



Measuring the Level of Regional Government Financial Efficiency in Aceh

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ABSTRACT: This research aims to analyze the process and strategy of utilizing Regional Government expenditure inputs in producing public service outputs, and their influence on community welfare. Practically, it is hoped that the results of this research can provide input for improving management and strategies for optimizing the use of decentralization funds to increase efficiency in improving the quality of public services. Considering the many weaknesses and problems faced in managing APBD in the context of decentralization. This research uses a census method where the entire research population is observed. We collected secondary data in the form of audited Regional Government Financial Reports (LKPD) from 23 Regencies/Cities in Aceh from 2017 to 2021 and reports published by the Central Statistics Agency. The measurement uses the Data Envelopment Analysis (DEA) method which will show local governments with input or output inefficiencies. Results studies This find that only there are 4 of the 23 regional governments in Aceh that are relatively large efficient during 2017-2021 period. City Government Langsa is relatively the most efficient regional government compared to with Local Government others in Aceh. This research provides important information in the form of values that must be achieved so that regional governments can be efficient. If regional governments are able to increase their output, they will achieve efficiency, thus opening up the potential for efficient regional governments to be greater than inefficient regional governments.

KEYWORDS: Data Envelopment Analysis, Efficiency, Input, Output, Regional Government.

INTRODUCTION

The asymmetric decentralization policy implemented specifically for Aceh is an answer to the political demands of the people who have the desire to separate themselves from a country. This policy mandates the delegation of authority to the Special Autonomous Region (Otsus) to regulate its own government in accordance with the context and aspirations of its people. The implementation of Special Autonomy for Aceh is based on Law Number 11 of 2006 concerning Aceh Government. The granting of Special Autonomy status to the Aceh Government has fiscal implications in the form of transfer funds from the APBN with a very significant nominal value. As one of the Special Autonomy regions, since 2008 the Aceh Government has received quite large transfers of funds from the Central Government. The Aceh government then followed up on this policy by issuing Qanun number 2 of 2013 to give full authority to the Regency/City Government to manage Special Autonomy funds.

The fairly large fiscal implications accompanied by full discretion in its management should be a stimulus for Aceh Province to increase regional spending to support the provision of public goods and services, development of infrastructure and public facilities, especially in the fields of education, health and economic growth. This is very necessary so that Aceh Province can catch up with the progress of other regions in Indonesia and accelerate efforts to improve community welfare, which is the main goal of special autonomy and asymmetric decentralization (Widodo, 2019). Theoretically, the implementation of Special Autonomy within an asymmetric decentralization framework should be able to increase the efficiency of better public services (Widodo, 2019). In the context of providing public services, the regional government is the closest to the community, knowing more about the characteristics and needs of the local community so that it is more efficient for the regional government to respond to the needs of the community.

Even though Aceh has received a significant amount of allocated funds, the condition of public facilities and the level of welfare of the population in Aceh are still relatively behind when compared to other provinces in Indonesia. An evaluation carried out by the Ministry of Finance in 2021 shows that the management of Aceh's special autonomy allocation funds has not been optimal. The large budget received by the Regional Government is still not able to solve the problems of the people of Aceh. The problem of how to fulfill regional commitments regarding educational services is a very interesting thing to analyze.



Even though it is no longer a relatively new issue, the study of decentralization practices has always been a hot topic of debate in various circles. Considering the many weaknesses and problems faced in managing regional revenue budgets (APBD) in the context of decentralization, it is important to further develop relevant research. Most regional government revenues are still very dependent on the central government, regional spending is of poor quality because it is prioritized for personnel spending and operational spending, and the minimum allocation for regional spending directly related to basic community services is still not fully met (Kementerian Keuangan, 2018). This condition raises a fundamental question, why is the Aceh Special Autonomy fund allocation which is so large and growing rapidly not immediately followed by an increase in service performance and the level of community welfare in the region.

Previous research examining how decentralization affects public services, economic growth and community welfare is starting to be widely researched (Haryanto, 2019; Widodo, 2019), but these studies are still quite broad in national scope. Studies regarding the impact of decentralization in the regional scope are still considered minimal so it is deemed necessary to carry out further research. Previous research also found that the realization of regional government budgets in many regions is dominated by personnel spending rather than capital and development spending (Haryanto, 2019), regional spending tends to be inefficient and increases in local government revenues are not accompanied by improvements in public services (Widodo, 2019).

Research examining fiscal decentralization on the efficiency of public services was conducted in Spain (Esteller Moré & Solé Ollé, 2005); in OECD countries (Adam et al., 2014); in the fields of education and health which focus on increasing output with unchanged input (Sow & Razafimahefa, 2015). In contrast to previous studies which emphasized more on the performance (output) aspects of public services, the object of study in this research is more focused on the efficiency of public service delivery, not on public service performance. This research aims to help analyze the processes and strategies for utilizing regional government expenditure inputs in producing public service outputs, and their impact on community welfare. Practically, it is hoped that the results of this research can provide input for improving management and strategies for optimizing the use of decentralization funds to increase efficiency in improving the quality of public services and accelerate efforts to improve community welfare in the regions.

Evaluation in this research uses the Data Envelopment Analysis (DEA) method which aims to sharpen the analysis. The DEA measurement model was chosen because it has different characteristics from the efficiency concept in general. The efficiency measured by the DEA model is technical rather than economic, so the resulting efficiency value is relative to the Regional Government or DMU (Decisions Making Unit) being analyzed (Purwantoro & Siswadi, 2006). Besides that, DEA can handle many variables and does not limit the input and output that will be selected because the technique used can handle it .

LITERATURE REVIEW

According to Adolf Wagner, (Mankiw, 2012) government activities are followed by government spending increasing over time. Wagner stated that if per capita income increases in the economy, government spending will relatively increase overall. If the government sets a policy to purchase goods/services, then the costs that must be incurred to implement the policy are government expenditure (Mangkoesebroto, 2002). According to government expenditure theory, an increase or decrease in government spending will have an impact on national income, with all considerations for managing expenditure (Dumairy, 2006).

The concept of efficiency in this study refers to Government Regulation Number 12 of 2019 where efficiency is defined as achieving maximum output with certain inputs or using the lowest input to achieve a certain output. A regional government is said to be efficient if with lower input or expenditure compared to other regional governments it is able to produce a certain level of output , or with the same expenditure it is able to produce higher output. Efficiency measurement is carried out by comparing actual costs with standard costs expressed in output. Efficiency can be calculated by comparing the output produced to the input that has been used.

Previous research shows several inputs and outputs that are considered appropriate for measuring the level of financial efficiency of government spending. Government spending used as input to measure efficiency consists of education function spending, health function spending (González et al., 2010; Pertiwi, 2007) as well as economic function spending (Rambe, 2020). Meanwhile, the output is linked to the regional government's goal, namely to provide public services to improve the welfare of citizens. Thus, the output used to measure local government efficiency is life expectancy, average years of schooling and real expenditure per capita (Rambe, 2020).



This research measures the level of efficiency of local government spending using DEA (Data Envelopment Analysis) analysis. DEA is designed to be able to measure relative efficiency by using input and output from more than one indicator (Widyastuti & Nurwahyuni, 2022). The input data used in this research are economic function expenditure, education function expenditure, and health function expenditure, while the output is seen from real expenditure per capita, average years of schooling, and life expectancy.

The DEA method will produce the relative efficiency of each Regional Government or DMU (Decisions Making Unit) studied. DEA is also able to create scenarios to improve the use of input and output. DEA informs which inputs are not used efficiently, and which outputs must be increased to increase to perfect efficiency (=1), by identifying the use of inputs that are too high or output that is too low. The analysis results show that DMU have input or output inefficiencies, then improvements will be made to achieve a perfect level of efficiency.

RESEARCH METHODS

The secondary data source for this research uses audited Regional Government Financial Reports (LKPD) within the Aceh Province. The document used is information on the APBD Realization Report for the 2017-2021 fiscal year. Meanwhile, data on population, life expectancy, average years of schooling, and real expenditure per capita which will be used as output variables for financial efficiency are collected based on data published by the Central Statistics Agency. This research uses Data Envelopment Analysis (DEA) to measure the efficiency and/or evaluate the productivity of a local government or Decision Making Units (DMU) which is responsible for using a number of inputs to obtain a targeted output (Purwantoro & Siswadi, 2006). The DEA method was chosen because it only requires input and output data to measure technical efficiency (Vincova, 2005). DEA also has the advantage of being able to handle many inputs and outputs without requiring the assumption of functional relationships between input variables and output variables (Sunarto, 2007).

There are two measurement models in DEA analysis, namely Input Oriented and Output Oriented (Rusydia, 2013). Assuming that a number of outputs can be increased proportionally and optimally without changing the amount of input used, this research uses an output oriented approach. Meanwhile, the model used is Variable Return to Scale (VRS) because it assumes that the ratio of additional input and output is not the same. Considering that increasing the proportion of input may not necessarily increase the proportion of output with the same value, because there are other factors that also influence the output produced, such as level of education, income, public awareness and the environment. Meanwhile, the Constant Return to Scale (CRS) assumption is only appropriate to use if all DMUs are operating at optimal scale, otherwise it is more appropriate to use VRS.

Efficiency measurement basically compares the output ratio and input ratio, with the following formula:

$$Efficiency = \frac{Weighted\ Output\ Sum}{Weighted\ Input\ Sum}$$

This research uses the DEA proxy form of the linear divisive programming model developed by Vincova (2005), with the following equation:

Maximize	$\frac{\sum u_i y_i q}{\sum v_j x_j q}$		(1)
Subject to	$\frac{\sum u_i y_i k}{\sum v_j x_j k}$	$\leq 1 \quad k=1,2,\dots,n$	(2)
	$u_i \geq \epsilon, \quad i=1,2,\dots,s; \quad v_j \geq \epsilon, \quad j=1,2,\dots,m$		

Equations (1) and (2) are the ratio of the ratio of the ith output multiplied by the output matrix y to the value of the jth input multiplied by the input matrix x, so that $\sum u_i y_i q$ is the weighted amount of output, $\sum v_j x_j q$ is the weighted amount of input, u_i is



the value set for the i th output, v_j is the value set for the j th input, y is the output, x is the input, while k indicates the DMU productive units, n is the number of DMUs, s is the number of outputs, and m is the number of inputs.

RESULTS

Data Envelopment Analysis (DEA) is a technique used to evaluate the relative efficiency of a collection of Decision Making Units (DMU) to manage resources (input) so that they become results (output). DEA was chosen because it can handle many variables and does not limit the input and output that will be selected because the technique used can handle it. The DEA program is used to measure the efficiency of services provided by local governments.

Table 1. Regional Government Input and Output in Aceh In 2021

No	DMU (Local government)	Input Data			Output Data		
		Function Economy	Function Education	Function Health	Real expenditure per capita	Average Years of Schooling	Life expectancy
1	Regency West Aceh	224849067781	318799501379	230810743660	9593	955	6799
2	Regency Aceh Besar	120421945582	423915468309	251129840660	9644	1033	6979
3	Regency South Aceh	147397175995	383051071097	284852420433	8180	888	6440
4	Regency Aceh Singkil	61876296108	226719684230	140281459494	8776	868	6743
5	Regency Central Aceh	158218754112	291605962192	285796470845	10780	986	6886
6	Regency Southeast Aceh	161594206431	301385030186	192772233550	8030	967	6822
7	Regency East Aceh	264621778897	554993223408	118341955739	8577	821	6874
8	Regency North Aceh	78123572286	697200743210	406547835818	8201	864	6881
9	Regency Bireuen	311554278843	473721079629	364325285878	8867	929	7126
10	Regency Pidie	213012472291	457033446331	437266338374	9860	900	6695
11	Regency Simeulue	129471771801	176296272857	149364361460	7148	948	6528
12	Banda Aceh City	171350510078	289959265700	224097789705	16891	1283	7152
13	Sabang City	68482758314	139882135883	162487907056	11378	1118	7056
14	Langsa City	83989626325	246432159712	192496909960	12067	11,12	6943
15	Lhokseumawe City	107112535270	204371549750	125254694525	11390	11,11	7164



16	Regency Gayo Lues	143863553441	158568883572	144323499520	8856	840	6553
17	Regency Southwest Aceh	152991558885	209727668529	188349245696	8428	867	6506
18	Regency Aceh Jaya	154194199107	226400373809	165407727960	9666	871	6719
19	Regency Nagan Raya	174265794234	258867404083	199322285561	8292	869	6924
20	Regency Aceh Tamiang	142047411287	300458756490	221318188584	8367	891	6963
21	Regency Really Merry	141811671680	215534980789	172040645287	11118	1000	6926
22	Regency Pidie Jaya	136022431336	228723880457	172254414177	10290	934	7018
23	Subulussalam City	94500820047	151435271655	125482743931	7385	803	6407
Average		149642356093	149642356093	301525383185	215405434690	9643	6831

Source: Data processed

Table 1 shows the allocation of regional government spending as input and the achievements resulting from the allocation of regional government spending as output in 2021. The input data shows that all regional governments allocate spending on the education function as the largest, followed by the health function, and then the economic function which is ranked third. The North Aceh District Government is the regional government that allocates the highest education spending, while the lowest is allocated by the Sabang City Government. Bireuen Regency allocates the highest expenditure for economic functions while the lowest is allocated by Aceh Singkil Regency. For spending on health functions, the highest allocation belongs to Pidie Regency while the lowest is to East Aceh Regency.

The first output in measuring efficiency is real expenditure per capita with an average value of only IDR 964 million per year. The Banda Aceh Municipal Government had the largest real expenditure per capita at IDR 1689 million, while the regional government with the lowest real expenditure per capita was Simeulue Regency at IDR 714 million. When compared with the national average in 2021 of IDR 1115 million, it can be seen that the majority of regional governments in Aceh have real expenditure per capita below the national average. Only the Municipal Governments of Banda Aceh, Langsa, Sabang and Lhokseumawe have real regional expenditure per capita above the national average. This indicates that economic progress in urban areas is better than in districts.

The next output, namely the average length of schooling, has an average of 950 years, which means that on average the Acehnese people only finish junior high school. In 2021, the local government with the average length of schooling is Banda Aceh City Government at 1283 years, followed by Sabang City Government at 1118, Langsa City Government at 1112, and Lhokseumawe City Government at 1111. On the other hand, the lowest average length of schooling is in the Subulussalam City Government, which is only 803. Subulussalam City is a city government division of South Aceh Regency which was established independently in 2007. This indicates that educational infrastructure and teaching staff are also available more in urban areas, both in quantity and quality.

The final output is life expectancy with an average of 6831 years. In 2021, the highest life expectancy is owned by the Lhokseumawe City Government at 7164 years, while the lowest is also owned by the Subulussalam City Government. This information indicates that health infrastructure, health workers and government health programs are better in urban areas. Inefficiencies that occur in district governments are due to a lack of service coverage to the community, especially in rural areas. Regional government services, both infrastructure development and distribution of human resources, are still uneven.



The next step, to obtain information from regional government financial efficiency variables, this research uses the Data Envelopment Analysis method with an output oriented model based on the return to scale (VRS) variable Results of financial efficiency analysis testing for 23 regional governments in Aceh during 2017-2021

Table 2. Relative Efficiency of Regional Government in Aceh in 2017-2021

Regional Government (DMU)	Index Efficiency					Average Regional Government
	2017	2018	2019	2020	2021	
Regency West Aceh	0,958	0,958	0,944	0,944	0,944	0,950
Regency Aceh Besar	0,986	0,986	0,972	0,972	0,972	0,978
Regency South Aceh	0,901	0,901	0,889	0,889	0,889	0,894
Regency Aceh Singkil	0,944	0,944	0,931	0,931	0,931	0,936
Regency Central Aceh	0,972	0,972	0,958	0,958	0,958	0,964
Regency Southeast Aceh	0,958	0,958	0,944	0,944	0,944	0,950
Regency East Aceh	0,958	0,958	0,958	0,958	1,000	0,966
Regency North Aceh	0,972	0,972	0,958	0,958	0,958	0,964
Regency Bireuen	1,000	1,000	0,986	0,986	0,986	0,992
Regency Pidie	0,944	0,944	0,931	0,931	0,931	0,936
Regency Simeulue	0,915	0,915	0,903	0,903	0,903	0,908
Banda Aceh City	1,000	1,000	1,000	1,000	1,000	1,000
Sabang City	1,000	1,000	1,000	1,000	1,000	1,000
Langsa City	1,000	1,000	1,000	1,000	1,000	1,000
Lhokseumawe City	1,000	1,000	1,000	1,000	1,000	1,000
Regency Gayo Lues	0,915	0,915	0,903	0,903	0,917	0,911
Regency Southwest Aceh	0,915	0,915	0,903	0,903	0,903	0,908
Regency Aceh Jaya	0,944	0,944	0,931	0,931	0,931	0,936
Regency Nagan Raya	0,972	0,972	0,958	0,958	0,958	0,964
Regency Aceh Tamiang	0,972	0,972	0,972	0,972	0,972	0,972
Regency Really Merry	0,972	0,972	0,959	0,959	0,958	0,964
Regency Pidie Jaya	0,986	0,986	0,972	0,972	0,972	0,978
Subulussalam City	0,901	0,914	0,889	1,000	0,889	0,919
Average per year	0,960	0,961	0,950	0,955	0,953	0,956

Source: DEAP 21 output

The efficiency score ranges from 0 to 1, where a score of 1 means efficient The measurement results show that the average regional government efficiency score for each region per year is around 0,950 -0,960 and the average spending efficiency during 2017-2021 is 0,956 This means that in spending, the average relative level of regional government efficiency in Aceh is only 95,6% This indicates that on average the inefficiency of the Regional Government in Aceh in using spending for these three functions is 4,4%

Based on Table 2, it can be seen that the efficiency of regional government spending in Aceh varies during 2017-2021 There were 4 regional governments that were relatively efficient during the research period, namely, Banda Aceh City, Sabang City, Langsa City and Lhokseumawe City, while the other 19 regional governments were relatively inefficient This provides recommendations for 19 other inefficient regional governments to benchmark against relatively efficient regional governments (called peers) Furthermore, of the 4 regional governments that are always relatively efficient, it turns out that Langsa City is the



regional government that is used the most as *peers*. Therefore, Pemko Langsa is declared as the relatively most efficient regional government based on DEA in using government spending for 3 functions for 3 outputs in Aceh.

CONCLUSION, IMPLICATIONS AND LIMITATIONS

Regional government expenditure is said to be efficient if the available input is able to produce output at the most optimal level in order to improve community welfare. However, the fact that financial efficiency tends to decline indicates that there has not been a balance between the use of increasingly expensive inputs and the output produced. If this continues to happen, then the increasingly large budget allocation will not have a significant effect on the quality of education, quality of health and people's income.

This study found that only a small number of regional governments were relatively more efficient compared to other regional governments, only 4 of the 23 regional governments in Aceh were relatively efficient during the 2017-2021 period. The study also found that the Langsa Regional Government is the relatively most efficient regional government compared to other regional governments in Aceh. The study results also provide information on the values that must be achieved so that local governments can be efficient. If regional governments are able to increase their output, they will achieve efficiency, so it is possible that the number of efficient regional governments cannot be greater than inefficient regional governments.

The input in this research uses indicators for the realization of economic function expenditure, education function expenditure, and overall health function expenditure, this could be a limitation in the research. For future research, it would be better to use more detailed functional expenditure allocation data, such as allocation of personnel expenditure, capital expenditure and goods expenditure. Likewise, for output data that uses indicators of real expenditure per capita, average years of schooling, and life expectancy, more detailed measurements can be used such as service facilities, level of service human resources, and coverage of the community served. Study furthermore also can done in more scope wide with use all local government in Indonesia as sample.

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