MIX: Jurnal Ilmiah Manajemen

Management Scientific Journal
ISSN (Online): 2460-5328, ISSN (Print): 2088-1231
https://publikasi.mercubuana.ac.id/index.php/jurnal_Mix

Simultaneous Toll Road Public Infrastructure and its Transaction Volume in Non-Taxable State Revenue a Case Study at PT. Hutama Karya Persero

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ABSTRACT

Objectives*: Toll roads are vital transportation infrastructure in improving connectivity between regions in Indonesia. Apart from being a means of transportation, toll roads also contribute to state revenue through non-tax state revenue (PNBP). However, there are still limitations in understanding the extent to which toll road length and traffic volume affect PNBP.*

Methodology*: This research uses a quantitative approach with descriptive methods. The data used is time series data from 2013 to 2023 which includes toll road length, traffic volume, and PNBP managed by PT Hutama Karya (Persero). The analysis was carried out using linear regression to test the relationship between these variables.*

Finding*: The results showed that there is a significant relationship between the length of toll roads and traffic volume to PNBP. The increase in toll road length and traffic volume simultaneously contributes to the increase in PNBP. In addition, toll road construction also has a positive impact on local economic growth and economic diversification of communities around toll roads.*

Conclusion*: Toll roads not only serve as a means of transportation, but also a significant source of state revenue. Therefore, this study recommends strategies to improve the efficiency of toll road infrastructure management to optimize PNBP revenue and encourage broader economic growth.*

Keywords*: Toll Roads; Traffic Volume; PNBP; Infrastructure; Economic Growth.*

Submitted: 19-02-2025 Revised: 24-05-2025 Accepted: 26-06-2025

Article Doi:
http://dx.doi.org/10.22441/jurnal_mix.2025.v15i2.006

p-ISSN: 2088-1231
e-ISSN: 2460-5328

INTRODUCTION

Toll roads are transportation infrastructure designed to accelerate vehicle mobility by providing special, barrier-free lanes. In Indonesia, toll roads play an important role in improving connectivity between regions, supporting economic growth, and reducing logistics costs. Since the construction of the first toll road, namely the Jakarta-Bogor-Ciawi (Jagorawi) Toll Road in 1978, the construction of toll roads has continued with various strategic projects. The main functions of toll roads include increasing accessibility to remote areas, accelerating the flow of goods and people, and reducing congestion on ordinary highways. According to Government Regulation Number 15 of 2005, toll roads are part of the national road network system whose use is required to pay tolls.

According to (Santosa et al., 2023) the management of toll roads in Indonesia is carried out by various Toll Road Business Entities (BUJT), with around 73 toll road sections managed by 59 BUJT. Despite challenges in the development process, such as land acquisition and budget constraints, the government remains committed to expanding the toll road network as part of the national infrastructure development strategy. Future plans include increasing the length of toll roads to reach about 3,254 km by 2024, with a focus on strategic projects such as the Trans-Sumatra Toll Road. Thus, toll roads not only have a function for transportation facilities but also have a function as a main driver for economic growth and regional development in Indonesia.

Traffic volume refers to the number of vehicles passing at a certain point or line on a road cross-section. Data on traffic volume is important information needed in the planning, design, management, and operation stages of roads (Sukirman in I Ketut Sudipta Giri, 2022) (reference I Ketut Sudipta Giri, C. P. (2022). Traffic Volume Analysis of Mount Agung Road Section in Denpasar City. Scientific Engineering Curves, 54-60.)

According to Sukirman (1994), traffic volume describes the number of vehicles passing through an observation point in a certain period of time (such as days, hours, or minutes). In the context of determining the number and width of lanes, commonly used traffic volume units are average daily traffic, planning hourly volume, and capacity.

In this calculation, vehicles are grouped into three categories, namely:

1. Light Vehicles (Light Vehicles = LV)
   This category includes motor vehicles with four wheels and two axles that have a distance between 2.0 m to 3.0 m, such as passenger cars, opelets, microbuses, public transportation, pick-ups, and small trucks.
2. Heavy Vehicles (Heavy Vehicles = HV)
   This category includes motor vehicles with an axle distance of more than 3.50 m, usually having more than four wheels, such as buses, two-axle trucks, three-axle trucks, and combinations of vehicles according to the Bina Marga classification.
3. Motorcycle (Motorcycle = MC)
   This category includes motor vehicles with two or three wheels, such as motorcycles and three-wheeled vehicles according to the Bina Marga classification system.
4. Unmotorised (Unmotorised = UM)
   This category includes vehicles that do not use engines or vehicles that are driven by human or animal power, such as bicycles, rickshaws, and strollers. This non-motorized vehicle is considered a side obstacle.

p-ISSN: 2088-1231
e-ISSN: 2460-5328

According to (Wahyuni & Khoiruzin, 2020), Aset comes from the English word, namely the word "asset," which in Indonesian means "wealth." Assets include everything that has economic value and can be owned by individuals, companies, or governments, and can be financially evaluated. According to Government Regulation Number 71 of 2010 concerning Government Accounting Standards (SAP), assets are defined as economic assets controlled or owned by the state due to past events, from which it is expected to obtain economic or social benefits in the future, both for the government and society. These assets can also be measured in monetary value and include non-financial resources necessary to provide services to society, as well as resources that are preserved due to historical and cultural value.

Public assets include all wealth owned, controlled, or managed by the central government and local governments (provinces, cities, districts). Meanwhile, state property (BMN), based on Government Regulation Number 27 of 2014 concerning the Management of State/Regional Property, includes all goods purchased or obtained using state budget funds or from other legitimate sources. State-owned or regional-owned assets consist of:

1. Goods obtained through the Indonesian State Revenue and Expenditure Budget /D,
2. Goods obtained from other legitimate sources, for example:
    a) Goods received as donations or grants,
    b) Goods obtained through the execution of an agreement or contract,
    c) Goods obtained in accordance with legal provisions or through court decisions that have permanent legal force.

Based on (Hendrawati, 2017), Income is a source of financing obtained by individuals in the form of dividends, wages, salaries, and profits, which is a flow of money measured in a certain period. All forms of money received by individuals, families, or organizations fall into the income category, and high income levels can affect the economic development of a country.

State Revenue refers to the income received by the state, which is used as a source of funding for state activities and needs in the context of development. This income is the right of the central government which is recognized as an increase in the value of net worth. State Revenue consists of Tax Revenue, Non-Tax State Revenue, and Grant Revenue (Wikipedia, 2022).

Based on (Widodoaji, 2020) PT Hutama Karya (Persero) is an Indonesian state-owned company engaged in construction services and infrastructure development. The main goals include the construction and management of the Trans Sumatra Toll Road as a national strategic project. The company is also engaged in planning, construction supervision and production. Through the government's mandate, Hutama Karya aims to strengthen connectivity and accelerate the distribution of goods in various regions. The company's business strategy includes the development of additional assets and revenues to support sustainable operations.

In a situation of rapid economic growth, the need for better connectivity between various regions is increasingly urgent. Toll roads not only serve as an effective means of transportation, but they are also very important in improving accessibility, speeding up the delivery of goods, and supporting the development of other economic sectors. However, with the increase in vehicle volume, challenges arise in the management of toll rates, infrastructure maintenance, and social impacts that may arise. Therefore, this article aims to analyze the relationship between the length of a functioning toll road, traffic volume, and revenue earned, as well as investigate the social and economic impact of the management of such toll roads.

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e-ISSN: 2460-5328

By understanding this issue, it is hoped that effective solutions can be found to improve the performance of public asset revenues and provide greater benefits to the community.

LITERATURE REVIEW

Based on (Santosa et al., 2023), the construction of toll roads in Indonesia supports connectivity between regions and improves logistics efficiency through reducing transportation costs and travel time. This study is relevant to PT Hutama Karya's efforts to continue to develop the Trans-Sumatra Toll Road to accelerate the distribution of goods and community mobility.

According to (Jacob and Herman, 2011) the length of toll roads affects the volume of vehicles, which ultimately has an impact on state revenue. This relationship is the basis for analyzing the influence of toll road length variables on PT Hutama Karya's financial performance. The construction of toll roads can stimulate local economic growth through increased investment and the opening of new business districts around toll roads. This is reflected in PT Hutama Karya's project which strengthens economic growth in the Sumatra region (Widodoaji, 2020). Public assets managed by business entities such as PT Hutama Karya provide significant economic and social benefits, especially in supporting the development of national strategic infrastructure (Wahyuni & Khoiruzin, 2020).

The novelty of this research lies in a quantitative approach that utilizes data from 2018 to 2023, to measure the influence of toll road length and traffic volume on non-taxable state revenue. In addition, this study recommends better strategies to improve the efficiency of toll road infrastructure management in Indonesia, especially those managed by PT Hutama Karya.

Length of Toll Roads and Their Role in Public Infrastructure

Toll roads are strategic in the development of public infrastructure, especially in accelerating inter-regional connectivity and improving logistics efficiency. The Indonesian government targets a significant increase in the length of toll roads to support national economic growth (Wirabrata, 2019).

1. Improved Connectivity and Accessibility
   The ever-increasing length of toll roads allows for better connectivity between regions. With the existence of toll roads, areas that were previously difficult to access become more connected, so that the distribution of goods and community mobility increases. For example, the Trans-Java and Trans-Sumatra toll roads open access to areas that have high economic and tourism potential.
2. Regional Economic Impact
   Toll roads act as a lever for the regional economy. Areas that are traversed by toll roads tend to experience faster economic growth because the ease of transportation encourages investment and trade. For example, Ogan Komering Ilir Regency (OKI) has experienced an acceleration in development after the opening of the Trans-Sumatra toll road. The increase in toll road length directly contributes to local and national economic activity. Studies show that a 1% increase in road stock can increase economic growth by 8.8%. Toll roads also support the development of new business districts, such as in Bandung after the operation of the Cipularang toll road. Another example is seen in Madura, where the regional economy grew rapidly after the Suramadu toll bridge was operational.

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3. Logistics Efficiency
   Toll roads increase transportation cost efficiency. Shorter travel times and lower logistics costs provide added value for various sectors, including industry and agriculture. This supports the competitiveness of local products in the national and international markets. However, the construction of toll roads also poses challenges, especially related to land conversion. The Trans-Java toll road, for example, has the potential to convert up to 655,400 hectares of agricultural land, which risks disrupting national food security. Therefore, it is important to carefully consider environmental and spatial impacts in development planning (Sumaryoto, 2010).
4. Influence on Other Infrastructure
   The length of toll roads encourages the development of infrastructure such as industrial areas, airports, and ports, strengthening the national transportation system and economic stability. Planning needs to consider social, economic, and environmental aspects, ensure that toll road construction does not harm agriculture, and support agribusiness. The development of industrial estates must be balanced with adequate transportation access.
5. Challenges to Other Infrastructure
   The construction of toll roads requires careful planning and support from the local government. One of the biggest challenges is land acquisition. Efforts such as funding through the Public Service Agency (BLU) of the State Asset Management Agency (LMAN) have made this process easier. Toll roads not only affect the economy, but also have a social impact. The area around the entrance and exit of the expressway tends to grow faster, creating new business opportunities. However, local communities along the old route often experience a decrease in income due to reduced traffic. In addition, the reduction of water catchment areas due to the construction of toll roads can increase the risk of flooding, as happened in several areas in Semarang.

State Revenue from Toll Transactions as Public Assets

State Revenue is a flow of funds used to finance various activities and state needs in the context of development. This income is considered a central government right and is recognized as an increase in the value of net worth. State Revenue includes Tax Revenue, Non-Tax State Revenue, and Grant Receipts. (Wikipedia, 2022).

a. Tax Revenue
   According to Article 1 number 1 of Law Number 28 of 2007 which amends Law Number 6 of 1983 concerning General Provisions and Procedures of Taxation, tax is defined as a contribution that must be paid by an individual or entity to the state on a mandatory basis, based on legal provisions, without any direct compensation. The funds collected from this tax are used for the benefit of the state in order to improve the welfare of the community.
b. Non-Tax State Revenue
   PNBP refers to payments made by individuals or institutions that benefit, either directly or indirectly, from services or the utilization of resources and state property rights. Based on Law Number 20 of 1997 concerning Non-Tax State Revenue, PNBP is divided into six categories, which include revenues from the management of government funds, the use of natural resources, and the results of separate state wealth management. In addition, there are also revenues from services provided by the government, revenues derived from court decisions

p-ISSN: 2088-1231
e-ISSN: 2460-5328

related to administrative fines, and other revenues regulated by laws and regulations.

c. Grant Acceptance
According to Article 1 number 2 of Government Regulation (PP) Number 10 of 2011 concerning Procedures for Procurement of Foreign Loans and Grant Receipts, grants are defined as all forms of state revenue in the form of foreign exchange, rupiah, goods, services, and/or securities received from the grantor without the obligation to return them, both domestic and foreign.

Based on (Tempo, 2024), toll transactions as public assets are included in state revenue because the revenue generated from toll road management is a form of Non-Tax State Revenue (PNBP). PNBP covers various types of revenue that does not come from taxes, including revenue from the management of public infrastructure such as toll roads. Revenue from toll transactions can be considered as the result of the utilization of state assets managed by the government or State-Owned Enterprises (SOEs). The money earned from toll transactions is used to support further infrastructure development, road maintenance, and various other government activities. Thus, revenue from toll roads contributes to state revenue and can be used for the wider public interest.

The development of the toll road industry in Indonesia began by accident when the government decided to turn the Jagorawi expressway into a toll road. Jagorawi began operating in 1978 by a marga service company established as a special company to manage toll roads. In the management of toll roads, the right to build and manage toll roads can be owned by the government, which is then transferred to government-owned enterprises called operators. The party organizing the project can build and manage the toll road by collaborating with investors both as investors who have the authority to implement it and investors who do not have the authority to implement it.

The investor who has the power to operate is a business entity that finances the construction of the toll road and then operates the toll road during the concession period determined by the toll road operator who authorizes the investor. Meanwhile, non-operator investors are business entities that finance the construction of toll roads and then hand them over to operators when the toll roads are ready to be operated.

The construction of toll roads is closely related to efforts to improve the national road network system and accelerate the growth of the area around the toll road. In the process of construction and operation of toll roads, operators may face demands from the environment to expand the non-toll road network, build supporting facilities, and provide road equipment. This demand has a significant impact on toll road operations as an alternative to transportation. Toll roads are considered tangible fixed assets by the operator and are recorded when they are ready for operation at a cost of acquisition, provided they meet the criteria of clear economic benefits, toll road control, and a well-measurable acquisition value.

Investors receive payments or compensation for funding the construction of toll roads through various methods. For example, through the sharing of toll revenue or revenue over a certain period, periodic payments of toll revenue, or guaranteed minimum payments, as well as other methods. The organizer records transactions based on the handover value according to the contract. If the contract value is not available, it must choose between the acquisition cost or the fair value based on the more trustworthy one. On the other hand, investors record the right to toll revenue or revenue sharing according to the amount paid.

Investors finance the construction of toll roads without involving the governing authority and receive periodic payments. Funding comes from investors without operator

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e-ISSN: 2460-5328

involvement, with a toll revenue sharing scheme that affects investor rewards based on toll revenue earned. The organizer noted that the toll road uses the fair value of the asset approach. Payments for toll revenue or revenue sharing should be considered as installment payments that are part of the obligation of successful operation cooperation, where the recognition of toll roads as an asset of the operator should be recorded as an expense or income of the operation cooperation.

Toll roads that are built with investor funds and managed during the concession period are referred to as operational cooperation toll roads when they are operated. After the concession period ends, the party managing the toll road will record the value of the toll road provided by the investor as reasonable operating cooperation income if the economic benefits can be ascertained, or as the operating cooperation income that is postponed if the economic benefits cannot be ascertained.

Currently, the majority of funding for toll road construction still comes from domestic banks, especially government banks. This means that toll road construction financing is a long-term investment with a financing period of 10-12 years, so financial institutions that want to fund the project must pay attention to Indonesia's macroeconomic situation and government policies in the next 10-12 years. With such a long-term strategy, financial institutions that have a better understanding of long-term risks and are willing to take those risks are domestic financial institutions.

Since all revenue from toll roads is in rupiah, long-term funding will also be carried out in rupiah to avoid risks due to currency changes. Domestic financial institutions have more potential to provide loans in rupiah currency than multinational financial institutions. Expenditures made after the acquisition of toll roads that can increase the economic life or capacity will be capitalized.

Meanwhile, expenses for resurfacing or similar will be recorded as a deferred expense if the benefit lasts more than one year. Expenditures made after revenue from tolls to build public facilities or other fixed assets that are not managed by the operator or investors who have management rights will be presented as deferred expenses. Toll roads are considered as tangible fixed assets by the operator and are recorded with the value of the acquisition cost when they are ready for operation, as long as they meet the following criteria:

1. There is certainty about the economic benefits that will be obtained.
2. There is over-handling of the expressway.
3. The value of the acquisition can be measured accurately.

The Relationship Between Vehicle Volume and Revenue

The number of vehicles passing through toll roads is closely related to non-tax state revenue (PNBP), especially those from the transportation infrastructure sector. This PNBP is one of the sources of funding for the state in addition to taxes, which is used for infrastructure development, toll road management, and the transportation sector.

1. Receipt of Transportation Service Tariff
   Several factors, such as economic growth, urbanization, and current transportation policies, affect the volume of vehicles on toll roads. The volume of traffic on toll roads increases along with the increase in the number of vehicles, especially private vehicles. This has a direct impact on revenue from toll rates (Akmalah, 2013).

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2. Influence on PNBP
   Toll rates in Indonesia are usually based on the type of vehicle and the distance traveled. Due to the greater number of vehicles crossing, the tariff paid by toll road users also increases, which directly increases the PNBP received by the state. PPNBP toll roads are very important for financing infrastructure development, including toll roads (JBA, 2024).
3. Driving Factors and Obstacles
   Factors that drive an increase in vehicle volume, such as economic growth and an increase in the number of people who own private vehicles, play an important role in increasing the volume of vehicles on toll roads. In addition, the construction of new toll roads or the repair of existing toll roads can also attract more users. However, obstacles such as congestion, tariff policies, or poor road quality can affect road users' decisions to use toll roads, thus having an impact on the volume of vehicles and PNBP generated.
4. PNBP Projection Based on Number of Vehicles
   The government through the Toll Road Regulatory Agency (BPJT) continues to monitor and plan revenue estimates from the toll road sector. For example, if the number of vehicles increases, the revenue from toll fees will also increase, which will contribute more to PNBP. This revenue estimate is crucial so that the construction and maintenance of toll roads can still be financed (Expertise & Ri, 2017).

Social and Economic Impacts of Toll Roads as Public Assets

Toll roads play an important role as public infrastructure that connects various regions, accelerates the distribution of goods and services, and improves connectivity between regions. However, the impact it has caused is not only limited to the economic aspect, but also to the social life of the surrounding community. Studies related to the construction of toll roads, such as the Permai Toll Road (Pekanbaru-Dumai) and the MKTT Toll Road (Medan-Kualanamu-Tebing Tinggi), show various social and economic impacts that need to be considered in the evaluation and management of toll roads (Astuti, 2023).

1. Social Impact
   a. Social Security and Well-Being
      The presence of toll roads provides significant benefits in creating a sense of security for the community. During the construction process, the safety of workers and the surrounding community is a top priority, with measures such as restricting access to construction areas to prevent accidents. Additionally, toll roads improve public access to public facilities such as hospitals and schools, supporting the improvement of overall social welfare.
   b. Social Conflict Reduction and Land Management
      The land acquisition process is often a source of conflict in infrastructure projects. However, in the construction of the Permai Toll Road, conflicts have been minimized through a fair and transparent approach. Affected communities receive proper compensation, and they are invited to deliberate to understand the long-term benefits of the project. This creates a cooperative atmosphere that supports the smooth running of the project.

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c. Changes in Lifestyle and Social Structure
Major changes have occurred in communities that previously relied on agricultural land. Those whose land is used for toll road projects have switched to other sectors, such as small trade or culinary businesses. This change affects the social dynamics in the area, where relations between communities are more oriented towards new economic activities compared to traditional patterns.
d. Impact of Pollution, Noise, and Quality of Life
Air pollution and noise are often issues in the construction of toll roads. However, surveys show that most communities are not too bothered by these impacts, mainly due to mitigation measures such as greening around the project site. This temporary impact is also offset by the expected long-term benefits, such as increased mobility and connectivity between regions.
e. Increased Social Mobility
Toll roads provide opportunities for the community to increase social mobility. With faster access to transportation, people have the opportunity to find work outside their area, increase their income, and improve their families' living standards. In addition, toll roads also facilitate wider interaction between communities, creating a greater social network.
f. Social Integration of Urban and Rural Areas
The construction of toll roads helps connect urban and rural areas, strengthening social integration. Rural communities that were previously isolated now have better access to cities, opening up opportunities for education, employment, and health services. This integration also helps to reduce the social gap between urban and rural areas.

2. Economic Impact
a. Increase in Income and New Jobs
During the construction period, the expressway project created many jobs for the local community, helping to increase their income. Once the toll road is operational, new business opportunities have sprung up around rest areas and toll roads, such as food stores and lodgings, providing a significant positive economic impact (Butarbutar & Rahayu, 2023).
b. Efficiency of Transportation and Distribution of Goods
Toll roads speed up the delivery of goods and services, reduce logistics costs, and support smooth distribution. Areas that were previously hampered by poor road conditions now have direct access to economic centers, strengthening their competitiveness in the market.
c. New Regional Development
The construction of toll roads often triggers the development of new areas around it. In the Permai Toll Road area, for example, a new trade area has emerged that supports regional economic growth. This development involves various sectors, including retail, transportation, and tourism, all of which contribute to the improvement of the local economy.
d. Reduction of Traditional Economic Activities
While toll roads create new opportunities, some traditional economic activities such as spillover markets and small MSMEs on non-toll roads have experienced a decline in revenue. This requires business actors to innovate and find new ways to remain relevant in the midst of economic changes.

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e. Economic Integration Between Regions
Toll roads help integrate economies between regions by connecting major economic corridors. Projects such as the Permai Toll Road connect industrial areas, ports, and major cities, creating synergies that strengthen economic growth on a regional and national scale.
f. Development of Tourism Potential
With easier access through toll roads, tourist destinations in remote areas are now easier to reach. This increases the number of tourist visits, opening up new business opportunities in the tourism sector, such as hotels, restaurants, and local transportation service providers.
g. Diversification of the Local Economy
Some communities affected by land acquisition take advantage of the compensation received to start new businesses. Those who previously worked in the agricultural sector switched to retail or service businesses, creating economic diversification at the local level. This diversification strengthens the economic resilience of the community in the face of change.

Public Financial Management Theory and Infrastructure Investment Efficiency

According to Eltokhy et al. (2024) in an IMF Working Paper, the efficiency of public investment in low-income countries is strongly influenced by five key institutions: project management, project appraisal, procurement, funding availability, and project selection. Weaknesses in these institutions can hinder the effectiveness of infrastructure investments. Therefore, strengthening public governance is crucial to ensure that infrastructure investments deliver optimal economic benefits.

Furthermore, Reynilda and Renal (2023) emphasize the importance of implementing performance-based budgeting systems and costing methods such as Activity-Based Costing (ABC) and Zero-Based Budgeting (ZBB) in improving the efficiency of public financial management. The application of these methods can ensure that resource allocation corresponds to measurable results, increase fiscal transparency, and strengthen accountability in public financial management.

Toll Road Infrastructure and its Impact on the Regional Economy

The study by Nairobi and Respitasari (2021) shows that public infrastructure investment, including toll roads, has a significant positive impact on regional economic growth. Analysis of panel data in Lampung Province shows that roads, irrigation, and health infrastructure contribute positively to economic growth, while capital expenditure shows no significant effect. This emphasizes the importance of public infrastructure investment in driving regional economic growth.

However, Ansar et al. (2016) warn that poorly managed infrastructure investment can lead to economic instability. Their study on infrastructure investment in China shows that many infrastructure projects fail to provide positive returns and instead increase debt burden and financial risks. This emphasizes the importance of effective and selective project management in infrastructure investment.

Relationship between Vehicle Volume and PNBP from Toll Road

The volume of vehicles passing through toll roads directly affects the revenue from toll tariffs, which is part of the non-tax revenue. Factors such as economic growth,

p-ISSN: 2088-1231
e-ISSN: 2460-5328

urbanization, and transportation policies affect the volume of traffic on toll roads. An increase in vehicle volume, especially private vehicles, contributes to an increase in revenue from toll tariffs. However, factors such as congestion, tariff policies, and road quality may affect the decision of toll road users, which in turn affects the volume of vehicles and the resulting PNBP.

Referring to the above findings, there is an urgent need to conduct a quantitative evaluation of toll road management, especially by PT Hutama Karya. This research aims to measure the effect of toll road length and traffic volume on PNBP, as well as evaluate strategies for more efficient management of toll road infrastructure. Using data from 2018 to 2023, this study will provide empirical insights that can be used to improve the efficiency of toll road management and its contribution to state revenue.

METHOD

In this study, the method used is quantitative mentode with a descriptive approach. In data collection, we use time series data for six years, starting from 2013 to 2023. The data source is in the form of secondary data, namely data taken from the Annual Report of PT. Hutama Karya (Persero) and also the Annual Report of the Ministry of Finance. The analysis methods used are classical assumption tests and also multiple linear regression analysis using e-views software. The purpose of this analysis is to determine the influence between independent variables on dependent variables, namely Toll Road Length (X1), Traffic Transaction Volume (X2) on Non-Taxable State Revenue (Y).

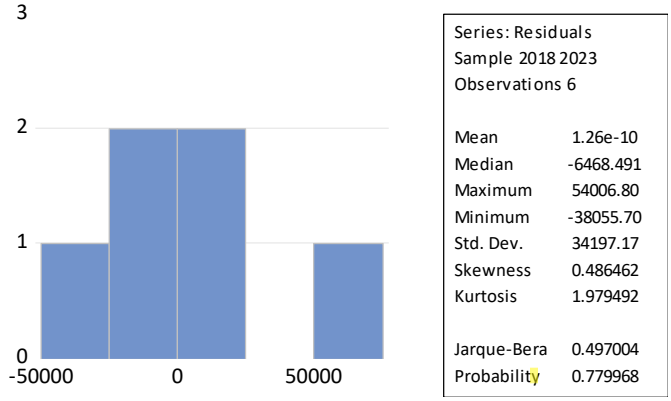
In testing the hypothesis, the test used is the t-test to determine the influence of X1 and X2 on Y individually. In addition, the F-Test is also used to determine the influence of X1 and X2 on Y together. It is hoped that the results of this study can provide a clear picture of the influence of toll road length and traffic transaction volume on non-taxable state revenue on PT. Hutama Karya (Persero).

RESULTS AND DISCUSSION

Classical Assumption Test

a. Normality Test (Jarque Bera)

Figure 1 Normality Test



p-ISSN: 2088-1231
e-ISSN: 2460-5328

The Normality Test is a test conducted to determine whether the residue in the study is normally distributed or not. The results of this test are important to meet in the aspect of the parametric statistical test, which relies on the nature of this distribution to produce a valid analysis. In the research conducted, the normality test used was Jarque Bera. This test measures the difference between skewness and data curtosis (Iii, 2019). If the p-value < 0.05, then the residuals are not normally distributed. Conversely, if the p-value > 0.05, then the residuals can be distributed normally.

In the results of the study, the Jarque-Bera value is 0.497004 with a probability of 0.779968, where the value > 0.05 means that the residual is normally distributed and indicates the assumption that normality is fulfilled in the regression model used.

b. Multicollinearity Test (Variance Inflation Factor)

Table 1 Multicollinearity Test (Variance Inflation Factor)

Date: 12/06/24
Time: 09:13
Sample: 2018 2023
Included observations: 6

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	2.22E110	68.23626	NA
X1	9270.325	6.425917	1.939459
X2	493020.9	92.79202	1.939459

Multicollinearity Test (Variance Inflation Factor), which is a test conducted to determine whether there is a high correlation between independent variables that can cause multicollinearity, which can cause damage to model estimates. If the result of the Variance Inflation Factor (VIF) is > out of 10, then there is a high multicollinearity between the independent variables. On the other hand, if the VIF is < 10, then there is no significant multicollinearity problem.

In the results of the study, the VIF X1 value is 6.425917, where the value is <10 means that there is no significant multicollinearity problem. As for the VIF X2 value of 92.79202, where the value > 10 means that there is a high multicollinearity and needs to be considered in further analysis. However, in this study we did not conduct further tests on X2.

c. Heterokedasticity Test (Glacier Test)

Table 2 Heterokedasticity Test (Glacier Test)

Heteroskedasticity Test: Glejser
Null Hypothesis: Homoskedasticity

F-statistic	8.051319	Prob. F (2,3)	0.0622
Obs*R-squared	5.057722	Prob. Chi-Square (2)	0.0797
Scaled explained SS	1.522206	Prob. Chi-Square (2)	0.4672

The Heteroscedasticity Test (Gglejser Test), which is carried out to determine whether the error variance in the regression model is constant, which can affect the efficiency of the coefficient estimation and can also affect the accuracy of hypothesis testing. In the

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Heterokedasticity Test, we use the Gleejser Test. If the p-value < 0.05, it indicates a heteroscedasticity problem. On the other hand, if the p-value > 0.05, it indicates the absence of heteroscedasticity problems.

In the results of the study, the F-statistic value is 8.081319 with a probability of 0.0622, where the value is >0.05 which means that there is no heteroscedasticity in this study and the residual variance is constant.

Table 3 Autocorrelation Test (Durbin Watson)

Mean dependent var	340,335.8
S.D. dependent var	269,792.2
Akaike info criterion	24.53535
Schwarz criterion	24.43123
Hannan-Quinn criter.	24.11855
Durbin-Watson stat	3.217308

d. Autocorrelation Test (Durbin Watson Test)

Autocorrelation Test (Durbin Watson Test), which is a test carried out to determine whether there is a correlation between residual (error) in one period and the previous period, which is called autocorrelation. If the Durbin-Watson value is at 1.5 – 2.5, the value is in the ideal range. If it is too low (<1) or too high (>3), then it indicates that there is an autocorrelation problem in the model.

In the results of the study, the Durbin Watson value is 3.217308, where the value > 2 means that if based on the provisions that have been explained, it shows that there is a positive autocorrelation in the residual that can affect the results of the analysis. However, if you interpret the value distribution of Watson's durbin table for k=2 and n=6 it is empty, which means it is free of autocorrelation.

Table 4 Multiple Regression Test

Dependent Variable: Y
Method: Least Squares
Date: 12/06/24
Time: 09:09
Sample: 2018 2023
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-91,887.52	148,883.5	-0.617177	0.5808
X1	908.5887	96.28253	9.436694	**0.0025**
X2	294.1469	702.1545	0.418920	0.7035

Multiple Regression Test

Multiple regression test is a statistical method that provides information about the influence between independent variables and dependent variables. In addition, it also provides information about the positive or negative relationship between independent and dependent variables. In this model, it includes significant testing through the F test (simultaneous) and t test (partial), as well as measuring the model's ability to explain the variability of dependent variables using R-squared values. The resulting regression equation is: Y = -91887.5176154 + 908.588692593*X1 + 294.146870581*X2, where the constant is -91887.5176154, the

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variable Toll Road Length (X1) has a coefficient of 908.588692593 which provides information that the positive influence on state revenue is not taxable. Meanwhile, the transaction traffic volume variable (X2) has a coefficient of 294.146870581, which provides information that a positive influence on state revenue is not taxable.

Table 5 Test T (Partial)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-91,887.52	148,883.5	-0.617177	0.5808
X1	908.5887	96.28253	9.436694	**0.0025**
X2	294.1469	702.1545	0.418920	0.7035

a. Test T (partial)

The T test (partial), which is a test used to determine whether the regression model as a whole is significant or not. *t-Test* is a test to see if an independent variable affects a dependent variable. The regression model is declared significant if the *t-Statistic* is <0.05.

In the results of the study, the coefficient of the X1 variable is 908.5887 with *a t-statistic* of 9.436694 and a probability of 0.0025, this shows that the test value of t-X1 < 0.05, which means that the variable X1 has a significant influence on the variable Y. As for X2, with a coefficient of 294.1469 with *t-statistic* is 0.418920 and the probability is 0.7035, this shows that the t-test value X2 > 0.05, which means that the X2 variable has no effect on the Y variable.

Table 6 Test F (simultaneous)

R-squared	0.983933	Mean dependent var	340,335.8
Adjusted R-squared	0.973222	S.D. dependent var	269,792.2
S.E. of regression	44,148.35	Akaike info criterion	24.53535
Sum squared resid	5.85E109	Schwarz criterion	24.43123
Log likelihood	-70.60606	Hannan–Quinn criter.	24.11855
F-statistic	91.86194	Durbin–Watson stat	3.217308
Prob(F-statistic)	0.002036		

b. Test F (Simultaneous)

The *F test (*simultaneous), which is a test used to determine whether the overall regression model is significant or not. *F-Test* is a test to see if an independent variable affects a dependent variable. The regression model is declared significant if the *F-Statistic* is <0.05.

In the results of the study, the F test showed a *F-static* value of 91.86194 with *a Prob(F-statistic)* of 0.002036. Which shows that the test value F < 0.05. This means

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that the regression model as a whole is significant, at least one of the dependent variables (X1 or X2) has an influence on the dependent variable (Y).

Table 7 Coefficient of Determination

R-squared	0.983933	Mean dependent var	340,335.8
Adjusted R-squared	0.973222	S.D. dependent var	269,792.2
S.E. of regression	44,148.35	Akaike info criterion	24.53535
Sum squared resid	5.85E109	Schwarz criterion	24.43123
Log likelihood	-70.60606	Hannan–Quinn criter.	24.11855
F-statistic	91.86194	Durbin–Watson stat	3.217308
Prob(F-statistic)	0.002036		

c. Coefficient of Determination (Adjusted R-Square)

The coefficient of determination (R *square or* R squared) or symbolized by "R2" which has a great meaning of the influence exerted by its independent variable (X) on the dependent variable (Y) (Raharjo, 2019).

In the results of the study, the *Adjusted R-Squared* Test showed a value of 0.973222, which means that the independent variables (Toll Road Length and Transaction Traffic Volume) have an influence of 97.3% on non-taxable state revenue, while 2.7% is influenced by other factors outside this study.

Effect of Toll Road Length and Transaction Volume on Non-Taxable Income

We can conclude from the results of the research conducted, namely the Length of Toll Road (X1) has a significant and positive influence on Non-Taxable State Revenue (Y). With a coefficient of 908.5887, an increase in each unit of toll road length will increase non-taxable state revenue by 908.5887 units. The results of the t-test showed a probability value smaller than 0.05, which was 0.0025, which confirmed that the relationship was significant. This shows that the construction and extension of toll roads make a real contribution to the increase in non-taxable state revenue, most likely through increased economic activity and transportation efficiency.

Meanwhile, Transaction Traffic Volume (X2) has a regression coefficient of 294.1469, which means that there is a potential positive relationship with non-taxable state revenue. However, the results of the t-test showed that this effect was not significant, with a probability value of 0.7035 (greater than 0.05). In addition, the Variance Inflation Factor (VIF) value for X2 of 92.79202 indicates a high multicollinearity, which can obscure the true relationship between this variable and the dependent variable. Therefore, although transaction traffic volume has the potential to be influential, the results of this study do not support a significant relationship between the two.

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Overall, the regression model used has a very high level of reliability, with an R-Squared value of 0.983933. This shows that 98.3% variability of Non-Taxable State Revenue can be explained by the Length of Toll Road and Transaction Traffic Volume. However, the main contribution to this model is more dominant coming from the Length of the Toll Road. The results of the F test also showed that the regression model as a whole was significant, with a probability value of 0.002036, so that at least one independent variable had a real influence on the dependent variable. Nonetheless, the multicollinearity problems found in X2 and its insignificant existence point to the need for further evaluation, such as the use of alternative methods or model development to overcome these constraints. In conclusion, infrastructure development such as toll roads is essential in increasing non-taxable state revenue, while other variables, such as transaction traffic volume, require more in-depth analysis.

CONCLUSION

The conclusion of this study confirms that the length of toll roads and traffic volume have a significant influence on non-taxable state revenue (PNBP) managed by PT Hutama Karya (Persero). The construction of toll roads in Indonesia not only serves as a means of transportation that accelerates connectivity between regions, but also contributes directly to local and national economic growth. With the increase in the length of toll roads, the volume of vehicles passing through has also increased, which has a positive impact on revenue from toll rates. This shows that investment in toll road infrastructure is a strategic step to encourage economic growth, create jobs, and improve people's welfare. Furthermore, toll roads act as a lever for the regional economy, where the areas that toll roads pass through tend to experience faster economic growth. The ease of transportation access offered by toll roads encourages investment and trade, as well as opens up new business opportunities around the toll area. For example, the opening of the Trans-Sumatra toll road has had a positive impact on areas that were previously difficult to access, thereby increasing economic and tourism potential. However, challenges faced in toll road development, such as land acquisition, congestion, and inconsistent tariff policies, need to be overcome to ensure the effectiveness of infrastructure management.

Therefore, it is important for the government and related parties to formulate policies that support the sustainable development of toll road infrastructure. This includes improving the quality of services, developing a fair fare system, and careful planning to reduce negative impacts on local communities, such as a decrease in income for areas that toll roads pass through. In addition, attention must also be paid to environmental aspects, such as the management of water catchment areas to reduce the risk of flooding that can be caused by the construction of toll roads. Thus, toll roads can function not only as transportation infrastructure, but also as a main driver for economic diversification and improving the quality of life of people around the toll area. This study provides recommendations for better management strategies, which are expected to improve the efficiency and effectiveness of toll road infrastructure in Indonesia. Through a holistic and integrated approach, it is hoped that toll road construction can support the achievement of broader economic development goals, as well as provide sustainable social and economic benefits for the entire community. As such, investment in toll road infrastructure should be seen as an integral part of a larger national development strategy, which aims to create better connectivity, improve economic competitiveness, and foster inclusive growth across Indonesia.

p-ISSN: 2088-1231
e-ISSN: 2460-5328

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