



REGIONAL INCOME EFFICIENCY AND ECONOMIC DEVELOPMENT

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Abstract

Regional income is input in economic development. The sector includes local own-source revenue, balanced funds, and other legitimate income which is used as the capital of the regional government to promote better regional economic development. To reach economic development goals, the government must look at the efficiency of fund allocations. Efficiency is the right key to optimize the available resources so that they can be managed or allocated to certain sectors with the hope of improving good results in the development stage of a region, it can be concluded that the efficiency of government spending can be achieved if the results from existing resources can be optimized in its allocation with strategic steps to achieve optimal community welfare and economic development. This study aims to analyze the efficiency of the public sector, namely allocation of regional income in Bali, Indonesia, which consists of local own-source revenue, balanced funds, and other legitimate income as input variables in increasing economic development as seen from the Gross Regional Domestic Product (GRDP), Human Development Index (HDI), and the number of people who are not poor as output indicators of regional economic development indicators.

Introduction

In Indonesia, the government has dominated various aspects of social life. From the proportional average of the State Budget (APBN), around 80% of state revenue has been generated by public sector mechanisms. Resources owned by the regions should be empowered to the maximum extent possible to achieve better public sector services and to be targeted to the community, in other words, that the allocation of government spending from various resources produced by the regions must be used efficiently, given that from year to year government

spending on development continues to increase and will continue to increase (Chusna, 2014).

In the financial review of the government of Bali province, Bali has long been a province that has the leading tourism sector in Indonesia, based on 2011-2015 APBD realization data per Regency/city in Bali Province (Statistics Indonesia, 2016). It has been explained that there is an upward trend both in terms of total income and expenditure. Based on these data it can be concluded that the increase in government revenue is always accompanied by an increase in expenditure and this also means that because the greater

the income, the greater the allocation of expenditure funds for regional development, and the greater the allocation for development, the greater the achievements regional goals to increase economic growth. Then for each Regency/city in a province has a different income and expenditure (Adisasmita, 2014). Efficiency is the right key to optimize the available resources so that they can be managed or allocated to certain sectors with the hope of improving good results in the development stage of a region, it can be concluded that the efficiency of government spending can be achieved if the results from existing resources can be optimized in its allocation with strategic steps to achieve optimal community welfare and economic development. When these conditions are achieved, government spending can be categorized as having reached an efficient level (Anwar, 2017).

Literature Review

Efficiency in company management or coIDRorate governance is needed for the survival of the company. Companies in the production process can use one or more variable inputs in creating efficiency. Jeffrey (2015) explained that the efficiency of a company consists of two components, namely technical efficiency that reflects the ability of a company to obtain maximum output from a particular set of inputs. Another component is allocative efficiency which reflects the ability of a company to use inputs in optimal proportions, given the existence of responsive prices and production technology. The two measures are then combined to provide a measure of total economic efficiency (Aidar 2017).

Efficiency in public services is needed. The puIDRose of the efficiency of public services is how the local government manages the resources it has, in this case, is the source of regional revenue as an input that is managed to then produce many outputs or public services and has the goal of achieving prosperity and economic growth (Asghar, 2012). In this study the method used is the Data Envelopment Analysis (DEA) method, this method requires variable data consisting of input variables and output variables in an Economic Activity Unit (EAU). Input and output variables used in this study are:

Input variable

Local Own-Source Revenue (LOSR)

It is a regional income sourced from the economic activities of the region itself, which consists of local taxes, regional levies, the results of the management of regional wealth and other legal income (Law, 2009).

Balanced Funds

Balancing funds are funded from the central government to be allocated to finance regional needs in carrying out the implementation of decentralization, which is sourced from the APBN (Law, 2009).

Other Legal Revenue (OLR)

These income include, among others, grants, emergency funds, regional loans, and other revenues by applicable laws and regulations (Law, 2004)

Output Variable

Economic growth

Economic growth is an increase in the economic system or economic growth based on the added value of the Gross Regional Domestic Product (GRDP) concerned so that it can improve the welfare of the community (Samuelson, 2019)

Poverty

Conditions where the level of welfare of the people is low so that it threatens them in meeting their own needs for consumption, the need to obtain basic health services, education and to meet other basic needs (Saleh, 2016).

Human Development Index (HDI)

Human development index is an index that measures the achievements of development, among others, the achievements of longevity and health that represent the health sector, literacy rates, school participation and average length of schooling which is a reference to measure development performance in education, as well as the purchasing power of the community towards basic needs seen from the average expenditure per capita. The size of the HDI is one of the variables in determining the level of community welfare in the regional economic system (Anwar, 2017).

Research Methods

In this study, Data Envelopment Analysis (DEA) is an analytical tool used for mathematical operations to measure the technical efficiency level of an Economic Activity Unit (EAU) which has many inputs and many outputs and then compares relative to other Economic Activity Units. In measuring efficiency, the DEA identifies the unit used as a reference that can help to find causes and solutions to inefficiencies, which are the main advantages in managerial applications. Besides, DEA does not require a more complete specification of the form of the function that shows the relationship between production and distribution of observation. DEA theory has several value concepts that are used as a basis for the managerial process, namely (Priyadi, 2019):

- a. Efficiency ratio values are relative, meaning DEA produces efficiency for each economic unit relative to the sample of other units. This can be used to see economic units that need managerial improvement.
- b. Data Envelopment Analysis showed that the economic unit has perfect efficiency at 100% and less efficient with value <100%. Besides that, there is a multiplier number that is used as a basis for managerial improvement.
- c. The DEA presents a cross-efficiency matrix that can show economic units of efficiency with different

inputs and produce outputs that are different from other economic units.

In this study, DEA is used in addition to operational wise, it can also be used to recommend improvements for managerial individuals or groups that are less efficient to be efficient.

The essence of DEA is to determine the weights or scales for each EAU output and input. These weights have the following properties (Priyadi, 2019):

- a. Not negative
- b. Be universal, meaning that each EAU in the sample must be able to use the same set of weights to evaluate its ratio (total weight output / total weight input) and the ratio must not be more than 1 (total weighted output / total weighted input ≤ 1).

The DEA (Data Envelopment Analysis) for an Economic Activity Unit (EAU) can be formulated as a fractional linear program, the solution of which can be obtained if the model is transformed into a linear program with the weight of input and output of the Economic Activity Unit (EAU) as a decision variable (Danu, 2013).

DEA is a calculation of efficiency, relative technique. The hypothesis for the DEA calculation results is:

- a. EAU is less efficient if efficiency $< 100\%$
- b. EAU is efficient if efficiency = 100%

Based on research by Solihin (2017) who analyzed the efficiency of government spending using the Data Envelopment Analysis (DEA) method, has reviewed the technical efficiency of government spending on the public sector in the ASEAN Region, the optimization model used is minimize input (input-oriented model) which aims to evaluate how much the quality of inputs can be reduced to produce optimal output without changing the amount of output. In this study, the results of the analysis of DEA have been varied in the Southeast Asia region, where Singapore is the country with the highest average efficiency level in all three sectors, while Malaysia, based on the analysis, has the most severe inefficiency, middle and upper-income countries tend to have the highest expenditure levels high in the public sector so inefficient as for the country namely Malaysia, Brunei Darussalam, and Vietnam, while countries with poor categories such as Cambodia and Laos have relatively high levels of efficiency but in public services are countries in Southeast Asia with the most public services - bad in both the health and education sectors (Solihin, 2017).

High level of efficiency due to low input levels. For countries that have a degree of efficiency in the middle zone such as Indonesia and the Philippines can increase the degree of efficiency by reducing inputs at a fixed level of output through targeted budget allocations and/or vice versa increasing output at a fixed level of inputs. The input-referred is the variable government expenditure such as

government spending, government financing, and investment and the output is public services such as health, education, industry, etc (Okoro, 2013).

Saidah (2017) research has been conducted on the public health sector that has been researched hospitals categorized as large hospitals and small hospitals in America (USA) by measuring the level of efficiency in achieving the income of each hospital in America with the DEA method, in large hospitals produced an average of 71% in 2013, then for the category of small hospitals an average efficiency of 60% in the same year in achieving profit, while the variables analyzed using the method DEA in the study are:

Inputs:

Operating expenses - payroll expenses are not included because the number of full-time employees is used as a separate measure of labor input. Hospital Beds - The number of hospital beds is an accepted indicator of capital investment. Full-time employees of labor is an important facet of an organization's resource consumption.

Outputs:

Inpatient Days - Inpatient Days is a common measure of hospital productivity and is a widely accepted measure of inpatient workload. Outpatient Visits - Outpatient workload is a widely accepted measure of hospital output. Surgical Procedures - Surgical procedures are a widely accepted measure of hospital output.

The results of research have proven that input as capital in hospital productivity activities in providing services to achieve good health access for the community and to achieve the expected benefits, efficiency measurement is a matter of it is important to evaluate in achieving the expected output target (Saidah, 2017).

Discussion

Measurement of the level of efficiency based on the Data Envelopment Analysis (DEA) method that analyzes the input and output of a region. This study calculates the level of efficiency from 2013 to 2015 in each Regency/city in the Province of Bali. The results of calculations using the DEA method have been obtained efficiency tables for each Regency/city in the Province of Bali.

Financial Management Efficiency by Regency/City in Bali Province (percent%)

Regency/City	Efficiency Level		
	2013	2014	2015
Jembrana	100	100	100
Tabanan	87.89	81.61	74.87
Badung	100	100	100
Gianyar	90.74	89.73	81.44
Klungkung	100	100	96.05
Bangli	100	100	100
Karangasem	89.33	88.45	82.40

Buleleng	100	100	95.83
Denpasar	100	100	100
Average	96.44	95.53	92.28

Source: Statistics Indonesia Data

The table above shows the results of data processing using the Data Envelopment Analysis (DEA) method, based on these results in 2013 and 2014 in Tabanan, Gianyar, and Karangasem Regencies show that the three regencies in Bali are relatively inefficient 100%, while the city of Denpasar and other Regency has demonstrated the level of 100% relative efficiency in the management of local input da lam produce output areas for which data are studied.

The level of financial management efficiency that is sourced from regional income which includes LOSR, Balance Funds, and Other Legitimate Revenues that have been used to achieve economic development in each region to increase Gross Regional Domestic Product (GRDP),

Human Development Index (HDI), and efforts to reduce poverty as output from development economy, it has been shown in the results of the table above, in 2015 based on the results of data processing, two regions showed an efficiency level of less than 100%, namely in the Klungkung and Buleleng Regencys, while each of these regions with their efficiency levels in 2015.

Overall the level of efficiency in managing the public sector funds of the Province of Bali from 2013 to 2015 has decreased the level of efficiency in achieving economic development in the Province of Bali. Then in line with the inefficiency in some regions in the Province of Bali according to the data of this study it has been shown that some inefficient financial management, based on calculations using the DEA method is a waste of the use of regional finance or in other words, there is a financial allocation for economic development to increase the Gross Regional Domestic Product (GRDP), Human Development Index (HDI), and reducing poverty that is not quite right, based on the data of this study which has been processed as follows:

Efficiency of Input Allocation on The Output Generated and Waste of Input Allocation

Tahun	Regency/city	Efficient Input Allocation (IDR)			Waste of Input Allocation (IDR)		
		LOSR	BF	OLR	LOSR	BF	OLR
2013	Tabanan	160,662,140	641,673,901	173,955,568	22,136,973	88,413,596	23,968,619
2013	Gianyar	216,468,369	579,712,843	172,286,276	22,090,556	59,159,587	17,581,782
2013	Karangasem	125,947,464	574,248,202	155,849,627	15,043,764	68,590,936	18,615,421
2014	Tabanan	173,773,480	651,778,673	203,503,050	39,158,121	146,871,827	45,857,384
2014	Gianyar	280,101,571	613,915,377	171,858,877	32,058,878	70,265,362	19,670,017
2014	Karangasem	141,527,397	620,856,451	225,046,492	18,480,966	81,072,832	29,387,077
2015	Tabanan	182,528,536	80,244,127	267,266,280	61,265,422	26,933,818	89,707,514
2015	Gianyar	301,881,277	59,541,676	246,492,522	68,798,091	13,569,419	56,175,113
2015	Klungkung	86,025,694	37,878,654	184,483,820	3,537,756	1,557,737	7,586,789
2015	Karangasem	169,145,275	41,904,546	242,830,626	36,128,117	8,950,486	51,866,736
2015	Buleleng	212,649,645	95,764,644	450,206,502	9,253,355	4,167,156	19,590,536

Source: Statistics Indonesia Data

Note: -LOSR: Local own-source revenue

-BF: Balancing Fund

-OLR: Other Legal Revenues

Based on the analysis per unit, it has shown how much funding comes from local own-source revenue (LOSR), balancing funds and other legitimate income that should be used to achieve 100% efficiency and in these results also shows how much money is wasted has been used for development to increase Gross Regional Domestic Product (GRDP), Human Development Index (HDI), and reduce poverty in each region that has not reached 100% relative efficiency in financial management in the sector, in 2013 to 2015. Waste that occurs based on data that has been processed is found in Tabanan Regency, especially in

the use of balancing funds from 2013 to 2015. In 2013 Tabanan became the region with the lowest level of efficiency, amounting to 87.89%, then based on the analysis of the DEA has provided a solution that Tabanan Regency must reduce the use of funds sourced from LOSR in the amount of IDR. 22,136,973, then have to reduce the balance funds amounting to IDR 88,413,596, and should reduce the use of other funding lawful income of IDR 23,968,619 to increase the Gross Regional Domestic Product (GRDP), Human Development Index (HDI), and reduced poverty.

Furthermore, in 2014 Tabanan Regency remained the most inefficient region, which only reached an efficiency level of 81.61%, to achieve efficient financial management to achieve these development objectives, Tabanan Regency was recommended to reduce its Local own-source revenue (LOSR) funds by IDR 39,158,121 reduce the use of balancing funds by IDR 146,871,827 and can reduce the use of funds originating from other legal income by IDR 45,857,384. Then in 2015 Tabanan Regency remained the

region with the lowest level of efficiency achievement, and increasing regions, namely Klungkung and Buleleng Regencies.

Then in the analysis of this study has shown the efficient reference set, namely to achieve 100% efficiency in areas that are not efficient can refer to areas that become efficient reference sets by the area concerned and in the period under study, the following table shows efficient reference set.

Efficiency, Efficient Reference Set and Multiplier Value of All Inefficient Regencies/Cities

Year	Regency/City	Efficiency (%)	Efficient Reference Set	Multiplier
2013	Tabanan	87.89	Klungkung	0.404
			Bangli	0.197
			Buleleng	0.223
			Denpasar	0.203
2013	Karangasem	89.33	Jembrana	0.348
			Bangli	0.207
			Buleleng	0.221
			Denpasar	0.136
2013	Gianyar	90.74	Jembrana	0.645
			Buleleng	0.024
			Denpasar	0.347
2014	Tabanan	81.61	Jembrana	0.714
			Buleleng	0.147
			Denpasar	0.166
2014	Karangasem	88.45	Jembrana	0.560
			Buleleng	0.253
			Denpasar	0.099
2014	Gianyar	89.73	Jembrana	0.653
			Badung	0.011
			Denpasar	0.350
2015	Tabanan	74.87	Jembrana	1.119
			Denpasar	0.148
2015	Gianyar	81.44	Jembrana	0.379
			Bangli	0.276
			Denpasar	0.369
2015	Karangasem	82.40	Jembrana	1.006
			Denpasar	0.141
2015	Buleleng	95.83	Jembrana	2.189
			Denpasar	0.078
2015	Klungkung	96.05	Jembrana	0.502
			Bangli	0.513

Source: Statistics Indonesia Data, Bali Province 2013-2015

According to the DEA, analysis to achieve 100% relative efficiency, then each region should refer to the regions that have been shown based on this analysis. For Tabanan Regency whose efficiency level is only 87.89% to achieve 100% relative efficiency, it can refer to Klungkung Regency, Bangli, Buleleng, and Denpasar each have multiplier values of 0.404, 0.197, 0.223 and 0.203 in 2013, then for 2014 the financial management is to be efficient in Tabanan Regency can refer to the Jembrana area, 0.714, Buleleng at 0.147 and

Denpasar 0.166. Then in 2015 Tabanan referred to the Jembrana area 1,119 and referred to Denpasar with a multiplier value of 0.148. The multiplier functions as a dynamic multiplier as a basis for adjusting the input and output of Tabanan Regency to achieve a relative efficiency of 100% as well as for other regions that have not reached a relative efficiency of 100% can achieve efficiency by referring other regions based on the multiplier that has been shown based on analysis DEA.

In Karangasem Regency which has not reached 100% relative efficiency, in 2013 it can refer to Jembrana with a multiplier value of 0.348, Bangli of 0.207, Buleleng of 0.221 and Denpasar 0.136, in 2014 Karangasem Regency can refer to Jembrana Regency with a multiplier value of 0,56, Buleleng of 0.253 and Denpasar of 0.99. Whereas in 2015 the Karangasem Regency to achieve a 100% relative efficiency could refer to the Jembrana Regency of 1,006 and the City of Denpasar of 0.141. Furthermore, for Gianyar Regency which has not reached 100% relative efficiency, in 2013 it can refer to Jembrana Regency with a multiplier value of 0.645, Buleleng of 0.24 and Denpasar City of 0.347, in 2014 Gianyar Regency can refer to Jembrana Regency with a deficiency of 0,653, Buleleng by 0,11 and Denpasar City by 0,35. Whereas in the 2015 Gianyar Regency to achieve a 100% relative efficiency it can refer to Jembrana Regency with a multiplier value of 0.379, Bangli 0.276, and Denpasar City of 0.369.

Then in 2015, the number of regions that did not reach perfect efficiency has increased, namely Buleleng Regency and Klungkung Regency, in both regions to achieve 100% relative efficiency can refer to other regions, according to the results of the DEA analysis shows that Buleleng Regency is recommended to refer to Jembrana Regency with a multiplier value of 2,189 and can refer to Denpasar City of 0.78 and to Klungkung Regency in 2015 to reach 100% efficient can refer to Jembrana Regency with a multiplier value of 0.502 and can refer to the Bangli Regency with a multiplier value of 0.513.

Conclusion

Based on the results of data analysis using Data Envelopment Analysis (DEA) on the level of efficiency of the Regency/city public sector in the Province of Bali in 2013 to 2015, it can be concluded that:

Local own income (LOSR), balanced funds, and other legitimate income as input variables that influence economic development, namely in increasing GDP, increasing HDI and poverty alleviation as a measure of the level of achievement of people's welfare in enjoying economic development. In Bali Province, among others, Jembrana Regency, Badung Regency, Klungkung Regency, Bangli Regency, Buleleng Regency and Denpasar City in 2013 and 2014 reached 100% efficiency while in Tabanan Regency, Gianyar Regency, and Karangasem Regency in 2013 and year 2014 respectively only reached 87.89%, 90.74% and 89.33% in 2013, whereas in 2014 the three regions with efficiency levels were only 81.61%, 89.73%, and 88.45%. Then in 2015 based on DEA analysis, the number of regions experiencing inefficiencies has increased. Tabanan Regency, Gianyar Regency, and Karangasem Regency continue to experience inefficiencies from 2013 to 2015 experiencing decreasing levels of efficiency, while the two regions that experienced inefficiencies in 2015 namely Klungkung and Buleleng Regencies with each efficiency level of 96.05% and 95.83%.

Inefficiency occurs because there are indications that the area experiencing inefficiency is due to the wasteful use of input variables. To overcome the inefficiencies that lead to wasteful use of input variables, the results of the DEA analysis have shown how to overcome inefficiencies by reducing the use of inputs based on the results of DEA analysis. Then for areas that are experiencing inefficiency to reach a 100% efficiency level, it can refer to other regions that have reached 100% relative efficiency based on the multiplier value that has been shown in the DEA analysis.

Implication

Regencies/Cities in Bali Province that have reached the maximum level of efficiency are expected to be able to maintain progress for better economic development. Whereas for regions that have not yet reached the maximum level of efficiency it is expected to be able to reduce the use of inputs and offset the output. If seen from the amount of local own-source revenue (LOSR) there are indeed significant differences between Regencies/Cities in Bali Province, this is caused by differences in the level of natural resources utilized by each of these regions, other factors namely infrastructure resources human, social, bureaucratic, political, and cultural factors and geographical conditions. However, differences in resources and other factors are not obstacles to getting maximum output. What needs to be done is to take steps to supervise and evaluate the use of each input to avoid the waste that can lead to inefficiency. Besides, it is also necessary to prepare a plan to use inputs to the sectors that are right on target and following needs so that in the future it can achieve a 100% efficiency level sustainably in economic development.

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