Local Government Pro-Poor Growth Spending Efficiency And Their Determinants In Indonesia

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ARTICLE INFO	ABSTRACT
	This research aims to (1) assess the efficiency of pro-poor growth spending by local governments in Indonesia and (2) examine the factors influencing this efficiency. This research is conducted in two steps. In the first step, employing the Data Envelopment Analysis method, the efficiency level was assessed across local governments in 34 provinces in Indonesia, spanning from 2015 to 2021. The analysis considers five inputs: per capita spending on education, health, economy, social protection, and infrastructure, with economic growth and poverty rates as the outputs. The study examines efficiency determinants in the second stage through the Tobit regression method. The efficiency determinants encompass government splitting, GRDP per capita, intergovernmental transfers, and taxes. Findings reveal that the average efficiency score is 0.96. However, only Jakarta, Bali, and Banten provinces consistently demonstrate efficiency.
	Moreover, Tobit regression underscores that regional expansion adversely impacts spending efficiency, with local governments in burgeoning provinces exhibiting lower efficiency levels. GRDP per capita and transfers also have a negative influence on spending efficiency. Conversely, taxes exhibit a positive effect on spending efficiency. Consequently, it is recommended that the Indonesian government cease regional expansion and instead focus on intensifying and extending tax efforts. Simultaneously, local governments should strive towards reducing fiscal reliance on the central government, a crucial step towards enhancing spending efficiency.
	Keywords: Efficiency, GRDP per capita, government spending per capita, regional expansion, taxes.

INTRODUCTION

As a developing country, Indonesia is continuing to carry out economic development in order to achieve a prosperous society. For this reason, regional governments in Indonesia continue to strive to create policies that can improve the welfare of people in the regions. One of the government policies in Indonesia that is used to achieve increased community welfare is the regional expansion policy.

Although some countries carry out mergers for efficiency in government spending, Indonesia does the opposite, namely regional expansion. Indonesia consists of 34 provinces, 26 of which are experiencing regional expansion. It means that in these 26 provinces, new local governments have emerged. Several provinces experiencing regional expansion include Bengkulu Province (Sumatra region) and NTT Province (Nusa Tenggara region). Therefore, to achieve the goal of regional expansion, namely improving the welfare of the people in the regions, regional governments in each province need to regulate the allocation of government expenditure appropriately and efficiently so that the welfare of the people in the regions increases. For this reason, it is necessary to measure the efficiency of regional government spending in Indonesia to improve community welfare after regional expansion.

Measuring efficiency is a central issue in discussing public sector economics. How local governments allocate spending efficiently has always been a hot topic of discussion, especially in efforts to improve community welfare. Of course, achieving a prosperous society in each region takes quite a long time. One stage in this

process is regional economic growth. For developing countries, including Indonesia, regional economic growth is still an engine of development to improve people's welfare. Through economic growth, the problems of unemployment and poverty in the regions can be slowly eliminated.

Local governments have an essential role in encouraging economic growth. Through government spending, regional governments can build infrastructure and revive the business sector so that the regional economy can grow. However, even though the regional economy is growing, the poverty level in the region still needs to decrease. The poverty level is an indicator of low social welfare. Previous studies show that economic growth influences poverty (Balasubramanian et al., 2023; Kouadio & Gakpa, 2021).

On the other hand, poverty affects economic growth (Zhu et al., 2022). There is a link between economic growth and poverty, so local governments need to allocate expenditure that is pro-poor growth. Pro-poor growth expenditures are government expenditures allocated to encourage pro-poor economic growth. With efficient pro-poor growth expenditures, the regional economy grows, and the poverty rate decreases, so people's welfare improves.

Indonesia has several expansion provinces with high poverty rates, such as Bengkulu and NTT. Meanwhile, the poverty level in provinces such as Bali and Bangka Belitung is not lower (www.bps.go.id). It indicates that the goal of regional expansion has yet to be achieved because poverty in splitting provinces tends to be higher than in non-expanding provinces. Local governments in each province should be able to use pro-poor growth expenditures efficiently so that the poor can enjoy regional economic growth, reducing poverty in their respective provinces.

Not many studies have measured the efficiency of government spending in a pro-poor growth manner. Previous research measured the efficiency of government spending in reducing poverty (Fonayet et al., 2020). Author's own measured the efficiency of pro-growth poverty reduction in districts and cities in Indonesia. This research reveals that the highest average local government efficiency for districts and cities is in the Kalimantan region, and the lowest is in Sulawesi. However, this research needs to reveal which provinces are more efficient than other provinces after regional expansion. In other words, this research needs to explain the impact of regional expansion on the efficiency of government spending in each province. Local governments in each province need to be aware of their relative position among the 34 provinces in Indonesia—for example, NTT province. NTT province has a high poverty rate. Suppose the regional government in NTT Province is not yet relatively efficient. In that case, the regional government in NTT province needs to know which province is the benchmark for becoming more efficient. In this way, the solution to the problem of inefficiency in pro-poor growth expenditures in each province after regional expansion can be identified.

It is still rare to study the efficiency of local government pro-poor growth expenditures, especially those related to regional expansion. For Indonesia, this research is essential because it is necessary to investigate the impact of regional expansion on the efficiency of pro-poor growth expenditures. The results of this efficiency measurement can be a basis for government policy in evaluating the benefits of regional expansion and whether regional expansion can encourage increased efficiency of regional government. If the opposite happens, namely, regional expansion does not encourage an increase in the efficiency of pro-poor growth expenditures in regional governments, the central government will consider merging the districts and cities resulting from the expansion. Therefore, measuring the efficiency of pro-poor growth expenditures between provinces is novel in this research.

This efficiency driving factor needs to be paid attention to so that inefficient provinces can increase the efficiency of government spending, which is pro-poor growth. Apart from regional expansion, another factor driving efficiency is GDP per capita. Countries with high GDP per capita cause the government to use spending more efficiently (Mohanty & Bhanumurthy, 2020; Moreno-Enguix & Bayona, 2017).

Another efficiency-driving variable is local government revenue. Some sources of local government revenue are taxes and grants. Afonso and Venâncio (2019) revealed that increasing taxes will increase municipal efficiency in mainland Portugal. However, other research finds the opposite, where increasing taxes will reduce the efficiency of government spending in 18 OECD economies (Afonso et al., 2021).

Another source of local government revenue is intergovernmental transfer. In contrast to taxes, it turns out that grants are insignificant in influencing efficiency (Drew et al., 2015). However, Chalil (2020) stated that grants from the central government have worsened the efficiency of village governments in Indonesia. These findings should become a policy basis for the central government in Indonesia in providing grants to village governments. Do central government grants similarly impact all local governments in each province? There are no empirical studies that reveal this. For this reason, it is essential to analyze the role of grants in encouraging increased efficiency of local government.

Based on this explanation, this research aims to (1) assess the efficiency of pro-poor growth spending by local governments in Indonesia and (2) examine the factors influencing this efficiency.

This paper is explained in the following order. This paper starts with the background and reasons why pro-poor growth spending efficiency measurements must be carried out. It is followed by a literature review that underlies the selection of inputs and outputs in measuring efficiency and the determinants of efficiency. Then, the research method is described. Then, the research results and discussion are described. This paper closes with conclusions and research implications.

LITERATURE REVIEWS

Local Government Spending Efficiency

Efficiency is a measure that shows the relationship between the use of input and output. Carrying out specific treatments maximizes output or minimizes input. Government spending patterns are directed to suit their functions as proposed by Musgrave's theory, namely allocation, distribution, and stabilization functions. Efficient government spending needs to be realized to achieve optimal results.

As shown in Table 1, various studies related to government spending efficiency were carried out using different input and output variables at both the central government and local government levels. In general, total expenditure or per capita expenditure is more widely used by researchers as an input variable (Cordero et al., 2017; Prasetyo et al., 2018; Tran & Noguchi, 2020; Tirtosuharto, 2021). Meanwhile, in several studies, the input variables used are government spending per sector, such as social spending, education, and health (Lo Storto, 2016; Halaskova, Halaskova. Prokop, 2018; Antonelli & Bonis, 2018; author's own). Apart from that, some use input in the form of a proportion of GDP (Cyrek, 2019; Fonayet, 2020; Mohanty & Bhanumurthy, 2020), welfare index (Shin et al., 2020; Fonayet, 2020), and costs of providing services (Perpina et al., 2020).

In contrast to input, output, which is used to measure the efficiency of government spending, does not have a centralized reference that serves as a parameter for the government's achievements. Therefore, researchers use various outputs as targets in calculating efficiency according to conditions in the research area. However, some researchers prefer to use social issues as a reflection of government performance, such as poverty and inequality (Cyrek, 2019; Fonayet, 2020; Shin et al., 2020), education (Mohanty & Bhanumurthy, 2020), population (Lo Storto, 2016; Cordero et al., 2017) and welfare (Prasetyo et al., 2018; Halaskova, Halaskova. Prokop., 2018; Thabrani et al, 2018). Judging from the method used to measure efficiency, DEA is still the favourite approach, even though some use other methods, such as FDH.

Table 1. Previous studies of Government Spending Efficiency

Author	Research Location	Method	Input	Output
Lo Storto, 2016	Italian		Expenditures for welfare, transport and roads, public education, culture, recreational activities, sport, local police, and the annual cost of territorial and environmental management.	Spatial size of councils and resident population.
Cordero et al., 2017	Portugal	DEA	Personnel expenditure and total expenditures	Total population, urban waste collected, water supplied, building permits issued, street lighting consumption, and school buildings for preschool and primary education.
Halaskova, Halaskova, Prokop, (2018).	European Union Countries	DEA	Public expenditure on services	GDP per capita, employment in services.
Prasetyo, Mulyono & Nugroho, 2018	Indonesia	DEA	Government expenditure per capita	Human development index
Antonelli & Bonis 2018	22 European countries	FDH and DEA	Social protection expenditure	Social Protection Performance Index:
Thabrani, et al (2018)	West Sumatra	DEA	a. Per capita Health Expenditure b. Number of doctors, nurses, and beds	a. Life expectancy b. Percentage of the population experiencing health complaints
Perpina et al., 2019	Spanish	DEA and FDH	Budget expenditure	Minimum specific services and facilities (total population, street infrastructure surface area, number of lighting points, tons of waste collected, length of water distribution networks, length of sewer networks)
Cyrek 2019	EU countries	DEA	a. General government expenditure by function % of GDP-social protection b. General government expenditure by function % of GDP-Education c. General government expenditure by function % of GDP-Health	a. Poverty b. Income inequality

Author	Research Location	Method	Input	Output
Fonayet 2020	Europe		a. Social Expenditure: Proportion of GDP b. Gini Index (GI)	Poverty
Mohanty & Bhanumurthy (2020)	India	DEA	Education: a. Education expenditure to GDP ratio b. Non-education expenditure to GDP ratio Health: a. Health Expenditure to GDP b. Non-health expenditure	Education: a. Gross enrolment ratio for school education b. Gross enrolment ratio for higher education Health: a. Infant mortality rate (IMR) b. Life expectancy (LE)
Shin et al. (2020)	OECD	DEA Tobit	Public Welfare: a. Income distribution index b. Employment index c. Public health index Social overhead capital: Expenditure on transport about GDP	Public Welfare: Gini coefficient, Poverty rates, Poverty gap, Disposable income, Employment rate, Unemployment risk, Life expectancy, Infant fatality rate, Low birth weight rate. Social overhead capital: Quality of roads, railroad, port, air transport, density of roads, railroads, air transportation, railways, container port traffic
author's own	Indonesia	DEA	1. Government Spending: a. health shopping b. education shopping c. economic spending d. social protection spending 2. Infrastructure spending	a. Economic growth **b.** Poverty rate

Determinants of regional government spending efficiency
The next step of this study is the determinants (determining factors) of government spending efficiency. Previous studies found several factors that still have uncertain relationships with efficiency. The first is regional expansion. There is a contradiction regarding the impact of regional expansion on government performance; on the one hand, regional expansion weakens the achievement of community welfare (Booth, 2011; Wibowo & Muljarijadi, 2014). On the other hand, it can encourage increased government spending performance and efficiency (author's own).

Second, the GRDP/capita. GRDP/capita measures an area's population's average income, reflecting regional prosperity. Previous studies explain that high GRDP/capita is associated with high government spending efficiency (Antonelli & De Bonis, 2018; Mohanty & Bhanumurthy, 2020; Moreno-Enguix & Bayona, 2017). However, different literature finds that GRDP/capita has yet to be proven to influence government spending efficiency significantly (Badun et al., 2014). Likewise, Ou et al. (2020) explain the negative influence of the per capita GDP growth rate on the efficiency of public spending. Author's own also found a negative influence of GDP per capita on the efficiency of government spending.

Third, the taxes show income capacity. In particular, the higher the tax, the more efficient the region is in spending. Previous studies reveal a positive influence of taxes on efficient government spending (Afonso et al., 2019; Balaguer-Coll et al., 2019). Meanwhile, Agasisti (2016) and Boetti (2012) state that contradictive that taxes have a negative effect on efficiency.

Lastly, central government transfers to local governments are explained. Transfers are budgets issued by the government to fund activities at the regional government level. This transfer aims to reduce government affairs and public services gaps between regions. In some countries, transfers from central government to local governments are the primary means of providing local services. A study conducted in Peru by Charles (2022) shows the positive influence of transfers on the efficiency of government spending. Meanwhile, Alonso and Andrews (2018) stated that external transfers to regions have a negative impact on efficiency levels. The same thing applies in Spain; in a study conducted by Narbon-Perpina et al. (2020), both direct transfers and capital transfers have a negative effect on efficiency.

METHODOLOGY

This research is conducted in two steps. The first stage was to measure the relative efficiency of local government pro-poor growth spending in 34 provinces in Indonesia. The second stage is an analysis of the

determinants of efficiency. The research data used is secondary data obtained from Statistics Indonesia and the Ministry of Finance of the Republic of Indonesia.

In the first stage, the relative efficiency of pro-poor growth is measured by applying the Data Envelopment Analysis (DEA) method. DEA was chosen for measuring efficiency because of several advantages of DEA, such as not needing to explain the functional relationship between output and input. DEA also can measure the relative efficiency of multiple outputs against multi-inputs (Cooper et al., 2002; Coelli et al., 2005; Bogetoft & Otto, 2011). Efficiency measurement is a measurement of the output/input ratio. This research uses five inputs with two outputs.

There are two outputs in measuring the relative spending efficiency in this research: economic growth and poverty levels. One of the assumptions in the DEA application is that a higher output value indicates better conditions, resulting in a higher efficiency level. However, the poverty level in this study shows otherwise. A higher poverty level does not indicate better conditions. For this reason, adjustments are made to the values of the three outputs to meet the DEA usage requirements. Adjustment of values for the poverty level is carried out using the formula: 100% − poverty level = percentage of population who are not poor. The higher the percentage of the non-poor population, the better the conditions.

Next, the input for measuring efficiency is described. There are five types of government spending as input: education, health, economic, infrastructure, and social protection. Provinces in Indonesia have very diverse populations. West Java Province is the province with the most dense population. This results in the government in West Java province having enormous government spending because it takes care of a vast population.

On the other hand, some areas are sparsely populated and have smaller governments, such as Papua Province. Therefore, this study uses per capita spending for the five types mentioned above. From this explanation, efficiency measurements are carried out using multi-output against multi-input. In this research, output orientation is applied to measure government efficiency using a variable return-to-scale approach.

The relative efficiency model of government spending for this research is as follows:
Objective function
Max E = $\mu_1 Y_1 + \mu_2 Y_2 + \mu_0$ (1)
Subject to
$\upsilon_1 X_1 + \upsilon_2 X_2 + \upsilon_3 X_3 + \upsilon_4 X_4 + \upsilon_5 X_5 = 1$ (2)
$\mu_1 Y_1 + \mu_2 Y_2 + \mu_0 - (\upsilon_1 X_1 + \upsilon_2 X_2 + \upsilon_3 X_3 + \upsilon_4 X_4 + \upsilon_5 X_5 \leq 0$ (3)
$\mu_{1,2}, \upsilon_{1,2,3,4,5} \geq 0$ (4)

Information: Y_1 is economic growth. Y_2 is the poverty rate. X_1 is education spending per capita, X_2 is health spending per capita, X_3 is economic spending per capita, x_4 is social protection spending per capita, and X_5 is infrastructure spending per capita. E is the efficiency score, μ_1 shows the output weight (Y), υ shows the input weight X, and μ_0 is the cutoff, which can be positive or negative.

In the second stage, a Tobit regression approach was used to examine the influence of exogenous variables on the level of government spending efficiency. The Tobit method uses maximum likelihood (ML), not least squares. Instead of minimising the squared error value like the OLS method, the ML method maximises the value of the likelihood function by looking for the regression parameters that give the highest value for the likelihood function.

The Tobit method assumes that the independent variables have unlimited values (non-censored), and only the dependent variables are censored. All variables (both independent and independent) are measured correctly; there is no autocorrelation, no heteroscedasticity, and no perfect multicollinearity, so the mathematical model used is correct.

The Tobit method is applied in this research because the data used is censored; that is, the value of the dependent variable is limited to the range of 0 to 100. In this research, regional expansion is a dummy variable, as seen from the status of the district/city and whether the area is expanding. In this research, the dependent variable data, namely government spending efficiency, is between 0 and 1.

The standard Tobit model is written as the following equation (Gujarati & Porter, 2012):
$$y_i^* = \alpha + \beta x_i + \varepsilon_i \tag{5}$$
where:
$$y_i = y_i^* \; jika \; y_i^* > 0 \tag{6}$$
$$y_i = 0 \; jika \; y_i^* \leq 0 \tag{7}$$
Information:
y_i^*: the observed value of the dependent variable
x_i: vector of observed independent variables
β: vector of unknown regression coefficients
ε: error term
The transformation of the probability equation model is presented as follows:
$$f(y^* | x_i^*) dy^* = \left[\frac{1}{\sigma} \varphi \left(\frac{y_i - x_i^* \beta}{\sigma}\right)\right]^{1-d_i} \left[\varphi \left(\frac{y_i - x_i^* \beta}{\sigma}\right)\right]^{d_i} \tag{8}$$

Based on n and observations yi, the standard Tobit regression model parameters have two interpretations: β and σ^2. Due to the lack of linearity of the relationship between the dependent and independent variables, least squares estimation cannot be used. Therefore, the standard Tobit model is estimated through maximum likelihood (ML) analysis, which minimizes the value of the likelihood function by looking for the regression parameters that give the highest value for the likelihood function.

The likelihood function of the Tobit model can be written with the following equation:

$$L = \Sigma_0 \ln\left[1 - \phi\left(\frac{x_i^*\beta}{\sigma}\right)\right] + \Sigma_1 \ln\left[\sigma^{-1}(2\pi)^{\frac{1}{2e}(-\frac{1}{2\sigma^2}(y_i - x_i^*\beta)^2)}\right] \qquad (9)$$

To see the partial influence of the independent variable on the dependent variable in the Tobit regression model, use the z test which has the same function as the t-test in ordinary least square (OLS) regression, comparing the z-statistic value with the z-table and looking at the p-value value. The significance level is seen from the probability value of the error made to reject the null hypothesis when the estimate is correct, with various significance levels in the form of 1 per cent, 5 per cent, and 10 per cent.

The equation model for this research is:

$$\text{Eff}_i = \beta_o + \beta_1 Split_i + \beta_2 GRDPpc_i + \beta_3 Grants_i + \beta_4 Tax_i + \mu_i \qquad (10)$$

Eff is the score for the efficiency of government spending. Split describes regional conditions as a result of expansion using a dummy approach, 1 for expansion areas and 0 otherwise. Meanwhile, GRDPpc is the gross regional domestic product ratio to the total population. Grants are transfer funds received by regions from the central government, and tax is the total taxes received by regional governments in a certain period.

RESULTS AND DISCUSSION

The results of measuring the relative efficiency of local government pro-poor growth spending in 34 provinces during 2015-2021 are shown in Table 1. The average efficiency score during 2015-2021 is 0.96. It means that, on average, there is an inefficiency of 4% in using pro-poor growth spending in Indonesia. This 4% inefficiency level is obtained from formula 1 – efficiency score (1- 0.96 = 0.04 (4%)).

Table 1. Pro-poor Growth Local Government Spending Efficiency Scores in 34 Provinces.

No	Provinces	2015	2016	2017	2018	2019	2020	2021	average
1	NAD	0.87	0.87	0.89	0.88	0.90	0.90	0.89	0.89
2	North_Sumatra	0.95	0.98	0.96	0.96	0.97	1	0.98	0.97
3	West_Sumatra	0.98	0.97	0.98	0.97	0.98	1	0.99	0.98
4	South_Sumatra	0.92	0.93	0.97	0.95	0.99	1	0.93	0.96
5	Riau	0.96	0.97	0.97	0.97	0.97	1	0.99	0.98
6	Riau Islands	0.99	0.99	0.98	0.98	0.98	0.99	0.99	0.99
7	Jambi	0.96	0.95	0.96	0.96	0.97	1	0.98	0.97
8	Bengkulu	0.89	0.90	0.91	0.89	0.92	0.94	0.95	0.91
9	Bangka_Belitung	1	0.99	0.99	0.99	0.99	1	1	0.99
10	Lampung	0.95	0.95	0.97	0.94	0.98	0.98	0.94	0.96
11	Jakarta	1	1	1	1	1	1	1	1
12	Banten	1	1	1	1	1	1	1	1
13	West_Java	1	1	1	1	1	1	0.99	0.998
14	Central_Java	0.94	1	1	0.97	1	1	0.98	0.98
15	East_Java	0.96	0.98	0.99	0.96	1	0.98	0.96	0.98
16	Yogyakarta	0.93	0.94	0.99	0.96	1	0.95	1	0.97
17	Bali	1	1	1	1	1	1	1	1
18	NTB	1	0.97	0.89	0.89	0.92	0.95	0.90	0.93
19	NTT	0.84	0.94	0.92	0.84	0.92	0.92	0.84	0.89
20	West_Kalimantan	0.97	0.96	0.97	0.96	0.97	0.99	0.99	0.97
21	Central_Kalimantan	1	0.99	1	0.98	1	0.99	1	0.99
22	South_Kalimantan	1	0.99	1	0.99	1	1	1	1
23	East Kalimantan	0.99	0.98	0.98	0.97	0.98	0.98	0.98	0.98
24	North Kalimantan	0.98	0.97	0.99	1	1	0.97	1	0.99
25	West Sulawesi	0.95	0.95	0.97	1	0.96	0.94	1	0.97
26	Central Sulawesi	0.98	1	0.99	1	1	1	0.93	0.99
27	South Sulawesi	0.96	1	1	0.96	1	0.99	0.96	0.98
28	Southeast Sulawesi	0.93	0.96	0.98	0.95	0.97	1	0.94	0.96
29	North Sulawesi	0.97	0.97	0.98	1	0.98	0.98	1	0.98
30	Gorontalo	0.88	0.92	0.98	1	0.95	0.94	1	0.95
31	Maluku	0.87	0.89	0.94	0.87	0.91	0.88	0.87	0.89
32	North_Maluku	0.98	0.98	1	0.98	0.99	1	1	0.99
33	Papuan	0.80	0.97	0.87	0.80	0.76	0.86	1	0.87
34	West_Papua	0.80	0.84	0.84	0.83	0.83	0.83	0.82	0.83
	Average	0.95	0.96	0.97	0.95	0.96	0.97	0.96	0.96

Source: Research results.

Note: Red letters represent blooming provinces (25 provinces). Black letters represent non-blooming provinces (9 provinces).

The 34 provinces in Indonesia are grouped into seven regions. The seven regions have been sorted in Table 1, namely Sumatra (10 provinces, with serial numbers 1-10), Java (6 provinces, serial numbers 11-16), Bali and Nusa Tenggara (3 provinces, serial numbers 19-21), Kalimantan (5 provinces, serial numbers 20-24), Sulawesi (6 provinces, serial numbers 25-30), Maluku (2 provinces, serial numbers 31-32), and Papua (2 provinces, serial numbers 33-34).

Efficiency scores between provinces vary. However, the Jakarta, Bali, and Banten provinces have been efficient from 2015 to 2021. The low poverty rate and higher-than-average economic growth in these two provinces make them relatively efficient yearly. Furthermore, the Jakarta and Bali provinces are not split, while the Banten Province is split. Of the 25 splitting provinces, only Banten Province can always be efficient.

Regarding expansion status, the average efficiency score of governments in non-expanding provinces is higher than that of governments in expanding provinces. The government's average efficiency score in non-expanding provinces is 0.98, showing that the average inefficiency level in the eight expanding provinces is 2%. Meanwhile, the government's average efficiency score in the expanding provinces is 0.95; this means that the average level of inefficiency in the 25 expanding provinces is 5%.

After knowing the efficiency of the government in 34 provinces, the next stage is to evaluate the factors that determine the level of efficiency of local government spending. Tobit regression is used to investigate this. The explanatory variables used to predict the efficiency of government spending in this research are taken based on variables widely used in similar literature and also refer to the situation in the research area during the 2015-2021 period.

Table 2 presents the results of the Tobit regression. All explanatory variables statistically show a significant effect on efficiency. Interestingly, there is an inverse relationship between gross regional domestic product per capita and intergovernmental transfers on the efficiency level. The more funds that are disbursed to local governments should encourage the budget use that is right on target, and the increase in the value of GRDP per capita will increase the efficiency of government spending, but this is not the case.

Meanwhile, the estimated coefficient indicates that expanding areas are more inefficient than non- expanding areas, with a percentage of 0.01%. Meanwhile, regions with higher levels of GRDP per capita experienced a decrease in efficiency of 0.0002% compared to regions with lower GRDP per capita. Local governments that received more transfers experienced a decrease of 0.0032 per cent in their efficiency score. On the other hand, regions that have a greater level of tax revenue increase their efficiency by 0.009 per cent.

Table 2. Marginal Effects Tobit Regression

	Coef.	Std. Error	t	p-value	95% Conf. Interval	
Split	-0.0181	0.0071	-2.54	0.012	-0.0321	-0.0040
GRDPpc	-0.0002	0.0001	-2.01	0.046	-0.0005	-5.44e-06
Grants	-0.0032	0.0006	-4.78	0.000	-0.0045	-0.0019
Tax	0.0098	0.0018	5.42	0.000	0.0062	0.0134
238 number of observations, 0 left-censored observations, 173 uncensored observations, 65 right-censored observation. Prob > chi2 = 0.000.						

Source: Research results.

The research results, which show that regional expansion significantly negatively affects government spending efficiency, align with previous research studies' results (Booth, 2011; Wibowo & Muljarijadi, 2014). According to the explanation above, the average government efficiency score in non- expanding provinces is higher than the average government efficiency score in expanding provinces. Expanding regions show a higher degree of autonomy. In their research on local autonomy, D'Inverno et al. (2018) and Charles et al. (2022) revealed that local autonomy increases spending efficiency. However, this research found that governments in expanding provinces have lower spending efficiency.

Some reasons for lower spending efficiency in expanding provinces are because expanding provinces consist of several expanding local governments, which have only been formed for about ten years. This expanding local government is still in a state of improvement in government management. Some of them are still in the stage of providing government infrastructure, such as office buildings, hospitals, roads, and others. This condition resulted in some government funds being absorbed there. Apart from that, the quality of human resources in expanding local governments still needs to be developed so that they can create appropriate pro-poor growth programs. This condition can be seen from the higher poverty rates in the developing provinces.

Meanwhile, taxes have a significant positive effect on the efficiency of government spending. The results of this research are parallel research conducted by Afonso & Venâncio (2019), Afonso et al. (2019), Balaguer-Coll et al. (2019), and Tran & Noguchi (2020).

The positive influence of taxes on spending efficiency in Indonesia can be explained as follows. In Indonesia, taxes are the primary source of local government income. However, most provinces have low taxes. In such conditions, local governments in provinces receiving higher taxes can also spend more. Taxes are obtained from

local government efforts through tax intensification. Because local tax collections are obtained through their efforts, local governments are becoming more careful in spending. They are trying to create pro-poor growth programs that are right on target. Under these conditions, spending allocations for pro-poor growth programs are on target, and the government can work more efficiently.

In contrast to taxes, intergovernmental transfers significantly negatively affect spending efficiency. The results of this research align with the results of a study in Spain conducted by Narbon-Perpina et al. (2020), which shows that local governments do not experience difficulties in increasing their revenues due to direct transfers from higher levels of government. It is one of the reasons why increasingly large transfers to regions negatively impact regional governments' performance. The existence of transfer funds disbursed by the central government to regional governments creates lower incentives to manage them efficiently, as well as to provide a level of public service appropriate to their constituents. On the other hand, Chalil (2020) stated in his study regarding the efficiency of autonomous and non-autonomous village governments in Indonesia that increasing direct transfers to villages would reduce inefficiency by around 2.67% to 2.77%. However, a comparison is made of the magnitude of the impact of the transfer. In that case, it is known that the transfer positively impacts the efficiency of government spending, especially for non-autonomous villages (sub-districts).

Meanwhile, in this research, although taxes and transfers are both sources of local income, the direction of their influence is opposite on spending efficiency. Local taxes encourage local governments to work more efficiently. On the other hand, transfers cause local governments to work inefficiently. The explanation for this condition is as follows. Transfers in Indonesia are local government revenues sourced from the central government, which can be fiscal equality for poor provinces. In other words, whether rich or poor, provinces will receive transfers whose value is similar.

In addition, the allocation of most of these transfer funds is regulated so that local governments do not have the authority to regulate and create programs that suit the needs of their regions. Examples of expenditure obtained from transfers are employee salaries and activity costs not directly related to poverty alleviation programs, not pro-poor growth expenditure, such as building school infrastructure. School construction does not automatically directly impact economic growth and poverty reduction in the year in question. Thus, large transfers require local governments to carry out all activities from the transfer funds. Even local governments become busy with activities originating from transfers because the government is asked to be responsible for using these transfers. Therefore, local governments should be more focused on implementing pro-poor growth programs so that the efficiency of government spending decreases.

Likewise, GDP per capita has a significant negative effect on spending efficiency. The results of this research are in contrast to research conducted by Mohanty & Bhanumurthy (2020), which suggests that GDP per capita can sharpen the efficiency of local government spending in the social, education, and health sectors, or in other words, countries with high GDP per capita cause the government to spend more efficient.

On the other hand, the study by Ou et al. (2020) strengthens the findings of this research, which explains in their study that GDP per capita is negatively related to the efficiency of government spending. It is connected to the contraction of economic growth, concentrated in sectors with more significant investment (capital intensive), such as the industrial and service sectors.

In this research, increasing GRDP per capita can reduce the efficiency of pro-poor growth spending. In Indonesia, many poor people work in the agricultural sector. However, several provinces are vital in the industrial and service sectors. Provinces that dominate the industrial and service sectors have higher GDP per capita than other provinces that are still dominated by the agricultural sector. The increasing income of the industrial community has encouraged the government to begin directing the provision of infrastructure and programs that support industrialization. These prosperous societies need infrastructure related to technology and insurance related to welfare. These rich people can take advantage of the infrastructure provided by the government even though it is paid for it. It causes local governments to prioritize providing infrastructure and services for people with money. This condition does not encourage economic growth and cannot reduce poverty, so the efficiency of local government spending is lower in rich provinces.

CONCLUSIONS

The research results show that regional expansion causes the efficiency of pro-poor growth government spending to decrease. Another variable, namely taxes, has a positive effect on the efficiency of government spending. On the other hand, transfers and GDP per capita significantly negatively affect government spending efficiency.

This research implies that the central government in Indonesia should cease the regional expansion policy. If further regional expansion occurs, the possibility of inefficiency in using pro-poor growth spending will be greater.

Meanwhile, taxes' positive influence on government spending's efficiency has implications for local government efforts to optimise local taxes through tax intensification and extensification. Efforts to extend taxes require strict analysis and consideration to maintain the business world's power to develop due to high taxes.

Vice versa for intergovernmental transfers. Because transfers have a negative effect on the efficiency of government spending, the implication is that local governments need to increase financial independence so that in the future, transfers from the central government can be reduced. The government should also create a pro-poor growth program from the intergovernmental transfer.

Finally, the negative influence of GRDP per capita on the efficiency of government spending has implications for the decreasing efficiency of government spending if GRDP per capita increases. The aim of administering government is to improve community welfare, which is reflected in an increase in GDP per capita. Therefore, the government should integrate the industrial sector into the upstream sector. Communities in the industrial and service sectors are still encouraged to progress, and communities in the agricultural sector are also built to support industrialization.

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REFERENCES

1. Afonso, A., Jalles, J. T., & Venâncio, A. (2019). Taxation and Public Spending Efficiency: An International Comparison. *Comparative Economic Studies*, *63*(3), 356–383. https://doi.org/10.1057/s41294-021-00147-2
2. Afonso, A., Jalles, JT, & Venâncio, A. (2021). Structural Tax Reforms and Public Spending Efficiency. *Open Economies Review, 32,* 1017-1061. https://doi.org/10.1007/s11079-021-09644-4
3. *Agasisti (2016).* The Public Sector Efficiency in Italy: The case of Lombardy municipalities in providing essential public services. *Economica Public, 1*(1), 59-84
4. Alonso, Jose. M., & Andrews, Rhys. (2018). Fiscal decentralisation and local government efficiency: Does relative deprivation matter? *Environment and Planning C: Politics and Space*, *37*(2), 360–381. https://doi.org/10.1177/2399654418784947
5. Antonelli, M. A., & De Bonis, V. (2019). The efficiency of social public expenditure in European countries: A two-stage analysis. *Applied Economics*, *51*(1), 47–60. https://doi.org/10.1080/00036846.2018.1489522
6. Antonio Afonso & Ana Venâncio (2019). Local, territorial reform and regional spending efficiency. *Local Government Studies*, 1-23. DOI: 10.1080/03003930.2019.1690995
7. Bađun, M., Pribičević, V., & Deskar-Škrbić, M. (2014). Government size and efficiency as constraints to economic growth: Comparing Croatia with other European countries. *Post-Communist Economies*, *26*(3), 297–323. https://doi.org/10.1080/14631377.2014.937089
8. Balaguer-Coll, M. T., Brun-Martos, M. I., Marquez-Ramos, L., & Prior, D. (2019). Local government efficiency: Determinants and spatial interdependence. *Applied Economics*, *51*(14), 1478–1494.
9. Balasubramanian, P., Burchi, F., & Malerba, D. (2023). Does economic growth reduce multidimensional poverty? Evidence from low- and middle-income countries. *World Development*, *161*, 106119. https://doi.org/10.1016/j.worlddev.2022.106119
10. Becerra-Ornelas, AU, & Nuñez, HM (2019). The technical efficiency of local economies in Mexico: a failure of decentralised public spending. *Annals of Regional Science*, *62* (2), 247–264. https://doi.org/10.1007/s00168-018-0894-1
11. Boetti, L., Piacenza, M., & Turati, G. (2012). Decentralisation and Local Governments' Performance: How Does Fiscal Autonomy Affect Spending Efficiency? *FinanzArchiv*, *68*(3), 269. https://doi.org/10.1628/001522112X653840
12. Booth, A. (2011). Splitting, splitting and splitting again: A brief history of the development of regional government in Indonesia since independence. *Bijdragen Tot de Taal-, Land- En Volkenkunde / Journal of the Humanities and Social Sciences of Southeast Asia*, *167*(1), 31–59.

https://doi.org/10.1163/22134379-90003601

13. Brini, R., & Jemmali, H. (2016). Public spending efficiency, governance, political and economic policies: Is there a substantial causal relationship? Evidence from selected MENA countries. *International Journal of Economics and Financial Management Vol. , 1* (January), 24–34.

14. Bustos, WOP, & Esstupinan, JMT (2019). Technical efficiency of local public institutions in Colombia. *Revista De Estudios Regionales , 7585* (115), 15–41.

15. Chalil, Tengku Munawar. (2020). The Efficiency of Village Government Spending in Indonesia: A Meta-Frontier Analysis. *Journal of Indonesian Economy and Business, 35* (1): 1-16.

16. Charles, V., Diaz, J., & Aparicio, J. (2022). The performance of regional governments under the results-based budgeting framework: A two-stage sectoral analysis. *RAIRO - Operations Research*, *56*(2), 501–528. https://doi.org/10.1051/ro/2022012

17. Cordero, J. M., Pedraja-Chaparro, F., Pisaflores, E. C., & Polo, C. (2017). Efficiency assessment of Portuguese municipalities using a conditional nonparametric approach. *Journal of Productivity Analysis*, *48*(1), 1–24. https://doi.org/10.1007/s11123-017-0500-z

18. Cyrek, M. (2019). Government social spending in the EU countries: Efficiency in poverty and income inequality reduction. *Equilibrium*, *14*(3), 405–424. https://doi.org/10.24136/eq.2019.019

19. Drew, J., Kortt, M., & Dollery, B. (2015). What Determines Efficiency in Local Government? A DEA Analysis of NSW Local Government. *Economic Papers: A Journal of Applied Economics and Policy*, *34* (4), 243–256. https://doi.org/10.1111/1759-3441.12118

20. Fonayet, F. ., Belzunegui Eraso, Á., & De Andrés Sánchez, J. (2020). The efficiency of Social Expenditure Levels in Reducing Poverty Risk in the EU-28. *Poverty and Public Policy*, *12* (1), 43–62. https://doi.org/10.1002/pop4.267

21. Guo, X., Zhang, J., Xu, Z., Cong, X., & Zhu, Z. (2021). The efficiency of provincial government health care expenditure after China's new health care reform. *PLoS ONE , 16* (Oct. 10), 1–17. https://doi.org/10.1371/journal.pone.0258274

22. Halaskova, M., Halaskova, R., & Prokop, V. (2018). Evaluation of Efficiency in Selected Areas of Public Services in European Union Countries. *Sustainability*, *10*(12), 4592. https://doi.org/10.3390/su10124592

23. Kouadio, HK, & Gakpa, LL (2021). Do economic growth and institutional quality reduce poverty and inequality in West Africa? *Journal of Policy Modelling*. https://doi.org/10.1016/j.jpolmod.2021.09.010

24. Lo Storto, C. (2016). The trade-off between cost efficiency and public service quality: A nonparametric frontier analysis of Italian major municipalities. *Cities*, *51*, 52–63. https://doi.org/10.1016/j.cities.2015.11.028

25. Mohanty, R.K., & Bhanumurthy, N.R. (2020). Assessing public expenditure efficiency at the subnational level in India: Does governance matter? *Journal of Public Affairs*, *21* (2), 1–14. https://doi.org/10.1002/pa.2173

26. Moreno-Enguix, MDR, & Bayona, LVL (2017). Factors Affecting Public Expenditure Efficiency in Developed Countries. *Politics & Policy*, *45* (1), 105–143. https://doi.org/10.1111/polp.12139/abstract

27. Narbón-Perpiñá, I., Arribas, I., Balaguer-Coll, M. T., & Tortosa-Ausina, E. (2020). Explaining local governments' cost efficiency: Controllable and uncontrollable factors. *Cities*, *100*, 102665. https://doi.org/10.1016/j.cities.2020.102665

28. Narbón-Perpiñá, I., Balaguer-Coll, M. T., Petrović, M., & Tortosa-Ausina, E. (2020). Which estimator to measure local governments' cost efficiency? The case of Spanish municipalities. *SERIEs*, *11*(1), 51–82. https://doi.org/10.1007/s13209-019-0194-8

29. Ou, Z., Zeng, F., & Zhan, X. (2020). Does Public Spending Structure Affect the Efficiency of Spending? Evidence from a Panel Tobit Model for Chinese Provinces. *International Journal of Management, Economics and Social Sciences*, *9*(3). https://doi.org/10.32327/IJMESS/9.3.2020.11

30. Prasetyo, A. D., Mulyono, N. B., & Nugroho, L. I. (2018). Local governments' expenditures efficiencies and determinants: The case of Indonesia. *International Journal of Trade and Global Markets*, *11*(3), 160. https://doi.org/10.1504/IJTGM.2018.095820

31. author's own

32. author's own

33. author's own

34. Shin, D. J., Cha, B. S., & Kim, B. H. S. (2020). Efficient Expenditure Allocation for Sustainable Public Services? Comparative Cases of Korea and OECD Countries. *Sustainability, 12* (22). 2–19.

35. Thabrani, G., Irfan, M., Mesta, H. A., & Arifah, L. (2019). Efficiency Analysis of Local Government Health Service in West Sumatra Province Using Data Envelopment Analysis (DEA). *Proceedings of the 1st International Conference on Economics, Business, Entrepreneurship, and Finance (ICEBEF 2018), Indonesia. Advanced in Economics, Business and Management Research Series.* https://doi.org/10.2991/icebef-18.2019.164

36. Tirtosuharto, D. (2021). The impact of fiscal efficiency on poverty reduction in Indonesia: Institutional factor and geographical differences. *Journal of Geographical Systems*, *24*(1), 67–93. https://doi.org/10.1007/s10109-021-00359-1

37. Tran, T. V., & Noguchi, M. (2022). Public efficiency in Tokyo's metropolitan local governments: The role of asset utilisation and budgeting. *Public Money & Management*, *42*(2), 114–123. https://doi.org/10.1080/09540962.2020.1734315
38. Wibowo, K., & Muljarijadi, B. (2014). *Reformasi Pembentukan Daerah Otonom Baru dan Kapasitas Fiskal Kabupaten Belitung Timur.* http://www.academia.edu/19226920/Reformulasi_pembentukan_Daerah_Otonom_Baru_Studi_Kasu s_Kapasitas_Fiskal_di_Kabupaten_Belitung_Timur_Propinsi_Bangka_Belitung
39. Zhu, Y., Bashir, S., & Marie, M. (2022). Assessing the Relationship between Poverty and Economic Growth: Can Sustainable Development Goals be Achieved? *Environmental Science and Pollution Research*, *29* (19), 27613–27623. https://doi.org/10.1007/s11356-021-18240-5