional competitiveness distinct from the financial inputs used to build it. This distinction between financial input and physical output is central to the present study, since it implies that road density may respond to factors beyond the financial ratios captured in standard local government accounts, including planning quality, construction sequencing, and central government co-financing of strategic routes.

Direct evidence on Indonesian road infrastructure financing offers a cautionary parallel to the present study's expectations. [Saragih and Khoirunurrofik \(2022\)](#) find that the Special Allocation Fund, despite being explicitly earmarked for infrastructure, did not significantly improve road quality across Indonesian provinces between 2011 and 2018. [Azaki and Lutfi \(2023\)](#) similarly find that the allocative efficiency of the road-sector Special Allocation Fund varied considerably across Indonesian islands between 2015 and 2019, implying that the mere presence of earmarked infrastructure financing does not guarantee a proportional improvement in road networks. [Apriliani and Khoirunurrofik \(2020\)](#) reach a comparable conclusion for the health-sector Special Allocation Fund, showing that its effect on development performance depends heavily on how targeted and well-monitored the allocation is, a conditionality that plausibly extends to the road sector as well. [Hidayat, Tambunan, and Haning \(2025\)](#) extend this argument further, showing that local government infrastructure policy in Indonesia is shaped as much by political economy dynamics, including rent-seeking and budget capture, as by the technical adequacy of financing formulas, a pattern that helps explain why financial indicators alone, including those examined in this study, may fail to predict physical infrastructure outcomes such as road density.

2.4 Geographic Accessibility and Construction Cost as a Moderating Condition

Geographic accessibility is a particularly salient consideration in Papua, where construction costs vary substantially across regencies due to terrain, remoteness, and logistics constraints. The Construction Cost Index, published by Indonesia's national statistics agency, is designed precisely to capture this variation by benchmarking regional construction costs against a reference city. Al [Fath, Herwindiaty, Wibowo, and Sari \(2024\)](#) examine sustainable procurement readiness in Indonesian government construction projects and find that project delivery outcomes depend on a combination of cost conditions and institutional readiness, suggesting that cost alone does not mechanically determine construction results but interacts with implementation capacity.

Conceptually, a higher Construction Cost Index should reduce the physical output obtainable from a given amount of capital expenditure, since more of the budget is consumed by materials, labor, and logistics rather than converted into additional kilometers of road. This suggests that Construction Cost Index could plausibly weaken the positive relationship expected between financial performance and road density, since regions facing higher construction costs would need proportionally larger capital outlays to achieve the same physical increase in road network as regions with lower costs. Whether this moderating relationship holds empirically in the Papuan context, however, remains an open question that the present study is designed to test.

2.5 Special Autonomy Transfers and the Limits of Fiscal Inflows

Beyond own-source revenue and standard transfers, Papua receives special autonomy funds intended specifically to accelerate regional development and narrow welfare gaps with other Indonesian

provinces. [Muhtarulloh \(2021\)](#) evaluates the impact of Papua and West Papua's special autonomy funds on the Human Development Index and finds effects that are neither uniformly strong nor consistent across the observation period, indicating that additional fiscal inflows targeted at Papua's development gap do not automatically produce proportional improvements in development outcomes. This finding is instructive for the present study because it suggests that the weak link between financial indicators and development outcomes documented for special autonomy funds may extend to more conventional financial performance ratios as well, reinforcing the case for empirically testing rather than assuming this relationship for road infrastructure specifically.

2.6 Conceptual Framework

Drawing on the theoretical foundations and empirical findings reviewed above, this study's conceptual framework positions local government financial performance, represented by the Regional Financial Independence Ratio and the Capital Expenditure Ratio, as the independent variables expected to influence road infrastructure development, represented by the Road Density Ratio. Geographic accessibility, proxied by the Construction Cost Index, is positioned as a moderating variable expected to condition the strength of this relationship. Regions with higher construction costs are expected to see a weaker translation of financial capacity into road density, since a larger share of available capital expenditure is absorbed by cost inflation rather than converted into physical road length. This framework treats road infrastructure development not simply as a function of budgetary inputs but as an outcome jointly shaped by fiscal capacity and the geographic cost environment in which that capacity must be deployed.

2.7 Hypotheses

Based on the theoretical and empirical foundations discussed above, this study proposes the following hypotheses.

H₁: Local government financial performance has a positive effect on road infrastructure development in the regencies and municipalities of Papua Province

H₂: The Construction Cost Index weakens the effect of the Regional Financial Independence Ratio and the Capital Expenditure Ratio on the Road Density Ratio in the regencies and municipalities of Papua Province

Local governments with stronger financial capacity are expected to have greater fiscal space to allocate resources toward infrastructure development. However, the effectiveness of financial resources in improving road infrastructure may vary depending on regional accessibility conditions. In areas with higher construction costs, limited accessibility, and greater logistical challenges, the impact of financial performance on road development may be reduced because a larger proportion of available resources is absorbed by implementation constraints. Therefore, geographic accessibility is expected to influence the extent to which local financial performance contributes to road infrastructure outcomes.

3. Research Methodology

3.1 Research Design, Location, and Period

This study uses a quantitative approach with a panel data design, combining cross-sectional variation across regencies and municipalities with time-series variation across years. The study covers the 29 regencies and municipalities that constituted Papua Province before the establishment of new autonomous regions in 2022, observed annually from 2018 to 2022. Restricting the sample to this pre-division set of regions preserves administrative consistency and comparability of the panel across the observation period, since the province's territorial structure changed substantially after 2022. With 29 cross-sectional units observed over five years, the panel comprises 145 observations.

3.2 Data Types and Sources

The study relies on secondary quantitative data obtained from official government sources. Data on local government financial performance, used to compute the Regional Financial Independence Ratio and the Capital Expenditure Ratio, were drawn from realized Regional Revenue and Expenditure

Budget documents for each regency and municipality. Data on geographic accessibility, proxied by the Construction Cost Index, were obtained from official publications of Indonesia's national statistics agency. Data on road infrastructure, proxied by the Road Density Ratio, comprising road length relative to regional area in kilometers per square kilometer, were likewise obtained from statistical publications and official databases maintained by the national statistics agency.

3.3 Data Collection Method

Data were collected through documentary study, which involved compiling and reviewing official government documents and statistical publications relevant to the research variables. This method was appropriate given that all analyzed data are secondary and quantitative in nature. Budget realization reports, Construction Cost Index publications, and road length and regional area data were assembled systematically for each of the 29 regencies and municipalities across all five years of the observation period, yielding a dataset suitable for panel data analysis.

3.4 Analysis Method

Data were analyzed using a quantitative panel data approach with EViews software, combining descriptive statistical analysis with inferential panel data regression. Descriptive statistics summarize the mean, maximum, minimum, and standard deviation of each research variable, providing an initial picture of data distribution ahead of the inferential analysis.

The panel data regression model draws on the standard formulation described by [Gujarati and Porter \(2009\)](#), specified as follows:

$$Y_{it} = \alpha + \beta_1 * RKD_{it} + \beta_2 * RBM_{it} + \epsilon_{it} \quad (1)$$

Formula 1 show where Y: it is the Road Density Ratio in region i at year t, RKD: it is the Regional Financial Independence Ratio, RBM: it is the Capital Expenditure Ratio, alpha is the constant, beta1 and beta2 are regression coefficients, and epsilon: it is the error term.

Before interpreting the regression results, model selection among the Common Effect Model, Fixed Effect Model, and Random Effect Model was carried out through three sequential tests. The Chow test compared the Common Effect Model against the Fixed Effect Model, with a probability value below 0.05 favoring the Fixed Effect Model. The Hausman test compared the Fixed Effect Model against the Random Effect Model, with a probability value below 0.05 favoring the Fixed Effect Model and a value above 0.05 favoring the Random Effect Model. The Lagrange Multiplier test compared the Common Effect Model against the Random Effect Model, with a probability value below 0.05 favoring the Random Effect Model.

To test the moderating role of geographic accessibility, an interaction-term approach was used, following standard moderation testing procedures for panel regression models ([Muris, 2026](#); [Gujarati & Porter, 2009](#)). The full model incorporating the moderating variable is specified as follows:

$$Y_{it} = \alpha + \beta_1 * RKD_{it} + \beta_2 * RBM_{it} + \beta_3 * IKK_{it} + \beta_4 * (RKD_{it} * IKK_{it}) + \beta_5 * (RBM_{it} * IKK_{it}) + \epsilon_{it} \quad (2)$$

Formula 2 show where IKK_it is the Construction Cost Index, RKD_it x IKK_it and RBM_it x IKK_it are the interaction terms, and beta1 through beta5 are regression coefficients. The presence of a moderating effect is determined by the statistical significance of the interaction term coefficients, indicating whether geographic accessibility strengthens or weakens the effect of financial performance on infrastructure development.

3.5 Hypothesis Testing Procedure

Hypothesis testing used the estimated panel data regression results from both the baseline and moderation models. The effect of each independent variable on the dependent variable was tested using the t-statistic, while the joint significance of all independent variables was tested using the

F-statistic. The moderating role of the Construction Cost Index was evaluated based on the statistical significance of the relevant interaction term coefficients. A probability value below 0.05 was treated as indicating a statistically significant effect, while a probability value at or above 0.05 was treated as indicating no significant effect.

3.6 Operational Definitions

$$RoadDensityRatio = RoadLength / RegionalArea \quad (3)$$

Table 1 summarizes the operational definitions of the variables used in this study. The dependent variable, road infrastructure development, is proxied by the Road Density Ratio, calculated as road length divided by regional area, expressed in kilometers per square kilometer as can be seen in Formula 3.

Table 1. Operational definitions of research variables

Variable	Operational Definition
Local Government Financial Performance (<i>X</i>)	The capacity of local government to manage financial resources to finance the administration of government and regional development
Geographic Accessibility (<i>M</i>)	The condition of ease or difficulty of a region that affects the cost and implementation of infrastructure development
Road Infrastructure / Road Infrastructure Development (<i>Y</i>)	The availability of road infrastructure in a region, indicating the level of territorial connectivity supporting the mobility of population, goods, and public services
Public Finance	The management of financial resources by government to finance the administration of government, public services, and regional development; in this study, public finance is the foundational concept explaining the role of local government in managing regional finance to support road infrastructure development

Table 1 show the independent variables represent local government financial performance. The Regional Financial Independence Ratio is calculated as regional own-source revenue divided by total regional revenue, following standard measurement of regional financial independence used in Indonesian local government finance research ([Agustina, Pramono, Akbar, & Alma, 2022](#)).

$$RegionalFinancialIndependenceRatio = \frac{RegionalOwn - SourceRevenue}{TotalRegionalRevenue} \quad (4)$$

Formula 4 show the Capital Expenditure Ratio is calculated as capital expenditure divided by total regional expenditure, following standard analysis of regional expenditure structure used in Indonesian local government finance research ([Ramadani & Muslimin, 2022](#)):

$$CapitalExpenditureRatio = \frac{CapitalExpenditure}{TotalRegionalExpenditure} \quad (5)$$

Formula 5 show the moderating variable, geographic accessibility, is proxied by the Construction Cost Index, which expresses the relative cost of construction in a given region compared with a reference city. Two interaction terms operationalize the moderation test: the interaction between the Regional Financial Independence Ratio and the Construction Cost Index, and the interaction between the Capital Expenditure Ratio and the Construction Cost Index.

4. Results and Discussions

4.1 Descriptive Statistics

Descriptive statistics provide an initial overview of the characteristics of the research data. The dataset comprises 29 regencies and municipalities observed over the 2018 to 2022 period, yielding 145 observations in total. Table 2 presents the descriptive statistics for the research variables.

Table 2. Descriptive statistics of research variables

Variable	Mean	Maximum	Minimum	Std. Dev.	Observations
Y	0.321379	0.669784	0.000839	0.187093	145
X_1	0.035448	0.208144	0.001409	0.043969	145
X_2	0.207931	0.439838	0.062605	0.066905	145
M	233.092800	498.980000	118.750000	109.722000	145
X_1*M	6.167587	27.125700	0.000000	5.559199	145
X_2*M	48.809700	144.872000	12.020000	29.962330	145

Based on Table 2, the Road Density Ratio (Y) recorded a mean value of 0.321379, a minimum value of 0.000839, and a maximum value of 0.669784. The minimum value was found in Dogiyai Regency in 2018, corresponding to 5.92 kilometers of regency road divided by a regional area of 7,052.92 square kilometers. This range indicates considerable variation in the Road Density Ratio across regencies and municipalities in Papua Province during the study period.

The Regional Financial Independence Ratio (X_1) recorded a mean value of 0.035448. This value indicates that the overall level of regional financial independence among regencies and municipalities in Papua Province remains relatively low, indicating that regional own-source revenue has not yet become the primary component of regional revenue structure.

The Capital Expenditure Ratio (X_2) recorded a mean value of 0.207931, indicating that on average, capital expenditure accounted for approximately 20.79% of total regional expenditure. However, this capital expenditure figure does not solely capture road construction, since it also includes other categories of capital spending such as buildings, equipment and machinery, networks, and other fixed assets.

The Construction Cost Index (M) recorded a mean value of 233.0928, with a minimum value of 118.7500 and a maximum value of 498.9800. This range indicates substantial variation in construction cost levels across regencies and municipalities in Papua Province. The interaction variable X_1*M recorded a mean value of 6.167587, while the interaction variable X_2*M recorded a mean value of 48.80970. Both interaction variables were constructed to test whether the Construction Cost Index strengthens or weakens the relationship between local government financial performance and the Road Density Ratio.

4.2 Panel Data Model Selection

Before interpreting the regression results, panel data model selection was carried out because the research data take the form of panel data, combining regency and municipality cross-sectional data with annual time-series data. Three models are available in panel data regression, namely the Common Effect Model, the Fixed Effect Model, and the Random Effect Model. Model selection proceeded through three sequential tests, namely the Chow test, the Hausman test, and the Lagrange Multiplier test.

Table 3. Panel data model selection results

Test	Models Compared	Probability Value	Decision
Chow Test	CEM vs FEM	0.0000	FEM is more appropriate than CEM
Hausman Test	FEM vs REM	0.7980	REM is more appropriate than FEM

Test	Models Compared	Probability Value	Decision
LM Test	CEM vs REM	0.0000	REM is more appropriate than CEM

Table 3 summarizes the results of the model selection procedure. Based on the Chow test, the Cross-section F probability value was 0.0000, below the 0.05 threshold, indicating that the Fixed Effect Model is more appropriate than the Common Effect Model. The Hausman test produced a probability value of 0.7980, above the 0.05 threshold, indicating that the Random Effect Model is more appropriate than the Fixed Effect Model. The Lagrange Multiplier test produced a Breusch-Pagan probability value of 0.0000, below the 0.05 threshold, indicating that the Random Effect Model is more appropriate than the Common Effect Model. Based on these three tests, the Random Effect Model was selected as the most appropriate model for this study, and all subsequent regression interpretation and hypothesis testing are based on Random Effect Model estimation.

4.3 Random Effect Model Regression Results

Based on these regression results, the estimated regression equation as can be seen in Formula 6.

$$Y = 0.345979 - 0.390663X_1 + 0.081691X_2 - 0.000209M + 0.003992X_1M - 0.0000758X_2M + e \quad (6)$$

The regression results show that all independent variables and interaction variables recorded probability values above 0.05. This indicates that the Regional Financial Independence Ratio, the Capital Expenditure Ratio, the Construction Cost Index, the interaction between the Regional Financial Independence Ratio and the Construction Cost Index, and the interaction between the Capital Expenditure Ratio and the Construction Cost Index do not have a statistically significant effect on the Road Density Ratio, as can be seen in Table 4.

Table 4. Random effect model regression results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.345979	0.060120	5.754780	0.0000
X_1	-0.390663	0.496832	-0.786309	0.4330
X_2	0.081691	0.131702	0.620273	0.5361
M	-0.000209	0.000204	-1.025463	0.3069
X_1*M	0.003992	0.002957	1.350072	0.1792
X_2*M	-0.000076	0.000460	-0.164680	0.8694

Overall, these results indicate that the model has not been able to demonstrate a significant effect of local government financial performance and geographic accessibility on road infrastructure development in the regencies and municipalities of Papua Province during the 2018 to 2022 period. The R-squared value of 0.035995 indicates that only 3.60% of the variation in the Road Density Ratio can be explained by the Regional Financial Independence Ratio, the Capital Expenditure Ratio, the Construction Cost Index, and the two interaction variables in the model, while the remaining 96.40% is explained by factors outside the model. The Prob (F-statistic) value of 0.397838, above 0.05, indicates that all explanatory variables jointly do not have a statistically significant effect on the Road Density Ratio. This low R-squared value does not invalidate the individual coefficient tests, but it does limit the explanatory power of the model, and the findings should accordingly be interpreted cautiously rather than used as a basis for strong predictive claims.

4.4 Hypothesis Testing

Hypothesis testing was conducted to determine whether local government financial performance affects the Road Density Ratio and whether geographic accessibility moderates this relationship. Local government financial performance in this study is measured through the Regional Financial Independence Ratio and the Capital Expenditure Ratio, while geographic accessibility is proxied by the Construction Cost Index. Decisions were based on probability values, where a value below 0.05

indicates a statistically significant effect and a value at or above 0.05 indicates no significant effect. Table 5 summarizes the hypothesis testing results.

Table 5. Hypothesis testing results

Hypothesis	Relationship Tested	Test Indicator	Prob.	Decision
H_1	Financial performance -> Road Density Ratio	Financial Independence Ratio	0.4330	Not significant
H_1	Financial performance -> Road Density Ratio	Capital Expenditure Ratio	0.5361	Not significant
H_2	CCI weakens financial performance -> Road Density Ratio	$X_1 * M$	0.1792	Not significant
H_2	CCI weakens financial performance -> Road Density Ratio	$X_2 * M$	0.8694	Not significant

Based on the test results in Table 5, H_1 is rejected because both indicators of local government financial performance, the Regional Financial Independence Ratio and the Capital Expenditure Ratio, recorded probability values above 0.05. Local government financial performance has therefore not been proven to have a significant effect on the Road Density Ratio. H_2 is also rejected because both interaction variables, $X_1 * M$ and $X_2 * M$, recorded probability values above 0.05. The hypothesis that the Construction Cost Index weakens the effect of the Regional Financial Independence Ratio and the Capital Expenditure Ratio on the Road Density Ratio is therefore not empirically supported.

4.5 Discussion

The test results show that local government financial performance, geographic accessibility, and their interaction terms do not have a significant effect on the Road Density Ratio in the regencies and municipalities of Papua Province during the 2018 to 2022 period. This indicates that road infrastructure development in Papua cannot yet be strongly explained by the local financial performance and geographic accessibility indicators used in this study.

It should be noted that this study covers Papua Province before the establishment of new autonomous regions, namely 29 regencies and municipalities during the 2018 to 2022 period. The findings therefore describe the condition of road infrastructure development during the period preceding the change in Papua's administrative structure. Within this context, the non-significant findings indicate that variation in the Road Density Ratio across regencies and municipalities in Papua has not yet been strongly explained solely through local government financial performance and geographic accessibility. This condition is important as an initial illustration that road infrastructure development in Papua, both before and after the territorial division, continues to require attention to fiscal, geographic, budget priority, and cross-level government support factors.

In general, these results can be understood given the complex characteristics of road construction in Papua. Road development is influenced not only by local government financial capacity but also by geographic conditions, regional area, the policy priorities of regional heads, central government support, and the composition of regional expenditure. In addition, the Road Density Ratio as an infrastructure development indicator does not always change rapidly from year to year, since adding road length requires a process of planning,

budgeting, implementation, and physical completion that does not always occur within a single fiscal year.

The non-significant results in this study therefore do not imply that local government financial performance and geographic accessibility are unimportant for road infrastructure development. Rather, the results indicate that within the context of regencies and municipalities in Papua Province during the 2018 to 2022 period, these variables were not sufficiently strong to explain variation in the Road Density Ratio in a statistically significant way. The discussion that follows addresses possible explanations for these non-significant results, taking into account the characteristics of the Papuan region, regional expenditure structure, geographic conditions, and the infrastructure indicator used in this study.

4.5.1 The Effect of Local Government Financial Performance on Road Infrastructure Development

Local government financial performance in this study is measured through the Regional Financial Independence Ratio and the Capital Expenditure Ratio. Based on the test results, neither variable had a significant effect on the Road Density Ratio, indicating that local government financial performance has not been proven able to explain road infrastructure development in the regencies and municipalities of Papua Province during the study period.

The Regional Financial Independence Ratio did not have a significant effect on the Road Density Ratio. Conceptually, regions with higher financial independence should have greater fiscal space to finance development. However, in the context of regencies and municipalities in Papua, an increase in regional own-source revenue is not necessarily directed toward road construction. Regional revenue can be used for various governmental and public service needs, such as operational expenditure, education, health, government administration, and other regional needs.

In addition, the overall level of financial independence among regencies and municipalities in Papua remains relatively low, consistent with what [Melmambessy \(2022\)](#) documents for financial performance in a Papuan municipal government. This indicates that local governments remain heavily dependent on transfer revenue from the central government. Consequently, financial capacity sourced from the region itself has not been strong enough to serve as a primary driver of improvement in the Road Density Ratio, a pattern broadly consistent with the structural fiscal dependence documented across Indonesian regions more generally ([Negara & Khoirunurrofik, 2021](#)).

The Capital Expenditure Ratio also did not have a significant effect on the Road Density Ratio. Conceptually, capital expenditure is related to infrastructure development because it is used to acquire or construct fixed assets. However, the Capital Expenditure Ratio used in this study remains general in nature. Capital expenditure includes not only road construction but also land acquisition, equipment and machinery, buildings, networks, and other fixed assets.

This condition means that an increase in the Capital Expenditure Ratio is not necessarily followed by an increase in the Road Density Ratio. Local governments may increase capital expenditure without necessarily directing the allocation toward road construction or road length expansion. In the context of regencies and municipalities in Papua, capital expenditure may also be directed more heavily toward government buildings, public service facilities, equipment, or other assets considered higher priority. This aligns with findings from Banten Province showing that the relationship between capital expenditure, financial performance, and regional development outcomes depends heavily on how expenditure is composed and targeted rather than on its aggregate size alone ([Zein, Muhtarom, Mulyadi, & Septiani, 2024](#)).

In addition, road construction in Papua often requires substantial budget outlays due to geographic conditions and difficult logistical access. For strategic or high-value road segments, construction cannot always be fully financed by regency or municipal governments alone, and may require central government support. Road infrastructure development in Papua is therefore not adequately explained solely by the magnitude of local government financial performance, but is also shaped by

expenditure allocation structure, policy priorities, regional fiscal capacity, and central government funding support.

4.5.2 The Moderating Role of Geographic Accessibility

Geographic accessibility in this study is proxied by the Construction Cost Index, used to represent differences in construction cost levels across regions. Conceptually, regions with a higher Construction Cost Index generally face greater development costs compared with regions with a lower index. Based on the test results, the Construction Cost Index was not proven to weaken the effect of the Regional Financial Independence Ratio on the Road Density Ratio. The $X_1 * M$ interaction coefficient was positive but not statistically significant. This condition indicates that differences in construction cost levels have not been able to convincingly alter the effect of regional financial independence on road infrastructure development. This may occur because financial independence among regencies and municipalities in Papua remains relatively low overall, such that variation in the Construction Cost Index is not strong enough to alter the relationship between a region's own financial capacity and road network availability.

The test results also show that the Construction Cost Index was not proven to weaken the effect of the Capital Expenditure Ratio on the Road Density Ratio. The $X_2 * M$ interaction coefficient was negative, consistent with the direction of the hypothesis, but not statistically significant. Conceptually, higher construction cost levels can reduce the effectiveness of capital expenditure, since regions with higher construction costs require larger budgets to produce the same physical output. However, the Capital Expenditure Ratio in this study remains general in nature and does not specifically capture road capital expenditure. Consequently, an increase in capital expenditure is not necessarily directed toward road construction or the expansion of road length.

This finding contrasts with the general expectation, drawn from procurement and construction sector research, that cost conditions interact meaningfully with implementation outcomes in government infrastructure projects ([Al Fath, Herwindiaty, Wibowo, & Sari, 2024](#)). In the Papuan context, however, the Construction Cost Index as a proxy for geographic accessibility has not been proven to function as a moderator that weakens the effect of local government financial performance on road infrastructure development. The Construction Cost Index remains conceptually relevant as an indicator of cost and logistical barriers, but based on the specification and period of this study, its interaction effect is not statistically strong enough to explain variation in the Road Density Ratio.

4.5.3 The Relationship Between Research Findings, Theory, Prior Research, and Conditions in Papua

Overall, the research findings indicate that road infrastructure development in Papua cannot yet be strongly explained solely through local government financial performance and geographic accessibility. This finding is not entirely consistent with public finance theory and fiscal decentralization theory, which suggest that local government financial capacity should support the provision of infrastructure that generates collective benefits and positive externalities ([Musgrave, 1959](#); [Oates, 1999](#)). Although roads are not always a purely public good, the role of government remains important because the social benefits are broad and market mechanisms risk producing an inadequate level of provision. Theoretically, regions with stronger fiscal capacity are expected to have greater room to finance infrastructure development.

However, in the context of regencies and municipalities in Papua Province, this relationship does not always occur directly. From a financial perspective, the level of fiscal independence among Papuan regencies and municipalities remains relatively low, so the capacity of regions to finance development from regional own-source revenue remains limited. At the same time, the Capital Expenditure Ratio also does not necessarily reflect expenditure specifically directed toward road construction, since capital expenditure can be used for various other types of fixed assets.

Compared with prior research, the present findings differ from studies documenting a positive relationship between financial variables and development outcomes elsewhere in Indonesia. [Zein, Muhtarom, Mulyadi, and Septiani \(2024\)](#) find that financial performance and capital expenditure

together support economic growth in Banten Province, while [Agustina, Pramono, Akbar, and Alma \(2022\)](#) show that specific fiscal instruments, rather than financial performance in aggregate, drive regional financial independence. These differences may arise because the development indicators used differ across studies. Several prior studies use more general development indicators, such as economic growth, poverty, or composite development indices, whereas this study uses the Road Density Ratio as a specific physical indicator of road infrastructure.

From a geographic perspective, the Construction Cost Index can indeed describe differences in construction cost levels across regions, but this indicator does not necessarily directly determine an increase in the Road Density Ratio. Road construction is also influenced by regional area, topography, logistical access, regional policy priorities, and central government funding support. In the Papuan context, several strategic road construction projects also require central government intervention because of the scale of budget required and the high level of construction difficulty involved, a pattern documented in central government financing arrangements for strategic road segments in the province.

In addition, the Road Density Ratio is an indicator that does not always change rapidly from year to year. Adding road length requires a lengthy process, from planning, budgeting, and implementation, through to physical completion. Consequently, changes in local government financial performance within a single fiscal year do not necessarily translate immediately into an increase in the Road Density Ratio within the same year.

Overall, these findings indicate that road infrastructure development in Papua needs to be understood as a multidimensional issue, not simply as an outcome of local government financial performance in general. Development policy factors, expenditure priorities, central government support, geographic conditions, and the specific characteristics of each regency and municipality likely play a larger role in explaining differences in the Road Density Ratio across regions. This pattern is broadly consistent with regional development theory, which treats infrastructure investment as a necessary but not sufficient precondition for regional economic take-off, contingent on a wider set of institutional and geographic factors ([Rostow, 1960](#)).

5. Conclusions

5.1 Conclusion

Local government financial performance has not been proven to have a significant effect on road infrastructure development in the regencies and municipalities of Papua Province during the 2018 to 2022 period. Local government financial performance in this study is measured through the Regional Financial Independence Ratio and the Capital Expenditure Ratio, while road infrastructure development is proxied by the Road Density Ratio. The test results show that neither the Regional Financial Independence Ratio nor the Capital Expenditure Ratio has a significant effect on the Road Density Ratio. This condition indicates that a region's capacity to generate its own revenue and the proportion of capital expenditure relative to total expenditure are not sufficiently strong to explain variation in road network availability in Papua. This can be understood because the level of regional financial independence remains relatively low, while capital expenditure is not entirely directed toward road construction but is also used for other categories of fixed assets.

Geographic accessibility, proxied by the Construction Cost Index, has not been proven to moderate the relationship between local government financial performance and road infrastructure development in the regencies and municipalities of Papua Province during the 2018 to 2022 period. The test results show that the interaction between the Regional Financial Independence Ratio and the Construction Cost Index, as well as the interaction between the Capital Expenditure Ratio and the Construction Cost Index, do not have a significant effect on the Road Density Ratio. Differences in construction cost levels have therefore not been proven to strengthen or weaken the effect of local government financial performance on road infrastructure development. This indicates that road construction in Papua is influenced not only by local financial capacity and construction cost levels, but also by other factors such as regional area, geographic conditions, regional policy priorities, capital expenditure

allocation structure, and central government funding support. In general, the findings of this study indicate that road infrastructure development in Papua is a complex issue that cannot yet be strongly explained solely through the local government financial performance and geographic accessibility indicators used in this study.

5.2 Research Limitations

This study is subject to several limitations, the first, the research sample is confined to the 29 regencies and municipalities that constituted Papua Province before the 2022 to 2023 establishment of new autonomous regions, which limits the extent to which findings can be generalized to the province's current administrative configuration. Second, the Capital Expenditure Ratio used in this study is an aggregate measure that does not isolate expenditure specifically directed toward road construction, which constrains the precision with which the financial performance to road infrastructure relationship can be assessed. Third, the model's explanatory power is limited, with an R-squared value of 3.60%, indicating that most of the variation in the Road Density Ratio is driven by factors outside the variables examined in this study. Fourth, the annual observation frequency may not fully capture the multi-year planning, budgeting, and implementation cycle inherent to road construction projects, which can introduce timing mismatches between financial inputs and physical outputs.

5.3 Suggestions and Directions for Future Study

Future research is encouraged to use more specific expenditure indicators, such as capital expenditure allocated specifically to roads, irrigation, and networks, rather than aggregate capital expenditure. Future studies may also consider incorporating additional variables such as special allocation funds, special autonomy funds, regional area, topographic conditions, population size, or regional expenditure priorities, so that the research model can explain road infrastructure development more robustly and representatively. Given the administrative changes following the establishment of new autonomous regions in Papua, future research would also benefit from extending the observation period to capture road infrastructure development under the province's current territorial structure, and from incorporating qualitative approaches that can capture policy prioritization and central-regional coordination dynamics not readily observable through financial ratios alone.

Acknowledgement

The author gratefully acknowledges the guidance and supervision provided throughout this research, as well as the regional government agencies in Papua Province that made budget realization, construction cost, and road infrastructure data available for this study.

Author Contributions

DSU contributed to the conceptualization, research design, methodology development, data collection, data analysis, and interpretation of the results. AL contributed to literature review, theoretical framework development, validation of findings, and critical revision of the manuscript. AS contributed to manuscript preparation, visualization, editing, and final review of the article. All authors have read and approved the final version of the manuscript.

References

- Afrizal, R. M., & Khoirunurrofik, K. (2022). Impact of infrastructure development, education, tourism, and agriculture on regional economic growth in Indonesia. *The Es Economics and Entrepreneurship*, 2(3), 193-207. <https://doi.org/10.58812/esee.v2i03.235>
- Agustina, F., Pramono, A. J., Akbar, B., & Alma'arif, A. (2022). Factors determining low regional financial independence: Financial autonomy and degree of decentralization. *Jurnal Tata Kelola dan Akuntabilitas Keuangan Negara*, 8(1), 117-130. <https://doi.org/10.28986/jtaken.v8i1.701>
- Al Fath, A. A., Herwindiaty, D. E., Wibowo, M. A., & Sari, E. M. (2024). Readiness for implemented sustainable procurement in Indonesian government construction project. *Buildings*, 14(5), 1424. <https://doi.org/10.3390/buildings14051424>

- Al Muhariah, N., Akbar, A., & Wijaya, R. A. (2021). The influence of balancing funds and locally-generated revenue on economic growth in South Sumatra Province in 2014-2018. *Media Ekonomi*, 29(1), 79-92. <https://doi.org/10.25105/me.v29i1.10120>
- Ananta, B. M. E., & Erawati, N. M. A. (2024). The influence of PAD, DAU, and DBH on the allocation of capital expenditure in city districts in the Province of Bali in 2018-2021. *Transekonomika: Akuntansi, Bisnis dan Keuangan*, 5(1), 22-32. <https://doi.org/10.55047/transekonomika.v5i1.811>
- Aprianto, I. (2021). The effect of leverage, legislative measures, intergovernmental revenue and regional tax revenue on regency/city government financial performance in Indonesia. *International Journal of Applied Finance and Business Studies*, 9(3), 112-121. <https://doi.org/10.35335/ijafibs.v9i3.3>
- Apriliani, A. P., & Khoirunurrofik, K. (2020). The impact of special allocation fund (DAK) for health on achievements of health development performance in Indonesia. *Economies*, 8(3), 72. <https://doi.org/10.3390/economies8030072>
- Azaki, N., & Lutfi, A. (2023). The allocative efficiency analysis of special allocation fund for road sector in 2015-2019. *Jurnal Transformatif*, 9(1), 84-101. <https://doi.org/10.21776/ub.transformatif.v2023.009.01.5>
- Dellyana, D., Arina, N., & Fauzan, T. R. (2023). Digital innovative governance of the Indonesian creative economy: A governmental perspective. *Sustainability*, 15(23), 16234. <https://doi.org/10.3390/su152316234>
- Furqan, A. C., Wardhani, R., Martani, D., & Setyaningrum, D. (2020). The effect of audit findings and audit recommendation follow-up on the financial report and public service quality in Indonesia. *International Journal of Public Sector Management*, 33(5), 535-559. <https://doi.org/10.1108/IJPSM-06-2019-0173>
- Gujarati, D. N., & Porter, D. C. (2009). *Basic econometrics* (5th ed.).
- Gwijangge, K., Marlissa, E. R., & Urip S., T. P. (2026). Determinants of regional own-source revenue (PAD) and its implications for local budget capacity: Evidence from Nduga Regency, Indonesia. *International Journal of Accounting and Management Information Systems*, 4(1), 61-73. <https://doi.org/10.35912/ijamis.v4i1.4185>
- Hadisantoso, E., Arifuddin, A., Wawo, A. B., & Ridwan, M. (2023). The influence of original local government revenue, specific allocation fund on government capital expenditures in Southeast Sulawesi District/City. *Owner: Riset dan Jurnal Akuntansi*, 7(4), 3712-3720. <https://doi.org/10.33395/owner.v7i4.1937>
- Haq, F., Wati, L., & Istianda, M. (2023). The role of capital expenditure allocation in mediating regional financial performance on regional economic growth Aceh Province. *Journal of Social Entrepreneurship Theory and Practice*, 2(1). <https://doi.org/10.31098/jsetp.v2i1.1593>
- Hidayat, S., Tambunan, D., & Haning, Y. (2025). Unjust by default: The political economy of Indonesia's local government policy on infrastructure development. *Journal of Asian and African Studies*. <https://doi.org/10.1177/20578911241260442>
- Hummel, D., & Kusumasari, B. (2025). Local government financial performance and decentralization in Indonesia. *State and Local Government Review*. <https://doi.org/10.1177/0160323X251364379>
- Lewis, B. D. (2023). Indonesia's new fiscal decentralisation law: A critical assessment. *Bulletin of Indonesian Economic Studies*, 59(1), 1-28. <https://doi.org/10.1080/00074918.2023.2180838>
- Melmambessy, D. (2022). Analisis kinerja keuangan Pemerintah Kota Jayapura ditinjau dari rasio kemandirian daerah, ketergantungan daerah, desentralisasi fiskal dan efektivitas (Analysis of the financial performance of Jayapura City Government viewed from the ratios of regional independence, dependency, fiscal decentralization, and effectiveness). *Jurnal Ekonomi dan Bisnis*, 13(2), 10-15. <https://doi.org/10.55049/jeb.v13i2.90>

- Miar, Zakiyah, W., Giovanni, J., & Cerisma, S. T. (2024). Analisis pengaruh desentralisasi fiskal, investasi, dan kinerja keuangan daerah terhadap pertumbuhan ekonomi dan kemiskinan di Provinsi Kalimantan Tengah (Analysis of the effect of fiscal decentralization, investment, and local government financial performance on economic growth and poverty in Central Kalimantan Province). *Cendekia: Jurnal Pendidikan dan Pembelajaran*, 18(1), 72-88. <https://doi.org/10.30957/cendekia.v18i1.887>
- Montoya, J., Escobar, D., & Galindo, J. (2021). Analysis of road intervention based on geographical accessibility as a development tool in regional competitiveness. *Journal of Urban and Regional Analysis*, 13(2), 359-375. <https://doi.org/10.37043/JURA.2021.13.2.9>
- Muhtarulloh, F. (2021). Analysis of the impact of Papua and West Papua special autonomy funds on IPM. *Jurnal Budget: Isu dan Masalah Keuangan Negara*, 6(1), 96-113. <https://doi.org/10.22212/jbudget.v6i1.76>
- Muris, C. (2026). Estimating interaction effects with panel data. *Journal of Applied Econometrics*. <https://doi.org/10.1002/jae.70040>
- Musgrave, R. A. (1959). *The theory of public finance: A study in public economy*.
- Muturi, D. (2023). Infrastructure investment and economic development. *Journal of Poverty, Investment and Development*, 8(2), 90-99. <https://doi.org/10.47604/jpid.2074>
- Negara, B. P., & Khoirunurrofik, K. (2021). Dampak desentralisasi fiskal terhadap konvergensi pendapatan perkapita antar kabupaten/kota di Indonesia (The impact of fiscal decentralization on per capita income convergence among regencies and cities in Indonesia). *Indonesian Treasury Review: Jurnal Perbendaharaan, Keuangan Negara dan Kebijakan Publik*, 6(1), 1-18. <https://doi.org/10.33105/itrev.v6i1.185>
- Ningsih, K. S., Frinaldi, A., & Magriasti, L. (2023). Desentralisasi fiskal dalam penyelenggaraan otonomi daerah di Indonesia (Fiscal decentralization in the implementation of regional autonomy in Indonesia). *JISIP (Jurnal Ilmu Sosial dan Pendidikan)*, 7(3), 2656-6753. <https://doi.org/10.58258/jisip.v7i3.5389>
- Oates, W. E. (1999). An essay on fiscal federalism. *Journal of Economic Literature*, 37(3), 1120-1149. <https://doi.org/10.1257/jel.37.3.1120>
- Purnasari, N., Sitompul, E., & Laowo, D. K. (2022). The influence of PAD, DBH, DAU and DAK on North Sumatra regional capital expenditure in 2017-2019. *Owner: Riset dan Jurnal Akuntansi*, 6(2), 1412-1425. <https://doi.org/10.33395/owner.v6i2.765>
- Ramadani, A. F., & Muslimin. (2022). Pengaruh pendapatan asli daerah dan dana perimbangan terhadap kinerja keuangan pemerintah daerah Kota Kediri tahun 2016-2020 (The effect of regional own-source revenue and balancing funds on the financial performance of Kediri City Government, 2016-2020). *Journal of Management and Business (JOMB)*, 4(1), 362-372. <https://doi.org/10.31539/jomb.v4i1.3710>
- Redu, S. T., Vernanda, V., & Sumaryadi, A. (2023). Analysis of base and non-base sectors in the economic development of Jayawijaya Regency. *SOCA: Journal of Agricultural Socioeconomics*, 17(2), 63-72. <https://doi.org/10.24843/SOCA.2023.v17.i02.p01>
- Rostow, W. W. (1960). *The stages of economic growth: A non-communist manifesto*.
- Sadaruddin, S., Manan, A., & Sriningsih, S. (2024). An analysis of financial performance and regional capability mapping in regencies and cities of Nusa Tenggara Barat Province (2018-2022). *Economy and Finance Enthusiastic*, 2(2), 83-98. <https://doi.org/10.59535/efe.v2i2.256>
- Salomo, R. V., & Rahmayanti, K. P. (2023). Progress and institutional challenges on local governments performance accountability system reform in Indonesia. *SAGE Open*, 13(4), 1-15. <https://doi.org/10.1177/21582440231196659>
- Saragih, P. N., & Khoirunurrofik, K. (2022). Road quality in Indonesia: Is it linked to special allocation funds and political competition? *Signifikan: Jurnal Ilmu Ekonomi*, 11(1), 57-72. <https://doi.org/10.15408/sjie.v11i1.21090>

- Setiawan, D., Winarna, J., & Nugroho, Y. P. (2022). Determinants of local government accountability. Paper presented at Proceedings of the Second International Conference on Public Policy, Social Computing and Development, 400-405.
- Sudirman, F. A., & Saidin, S. (2022). Pemerintahan berbasis elektronik (e-government) dan pembangunan berkelanjutan: Reviu literatur sistematis (Electronic government and sustainable development: A systematic literature review). *Nakhoda: Jurnal Ilmu Pemerintahan*, 21(1), 44-58. <https://doi.org/10.35967/njip.v21i1.269>
- Usman, H., Marlissa, E. R., & Urip S., T. P. (2026). Determinants and performance of regional development planning: Evidence from Nduga Regency, Papua, Indonesia. *International Journal of Accounting and Management Information Systems*, 4(1), 47-59. <https://doi.org/10.35912/ijamis.v4i1.4184>
- Virani, A., & van der Wal, Z. (2023). Enhancing the effectiveness of public sector performance regimes: A proposed causal model for aligning governance design with performance logics. *Perspectives on Public Management and Governance*, 6(1), 54-65. <https://doi.org/10.1093/ppmgo/v/gvac026>
- Zakaria, R., & Syahputra, D. K. (2022). Optimalisasi pendapatan asli daerah Provinsi Jawa Barat sebagai upaya mewujudkan kemandirian fiskal (Optimizing West Java Province's regional own-source revenue as an effort to achieve fiscal independence). *Jurnal Pajak Indonesia*, 6(1), 47-59. <https://doi.org/10.31092/jpi.v6i1.1545>
- Zein, M. H. M., Muhtarom, M., Mulyadi, M., & Septiani, S. (2024). Examining the role of local government's financial performance and capital expenditure in increasing economic growth in Banten Province, Indonesia (2018-2022). *Journal of Risk and Financial Management*, 17(10), 456. <https://doi.org/10.3390/jrfm17100456>