

# Efficiency of Local Government Capital Expenditure

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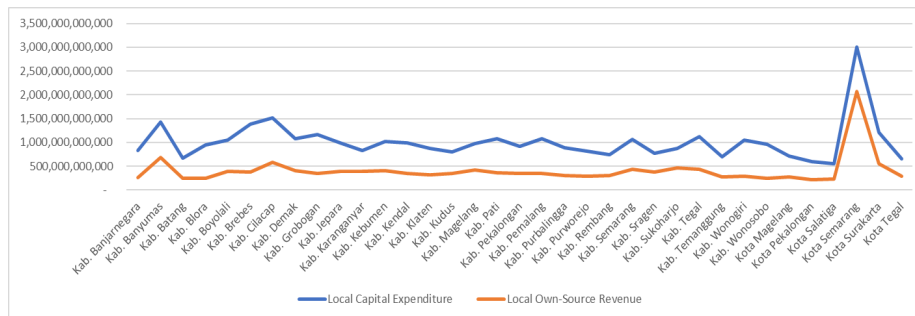
**Abstract.** This study aims to analyze the efficiency level of local government spending in generating local revenue and investment in the region. Capital expenditure which consists of capital expenditure and operating expenditure as input variable and income and regional investment as output variable. Data Envelopment Analysis is used as a method for measuring efficiency because the tool can accommodate several input variables and several output variables. The results of the study show that the level of efficiency of capital expenditure in the districts/cities in the province of Central Java varies widely. The results also show that many areas have not yet reached the maximum level of efficiency. Based on the classification of the amount of expenditure and the level of efficiency score, districts/ cities can be grouped into four categories. The first category is the area with the amount of capital expenditure and efficiency level above average. The second category is the area with the amount of capital expenditure below the average but the level of efficiency above the average. The third category is the area with the amount of capital expenditure and the efficiency level below the average and the last category is the area with the amount of capital expenditure below the average but the level of efficiency above the average. The results of the efficiency level and categorization can be used as a reference in formulating policies related to capital expenditure and local government efficiency.

**Keywords:** Efficiency, Local Government, Government Spending, Capital Expenditure, DEA

## 1 Introduction

One of the objectives of fiscal decentralization is to realize local government efficiency. This is due to fiscal decentralization, local governments are given the authority to manage their own finances. Therefore, the efficiency of the financial management is demanded. A study on the efficiency level of district/city government spending in Central Java in the education and health sectors and the results show that the efficiency level of education expenditure in 1999 – 2002 in each district/city in Central Java tends to be inefficient. Districts/cities in Central Java have an average efficiency level below 50% [1]. Studies on fiscal efficiency have also been conducted in districts/cities in DIY in 2007 – 2009 and the results were only 1 area that was efficient and 4 other regions were inefficient [2].

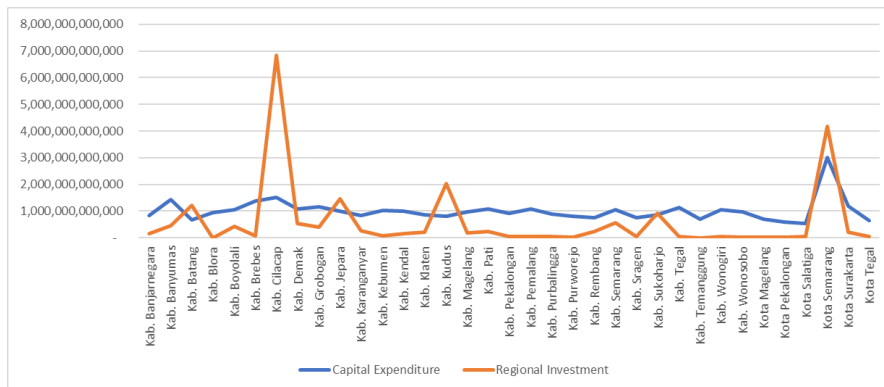
Fiscal decentralization also aims to realize regional financial independence. Regional financial independence can be achieved through the ability to generate good local revenue. It also requires the efficiency of government spending in generating local revenue. However, not all regions with large capital expenditures can generate large regional original revenues as well, as reflected in Figure 1 below.



**Fig 1.** Local Capital Expenditure and Local Own-Source Revenue in 2019 (Rupiah) (Ministry of Finance, 2020)

There are several comparisons where the expenditure is greater, but the original regional income is the same, or the expenditure is relatively the same, but the regional original income is different. For example, Blora Regency has a higher capital expenditure than Batang Regency, but its original regional income is relatively the same. Boyolali and Brebes districts also show the same thing, where the capital expenditure of Boyolali district is greater than that of Brebes district, but the income is relatively the same. This indicates that there is a difference in efficiency from one area to another.

The potential negative impact of increased public spending is lower investment and aggregate consumption in the private sector. This condition is usually referred to as crowding-out, where public capital acts as a substitute for private capital and in doing so hinders incentives for the private sector to invest. In the end, the increase in public spending may be due to higher taxes to finance public investment [3]. Based on this, we can conclude that the existence of government spending can lead to a decrease in private investment, because it is pressured by public investment.



**Fig 2.** Local Capital Expenditure and Regional Investment in 2019 (Rupiah) (Ministry of Finance, 2020)

Figure 2 provides an overview of how the capital expenditures and investment in the districts and cities in Central Java Province. There are varying conditions, where there are regencies/cities that have a regional investment value greater than their capital expenditure, such as Batang, Cilacap, Jepara, Kudus and Semarang Regencies. Meanwhile, other regions have regional investment values below the value of their capital expenditures. It is suspected

that there are regencies/cities that are efficient in spending their capital to generate investment, but there are still many that are not efficient.

Well-managed public spending plays an important role in supporting the government's efforts to attract foreign and local investors. Having high-quality infrastructure and effective government programs can support economic growth in the country and increase the private sector's contribution to Gross Domestic Product [4][5]. Increased government spending on infrastructure and social programs contributes to the creation of a more favorable environment for the private sector to invest, and thus can create jobs and better support economic growth [6][7].

The background that has been discussed raises the suspicion that regencies/municipalities are still not efficient in managing their capital expenditures, especially in generating local-own revenue and regional investment.

## 2 Method

The focus of this research is to measure the efficiency level of local government capital expenditure in investment and local revenue and to study whether high capital expenditure is related to the economic efficiency of districts/cities in Central Java Province. In this study used quantitative data types, which are secondary data. The secondary data used in this analysis is the amount of capital expenditure, operating expenditure, local own revenue, and investment in the districts and cities in Central Java Province in 2019.

The secondary data used in this study were sourced from the Ministry of Finance and the Central Statistics Agency. Data on the amount of capital expenditure, operating expenditure, and local revenue are obtained from DJPK, Ministry of Finance of the Republic of Indonesia. The investment data for districts and cities in Central Java Province were obtained from the Central Java Provincial Statistics Agency.

This study was conducted in two stages, firstly calculating the efficiency score of district/city government capital expenditures in Central Java Province. Furthermore, in the second stage, the district/city area is classified based on the efficiency score generated in the first stage and the amount of capital expenditure of the local government.

The analytical technique used to perform efficiency analysis is nonparametric statistical analysis, using the DEA approach. The consideration for choosing this DEA approach is that this approach is able to accommodate many inputs and outputs in the calculation of the linear program model to produce a single value of efficiency for each observation [8]. DEA is a procedure designed to measure the relative efficiency of a Decision Making Unit (DMU) that uses many inputs (multi-input) and many outputs (multi-output) where combining these inputs and outputs is not possible [1].

The way to assess the efficiency of decision-making units (DMUs) in public programs was first introduced by Charnes, Cooper and Rhodes in 1978. The article has introduced a new type of production function and a new method whose purpose is to measure the efficiency of resource utilization. in decision making units [9]. This method is known as Data Envelopment Analysis (DEA) CCR model. The model was developed with the introduction of methods that make it possible to determine whether operations are performed in areas with increasing, constant or decreasing returns to scale in multiple input and multiple output situations [10]. This model became known as the DEA BCC Model.

The DEA analysis used in this study adopts the BCC DEA Model developed by Banker, Charnes and Cooper. The input variable used is capital expenditure which consists of capital expenditure and operating expenditure. While the output variables used are investment and local revenue.

In the second stage, the district/city area is classified based on the efficiency score generated in the first stage and the amount of capital expenditure of the local government. Based on the classification, the regions will be grouped into four categories. The first category is the area with the amount of capital expenditure and efficiency level above average. The second category is the area with the amount of capital expenditure below the average but the level of efficiency above the average. The third category is the area with the amount of capital expenditure and the efficiency level below the average and the last category is the area with the amount of capital expenditure below the average but the level of efficiency above the average.

### 3 Result and Discussion

The results of the analysis in the first stage, obtained the value of the efficiency score of local government capital expenditure. Based on the DEA analysis using the BCC Model with the assumption of Variable Return to Scale, the results show that 7 regions have been efficient or have achieved maximum efficiency scores, while 18 regions have not been efficient or have not achieved maximum efficiency scores. The results of the efficiency scores in detail are presented in table 1.

**Table 1.** Results of Regency/City Regional Efficiency Scores in Central Java Province

No.	Distric/ City	Score	No.	Distric/ City	Score
1	Kab. Banjarnegara	0.667334084	19	Kab. Pemalang	0.563108769
2	Kab. Banyumas	0.774453933	20	Kab. Purbalingga	0.655989428
3	Kab. Batang	1	21	Kab. Purworejo	0.706505244
4	Kab. Blora	0.628034679	22	Kab. Rembang	0.86565071
5	Kab. Boyolali	0.886178307	23	Kab. Semarang	0.703846494
6	Kab. Brebes	0.525498305	24	Kab. Sragen	0.936600317
7	Kab. Cilacap	1	25	Kab. Sukoharjo	1
8	Kab. Demak	0.723433967	26	Kab. Tegal	0.675010994
9	Kab. Grobogan	0.516336487	27	Kab. Temanggung	0.808382715
10	Kab. Jepara	0.79205136	28	Kab. Wonogiri	0.733055923
11	Kab. Karanganyar	0.862952643	29	Kab. Wonosobo	0.508027177
12	Kab. Kebumen	0.701228713	30	Kota Magelang	0.818500713
13	Kab. Kendal	0.67269404	31	Kota Pekalongan	0.816620537
14	Kab. Klaten	0.665410329	32	Kota Salatiga	1
15	Kab. Kudus	1	33	Kota Semarang	1

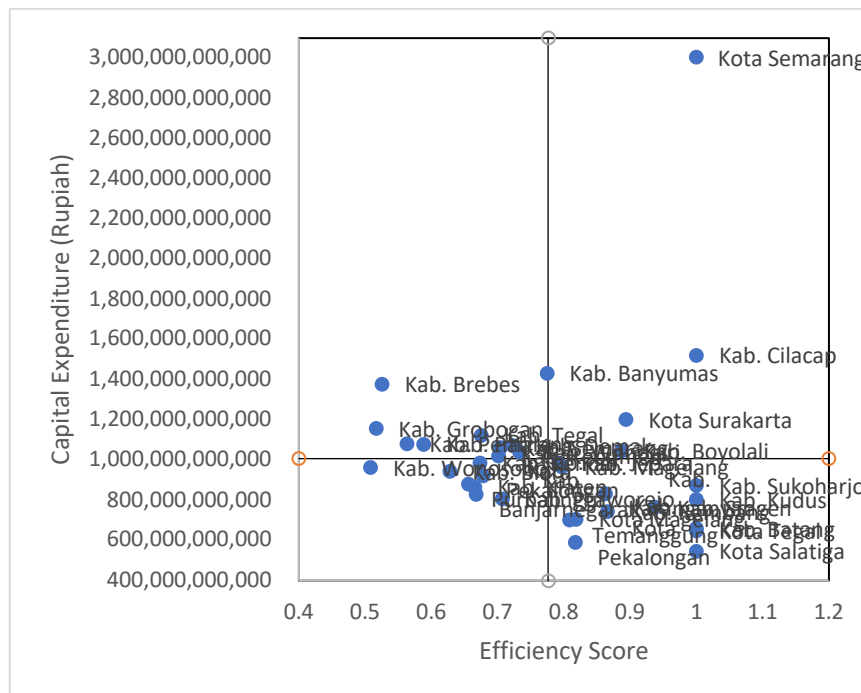
16	Kab. Magelang	0.796862106	34	Kota Surakarta	0.89331668
17	Kab. Pati	0.588173528	35	Kota Tegal	1
18	Kab. Pekalongan	0.678336393			

(Processed data)

The districts/cities that have the maximum efficiency score are Kabupaten (Kab) Batang, Kab Cilacap, Kab Kudus, Kab Sukoharjo, Kota Salatiga, Kota Semarang, dan Kota Tegal. The overall results are quite varied between districts/cities, with an overall average score of 0.776.

Thus, it can show that there are still many districts/cities in Central Java that are still not efficient in their public expenditures. These results are in line with the results of research by Pertiwi [1], Puspitasari and Pujiati [11], which examines the efficiency of local government spending in Central Java Province. The results of this study also complement the results of their research, where this research was conducted on capital expenditures, while those on education and health sector expenditures. Based on these results, it is necessary to further study what factors cause inefficiency in local government spending.

In the second stage, the district/city area is classified based on the efficiency score obtained in the first stage, associated with the amount of capital expenditure. This needs to be done, based on what Kirana and Saleh [12] stated, that increased government spending will not necessarily be followed by an increase in efficiency. The results of the district/city classification based on efficiency scores and the amount of capital expenditure are presented in the following scatter plot.



**Fig 3.** Regional Classification Scatter Plot by Efficiency Score and Local Government Capital Expenditure  
(Processed data)

There are 4 districts/cities included in the regional classification with efficiency scores and capital expenditures above the average, namely Kota Semarang, Kota Surakarta, Kabupaten Cilacap and Kabupaten Boyolali. There are 13 districts/cities that have efficiency scores above the average and capital expenditures below the average. These areas are Kabupaten Sukoharjo, Kudus, Batang, Sragen, Karanganyar, Rembang, Temanggung, Kab. Magelang, Jepara, Kota Magelang, Tegal, Salatiga and Pekalongan. Meanwhile Kabupaten Kendal, Pekalongan, Purbalingga, Klaten, Banjarnegara, Purworejo, Blora and Wonosobo are classified as regions with efficiency scores and capital expenditures below the average. Finally, there are 12 districts that have efficiency scores below average and total expenditures above average. These districts are Banyumas, Brebes, Grobogan, Tegal, Pati, Demak, Semarang, Wonogiri, Kebumen and Pemalang.

The existence of regions in each of these classifications shows that the regional government's capital expenditures are not always in line with their efficiency. This result is in line with what was stated by Kirana and Saleh [12]. However, it is necessary to study more deeply about the relationship between the amount of local government capital expenditure and its efficiency, with a wider area of analysis and a longer time series of data.

#### 4 Conclusion

The results of the study show that most of the regencies/cities in Central Java Province are still not efficient in their capital expenditures. These results imply that there are factors that cause the inefficiency. This needs to be studied further, what causes the inefficiency. The second result finds that high local government capital expenditures are not always followed by efficiency. This result implies that inefficiency can occur in both large and small amounts of local government spending. However, this needs to be tested further, with other methods. Therefore, local governments need to pay attention to the management of their capital expenditures, especially for those that are not yet efficient. It is also necessary to further identify what factors cause inefficiency.

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