The Impact of Local Government Expenditure Efficiency on Economic and Poverty Growth of East Java Province (A Study on Educational Expenditure, Health and Infrastructure)

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Abstract: The research aims to test the influence of East Java Province Budget on growth and poverty. In addition, the findings of this study not merely estimate the level of efficiency of the management of local government budget, but also estimate the impact of expenditure towards the society welfare in East Java Province. In this study, the Stochastic Frontier Analysis (SFA) was employed for estimating the efficiency level for strategic sectors including education, health and infrastructure. Furthermore, the Three Stage Least Square (3SLS) were used for estimating the effects of the increased spending efficiency on society welfare. The findings of this study reveal that the emendation of the efficiency level of budget management in the health sector is better than in education and infrastructure sector. It shows the different difficulty level for local government to manage each budget sector. Education sector is the most complicated compared to health and infrastructure sector. However, budget efficiency on education, health and infrastructure sector do not always give positive impact on the level of society welfare.

Key words: Society Welfare · Local Budget Efficiency · Economical Growth · Stochastic Frontier Analysis (SFA) · Three Stage Least Square (3SLS)

INTRODUCTION

The role of local government in economic development is represented by the magnitude of local revenue and expenditure (budget). The revenue of local budget is obtained from the withdrawal of public funds which afterwards is allocated through direct and indirect expenditure on productive sectors and the public. Thus, local government budget is classified as a distributive public policy instrument. Due to the dominant balancing funds, the increasing budget expenditure can contribute to the increase of local economy activity. Basically, budget expenditure could increase the consumption and investment which ultimately result in the acceleration on growing of Gross Domestic Product (GDP). Furthermore, the growth of GDP leads to the decline on the unemployment rates which finally could decrease the poverty level. Thus, by utilizing local budget, local government could actualize the society welfare by utilizing local budget as reflected on the increasing economic activity as well as reducing the number of poor people.

In East Java Province, it seems that the role of local government through local government budget has not shown the condition as mentioned above including increasing the prosperity by accelerating the economic growth and decreasing poverty level. Figure 1 illustrates the relationship between the growth of local government’s role through budget on economic growth. If there is a positive correlation between budget growth with GDP, the spreading of the area should be in quadrant I and III. In fact, there are still many district regions which are scattered in quadrant II and IV. It indicates that there is an unclear pattern relationship between the role of local government with economic growth. In addition, in two different time periods, year 2007-2008 and 2009-2010, the relationship between local government budget and GDP growth is too weak.
The above facts indicates that the relationship between the role of regional economic activity is be determined by the presence of other factors, namely the efficiency of spending in each area, especially public spending on education, health and infrastructure. Awareness the importance of the efficiency of public spending has been a large consensus, so any changes on budget policy should include the efficiency budget aspect as the policy targets. Decentralization policy, for example, expects the achievement of the efficiency of public spending. However, studies on the impact of the efficiency of budget is still limited [3-5]. The most complicated issue in the study of efficiency in the public sector budget is the measurement method. However, after the frontier efficiency approach being developed, the measurement of efficiency in the public sector could be done [6], even though the output quality aspect is usually ignored or being equal on public goods among the studied regions.

Therefore, the main focus of this dissertation is to answer those problems, comprising: the efficiency level of regional financial management resulted in an increase of welfare. Thus, the two main objectives of this dissertation are as follows:

- To find out the rank (score) of expense efficiency of local government budget in public sector in all regencies/towns in East Java Province.

- To find out the impact of management efficiency in public sector towards the social prosperity of East Java Province.

**Literature Review**

**Main actor in Economic Development:** In economic theory, there are two main views concerning with the actors in the economic development of a country. First, mainstream view leading to liberalism is the view concerning with the freedom of individual in achieving prosperity [7]. It means that the role of private sector is very dominant. But liberation inaccessing the existing resources causing imbalance ownership of the assets. The underlying reason is each individual or entity that has a good accessibility (good accessibility) will have higher income than the individual or group who has lower income. In addition, because of the freedom, it is feared that the massive exploitation will happen due to the motive of getting the highest profit (profit oriented).

Second, the view of non-mainstream which argues that centralized management of economy (hierarchy) is a system that is based on the teachings of Marxism-Leninism in which Government has a full authority in controlling the entire economic activity including production and distribution. The actors of state administration has a monopoly over economic decisions, therefore they must have access to the high number of
information related to the demand, inventories of goods and raw materials, as well as production capacity including technology [7].

While the management of the economy in Indonesia is not based on the both view above, but more on the intermingling of both views. Especially with the hallmark of Indonesia as multi-faceted country covering the area of Islands certainly has its own challenge. Thus, the decentralization era starts to emerge aiming at minimizing the disparity of the regions. Therefore, in the national economy, there are the two main actors in economic development comprising the private sector and the government. This role of private sectors is seen through its investments that can create economic activity through public expenditure which can increase the capacity of the region. Those two roles could increase society welfare through both high economic growth and a decrease in poverty levels. These descriptions are illustrated in the following figure.

**The Relationship Between Efficiency Level on Public Expenditure Sector and Society Welfare:** Government's role in improving prosperity can be done by managing budget efficiently. It means, any expense on shopping areas should have a clear output, because efficiency is the ratio of the input and output. When efficiency can be achieved, it will increase the capacity of the regional economy, good capacity, the capacity of health and education as well as infrastructure capacity. The increase capacity of those three sectors will improve society welfare through regional economic growth and the decrease in poverty levels. While the quality of human resources and unemployment is reflected on the level of poverty. When the local poverty level is low, then the human resources is high and the unemployment will reduce because public has greater access in getting jobs. This is briefly described in the Figure 3.

**Conceptual Framework of the Study:** This study is focused on three strategic areas of expenditure efficiency, comprising: (i) the efficiency of educational expenditures, (ii) efficiency of health expenditures and (iii) the efficiency of the infrastructure expenditure. Affect economic growth in the poverty level, indirect influence is through economic growth, afterwards this will affect economic growth in the poverty level. This framework is clearly described in the following figure.
Based on the conceptual framework above, then there are three main hypothesis in this study, comprising: (i) the efficiency of the public sector expenditure positively influences the economic growth, (ii) the economic growth negatively influences the poverty levels and (iii) the efficiency of the public sector expenditure negatively influences the poverty level.

MATERIALS AND METHODS

This study uses two methods of analysis comprising Stochastic Frontier Analysis (SFA) and Three Stage Least Square (3SLS). First, SFA was employed to estimate the efficiency level. SFA identifies the output and input ratio while considering the deviation such as error or noise due to random variation. SFA estimation results appear as value rank on efficiency levels between district/city in East Java Province. The SFA models in this study are taken from Kumbhakar [6] as follows:

\[
\ln Y_i = \ln \alpha + \sum_{i=0}^{n} \beta_i X_i + \varepsilon_i \tag{1}
\]

\[\varepsilon_i = u_i - v_i \tag{2}\]

where:
- \(Y\) : The budget as input (education, health and infrastructure expenditure).
- \(X\) : Output of education (the numbers of schools, students, teachers, elementary school, junior high school and senior high school), Health output (numbers of medical personnel, paramedics, hospital and health centre), infrastructure output (fresh water access, irrigation, electricity and proportion of good road).
- \(E\) : Error
- \(v\) : Statistical distribution error
- \(u\) : Inefficiency

Second step, 3SLS model was used to estimate the influence of efficiency on the economic growth and poverty in the budget management towards the welfare. Model specification consists of two simultaneous equations as follows:

\[Gr_t = f(\text{eff})\]  \hspace{1cm} (1)
\[Kms = f(\text{eff}, Gr_t)\]  \hspace{1cm} (2)

where:
- \(Gr_t\) : Economic growth
- \(\text{Eff}\) : Efficiency score of budget management
- \(Kms\) : Poverty percentage of the total population
- \(i\) : Education sector, health sector, infrastructure sector

Based on the method of analysis above, the data used in this study is secondary data in the form of local government budget in regencies and towns in East Java, especially expenditure in the field of education, health and infrastructure as well as the output of each of these fields. In addition to find out the economic growth of regencies and towns in East Java, those data will be processed using the SFA and 3SLS.

RESULTS AND DISCUSSION

Discussion on Statistics Results: There are two statistical estimation results, i.e. (i) the estimation of Stochastic Frontier Analysis (SFA) and (ii) the estimation of Three Least Square (3SLS). First, the estimation results of public expenditure efficiency analyzed by employing SFA method is shown in Table 1.

Based on Table 1, allowed public expenditure equation indicates that the input components (education expenditure, health expenditure and infrastructure expenditure) significantly influence with the error rates less...
Table 1: Efficiency Results of Public Expenditure Estimation Analyzed by Employing SFA Method

<table>
<thead>
<tr>
<th>No</th>
<th>Year</th>
<th>Efficiency Equation (all equations are in the ln form)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education expenditure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2006</td>
<td>Education Expenditure = 1.446756 – 0.8147929 number of schools + 3.331528 number of students – 1.025967 number of teachers + (inefficiency error + error distribution statistic)</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td>Education Expenditure = -1.004894 – 1.906332 number of schools + 2.28247 number of students + 1.222041 number of teachers + (inefficiency error + error distribution statistic)</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>Education Expenditure = -1.004894 – 1.906332 number of schools + 2.28247 number of students + 1.222041 number of teachers + (inefficiency error + error distribution statistic)</td>
</tr>
<tr>
<td>Health expenditure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2006</td>
<td>Health Expenditure = (1.22e +07) – 1.615017 number of health centers – 1.220156 the number of medical personnel + 5.14787 number of paramedic staff + (inefficiency error + error distribution statistic)</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td>Health Expenditure = 5.007604 + 1.511728 number of health centers – 0.8738893 the number of medical personnel + 4.893496 number of paramedic staff + (inefficiency error + error distribution statistic)</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>Health Expenditure = 1.051745 + 1.552213 number of health centers – 0.0259388 the number of medical personnel + 2.8940914 number of paramedic staff + (inefficiency error + error distribution statistic)</td>
</tr>
<tr>
<td>Infrastructure expenditure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2006</td>
<td>Infrastructure Expenditure = 0.2069826 + 4.189232 Access to fresh water + 0.5077458 irrigation + 0.070071 electricity + 1.096695 the proportion of good road + (inefficiency error + error distribution statistic)</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td>Infrastructure Expenditure = 0.2392471 + 0.9402983 Access to fresh water + 5.047905 irrigation – 0.3264561 electricity + 0.4464537 the proportion of good road + (inefficiency error + error distribution statistic)</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>Infrastructure Expenditure = (2.00e+07) + 0.0273623 Access to fresh water + 8.066752 irrigation – 0.3209033 electricity – 0.0219389 the proportion of good road + (inefficiency error + error distribution statistic)</td>
</tr>
</tbody>
</table>

Description:

** = Significant with an error rate less than 5%
* = Significant with an error rate 5% - 10%
Source: Analysis Result, 2013

Table 2: Estimation Results of The Impact of Budget Management Efficiency towards the Society Welfare through 3SLS Method

| Coef. | Std. Err. | z     | P>|z|  | [95% Conf. Interval] |
|-------|-----------|-------|------|-----------------------------|
| Growth06  | iP06  | -.0240261 | .0180652 | -1.33 | 0.184 | -.0594332 | .0113811 |
|        | iK06  | .0002015  | .0137768 | 0.01  | 0.988 | -.0268005 | .0272034 |
|        | iFn06 | .0675045  | .0280871 | 2.40  | 0.016 | .0124549 | .1225541 |
|        | cons  | 1.780675  | .0440925 | 40.38 | 0.000 | 1.694255 | 1.867095 |
| KMS06  | eK06  | -.070105  | .0517743 | -1.35 | 0.076 | -.1715808 | .0313708 |
|        | eP06  | .014414  | .0686767 | 0.21  | 0.834 | -.1201885 | .1490164 |
|        | eFn06 | -.1912697 | .1094912 | -1.75 | 0.081 | -.4058686 | .2033292 |
|        | Growth06 | -.8700606 | .4310815 | -2.02 | 0.044 | -.1.714965 | -.0251565 |
|        | cons  | 4.506956  | .7852972 | 5.74  | 0.000 | 2.967802 | 6.04611 |

Source: Analysis Result 2013

where:

ef : Efficiency
P : Education
K : Health
Inf : Infrastructure
Kms : Poverty level

than 10% of the output component. It means that all of the independent variables significantly influence the dependent variables.

Second, the result of simultaneous equations three stage least squares (3SLS) for estimating the magnitude of the impact of the efficiency of the budget management on welfare is presented in Table 2.

Based on Table 2, there are two principal equations i.e. equations for economic growth (the Growth) and poverty (KMS). This equation is the second simultaneous equations, meaning that there is one variable that has a dual function as independent variables and simultaneously become dependent variables. Where, in this analysis, a variable that has a dual function is the economic growth (Growth) variable. The details are as follows:

- The Impact of Efficiency on Public Expenditure Management (Education, Health, Infrastructure) towards the Economic Growth.
Growth = 1.780675 – .024261 efP + .0002015 efK + 0.06750 eflnf + $u_i - v_i$

- The Impact of Economic Growth towards Poverty

\[ KMS = 4.506956 + .014414efP - .070105efK - .1912697 eflnf \]

In this study, the independent variable is said to be the dependent variables that significantly influence the dependent variable \( \text{if} \) has value of \( P > |z| \) less and/or equal to 10%. Otherwise, it is not considered as having significant influence if the value of \( P > |z| \) more than 10%. Therefore, based on statistical estimation, the significant variables which influence economic growth is the efficiency of infrastructure expenditure only. Other variables (education and health) have no significant influence on the economic growth. The next insignificant variables affecting poverty are efficiency of infrastructure expenditure, health expenditure and economic growth. Because of the low value of chi-square, thus all models are feasible to be used to estimate the impacts.

Estimation Results of the Public Budget Management:

Based on the results of the SFA estimation, the efficiency score obtained from the three strategic sectors, namely (i) the educational sector, (ii) the health sector and (iii) infrastructure sector. District/city is said to be efficient if the score efficiency approaching one (1). It means that the ratio between the input and output is closer to the number one. The higher the efficiency score (higher than 1), then the more inefficient areas assessed.

First, Figure 5 shows the level of efficiency of the education sector of district/town in East Java for 2006-2010. This figure shows that the governance of the local government (regency/towns) in East Java could not be said as efficient. Almost the whole area suffered a deficiency (inefficiency). Of the 38 Districts/cities in East Java, there are only 7 (seven) regions which are more efficient (increasing efficiency level/score approaching the number one), 17 (seventeen) regions in which the level of efficiency decreased (score enlarged from the number one) and 14 (fourteen) other areas remain. Seven regencies/towns increasing the governance efficiency in the educational sector are Bangkalan Regency, Surabaya, Malang Regency, Jember, Sidoarjo Regency, Banyuwangi Regency and Jombang Regency.

Second, Figure 6 shows the efficiency level of the infrastructure sector in East Java Province in the year of 2006 to 2010. From these figure, it is shown that local government’s management for the mentioned sectors are slightly better compared to the education sector. From thirty eight regencies/cities in East Java Provincethere are seven regions in which the efficiency are increase (efficiency score is close to one), thirteen regions in which the efficiency are decreased (the efficiency score is getting further from one) and eighteen regions which does not change from the previous position of proficiency level. However, the government’s management in infrastructure sector in East Java Province could not be said comprehensively efficient yet.

Third, Figure 7 shows the efficiency level of health sector in East Java Province in the year 2006 to 2010. From these figure, it is shown that the local government
management for health sector is better than both infrastructure and education sector. These conditions are shown by the number of regencies/cities which are decreasing on efficiencies level (more inefficient) less than both infrastructure and education’s sector for years 2010. Those condition are shown by number of regencies/cities which decreasing on efficiencies level (more inefficient), less than both infrastructure and education sector in the year of 2010. From thirty eight regencies/cities in East Java Province there are seven regions in which the efficiency increased (efficiency score is close to one), six regions in which the efficiency decreased (the efficiency score was getting further from one) and twenty five regions do not change from the previous position of proficiency level.

For easier interpretation, Table 3 is provided to show the comparison of the above explanation. The Table 3 above shows that in 2010, the regencies/cities which have decreasing efficiencies (more inefficient/ the efficiencies score is getting further from one) is health sector only which occur in six sectors. Meanwhile, in the infrastructure sector, there are thirteen regions and in education sector there are seventeen regions. Those phenomena are caused by the different level of difficulties in each management style, whereas the education sector is the most complicated sector compared to infrastructure and health sector. There are too many output indicators to be defined which cause the government’s management become more difficult and so does infrastructure sector compared to health sector.
Table 3: The Number of Regencies/Cities of East Java Province with Their Efficiency Level in the Year of 2006 to 2010

<table>
<thead>
<tr>
<th>Sectors</th>
<th>Education</th>
<th>Infrastructure</th>
<th>Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>More Efficient (the score is close to one)</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>More Inefficient (the score is getting further from one)</td>
<td>17</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>Remain at the previous position</td>
<td>14</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>38</td>
<td>38</td>
</tr>
</tbody>
</table>

Source: Finding of the study, 2013

Fig. 8: The Impact of Efficiency to Welfare

The Impact Of Efficiency Against Welfare: Based on the three stage least square analysis (3 SLS), it found that the efficiency of education spending, infrastructure spending and health expenditure does not always have a positive effect on the welfare level, the impact of efficiency spending on welfare level; shown on Figure 8.

First, the efficiency of the infrastructure budget allocation affects poverty directly or indirectly. The indirect effects occur through economic growth. Infrastructure and poverty level has a negative correlation. It means that if the infrastructure budget level is high, the poverty level will be high. In other words, the increasing of budget efficiency on infrastructure will lead to poverty increased. In one construction road for example, to reach the efficiency of budget 10 labors are required, but the government as the contractor takes 13 labors in which it become no longer in efficient. The positive effects will occur in short-term because this can reduce the number of local unemployment, but in long-term this can enlarge the budget. It means that in long term the negative effects will be a heavy problem. The government budget comes from their citizen tax, so if they expense bigger cost, the citizen will be in sorrow.

The indirect effects of efficiency on infrastructure in which go through economic growth and the poverty level has a negative correlation index of 0.87. This number means that if the economic growth increase one percent, the proportion of poverty level will be reduced 0.87 point.

The increasing of economic growth is closely related to the increasing of economic activity and of course will decrease the poverty level. The higher of economic activity is positively related to investment level. The higher investment will increase people’s mobility and ultimately reduce the number of unemployment. Finally people’s income will increase and welfare will be reached at the following time.

Second, for health sector, the efficiency of the health score directly affects poverty without passing through the economic growth. Efficiency of the health budget is one kind of long term investment in the human resources (human investment), so the influence cannot be felt directly in short-term, but the impact would be felt in the long term.
Efficiency score of health has a direct and negative impact on the poverty in the rate of 0.0701. So, more in efficiency of health sector budget, will decrease the poverty level. When the efficiency of the health score increase one point, the poverty rate will decrease by 0.0701 percent. It means that when the output of health which is given by subsidy has declined, the access for the poor to health care will be more difficult. In other words, the lack of pocket community access to health care is also expensive [7, 8].

On the other hand, when there is inefficiency on health budget, in this case the budget distributed in the form of increased health funding, the burden of the government budget will also increase. It will result in improved access of poor health. However, it should be underlined that those government’s health budget which grow up, essentially is a collective burden which will be born by the citizen.

Meanwhile, health is one factors that affect labour productivity. When health quality of labor is in bad condition, the productivity will decrease (lower) and vice versa. So, the goodness of health quality would be made more people productiveto encourage the higher income. With higher productivity, it is expected that the percentage of poverty level will be reduced.

Thirdly, figure 8 shows us that the efficiency on education sector does not affect directly on economic growth (efficiency score – 0.0240), even on poverty (efficiency score 0.0144). However, the efficiency of education sector will not affect poverty level directly. Poverty is increased by economic growth in efficiency score – 0.87 to achieve social welfare, another stimulus is needed, furthermore it should be accompanied by good economic condition. Basically, efficiencies on education sector will only increase community foundation capacity.

Decreasing poverty level could be changed by economic recovery in a region. By improving economic growth the skills in the community will be useful. Community skill reached in education is identical to local government’s role in providing education facilities.

The limitations of this study are the measurement on the efficiency of public spending, especially on education and health sector whereas quantity aspect be in econsider rather than the quality aspect and the analytical models are only considering the government’s role without considering the private’s role in economic activity.

CONCLUSIONS AND SUGGESTION

Conclusion: Based on analysis of the discussion, conclusions of this research are as follows:

1. The government’s efficiency improvement on health sector budget is better than on infrastructure and education sector. This indicates that managing on education spending is more complicated than managing on infrastructure and health spending.
2. The decreased efficiency in the education and health sector is most likely caused by the improvement in the quality services. Otherwise, the declining efficiency of infrastructure sector is caused by the increasing of procurement cost of raw materials.
3. The improvement of efficiency level in education and health sector had no impact on economic growth.
4. There are some indications that the improvement of health sector efficiency actually has increased the number of poverty.
5. The efficiency improvements in infrastructure actually increase the number of poor people.

Suggestion:

1. The improvements of public service efficiency need to be taken care carefully. Not only in cost reduction but also the improvement of the service quality. For examples, increasing health care satisfaction will increase the cost of healthcare. However the satisfaction level itself is difficult to measure quantitatively.
2. The main consideration is the maintenance of public budgets, particularly in education and health sectors, preferably in the effectiveness aspect, after that the level of efficiency should be determined. Therefore, the Minimum Service Standards (MSS) is important to accompany the improvement of public service efficiency performance.
3. Further research is still needed related to the measurement of efficiency which consider the account aspects of quality.
4. The private sector’s role as other components should be included in the analysis model of the impact of efficiency on welfare.

REFERENCES


