



## Earmarking Tax Analysis on Vehicle Tax Revenues on Road Conditions in Indonesia 2011-2020

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### Abstract

Motor Vehicle Tax is allocated a minimum of 10% for road construction and maintenance in accordance with Law no. 28 of 2009 article 8 paragraph (5). However, data on the length of roads according to conditions at BPS shows that the number of lengths of roads with damaged conditions continues to increase every year. The research object used is all provinces in Indonesia in 2011-2020 except North Kalimantan. This research was conducted to see how the effect of motor vehicle tax revenues which are included in the earmarking tax category in its realization on public services. The method used is panel data regression analysis by choosing the best model between CEM, FEM, or REM. The data used is secondary data in the form of district road length data per province as the dependent variable obtained from the Central Statistics Agency. The independent variables are Motor Vehicle Tax data, Earmarking Tax, and the number of motorized vehicles. The results showed that the number of motorized vehicles had no effect on the condition of the length of the road. Earmarking tax has a positive effect on road length conditions. Motor vehicle tax has a negative effect on road length conditions.

**Keywords:** Road Length, Motor Vehicle Tax, Earmarking Tax, Number of Motorized Vehicles

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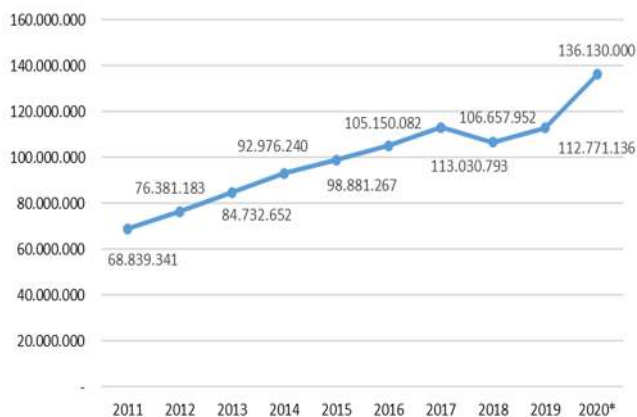
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### INTRODUCTION

The implementation of regional autonomy is one of the efforts to improve the welfare of the community through the provision of optimal public services. These public services are guided

by Presidential Regulation Number 65 of 2005 concerning the preparation and application of Minimum Service Standards (SPM). Each region must meet this service standard, which is entitled to be obtained by each resident at a

minimum. This is a basic service to meet the needs of people lives in the social, economic, educational, and governmental fields.



**Figure 1.** Growth of the number of Motor Vehicles in Indonesia in 2011-2020

Source: Badan Pusat Statistik, Transportasi Darat 2011-2020 (BPS)

Through a democratic approach and decision-making that involves the community, it is hoped that it will be more responsive in capturing the needs or problems that develop in

the community itself. Based on Law Number 33 of 2004 concerning the financial balance between the central government and local governments by creating a democratic society. The APBD is used as a guideline for the implementation of the revenue budget and as an assessment of the success or failure of the budget for the improvement of government needs and public services. Regional taxes which are one of the compositions of the APBD are still the regional income that has the largest contribution.

One of the largest tax revenues comes from the Motor Vehicle Tax. This is because the object of motorized vehicles is very much and increases every year. The number of motorized vehicles in Indonesia in 2016-2020 has reached more than 100 million units. There is a very strong correlation between the motor vehicle variable and the number of motorized vehicles, motor vehicle tax with earmarking tax, and the number of motor vehicles with earmarking tax (Setiasih & Sebayang, 2017).

**Table 1.** Provisions on the Amount of Earmarking Fund Allocation according to Law No. 28 of 2009

Regulation	Tax Type	Allocation Amount	Fund Realization
Article 8 paragraph (5)	Motor Vehicle Tax	Minimum 10%	Road construction and construction Improvement of transportation facilities and infrastructure
Article 31	Cigarette Tax	Minimum 50%	Service. Law enforcement by authorities.
Article 56 paragraph (3)	Road Lighting Tax	Some	Provision of street lighting.

Source: Law No. 28 of 2009 concerning Pajak dan Retribusi Daerah

The other side of the dense use of motorized vehicles which causes a lot of congestion and pollution is the increase in Regional Original Income (PAD) originating

from regional taxes such as Motor Vehicle Taxes, Motor Vehicle Transfer Fees, Motor Vehicle Fuel Taxes, and so on. The tax revenues will later be included in the APBD and processed to improve

regional needs and public services. From 2015 to 2020, vehicle taxes such as Motor Vehicle Tax, Motor Vehicle Transfer Fee, and Motor Vehicle Fuel Tax contributed more than 30% to Regional Original Revenue. This is a good opportunity for special allocations for public services such as road construction and maintenance.

**Table 2.** Vehicle Tax Revenue and Contribution to PAD in Indonesia 2015-2020 (Billion)

Year	Vehicle Tax	PAD	Contribution (%)
2015	30.001,10	174.314,91	48%
2016	35.266,15	229.399,26	38%
2017	41.144,13	243.006,28	37%
2018	30.339,81	269.908,54	31%
2019	42.453,89	295.522,47	32%
2020	52.592,62	328.418,72	33%

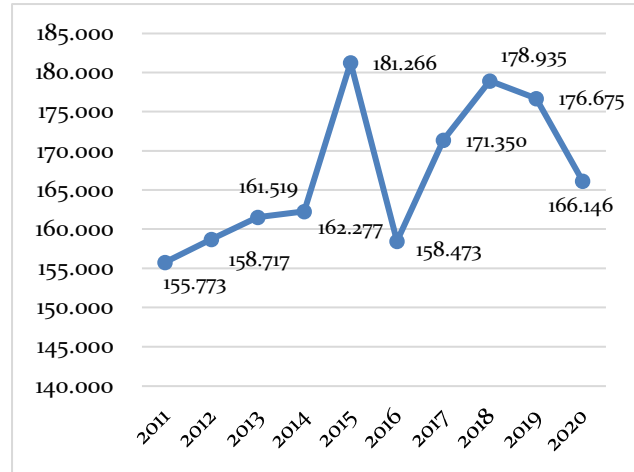
Source: Direktorat Jenderal Perimbangan Keuangan, 2015-2020

Some of the tax revenues that go to the regional treasury will later be allocated to finance regional needs, especially for public services. In the past, the allocation was common in European countries. Public services are largely financed by dues. In general, the citizen has to pay taxes in relation to utilities he obtains from local or public services provided.

Earmarking is defined as the practice of assigning income specifically for the public financing of certain goods and services (McMahon & Sprenkle, 2016). According to Mueller in the book *Public Choice III*, earmarking is the third form of special intergovernmental grants.

The grants allocated can only be used to finance programs intended for them, not restricting local governments from spending a certain amount of their own money on this program (Pyne, 2003). In Indonesia, earmarking

policies have been implemented but lack special attention and have not become a common thing. There are three types of local taxes that are included in earmarking taxes based on applicable laws in Indonesia.



**Figure 2.** Number of Damaged Roads in Indonesia in 2011-2020

Source: Badan Pusat Statistik 2011-2020 (processed)

This provision, makes the ability of regions to finance their needs even greater. Regions can easily adjust the costs that will be incurred to meet the needs of road construction. To continue to improve public services related to roads, people are urged to obey existing regulations by obediently paying vehicle tax. As a result of the payment of such taxes, the benefits can be felt directly by motor vehicle users.

In table 2, from 2015 to 2020, vehicle taxes such as Motor Vehicle Tax, Motor Vehicle Name Reversal Duty, and Motor Vehicle Fuel Tax have contributed more than 30% to Local Revenue. This is a good opportunity for special allocations for public services such as road construction. However, the development of the number of damaged roads in Indonesia tends to increase.

More than 150 thousand district/city roads have less decent conditions (Figure 2).

Especially in 2015 to 2019. The condition of roads that are not suitable for access occurs due to several possibilities such as poor quality of road construction, natural disasters, the presence of excess loads, etc. This condition shows that the allocation of capital expenditure for financing road construction is not optimal. It is very likely that the earmarking tax policy has also not been implemented optimally.

If this problem is not immediately followed up, it will cause new problems, especially for economic activities. Musgrave's theory in the book *State Finance* (2017) distinguishes three functions and objectives of government spending budget policy which he called: "Allocation, the Distribution, and the Stabilization of Branches" (*The Journal of Finance* Vol. 15: 118-120).

The main purpose of the allocation is to allocate the resources needed to meet what Musgrave calls "public wants". Peacock and Wiseman's theory in modul *Public Economics* (2012) explains that the government has always made efforts to increase its expenditure as a fulfillment of public services by increasing revenue from taxes, but people do not like the payment of taxes that are increasingly large to finance those government expenditures. The increase in tax revenues has caused government spending to also increase.

The increasing use of motorized vehicles from year to year makes this tax one of the taxes that contribute greatly to regional income. The high tax revenue should be able to properly balance the construction and maintenance of roads in Indonesia. Even in 2020, vehicle tax is the highest regional tax that contributes to local revenue. Therefore, this study aims to determine

the role of the earmarking tax policy on motor vehicle taxes related to road construction and maintenance in Indonesia in terms of road conditions and road lengths in each province in Indonesia.

## RESEARCH METHODS

This type of research is quantitative research. The variables used are Motor Vehicle Tax, Earmarking Tax, Number of Motor Vehicles, and District/City Road Length in each Province in Indonesia. Tax data is obtained from the Direktorat Jenderal Perimbangan Keuangan (DJPK) in the form of revenue data per tax type for 2011-2020 in 33 provinces in Indonesia.

Data on the number of motorized vehicles per province comes from the Central Bureau of Statistics 2011-2020. Based on the time of collection, this study uses panel data which is a combination of tax data and road lengths for 33 provinces over a ten-year period, namely 2011-2020. The regression model in this study is as follows:

$$Y_{it} = \alpha + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \varepsilon_{it}$$

Where  $\alpha$  expresses the interception of the model,  $Y_{it}$  is a dependent variable,  $X_i = (X_{i1}, X_{i2}, \dots)$  is independent variable,  $\beta_i = (\beta_1, \beta_2, \dots)$  is the slope coefficient, and  $\varepsilon_{it}$  is an error that is assumed to be normally distributed with a mean of 0 and a constant variance,  $t$  is the amount of time. The regression model in this study is as follows:

$$PJ_{it} = \alpha + \beta_1 JKB_{it} + \beta_2 \text{LOG}(\text{EARMARKING})_{it} + \beta_3 PKB_{it} + \varepsilon_{it}$$

Where PJ is Length of way, JKB is Number of Motor Vehicles, Log Earmarking is Logarithm of *earmarking tax* and PKB is Motor Vehicle Tax

Contribution. The method used is panel data regression analysis by choosing the best model between CEM, FEM, or REM. The selection of the best model is done with the indicators from table 3.

**Table 3.** Best Model Selection Indicator

Test	Hypothesis
Chow Test	Ho: CEM is the best model (p-value > 0.05) H1: FEM is the best model (p-value < 0.05)
Hausman Test	Ho: REM is the best model (p-value > 0.05) H1: FEM is the best model (p-value < 0.05)
LM Test	Ho: CEM is the best model (p-value > 0.05) H1: REM is the best model (p-value < 0.05)

Source : Data Prosesed, 2022

Not including North Kalimantan because it was only inaugurated in 2012. Earmarking tax data in this study is assumed to be in accordance with the profit sharing stipulated in Law no. 28 of 2009 concerning regional taxes and levies. The calculation comes from the Revenue Sharing Fund or 70% of motor vehicle tax revenues distributed to local governments multiplied by 10%.

This calculation is based on Law no. 28 of 2009 concerning the regulation on the allocation of motorized vehicle tax for road construction at a minimum of 10%. Data on the number of motorized vehicles per province in 2011-2020 comes from the Central Statistics Agency (BPS) for Land Transportation Statistics. District/city road length data were obtained from the Central

Bureau of Statistics (BPS) for Land Transportation in 2011-2020.

The data is the result of the sum of the length of district/city roads from several road conditions, namely good, moderate, damaged, and heavily damaged. The length of the DKI Jakarta provincial road listed is the length of the provincial road because based on the Government Regulation of the Republic of Indonesia No. 34 of 2006 concerning roads, that the status of roads in DKI Jakarta is only national roads and provincial roads.

## RESULTS AND DISCUSSION

The selection of regression models to get the best model was carried out with three stages of testing, namely the chow test, the hausman test, and the LM (lagrange multiplier) test. In the chow test, a test was carried out between CEM and FEM. The results showed that the f-statistical value of 0.0000 or less than 0.05, meaning that Ho was rejected and H1 was accepted so that the best model of the chow test was FEM (fixed effect model).

**Table 4.** Regression Results

Variable	Coefficient	t-Stat	Prob.
C	-4932.629	-1.233437	0.2184
JKB	7.74E-06	0.132253	0.8949
Log(Earmarking)	755.1216	4.457683	0.0000
PKB	-9.359209	-2.550334	0.0113

Source: Eviews 9 output (processed), 2022

Based on the regression results, the following equation is obtained:

$$PJ = -4932.629 + 7.74Jkb + 755.1216\text{LogEarmark} - 9.359209\text{Pkb} + \varepsilon_{it}$$

The hausman test is tested between REM and FEM, the f-statistical results show a value of

0.0181 or less than 0.05, meaning that  $h_1$  is accepted or FEM is the best model. In the LM test, it is carried out to test CEM and REM. The test results show a statistical f-value of 0.0000 or less than 0.05 which means REM (random effect model) is the best model. The conclusion is that two of the three tests chose FEM as the best model, so the best model used in this regression is FEM.

**Table 5.** Multicollinearity Test

	Jkb	Log (Earmark-ed)	Pkb
Jkb	1.000000	0.785533	0.120062
Log (Earmarking)	0.785533	1.000000	-0.184450
Pkb	0.120062	-0.184450	1.000000

Source: Eviews 9 output (processed), 2022

The results of the classical assumption test show that the Jarque-Bera statistical probability (JB) shows a number of 0.112385 or more than 0.05, meaning that the regression model used is normally distributed. The correlation between variables does not exceed 0.80.

**Table 6.** Heteroskedasticity Test

Variable	Coefficient	t-Statistic	Prob.
C	-225.9046	-0.129475	0.8971
JKB	-2.98E-05	-1.168583	0.2435
Log (Earmarking)	41.00335	0.554795	0.5795
PKB	1.237584	0.772954	0.4402

Source: Eviews 9 output (processed), 2022

That is, there is no multicollinearity in the model. Heteroskedasticity test shows the probability value of all free variables of more than 0.05, meaning that the model in this study did not contract the problem of heteroskedasticity.

**Table 7.** t-Stat test

Free Variable	t-statistik	Probability
JKB	0.132253	0.8949
Log(Earmarking)	4.457683	0.0000
PKB	-2.550334	0.0113

Source: Eviews 9 output (processed), 2022

T-statistics test show 2 variables namely earmarking tax and Motor Vehicle Tax have a significant effect on road construction and maintenance. However, 1 variable i.e. the number of motor vehicles is insignificant.

**Table 8.** f-Stat test

F-statistic	839.0783
Prob(F-statistic)	0.000000

Source: Eviews 9 output (processed), 2022

prob(F-statistic) value of 0.0000 or less than 0.05. This shows that the free variables (JKB, Earmarking tax, PKB) used in this study together have a significant effect on the bound variables, namely road construction and maintenance.

**Table 9.** Coefficient of Determination

R-squared (R <sup>2</sup> )	0.990122
Adjusted R-squared	0.988942

Source: Eviews 9 output (processed), 2022

R<sup>2</sup> value is 0.990122 and Adjusted R<sup>2</sup> is 0.988942. This explains that the free variable consisting of the number of motor vehicles, earmarking tax, and Motor Vehicle Tax has an effect of 99% on the bound variables, namely road construction and maintenance. While the remaining 1% is explained by other variables outside the model.

Variabel number of motor vehicles (JKB) has a positive result but the probability value is

insignificant. This means that the JKB variable has no influence on the dependent variable, namely the length of the road. This result is in accordance with research by Nuryanis (2010) who said that the financing of road construction so far is greater than tax revenues from the transportation sector.

The number of motor vehicles has no effect because the increase in the number of vehicles and the increase in tax revenues from the transport sector are not proportional to the large amount of funds spent on road construction. Setiasih (2018) said that the increasing number of motor vehicles will result in increased expenditure on public services (road construction and maintenance).

The World Bank states that damaged roads will increase operating costs by about 2-3 USD per kilometer per year. This happens because the higher the number of motorized vehicles, the higher their contribution to damage the road. The number of motor vehicles is increasing, so the expenditures used for public services are increasing, namely road construction and construction.

The earmarking log variable derived from the 10% allocated motor vehicle tax revenue share has a positive influence on its dependent variable, namely road length. Any increase in the amount of funds allocated (earmarking tax) by 1% will increase the construction of 755 km of roads. It is assumed that road financing with a special allocation is carried out in accordance with the law that has been formed regarding earmarking tax.

These results are in accordance with previous studies. Hoang (2012) which states that every time there is a decrease and/or 1% increase in allocated income (earmarking tax) it will reduce and/or increase national road

expenditures between 0.24% - 0.32%. Earmarking taxes can increase revenue, thereby encouraging more efficient allocation of resources.

Winston & Langer (2006) says that \$1 government spending on highways in a given year reduces the cost of congestion of road users by 11 cents in the same year. This shows that the allocation of funds for road construction has a considerable impact on government spending. Winston & Langer (2006) also says the section is nearly \$350 billion a year to eliminate those costs (addressing congestion due to damaged road conditions) by doing road repairs or building toll roads.

Setiasih and Sebayang (2018) said that directly earmarking tax has a significant influence on public services (road construction and maintenance). Earmarking tax that increases will also result in an increase in public services (road construction). The results of this regression are in accordance with the purpose of the earmarking tax stated by McCleary (1991) if applied in accordance with Law No. 28 of 2009 concerning earmarking policy in Indonesia which stipulates a minimum allocation of funds of 10% for road construction. McCleary (1991) states that the special allocation of taxes aims to improve public services based on the type of tax paid.

The Motor Vehicle Tax Variable (PKB) has a negative influence on the dependent variable, namely the length of the road. This means that if the motor vehicle tax increases by 1%, it will reduce road construction by 9.35 km. This result is inconsistent with Peacock and Wiseman's Theory which explains that an increase in tax revenue would increase government spending as a public service funding. The negative result is suspected to be because the amount of

earmarking tax allocation of 10% is fixed even though motor vehicle tax revenues have fluctuated. When motor vehicle tax revenues increase, the earmarking tax allocation also increases. And vice versa.

In addition, earmarking tax is a form of policy whose determination goes through a political process and requires approval from various parties. Brett and Keen (2000) in the journal *Earmarked Taxation and Political Competition* show that allocations can be used by current office holders to limit future

policymaking in the context of political uncertainty.

Policy makers can use earmarking as a signal to influence people's confidence in elections. Vincent Anisi (2006) proved that parties cannot fulfill their campaign promises before elections. In other words, parties who benefit from earmarking tax always apply the restriction rules according to the earmarking provisions. Conversely, the party who could not benefit from the allocation never did so.

**Table 10.** Regional Expenditure Data and Budget Realization for Employee Expenditure 2015-2020 (Billion IDR)

Year	Regional Expenditure (BD)	Employee Expenditure (BP)	Capital Expenditure (BM)	(BP/BD) %	(BM/BD) %
2016	1.003.052	351.534	220.847	35,05	22,02
2017	1.058.322	356.961	211.652	33,73	20,00
2018	1.093.892	368.348	203.509	33,67	18,60
2019	1.188.023	384.969	218.913	32,40	18,43
2020	1.121.957	373.299	157.572	33,27	14,04

Source: APBD, DJPK Kemenkeu, 2015-2020

The government has always tried to increase its expenditure by increasing revenues from taxes, as can be seen from local tax revenues that increase every year and expenditures on regional expenditures that increase every year. People don't like paying huge taxes to finance the growing government spending. The increase in tax revenues has resulted in increased government spending.

Hoang & Duncombe (2012) said that the increase in road funding came from a transportation-related source of revenue (Motor Vehicle Tax) attributed to road financing of a significant effect. This is because transportation-related revenues are usually taken into account

and there are limits in most states on how the money in those funds can be used. Motor vehicle tax is a potential source because motor vehicle tax is one of the biggest contributors to PAD.

Nesbit & Kreft (2009) says that the state's allocated tax revenues account for nearly 48% of all state highway funds. The estimated impact of a \$1 increase in state tax revenues allocated to highways increased highway spending by nearly 94 cents. However, allocation of funds from motor vehicle tax proceeds for public transportation facilities and infrastructure has not been maximized, as evidenced by the large number of inadequate facilities. Novlyani (2021)



said that obstacles faced by the government in implementing this policy is that the government does not have a special post/fund account for the allocation of these funds.

However, in research Setiasih and Sebayang (2018) said the effect of vehicle tax on public services (road construction) showed negative results. This means that when the vehicle tax increases, public services will decrease, and vice versa. Christen and Soguel (2021) The results showed the expected negative effects of allocation on the efficiency of construction and road construction. On average, additional expenditures with an allocation of funds of 1,000 Swiss francs led to an increase in input needs by 5.4 percent.

The motor vehicle tax has not been allocated to the maximum for road construction. Joko Tri Haryanto (2014) said that the government budgeted approximately 5 trillion in 2015 through the Ministry of Finance PUPR for road repairs through the DAK scheme. Most of the APBD spending is used for routine administrative expenditures for employees and official travel.

Table 10 shows that the realization of regional expenditures, one of whose funds comes from local tax revenues, more than 30% is used as employee spending. This amount is greater than the realization of capital expenditures which only range from 14-23%, used as a public service.

This shows that the funds received by the regions, especially from tax payments, have not been separated according to their needs and goals. The absence of this separation is one of the causes of the lack of financing for public services, especially road construction. This is what causes the Motor Vehicle Tax to negatively affect the length of the road.

This phenomenon shows that the separation of funds according to needs and benefits as stipulated in the Law has not been maximized, especially in the application of earmarking tax. Allocation precludes the "diversion" and additional assistance necessary for the achievement of equilibrium (McMahon & Sprenkle, 2016). Gultom, et al (2015) said that the collection of funds is periodically carried out by local governments by transferring earmarking funds to a special BRF account.

## CONCLUSION

Based on the results of the research and discussion that has been described in the previous chapters, the following conclusions can be obtained : The number of motor vehicles has no influence on the length of the road. This result shows that the number of motor vehicles does not participate in affecting the length of the road. The cost of road construction is greater than the annual cost of motor vehicles obtained from the results of the increase in the number of motor vehicles.

Therefore, an increase or decrease in the number of motorized vehicles cannot be fully a benchmark to find out the increase or decrease in road length in Indonesia. Earmarking has a positive influence on the length of the road. This shows that the length of the road will increase as the earmarking tax increases.

These results show that the purpose of earmarking tax can be achieved in order to increase road construction financed from allocated income. Earmarking tax is one of the sources of revenue that comes from the road sector, namely profit sharing from Motor Vehicle Tax revenue which will become more effective and efficient if reused to finance the needs of the road sector. Earmarking tax can

provide benefits to the availability of guaranteed finances and is one of the steps to increase public confidence in the management of funds by the government.

Motor vehicle tax has a negative influence on the length of the road. The negative result is suspected to be because the amount of earmarking tax is fixed, which is 10% even though Motor Vehicle Tax receipts have gone up and down. In addition, earmarking tax is a political process whose determination is through the approval of several parties.

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