ANALYSIS OF MEASUREMENT MODELS FOR THE GOVERNMENT SPENDING QUALITY AND ACHIEVEMENT OF SUSTAINABLE DEVELOPMENT GOALS (SDGs)

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Abstract

The absence of quality spending become the main reason for government failed to provide multiplier in achieving its economic objectives. The phenomenon of budgetray slack will be likely to occur if there is no any standard to control government expenditure's success. This study aims to provide a method to identify the effectiveness of government budget by Comparing Sustainable Development Indicators as outcome and government expenditure relative to its economy as output. We also measure the rasio of government expenditure to its revenue sources as indicators of budget efficiency. Using 2021 data of SDGs indicators and government budget (both at central and regional or province government level) we found that both at the national and regional levels, the spending had been quite effective. Meanwhile for the level of budget efficiency, the central government is quite efficient, while some of regional governments were not.

Keywords: *Public Sector Accountability, Government Spending, Sustainable Development Goals (SDGs)*

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INTRODUCTION

Public sector performance measurement is important to assess the quality of spending in the public sector. By knowing the performance in the public sector, the productivity and efficiency level of public sector spending can be identified. Increasing the productivity of an organization means that the organization is able to produce more output using the same number of inputs (output maximization) or it can also produce the same amount of output with a cheaper amount of input (input minimization). So, in the perspective of the public sector, it is by increasing the provision of public goods and services/services with the same level of expenditure or also the provision of public goods with less budget.

Accurate performance measurement is important in identifying the quality of public sector budget use or spending. According to Somani (2021) there are several reasons for the importance of accurate performance measurement in the public sector, namely first, many workers work in the public sector. Second, the public sector is one of the largest buyers of goods and services.

Public sector financial performance based on value for money is a concept of financial management performance that refers to three main components, namely economy, efficiency, and effectiveness (Mardiasmo, 2018); (Mahsun, 2009); (Mandl et al., 2008). This performance describes the level of achievement of the implementation of an activity/program/policy in realizing the goals, objectives, mission, and vision of the organization contained in strategic planning, which is usually reflected in outputs and outcomes.

Conceptually, effectiveness is basically the relationship between inputs / outputs and outcomes, namely end, broad, real, and long-term goals. Outcomes are often associated with welfare or growth goals and can therefore be influenced by many factors (including outputs, but also exogenous environmental factors) Mandl et al. (2008). Outcomes are also linked to the goal of political choice, which includes all the long-term effects of public programs in terms of well-being and should capture the various value dimensions of society. These achievements reflect the effectiveness of different types of policy actions (different outputs produce specific outcomes).

Often the obstacle is the determination of agreed outcome indicators as indicators of the achievement of quality spending in the public sector. The World Bank, for example, released the World Governance Indicator as an accountability indicator, political stability indicator, government effectiveness indicator, quality inidicator of laws and regulations, law enforcement indicator, and corruption control indicator (Kaufmann et al., 2010). Even the most commonly used indicator because of

the ease of data access and data availability is the indicator of the ratio of government expenditure to Gross Domestic Product (GDP) or the ratio of government income to Gross Domestic Product (GDP) (Matteo, 2014). However, these various measures are considered to still not reflect the overall outcomes of public sector performance.

Previous studies related to the quality of government spending both at the central and regional levels, most of which also only focus on the analysis of government spending realization and have not targeted the real achievements felt by the community. For example, research Tamburaka et al (2020) which identifies the financial performance of local governments by comparing the target and realization of the regional budget. While some other studies such as Wahyuni (2008), Scutariu & Scutariu (2015) and Muhajirin (2019), Still using the degree of decentralization ratio, the ratio of financial independence as the basis for determining the financial performance of the public sector. Meanwhile, there are also those who examine the government financial administration system as one of the determinants of the effectiveness of public sector performance (Gebreyesus, 2022). Several other studies have looked for the relationship between government spending and the achievement of outcomes, namely by relating it to macroeconomic indicators. For example, (Akhmad et al., 2022; Amusa & Oyinlola, 2019). Try to see the relationship between local government spending and macroeconomic indicators such as economic growth, poverty reduction and unemployment.

However, these studies have not analyzed further to the real achievements of comprehensive development as an outcome of quality government spending. Therefore, by examining and understanding deeply about the definitions, concepts, and empirical studies that have been explained, this study uses sustainable development indicators (SDGs) as a basis for achieving public sector performance outcomes.

The use of SDGs indicators is not without basis, the first reason is that SDGs are a global action plan agreed by world leaders, including Indonesia, to end poverty, reduce inequality, and protect the environment. Second, SDGs are a world development agenda that aims at human welfare globally. Third, the Agenda is a sustainable development program in which there are 17 goals with 169 measurable targets and has been agreed upon by 193 member countries including Indonesia. Fourth, according to Sachs (2012), Ishartono & Raharjo (2016), Hák et al (2016) that the lack of achievement in the Millennium Development Goals or MDGs can be solved with an idea in the form of setting SDGs goals to maintain sustainable development and applying various relevant indicators in the SDGs.

The relationship between SDGs indicators and government spending has been widely studied. For example, (Osuji & Nwani, 2020) and (Sisto et al., 2020) which shows a long-term relationship between government spending and the indicators contained in the SDGs target. Meanwhile, some researchers look at some achievements in SDGs indicators such as Rai, Brown and Ruwanpura (2019) which examines the relationship between economic growth and specific SDGs on gender equality (goal number 8 in the SDGs). Shulla et al. (2021) which examines the impact of the COVID-19 pandemic on SDGs achievements such as SDGs 3 (healthy and prosperous life), SDGs 4 (quality education), SDGs 8 (decent work and economic growth), SDGs 12 (responsible consumption and production), and SDGs 13 (handling climate change).

In recent years, the outcomes obtained from the management of state expenditure have not been effective enough and in accordance with the implementation of government priority programs. This is evidenced by the achievement of RPJMN indicators with the value of economic growth, inequality and inequality in Indonesia that have not been achieved. Without supervision and control of budget utilization on expenditures carried out by the government can encourage spending failure and reduce the effectiveness and efficiency of these expenditures. The low quality of spending is the main reason for the failure of government

spending in providing a multiplier effect for the Indonesian economy (Ananda, 2022).

The emergence of budgetary slack or budget gaps between potential and budget targets that have been proclaimed is increasingly possible without control with the standards determined on the use of budgets. This is quite a serious discussion with the fact that until now, there have been no precise and uniform indicators in measuring the quality of spending between the central and local governments both in terms of effectiveness and efficiency of budget use.

Therefore, this study aims to analyze the quality of government spending by measuring the level of effectiveness and efficiency of central and local government budgets based on development outcome indicators in the form of achievements in sustainable development indicators SDGs in Indonesia both at the national level and at the regional/provincial level. This research uses quantitative analysis which is expected to be able to show the quality, effectiveness, and efficiency of government spending both central and regional. The data used was obtained from the Central Bureau of Statistics and Bappenas related to the State Budget, Regional Budget, and the achievement of Indonesia's SDGs indicators. Measurement of the effectiveness of government financial performance in this study using the ratio between the national and regional SDGs achievement index to the ratio of government

spending to GDP and GDP. Meanwhile, to measure the efficiency level of government spending, Data Envelope Analysis (DEA) analysis will be used.

THEORETICAL BASIS

Effectiveness of Government Spending

One of the factors that measure the success of a government in implementing the wheels of its government is to look at the effectiveness of budget implementation. (Bisma & Susanto, 2010). Explain the purpose of effectiveness measurement, namely measuring the level of effectiveness to determine the success or failure of achieving budget goals that require data on revenue realization and revenue targets.

Definition of effectiveness according to Mardiasmo (2018) is a measure of whether or not an organization achieves its goals. If an organization succeeds in achieving its goals, then the organization is said to have run effectively. Likewise, according to (Mahmudi, 2007) that an operational activity is said to be effective if the process of achieving policy goals and objectives is obtained by spending on target and wisely.

Effectiveness focuses on outcomes. In other words, an organization, program, or activity is said to be effective if the output can meet the expected targets / objectives (outcome) (Mahmudi, 2007). The concept and empirical study of effectiveness are best described in economic papers (February, 2018, No.301) by (Mandl et al., 2008) that

effectiveness is linking inputs / outputs with the final objectives to be achieved, namely outcomes. Outcomes are often associated with welfare or growth goals and can therefore be influenced by many factors (including outputs, but also exogenous environmental factors).

Effectiveness is harder to assess than efficiency, because the outcome is influenced by political choices. The distinction between output and outcome is often blurred and used in interchangeable ways, even if the importance of the distinction between the two concepts is acknowledged. For example, the output of an education system is often measured in terms of student performance or achievement levels at a certain age. However, the outcome can be the educational qualifications of the working-age population as a whole. Effectiveness indicates the success of the resources used in achieving the goals that have been set.

Further, outcomes must be viewed in a broader context, because the selection of underlying goals is a political choice. Outcomes cover all long-term effects of public programs in terms of well-being and should capture the various value dimensions of society. These achievements reflect the effectiveness of different types of policy actions (different outputs produce a single outcome).

Thus, measuring effectiveness is much more complex than measuring efficiency

because it may be that the use of the budget is already efficient, but the development targets/goals have not been achieved or have not been felt clearly and widely by the community. This kind of condition has not shown effective use of the budget. This budget effectiveness measurement is applied to the use of the state budget (APBN) and regional budget (APBD) (provinces and districts/cities) in accordance with a value-for-money based performance approach (Mandl et al., 2008; Mardiasmo, 2018).

Several previous studies examined the relationship between government spending and development indicators. Like, (Laksono et al., 2016) examine the relationship between the effectiveness of local government spending on employment, (Enami et al., 2019) examine the relationship between the effectiveness of local government spending, especially transfer policies, to reduce poverty, while (Biriescu & Babaita, 2014) examine the role of effective government spending on the performance of the education system. However, some studies still identify the effectiveness of government spending as a ratio between target and budget realization and have not targeted outcomes. Although there are some studies that try to link government spending with development indicators such as (Matteo, 2014) which uses several indicators of development success in the economic, social and health fields, but these indicators are still not comprehensive.

This study offers a basis for measuring effectiveness by linking outputs to outcomes. The output in question is how much total government spending is relative to the economy, while the intended outcome is in the form of an end goal or goal that actually has a real, broad, and usually long- term impact. In this study, the outcomes are the achievement of 17 Sustainable Development Goals (SDGs) goals / targets as a measure of the real impact of development success in the regions, including economic growth as a measure of economic performance.

Government Spending Efficiency

Efficiency is a comparison of outputs/inputs used with links to performance standards or targe that have been set. The process of operational activities is said to be efficient if a certain product or work result can be achieved with the lowest use of resources and funds.

One of the factors that measure the success of a local government in implementing the wheels of government is to look at the efficiency of budget implementation. Bisma & Susanto (2010) Explain the purpose of measuring efficiency, namely measuring the level of effectiveness to determine the success or failure of achieving budget goals that require data on revenue realization and revenue targets.

Mardiasmo (2018) says that efficiency is measured by the ratio between output and input. The greater the output compared to the

input, the higher the level of efficiency of an organization. In accordance with this opinion Mahmudi (2007) explained that to measure the performance of local governments in mobilizing PAD revenues, the PAD effectiveness ratio indicator alone is not enough, because even if viewed from the effectiveness ratio it is good, if it turns out that the cost to achieve the target is very large, it means that the PAD collection is inefficient. Therefore, it is also necessary to calculate the efficiency ratio of PAD. This ratio is calculated by comparing the costs incurred by local governments to obtain PAD with the realization of PAD revenues. To be able to calculate the realization of PAD, additional data is needed that is not available in the Budget Realization Report, namely data on the cost of collecting PAD.

For this reason, local governments need to carefully calculate how much it costs to realize all the revenues they receive so that it can be known whether the revenue collection activities are efficient or not. This needs to be done because although the local government has succeeded in realizing the revenue revenue target in accordance with the set target, the success has no meaning if it turns out that the costs incurred to realize the revenue revenue target are greater than the realization of the revenue, they receive (Halim & Kusufi, 2007). APBD has an important role as a tool for stability, distribution, allocation of public resources, organizational planning and control and performance appraisal. Therefore, the budget realization report is one of the most important regional financial accountability reports (Tiawarman, 2022).

Some studies related to government financial performance in terms of measuring efficiency levels include (Rondonuwu et al., 2015), (Rampengan et al., 2016), (Kartika et al., 2016) which measures the level of efficiency of government budgets in regions in Indonesia by comparing the ratio between revenue and regional expenditure. The study will use the same tools to determine the efficiency level of central government spending.

Data Envelopment Analysis (DEA) Approach

The basis of measurement Efficiency is the ratio of output to input. There are two kinds of efficiency, namely technical efficiency and efficiency in allocation. Technical efficiency means the ability of an organization to achieve the highest level of output using a certain number of inputs or known as an output-oriented approach. While efficiency in allocation is the ability of the organization to use a number of inputs in optimal proportions to achieve certain output achievements or referred to as input oriented (Coelli, 1996) . In this study, budget efficiency as an indicator of spending quality and public sector accountability is more accurately analyzed from the point of view of technical efficiency. That is, to achieve certain outputs (regional/central spending targets) how

regional/central governments use their inputs in optimal proportions (optimal proportion of use of state/regional revenue sources).

DEA analysis introduced by (Charnes et al., 1978) which is a non-parametric approach to estimating frontiers. The DEA provides a way of calculating technical efficiency scores. There are two forms of assumptions in the DEA analysis, namely whether the organization has a constant return to scale (CRS) and decreasing return to scale (DRS) production function.
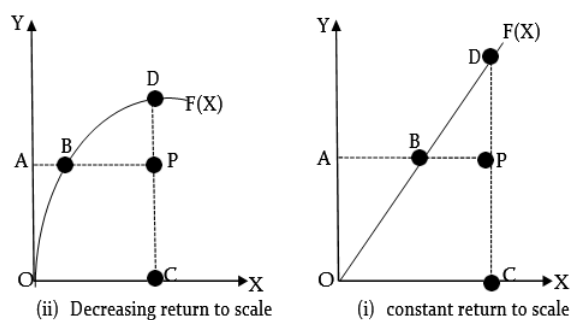
Source: Charnes et.al., 1978

Picture 1. DEA Analysis (i) CRS (ii) DRS

DEA analysis will measure the value of technical efficiency (point P) which is the ratio between the distance AB to AP if using output-oriented assumptions. Or if using the assumption of input oriented, the efficiency value is the ratio of the distance between CP and CD. For a CRS production function, the AB to AP ratio will be equal to the CP to CD ratio. To determine the level of efficiency of government spending at the provincial level in regions in Indonesia, this study uses the Data Envelopment Analysis (DEA) method assuming input oriented and constant return to scale.

RESEARCH METHODS

To analyze the level of effectiveness of government spending, two important things are considered, namely the realization of spending (as output) and the impact of the use of spending (as an outcome). In addition, T20 Indonesia has proposed a new type of measurement that is able to explain state welfare using an approach that is able to explain in various multidimensional aspects (Smith et al., 2022). Therefore, to capture both, in addition to analyzing the nominal budget used, it also relates it to the impact of budget use which is reflected in indicators of sustainable development achievements.

Effectiveness and Efficiency of Central Government Spending

Data and indicators used to measure the effectiveness of central government spending include data on central government spending and data related to sustainable development indicators (SDGs). Central government spending in this case is a measure of relative government spending (G) to the amount of economic output (GDP), where this measure better represents the strength of the government's role (Matteo, 2014).

Table 1. Distribution of SDGs Goals Based on Development Pillars

No	Aspect	SDGs Objective
1	Social	SDGs no 1. No poverty SDGs no 2. No hunger SDGs no 3. Healthy and prosperous life SDGs no 4. Quality education SDGs no 5. Gender equality
2	Economy	SDGs no 7. Clean and affordable energy SDGs no 8. Decent work and economic growth SDGs no 9. Innovation and infrastructure industry SDGs no 10. Reduced inequality SDGs no 17. Partnership to achieve goals
3	Law and governance	SDGs no 16. Peace, justice, resilient institutions
4	Environment	SDGs no 6. Clean water and proper sanitation SDGs no 11. Sustainable cities and settlements SDGs no 12. Responsible consumption and production SDGs no 13. Climate change management SDGs no 14. Ocean ecosystems SDGs no 15. Terrestrial ecosystems

Source: Data processed

In Table 1, these indicators will be used to determine the government's performance achievement score (Achievement Index) which will be compared with government spending figures to identify effectiveness, while efficiency is measured through the ratio of expenditure to central government revenue

The level of effectiveness of government spending in this study looks at the achievement of development outcomes. The achievement of development outcomes in this study by looking at the achievements of SDGs development indicators.

The SDGs indicators used in this study refer to the indicators set by Bappenas in the Decree of the Minister of National Development Planning/Head of Bappenas Number 136 of 2021 concerning the Establishment of the National Action Plan (RAN) for the Sustainable Development Goals (SDGs) for 2021-2024. This document contains indicators for each SDGs goal and achievement targets determined by the government for the next 5 years. Each indicator in each SDGs goal then becomes the basis for determining the achievement score of public sector performance or government spending performance.

Table 2. Calculation Score of the Level of Effectiveness and Efficiency of Central Government Spending

No.	Year	$\frac{G}{GDP}$ (output)	SDGs 1 Score	SDGs 2 Score	.... Score	SDGs 17 Score	Achievement Index (outcome)	Quality Shopping Index Effectiveness	Efficiency
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) = (8)/(3)	(10) = G/P
	2021								

> Information:
> 1. G is the amount of central government spending in a given year.
> 2. P is the amount of central government revenue in a given year.
> 3. GDP is gross domestic product
> 4. SDGs1... SDGsn are indicators of SDGs achieved by the central government
> 5. The achievement index is an index that measures the achievement of sustainable development targets. Thegreater the achievement index number, the better the government's achievement in achieving its target.
> 6. The Effectiveness Index is the ratio between the outcome index score to the measure of government spending *(output),* written G / GDP. The greater the value, the higher the level of effectiveness.
> • Efficiency is the ratio between government spending to government revenue. If the value is greater than orequal to 1, then the budget realization is declared efficient, but if the value is less than 1, then the budget realization is declared inefficient

Source: Data processed

The determination of the score for achieving development targets in this study is by using an index that has values from Zero, 0.5 and 1. The scoring is as follows: If the value in each indicator in each SDGs goal achieved is greater than the value targeted by the government, a score of 1 will be given.

If the value in each indicator in each SDGs goal achieved is the same as the value targeted by the government, a score of 0.5 will be given.

If the value in each indicator in each SDGs goal achieved is lower than the value targeted by the government, a score of 0 will be given.

Then to determine the level of effectiveness of the quality of central government spending in this study is to combine the SDGs achievement score with the proportion of government spending relative to the economy. To determine the level of effectiveness of government spending, the SDGs achievement score in 2021 is divided by the proportion of government spending to the economy or the proportion of government spending to Gross Domestic Product in 2021. As a comparison to determine the effectiveness or failure of government spending performance, the following calculations can be presented.

If the government's SDGs achievement index is 1, which means that all values in each indicator that occur exceed those targeted by the government in the 17 SDGs goals, then with the ratio of government spending in 2021, this is the maximum value of the level of effectiveness that can be obtained (first best possible outcome). Since this is the highest

score that a government can achieve with a certain level of spending, it is therefore given an index of 10.

If the government's SDGs achievement index is 0.5, which means that all values in each indicator that occur are the same as those targeted by the government in the 17 SDGs goals, then with the ratio of government spending in 2021, the maximum value of the level of effectiveness that may be achieved (second best possible outcome). Therefore, this effectiveness value is then given an index of 5.

If the government's SDGs cap index is 0, which means that all values in each indicator that occur are lower than those targeted by the government in the 17 SDGs goals, then with the ratio of government spending in 2021, the maximum value of the effectiveness level is 0. Therefore, this effectiveness value is then given an index of 0.

By converting the achievement of effectiveness into an index, it can be identified the extent of the effectiveness of government spending performance.

Meanwhile, to measure the efficiency level of central government spending is to use the following ratio:

$$Efficiency\ score\ = \frac{Central\ Government\ Spending}{Central\ Goverment\ Revenue}$$

Effectiveness of Local Government Expenditure Performance

To see the level of effectiveness of local government spending carried out is to look at the achievement of each indicator in all 17 SDGs agendas. This study indexes each SDGs goal based on indicators set by Bappenas. Then to get a single score of SDGs Achievement Score for each province is to calculate the average index value of each province on the achievement of the 17 SDGs agenda.

Meanwhile, to determine the level of effectiveness (effectiveness score) of provincial government spending in Indonesia, the SDGs achievement score for each province in 2021 is divided by the proportion of local government spending to the size of the regional economy or in other words the value of the SDGs Achievement Score is weighted with the proportion of local government spending to its Gross Regional Domestic Product in 2021.

Performance score measurement using the MinMax method. The MinMax method is widely used to obtain a representative and standardized score so that comparisons can be made. In addition, this method is also used by the United Nations to measure the human development index (Matteo, 2014).

Table 3. Calculation Score for the Level of Effectiveness and Efficiency of Local GovernmentSpending

No	Province	$\dfrac{Gp}{GRDP}$	SDGs 1*					SDGs 2*					…	SDGs17*					Access Index	Quality Shopping	
			1.1	1.2	1.3	…	1.n	2.1	2.2	2.3	…	2.n	…	17.1	17.2	17.3	…	17.n		Achievement Index Effectiveness	Efficiency
1	Aceh																				
2	Sumut																				
5	….	…																			

Information:
1. Gp is the amount of provincial local government spending in a given year.
2. GDP is the gross regional domestic product of a province
3. SDGs1... SDGsn is an indicator indicator of SDGs achieved by provincial governments
4. The achievement index is an index that measures the achievement of sustainable development targets *(outcomes).* Thegreater the achievement index number, the better the government's achievement in achieving its target.
5. Effectiveness is the ratio between the outcome index score to the measure of government spending (G/GDP) *(output).*The greater the number, indicating a higher level of effectiveness.
6. Efficiency is the ratio between local government spending to local government revenue. The greater the numberindicates a higher level of efficiency.

* SDGs indicators will be calculated using the MinMax method in order to obtain a representative and standardized score
- Composite Index with higher orientation **is better**: $\dfrac{Fact-Min}{Max-min}$
- Composite Index with lower orientation **is better**: $\dfrac{Max-fact}{Max-min}$

Source: Data processed

In this study, the measurement of the efficiency level of local government is by using the Data Envelope Analysis or DEA method. Using this DEA data, it can be identified which provinces are the most efficient in managing their funds.

Efficiency analysis at the provincial level by comparing outputs with inputs. What is meant by input in this efficiency analysis is all sources of regional revenue during 2021, which are divided into:

1. Local   Original Revenue or PAD.
2. Transfer   from   the   Central Government.
3. Income of other legal districts.

Meanwhile, what is meant by output is the amount of government spending in each region in 2021. Then based on these input and output criteria, an efficiency analysis was carried out using DEA. The results of the DEA analysis will find an efficiency score between 0 and 1. The closer to 1, the more efficient the province is in managing its budget.

The next analysis is to identify the level of effectiveness and efficiency of each province in Indonesia. This is done because there may be provinces that have been effective in achieving quality development goals but have not been efficient in managing regional expenditures. Thus, a comparison between the level of effectiveness and the level of efficiency needs to be done.

This study divides by quadra, where there will be 4 quadrants that show the relationship between the level of effectiveness and the level of efficiency of provincial government spending performance in Indonesia

in 2021. The division of the quadrant is as follows:

Quadrant I, is a region or province that has an Effectiveness Achievement Index of ≥ 5 and has an Efficiency score of ≤ 0.5 which means that the region or province is Effective but Not Efficient.

Quadrant II, is a region or province that has an Effectiveness Achievement Index of ≥ 5 and has an Efficiency score of ≥ 0.5 which means that the region or province is Effective and Efficient.

Quadrant III, is a region or province that has an Effectiveness Achievement Index of ≤ 5 and has an Efficiency score of ≥ 0.5 which means that the area or province is Not Effective but Already Efficient.

Quadrant IV, is a region or province that has an Effectiveness Achievement Index of ≤ 5 and has an Efficiency score of ≤ 0.5 which means that the region or province is Not Effective and Not Efficient.

RESEARCH RESULTS AND DISCUSSION

Effectiveness and Efficiency of Central Government Spending

Table 4 shows the achievement scores for each goal in the SDGs for 2021 at the national level. From each of these scores, the average value is then calculated to determine a single score or index of government performance achievements in 2021. As in Table X, the government's kinerka achievement score based on SDGs goals is 0.579. This shows that on average, the government has met the SDGs target in 2021. To determine the level of effectiveness of government spending, the SDGs achievement score in 2021 is divided by the proportion of government spending to the economy or the proportion of government spending to Gross Domestic Product in 2021. As a comparison to determine the effectiveness or failure of government spending performance, the following calculations can be presented:

1. If the government's SDGs cap index is 1 which means that all values in each indicator that occur exceed those targeted by the government in the 17 SDGs goals, then with a government spending ratio in 2021 of 0.1589, the maximum value of the effectiveness level is 6.29. Since this is the highest score that a government can achieve with a certain level of spending, it is therefore given an index of 10.

2. If the government's SDGs capian index is 0.5 which means that all values in each indicator that occur are the same as those targeted by the government in the 17 SDGs goals, then with a government spending ratio in 2021 of 0.1589 the maximum value of the effectiveness level is 3.14. Therefore, this effectiveness value is then given an index of 5.

3. If the government's SDGs capian index is 0 which means that all values in each indicator that occur are lower than those targeted by the government in the 17 SDGs goals, then with a government spending ratio in 2021 of 0.1589, the maximum value of the effectiveness level

is 0. Therefore, this effectiveness value is then given an index of 0. By converting the effectiveness achievement into an index, it can be identified the extent of the effectiveness of government spending performance (see Table 5).

Table 4. Central Government SDGs Achievement Score in 2021

SDGs Goals	Agenda	Score
Goal 1	Without Poverty	0,429
Goals 2	No Hunger	0,500
Goals 3	Healthy and Prosperous Life	0,429
Goals 4	Quality Education	0,550
Goals 5	Gender Equality	0,800
Goals 6	Clean Water and Proper Sanitation	1,000
Goals 7	Clean and Affordable Energy	0,500
Goals 8	Decent Work and Economic Growth	0,800
Goals 9	Industry, Innovation and Infrastructure	0,500
Goals 10	Reduced Inequality	0,750
Goals 11	Sustainable Cities and Settlements	0,571
Goals 12	Responsible Consumption and Products	0,556
Goals 13	Climate Change Management	1,000
Goals 14	Ocean Ecosystem	0,000
Goals 15	Terrestrial Ecosystems	0,000
Goals 16	Peace, Justice, and Resilient Institutions	0,625
Goals 17	Partnerships to Achieve Goals	0,833
Average (Achievement Index)		0,579

Source: Data processed

Table 5. Central Government Spending Effectiveness Rate in 2021

Expenditure to GDP Ratio	SDGs Achievement Score	Effectiveness	Effectiveness Index	Information
0,1589	0,579	3.64	5,78	Effective
Checklists				
0,1589	1	6.29	10	Highly effective
0,1589	0.5	3,14	5	Effective
0,1589	0	0	0	Not yet effective

Source: Data processed

The results of the effectiveness index calculation show that the achievement of government spending performance in 2021 was at 5.78. This shows that the performance of central government spending in 2021 is at the effective criteria.

Meanwhile, the level of efficiency of government spending can be seen in table 6.

The results of the calculation of the efficiency level show that: the government budget in 2021 is at 1.55. This shows that the performance of central government spending in 2021 is on the efficient criteria with a record of increasing central government spending in 2021 which caused the budget deficit to exceed 3 percent of GDP (the maximum

threshold of budget deficit) due to budget reallocation for handling Covid-19. Thus, conditions in 2021 are in abnormal conditions, or there are disturbances, so that the interpretation requires certain justifications

where the formal rules for deficit relaxation of up to 5 percent (relaxed later to 7 percent) and will be returned to the standard rule of a maximum deficit of 3 percent in 2023 (Law Number 2 of 2020).

Table 6. Central Government Expenditure Efficiency Score 2021.

Acceptance (A)	Shopping (S)	Efficiency (Shopping/Acceptance)
1.735.743	2.697.237	1,5539

Source: Data processed

Effectiveness and Efficiency of Local Government Spending

Table 7 shows the Effectiveness Achievement Index of the performance of government spending in Indonesia. An index value of 10 indicates that the province is very effective compared to other provinces. Riau Province in 2021 has an effectiveness achievement index of 10, meaning that this province is very effective compared to other provinces in Indonesia in achieving

sustainable development goals. In contrast, West Papua Province is a province with government spending that has not been effective in achieving the targets of the sustainable development goals. Here are some provinces whose Effectiveness Achievement Index is still very low, namely Aceh (0.69), North Maluku (0.50), East Nusa Tenggara (0.44), Maluku (0.28), Papua (0.15), and West Papua (0.00).

Table 7. SDGs Achievement Score of Provincial Local Governments in Indonesia in 2021

Province	SDGs Achievement Score	Proportion of Local Government Expenditure to GRDP	Effectiveness Score	Effectiveness Achievement Index
Aceh	5,27	0,07	71,20	0,69
Sumatera Utara	5,15	0,02	335,08	6,71
Sumatera Barat	4,93	0,03	192,64	3,46
Riau	5,08	0,01	479,36	10,00
Jambi	5,46	0,02	290,85	5,70
Sumatera Selatan	5,04	0,02	246,03	4,68
Bengkulu	4,45	0,04	122,93	1,87
Lampung	4,57	0,02	239,61	4,53
Kep. Bangka Belitung	5,11	0,03	178,09	3,13
Kep. Riau	5,67	0,01	421,63	8,68
DKI Jakarta	5,53	0,02	261,76	5,04
Jawa Barat	5,41	0,02	319,21	6,35
Jawa Tengah	5,63	0,02	309,47	6,13
DI Yogyakarta	5,30	0,04	143,05	2,33
Jawa Timur	5,39	0,01	390,79	7,98
Banten	5,41	0,02	309,12	6,12

Province	SDGs Achievement Score	Proportion of Local Government Expenditure to GRDP	Effectiveness Score	Effectiveness Achievement Index
Bali	5,30	0,03	185,66	3,30
Nusa Tenggara Barat	4,23	0,04	106,93	1,51
Nusa Tenggara Timur	3,00	0,05	60,32	0,44
Kalimantan Barat	4,70	0,03	172,33	3,00
Kalimantan Tengah	4,98	0,03	184,79	3,28
Kalimantan Selatan	4,84	0,03	144,99	2,37
Kalimantan Timur	5,27	0,02	341,33	6,85
Kalimantan Utara	4,96	0,02	231,56	4,35
Sulawesi Utara	4,61	0,03	151,09	2,51
Sulawesi Tengah	4,88	0,02	277,92	5,41
Sulawesi Selatan	4,98	0,02	267,07	5,16
Sulawesi Tenggara	4,39	0,03	135,64	2,16
Gorontalo	4,70	0,04	110,50	1,59
Sulawesi Barat	4,25	0,04	107,60	1,52
Maluku	3,29	0,06	53,14	0,28
Maluku Utara	3,58	0,06	62,68	0,50
Papua Barat	3,87	0,09	40,94	0,00
Papua	3,00	0,06	47,44	0,15

Source: Data processed

Table 8. Provincial Government Expenditure Efficiency Score in Indonesia in 2021

Province	Efficiency Score
Aceh	0,809
Sumatera Utara	0,831
Sumatera Barat	0,831
Riau	0,932
Jambi	0,922
Sumatera Selatan	0,849
Bengkulu	0,837
Lampung	0,817
Kep. Bangka Belitung	0,831
Kep. Riau	0,911
DKI Jakarta	1
Jawa Barat	0,891
Jawa Tengah	0,899
DI Yogyakarta	0,832
Jawa Timur	0,939
Banten	1
Bali	0,951
Nusa Tenggara Barat	0,547
Nusa Tenggara Timur	0,739

Province	Efficiency Score
Kalimantan Barat	0,862
Kalimantan Tengah	0,876
Kalimantan Selatan	1
Kalimantan Timur	1
Kalimantan Utara	1
Sulawesi Utara	0,905
Sulawesi Tengah	0,877
Sulawesi Selatan	0,798
Sulawesi Tenggara	0,91
Gorontalo	0,821
Sulawesi Barat	0,821
Maluku	0,471
Maluku Utara	0,888
Papua Barat	1
Papua	0,851

Source: Data processed

Meanwhile, the results of calculating efficiency scores using DEA can be seen in Table 8. An Efficiency Score with a value of one 1 is the highest score. Provinces with one level of efficiency in managing their regional expenditures include DKI Jakarta Province, Banten Province, South Kalimantan Province, East Kalimantan Province, North Kalimantan Province, and West Papua Province. Meanwhile, provinces that have a score difference that is far towards 1 are South Sulawesi Province (0.798), East Nusa Tenggara Province (0.739), West Nusa Tenggara Province (0.547), and Maluku Province (0.471). These four provinces require

greater efforts to achieve budget efficiency levels.

Combining the effectiveness and efficiency of each province in Indonesia needs to be done because there may be provinces that have been effective in achieving sustainable development goals but have not been efficient in managing regional expenditures. Or vice versa, perhaps many provinces are already budget-efficient but have not been able to be effective in achieving the sustainable development goals. The results of identifying the level of effectiveness and level of efficiency can be seen in Table 9 and Figure 1.

Table 9. Quadranization of Local Government Spending Performance in Indonesia in 2021

Province	Effectiveness Achievement Index	Efficiency Score	Quadrant
Aceh	0,69	0,809	Quadrant III
Sumatera Utara	6,71	0,831	Quadrant II
Sumatera Barat	3,46	0,831	Quadrant III
Riau	10,00	0,932	Quadrant II

Province	Effectiveness Achievement Index	Efficiency Score	Quadrant
Jambi	5,70	0,922	Quadrant II
Sumatera Selatan	4,68	0,849	Quadrant III
Bengkulu	1,87	0,837	Quadrant III
Lampung	4,53	0,817	Quadrant III
Kep. Bangka Belitung	3,13	0,831	Quadrant III
Kep. Riau	8,68	0,911	Quadrant II
DKI Jakarta	5,04	1	Quadrant II
Jawa Barat	6,35	0,891	Quadrant II
Jawa Tengah	6,13	0,899	Quadrant II
DI Yogyakarta	2,33	0,832	Quadrant III
Jawa Timur	7,98	0,939	Quadrant II
Banten	6,12	1	Quadrant II
Bali	3,30	0,951	Quadrant III
Nusa Tenggara Barat	1,51	0,547	Quadrant III
Nusa Tenggara Timur	0,44	0,739	Quadrant III
Kalimantan Barat	3,00	0,862	Quadrant III
Kalimantan Tengah	3,28	0,876	Quadrant III
Kalimantan Selatan	2,37	1	Quadrant III
Kalimantan Timur	6,85	1	Quadrant II
Kalimantan Utara	4,35	1	Quadrant III
Sulawesi Utara	2,51	0,905	Quadrant III

Source: Data processed
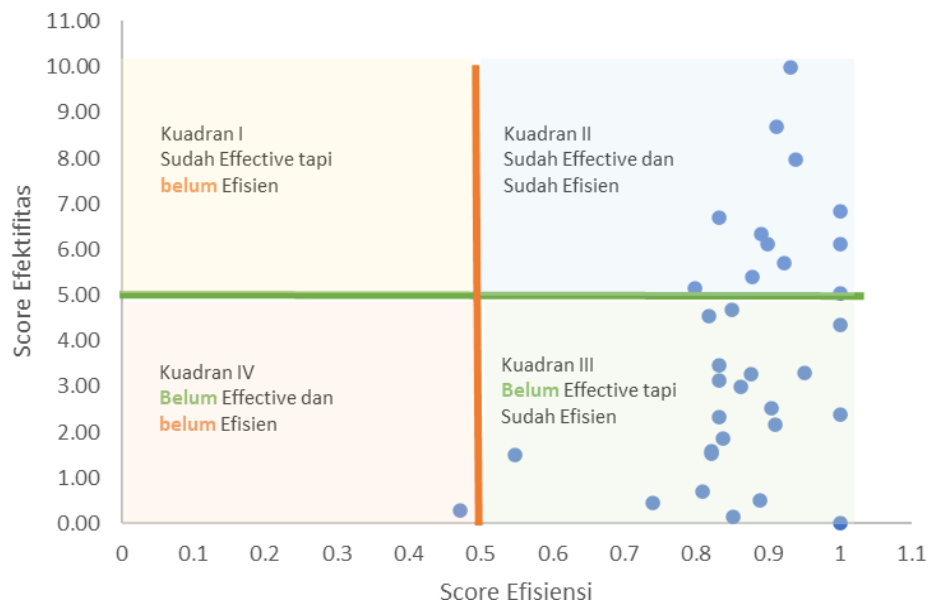
Source: Data processed

Figure 1. Quadrant of Local Government Spending Performance in Indonesia in 2023

As shown in Figure 1, if viewed from the point of view of the level of efficiency, it can be seen that although the majority of local governments have been efficient in managing their expenditures, some are still ineffective. This can be seen from the scatter plot in

Quadrant III, that there are at least 21 provinces that have been efficient in managing regional expenditures but have not been effective.

Meanwhile, there are 12 provinces in Quadrant II. This shows that not only is the province efficient in managing its regional budget but also effective in achieving the targets of sustainable development goals.

Meanwhile, those in Quadrant IV are the provinces of Maluku which are categorized as inefficient and not yet effective in managing regional expenditures when compared to other provinces. For Quadrant I, none of the provinces in Indonesia fall into this category.

CONCLUSIONS AND SUGGESTIONS

Based on the results of previous analyses related to the performance and quality of central and local government spending seen by measures of effectiveness and efficiency, the following conclusions can be drawn:

First, central government spending has been effective. This is in the sense that central government spending has targeted sustainable development targets. Second, central government spending is already efficient, albeit at a moderate level of efficiency. Third, some local government spending has been effective, but most have not been effective. Fourth, central government spending has been largely inefficient.

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