



Measurement of Productivity of Local Government Spending in Poverty Alleviation

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ABSTRACT

This study aims to measure the productivity of local government spending in alleviating poverty in West Java, Indonesia. The input used were local government spendings per capita, which consists of spending on education, health, economy, social protection, as well as housing and public facilities. The output applied was poverty reduction. The measurements of government spending efficiency and productivity were carried out in 26 local governments in West Java Province in 2018-2020. Malmquist productivity index was applied as analytical method. The results show that the average of TFP (total factor productivity) was 0.965. It shows the low productivity level of local government spending in poverty alleviation. Furthermore, only 12 local governments (46% of 26 local governments) were able to use spending productively in reducing poverty.

Keywords: Productivity, Poverty alleviation, Government spending, Malmquist productivity index.

1. INTRODUCTION

Poverty is synonymous with limited people's access to economic resources. Gaps in ownership of factors of production, low community capital formation, differences in the quality of human resources, failure of ownership, and biased policies are some of the various causes of poverty. If this is not overcome, the poor will be trapped in poverty.

Indonesia since 2001 has implemented a decentralized system that is expected to drive the regional economy more advanced and competitive. [1] states that fiscal decentralization provides flexibility of authority to local governments to allocate resources to increase economic growth and encourage competitiveness between regions. With the authority of local governments in regulating their budgets, it can be directed more precisely at poverty reduction programs.

However, the main problem is the low independence of the region. The dependence of local government financing whose main source is still on central transfers. Based on a report from the Ministry of Finance in 2019,

more than 60 percent of regional revenues are supported by the central government through balancing funds. [2] show that fiscal synchronization occurs in local governments on the island of Java, meaning that revenues in the form of taxes and expenditures affect each other and depend on the provision of goods and services for community welfare which leads to a decrease in poverty rates.

In addition, there are still many local governments in Indonesia that have difficulty realizing quality spending. No exception is the case for local governments in West Java. According to data from the central statistics bureau in 2023, this province is the region with the largest population in Indonesia of 50,025,605 people and places it as the second province with the highest number of poor people after East Java province which is 3,888,600 people (official news of statistics, March 2023). West Java Province also has the largest amount of spending compared to other regions.

Therefore, to break this poverty trap, the government has a big contribution. The role that can be played by the government in overcoming poverty is through its

spending policy. Good quality spending by directing to the development of priority sectors is very important to implement. According to [3], through quality regional spending, it is reflected in the level of efficiency of government spending that can reduce poverty.

Although the government is involved in the provision of public goods and services, it is often questioned whether the government should provide more inputs to private production or not. The consequence of government involvement in the provision of public goods is the allocation of productive spending. There is not much literature on the productivity of government spending, how the channels of fiscal policy to aggregate supply can affect the economy, especially in overcoming poverty.

The introduction of the concept of productive government spending is important considering the results of research from [4] reveal the increase in government spending that occurs will not cause a decrease in wealth and private consumption if government spending produces strong enough production externality. Furthermore, the idea of productive government spending is commonly used in the economic growth literature. The concept of productivity is also used in the study of the business cycle.

Productive government spending makes a decrease in real wages unnecessary because productive spending increases the marginal product of labor. An economic cycle that runs well through productive government spending stimulus will be able to boost people's welfare so that the number of poor people can be reduced.

Productive spending only has a positive impact on household welfare if government spending is allocated to services that are directly in contact with the society such as health services, education, social protection, infrastructure, and other economic expenditures. With the improvement of health and education services, it will improve the quality of human resources so that they are able to compete in economic activities that have an impact on reducing poverty ([5]; [6]; [7]).

Likewise with infrastructure services, [8] revealed that government spending in the infrastructure sector will accelerate the flow of goods and services and reduce production costs and make it easier for people to access services to other economic sectors and this has an impact on reducing poverty levels. [9] states that social protection spending has an impact on reducing poverty, especially in low- and middle-income countries. This finding is also supported by research from [10]; [11] and [12] which depict that government spending on the social protection sector directly improves the quality of life of the poor. Furthermore, if government spending is

sufficiently high, it will improve both domestic welfare and foreign welfare [13].

Actually, government spending can affect poverty depending on how much productivity the government spending. Poverty will decrease if government productivity is high. This is because the increase in government spending has two blades, it can reduce or increase private consumption which has an impact on the economy. The increase in government spending tends to reduce private consumption due to the increase in taxes as a source of government revenue. When government spending is productive, the provision of free inputs from the government will have a positive influence on output and consumption. The higher the productivity of government spending, it can cover the decrease in consumption caused by tax increases, and this actually encourages the creation of new economic sources that can improve people's welfare. For this reason, this study aims to examine the productivity value of government spending and its relation to poverty alleviation in Indonesia's West Java Province.

This paper is structured as follows. In the first section, we discussed the reasons why the productivity of government spending is important in conquer poverty. The second section outlines the literature review. Then, the third section explains the methods used in empirical evidence. Furthermore, the discussion related to the results of the study are presented in the fourth section and closed with conclusions in the fifth section.

2. LITERATURE REVIEW

The study of government spending productivity is an important issue today. The concept that has been limited to the study of the function of government spending in general needs to be aggregated. Several studies show that government spending has an impact on poverty alleviation. Studies on 81 counties in China prove the efficacy of government spending in reducing poverty, and the impact is greater for poor counties [14] the strong long-term effect of reducing poverty for the adult population is strong as a result of the allocation of government spending on primary, secondary, and tertiary education [15].

In understanding the productivity mechanism of government spending on poverty alleviation can be done with a macroeconomic model approach. This model is based on the theory of distribution. The return from macroeconomic balance will affect the income level of individuals which has an impact on reducing poverty. Referring to the model built by [16], detailing the aggregate output produced as a company representative according to the Cobb-Douglas production function:

$$Y(t) = F(K(t), L(t), G(t)) = AK(t)^\alpha L(t)^{1-\alpha} G(t)^\nu \quad (1)$$

Where K, L, and Y represent capital, labor supply, and output respectively. While G is government spending that provides externality of increased productivity measured through elasticity. The assumption of the company maximizing its profit, the factors of production are returned through marginal product so that gross turns into capital, $r(t)$, and wage level, $w(t)$, so it can be written as follows:

$$F_K(K, L, G) = \alpha \frac{Y}{K} = r(t) \quad (2a)$$

$$F_L(K, L, G) = (1 - \alpha) \frac{Y}{L} = w(t) \quad (2b)$$

Briefly, it can be explained that in macroeconomic balance, the government plays a role in creating an attractive business climate so that it absorbs investment that will increase in terms of income, besides that it will also drive greater employment.

The long-run response to wages and returns on capital is also supported by a dynamic response in the short run. Simply put, we can easily determine from equations (2a) and (2b), when L(t) and K(t) increase along their transition path due to the response of increased government spending.

The increase in government spending that occurred had an initial expansionary effect on labor supply. However, this is temporary, in the next stage of the transition, labor supply gradually declines to the initial equilibrium point in response to the expansion of productive government spending.

In the new steady state, when the increase in wage levels exceeds return to capital, poor people who have little capital will turn into people who have high income levels, pushing them out of poverty.

3. RESEARCH METHOD

This research was conducted with a quantitative descriptive approach. This study measures the productivity of local government spending in alleviating poverty in 26 districts and cities in West Java Province in 2018-2020. This study used secondary data sourced from Central Statistics Bureau (BPS) and the Ministry of Finance of the Republic of Indonesia. Productivity measurement is done by comparing output with input. The inputs used are five types of per capita expenditure, consisting of spending on education, health, economy, social protection, and housing & public facilities.

Meanwhile, the output that is measured is in the form of success in poverty alleviation. Thus, the output in this study is the percentage of the population not poor, with the formula: 100% – poverty rate.

Productivity can be interpreted as the level of efficiency in producing goods or services. This measure describes changes in production resulting from changes in the quantity of inputs used, changes in technology, capacity utilization and quality of factors of production. DMUs that have more than one TFPC value show a positive value and indicate the overall performance or performance of the DMU is productive and efficient both in terms of technical, technological, and production scale.

The method of measuring the productivity of government spending is carried out using the *Malmquist Productivity Index* (MPI). The Malmquist Productivity Index is known as the change in Total Factor Productivity (TFPC). MPI identifies sources of productivity growth, i.e. efficiency change (TEC), technical change (TCHCH), *pure technical efficiency change* (PTEC), and scale efficiency change (SEC). TEC is the growth in the efficiency level of a *decision making unit* (DMU) assuming *constant return to scale* (CRS).

A TEC value of more than one indicates a positive change in efficiency. While TCHCH shows changes or technological advances used in the production process, which can have implications for increasing productivity and efficiency of input use. DMUs that have more than one TCHCH value indicate that DMUs can take advantage of technological advances in improving production processes which can have implications for increasing productivity and efficiency in production factors.

PTEC has a concept that is almost similar to TEC, which is a value that shows the growth in the efficiency level of a *decision-making unit* (DMU). The difference between the two is that the TEC value is measured based on the CRS assumption, while the PTEC value is measured based on the *return to scale* (VRS) variable assumption. The final source of productivity is the SEC. SEC is a change in efficiency scale that can determine the magnitude of changes in output caused by proportional changes in inputs. This SEC shows changes in the efficient economies of scale used in the production process. Furthermore, changes in productivity are measured as the product of these four changes. The MPI index is:

$$TFPC^{s,t}(\mathbf{x}_s, \mathbf{x}_t, \mathbf{q}_s, \mathbf{q}_t) = \left[\frac{d_o^{*s}(\mathbf{x}_t, \mathbf{q}_t)}{d_o^{*s}(\mathbf{x}_s, \mathbf{q}_s)} \times \frac{d_o^{*t}(\mathbf{x}_t, \mathbf{q}_t)}{d_o^{*t}(\mathbf{x}_s, \mathbf{q}_s)} \right]^{-0.5}$$

4. RESULT AND DISCUSSION

The first component of the TFP measurement result is *technical efficiency change* (TEC). TEC represents a

growth in efficiency levels. Table 1 shows the average growth or change in TEC value during 2018-2020. The local government with the lowest TEC value is the Bandung district government, in contrast, the highest TEC value is held by the Cirebon City government.

Table 1. TEC, TCHCH, PTEC, SEC, DAN TFPC on Local Government

Districts/Cities	TEC	TCHCH	PTEC	SEC	TFPC
Bandung district	0.713	0.947	0.983	0.725	0.675
Bekasi district	0.955	0.95	0.989	0.966	0.908
Bogor district	1	0.975	1	1	0.975
Ciamis	1.277	0.947	1.005	1.27	1.209
Cianjur	0.932	0.979	1.001	0.931	0.912
Cirebon district	1.122	0.973	1.009	1.112	1.092
Garut	0.923	0.884	0.979	0.943	0.816
Indramayu	1.136	1.028	1.03	1.103	1.168
Karawang	1.003	1.014	0.983	1.019	1.017
Kuningan	1.269	0.919	1.027	1.236	1.166
Majalengka	0.794	0.88	0.954	0.833	0.699
Sukabumi District	0.903	0.995	0.987	0.915	0.898
Sumedang	1.219	0.932	1.031	1.182	1.136
Tasikmalaya	0.762	0.902	0.967	0.788	0.687
Purwakarta	1.162	0.919	0.999	1.164	1.068
Subang	0.831	0.914	0.991	0.839	0.76
Bandung Barat	0.901	0.905	0.974	0.925	0.815
Bandung City	1.204	0.972	0.981	1.228	1.171
Bogor City	1.003	0.94	1.01	0.993	0.942
Cirebon City	1.526	0.99	1.015	1.504	1.511
Sukabumi City	0.883	0.99	0.989	0.893	0.873
Bekasi City	0.779	1.005	0.973	0.801	0.783
Depok City	0.886	0.923	0.998	0.888	0.817
Cimahi	1.224	0.914	1.008	1.214	1.119
Tasikmalaya City	1.307	0.997	1.052	1.242	1.303
Banjar	1.192	1.014	0.964	1.236	1.208
Pangandaran	0.968	0.926	1.005	0.963	0.896
mean	1.014	0.952	0.996	1.018	0.965

Source: Author's Calculation

The government of Cirebon city has the most positive efficiency changes. In addition to the Cirebon city government, there are 11 local governments that also

have a TEC value of > 1 . This condition explains the positive efficiency changes in 12 local governments. From this explanation, it can be said that the good performance of government spending productivity is only owned by 12 regional governments (46% of 26 regional governments). Nevertheless, the average TEC value is 1.014. This explains overall positive efficiency changes. In other words, the efficiency level of local government spending is getting better. Information on measurement results is shown in Table 1.

Table 1 also presents the average technical change or technical progress (TCHCH). During 2018-2020, there were no local governments with a value of TCHCH = 1. This shows that the use of technology in local government spending is always changing and not static. The lowest TCHCH value is owned by the Garut Government (TCHCH = 0.884). In contrast, the Indramayu government has the highest TCHCH value (TCHCH = 1.028).

This information illustrates that technological advances in Indramayu have the biggest implications for increasing productivity and efficiency of government spending. Unfortunately, very few local governments have more than one TCHCH value. The majority of local governments (22 local governments or 85%) have a TCHCH score of less than 1. This description describes an average TCHCH value of less than 1 (TCHCH = 0.952). On average, the technological advances applied have not had implications for the increase in productivity and efficiency of local government spending to reduce poverty in West Java.

Productivity measurement analysis is continued by looking at *pure technical efficiency change* (PTEC). PTEC describes changes in efficiency based on the VRS scale. There are 11 local governments that have experienced positive efficiency changes with the VRS scale. Of the 11 regional governments, the highest PTEC value is owned by the Tasikmalaya city government (PTEC = 1,052). Conversely, the lowest PTEC value occurred in the Majalengka government (PTEC = 0.954). The Majalengka government occupies the worst position in terms of increasing efficiency with VRS scale. The overall average PTEC value was 0.996. Thus, there was an average decrease in efficiency during the 2018-2020 period. This decrease in efficiency causes the productivity of local government spending to be less good.

The next component described is scale efficiency change (SEC). The local government with the lowest SEC value is the Tasikmalaya government (SEC = 0.788). The worst changes in the scale of production occurred in this region. Conversely, the best production scale change was made by the Cirebon city government with a value of SEC =

1.504. In addition to Cirebon city, there are 13 other local governments with SEC scores of more than 1 (54%). Quite a few local governments with this positive change in production scale are reinforced by an average SEC value of more than 1 (SEC = 1.018). This shows that on average there is a positive or efficient change in production scale. That is, the percentage of additional spending made by local governments is less than the percentage of poverty reduction.

From these four components, Total *Factor Productivity Change* (TFPC) will be analyzed. Productivity in this study is defined as the level of efficiency in using government spending to reduce poverty. Table 1 shows the average change in TFPC values from 2018-2020. Local governments with more than one TFPC score showed positive changes in productivity and efficiency. This indicates that the overall performance of local governments is productive and efficient in terms of technical, technological, and production scale. The lowest TFPC value occurred in the Bandung district government (TFPC=0.675). Therefore, out of 26 local governments, this government has the lowest productivity in efforts to reduce poverty. On the contrary, the Cirebon City government experienced it, with a TFPC value = 1.511, so that the Cirebon City government became the most productive local government in reducing poverty.

There are 12 local governments with TFPC scores > 1. It can be said that the 12 local governments are able to use spending productively to reduce poverty. But unfortunately, more local governments are unproductive, with TFPC scores less than 1. This information is supported by an average TFPC value of less than 1. (TFPC = 0.965). For this reason, on average, local governments change productivity and efficiency negatively. Local government spending in the province has generally not been used productively in reducing poverty.

After describing the four sources of productivity of government spending, then analyzed which sources affect the level of productivity. The Malmquist Index approach applied in this study will produce variables or components that affect the level of productivity consisting of technical efficiency change (TEC), technological change or technical change (TCHCH), pure technical efficiency change (PTEC), scale efficiency change (SEC), and total factor productivity change (TFPC). Changes in components that are almost similar to changes in TFP, both direction (negative or positive changes) and values, become a source of productivity. Graph 1 presents the components of changes in the productivity of local government spending.

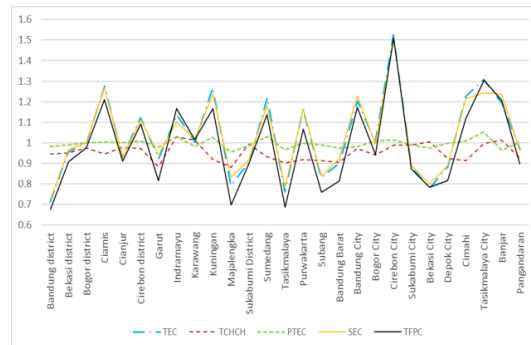


Figure 1. TFPC and Local Government Spending Productivity Source

Source: result of research

5. CONCLUSION

The average change in TEC is 1,014, which means there is a positive change in efficiency with the CRS scale. That is, the average performance of local governments has increased efficiency. Furthermore, the average change in TCHCH is 0.952 which shows that technological changes do not have implications for increasing shopping productivity. Meanwhile, for PTEC, the value is 0.996. This shows a negative change in efficiency based on the VRS scale. In other words, the average level of shopping efficiency decreases. Finally, an SEC score of 1.018 illustrates a positive change in production scale. Thus, the percentage of additional spending made by local governments is less than the percentage of poverty reduction. Of the four sources of productivity, the strongest source of productivity of local government spending in West Java comes from positive changes in efficiency (CRS scale) and positive changes in production scale as well.

With the contribution of changes in efficiency and positive production scale to productivity, there are 12 local governments that have productive spending. These 12 regional governments consist of 9 district governments (Ciamis, Cimahi, Banjar, Indramayu, Karawang, Kuningan, Sumedang, Purwakarta, Cirebon), and 3 city governments (Bandung, Cirebon, and Tasikmalaya).

This study measures the productivity of government spending based on the allocation of expenditure in reducing poverty in West Java. This study does not analyze what programs are run by productive local governments, so unproductive local governments cannot emulate those who are productive. In fact, what programs succeed in reducing poverty is also an important part that should be analyzed so that unproductive local governments increase their spending productivity. For this reason, recommendations for future research are

research on programs implemented by local governments that are productive in allocating spending.

AUTHORS' CONTRIBUTIONS

All authors contributed to the design of the study. Y. providing material and data, data processing is carried out by B.I.E.I. Analysis was conducted by R.E.F. and R.A.R. The draft of manuscript was written by R.E.F. and all authors responded to improve the writing.

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