The Effect of Educational, Health, Infrastructure Expenses on the Workforce Employment and Poverty

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Abstract. The research aims to analyze the influence and impact of educational, health, and infrastructure expenses on the employment of workforce (from agricultural, industrial, services sectors) and poverty in Central Java. The model was built by using an econometric approach in the form of a system of simultaneous equation model consisting of six blocks (human capital, inputs, outputs, revenues, expenditures and social welfare) with 33 equations (24 structural equations and 9 identity equation). The method of estimation model uses Two Stage Least Squares (2SLS). The simulation results show that the policies of increasing expenses on education, health, and infrastructure with the same value result in the increased employment of workforce in all sectors and reduced poverty. Among these policies, the increased health expenses have the most significant influence on the increase of workforce employment in services sector and reduce poverty. While the policy of increasing expenses on infrastructure has the greatest effect on the increase of workforce employment in industrial and agricultural sectors.

Keywords: education, health, infrastructure, workforce

INTRODUCTION

The recent concept of development is improving, marked by the inclusion of public welfare aspect, in addition to economic aspect (the growth of GDP per capita). Public welfare cannot be separated from the fulfillment of human basic needs, i.e. the increase of the quality of education and health or the quality of Human Resources. Poverty is one of the low qualities of human resources, hence reducing the number of poor people is a must for the goals of today’s development.

Underdevelopment and poverty exist partly because people do not have modern knowledge, skills and attitude. Poor education and health can cause people unable to work optimally and affect the level of income (Schultz, 1961). Poor people have low income, thus cannot meet their basic needs properly, and later results in a declining work productivity and income. If this takes place in some generations, it is called the vicious circle of poverty, as illustrated in figure 1 below.

Poverty is negatively and significantly correlated to the family’s decision to send the children to school. The need of schooling is an effective way to reduce the phenomenon of child labor in Ghana (Canagarajah and Coulombe, 1997). Such is also common in Indonesia, where poverty is the main reason for the kids to get out of school. According Suryahadi et al. (2005) approximately 95% of children in Indonesia are out of the basic education. The contributing factor is the lack of a fee by 50-80%, helping the elderly by 8-17% and the rest is for other reasons. There is a tendency that the need to work to help parents is due more to the severity of poverty.

Poverty cannot be separated from the high number of unemployed population. The increase of population...
describes the influence of educational level on the growth. The increase of investment in human capital. This theory function. Economy will achieve a high growth due to human capital formation is included in the production and natural resources. In Endogenous growth models, social and economic conditions of the people, security, addition to several other variables such as technology, is one of the major variables in economic growth, in workforce and poverty in Central Java. The purpose of the study is to analyze factors affecting employment of workforce and poverty in Central Java. Is interested in analyzing the influence and impact of educational, health, and infrastructure expenses on the employment of workforce and poverty in Central Java. Through this role, the government is expected to help the poor get out of the trap of the vicious circle of poverty. Based on the background, the researcher argues that capital only includes supplies plant and economic equipment; thus it is reasonable to assume significant influence of human capital on the production. Human capital is believed to be an important factor in the process of economic growth. Endogenous growth theorists argue on the assumption of constant returns to capital, and perceive knowledge as a capital. Compared with other forms of capital, theoretically it is uncommon to assume that knowledge has a diminishing returns unit. Even, the continuously increasing knowledge and technological innovation thus far make some economists argue that there is increasing knowledge returns. Then the endogenous growth model with the assumption of constant returns to capital becomes a more promising description in long-term economic growth. Similarly, human factors can develop, following the development of science and technology. Advances in science and technology become an important growth factor (Mankiw, 2003).

According to Mankiw (2003), the differences in income per capita are due to: differences in factors of production, such as the quantity of physical capital and human capital, and differences in the usage efficiency of production factors. There is a positive correlation between capital accumulation factors (including HR) and the efficiency of production. Countries with a high level of physical and human capital are likely to use the factors of production efficiently. One hypothesis is that efficient economy may encourage capital accumulation. Resources and incentives to stay in school will accumulate a larger human capital, so that the economy can function properly.

Endogenous growth theory was pioneered by Romer (1986) who argue that economic growth is influenced by the level of human capital through technological advances, with the aggregate production function as follows: $Y = F(A, K, L, H)$, where: $A$ is technological advances, $K$ is physical capital, $H$ is human resources (accumulation of education and training), and $L$ is workforce. This is also confirmed by Lucas (1988) who argues that in addition to physical capital, human capital accumulation is crucial for economic growth. On the other hand, Solow (1998) argues that capital only includes supplies plant and economic equipment; thus it is reasonable to assume diminishing returns. Investment in physical capital and workforce cannot be fully implemented independently (internalized) by investor. The existence of externalities can create increasing returns to scale, thus repairing the assumption of constant returns to scale used by the neoclassical model.

**RESEARCH METHODS**

This research uses positivistic paradigm by employing quantitative approach. The data used is pooled data, i.e. a combination of time series data in 2004-2007 and cross section (35 districts/municipalities in Central Java). The models were created by using econometric approach in the form of a system of simultaneous equations, consisting of 33 equations (24 structural equations and 9 identity equations). The models are divided into 6 blocks,
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RESULT AND DISCUSSION

Results of equation parameter estimation of agricultural workforce employment have a coefficient of determination (R2) of 79.59%. Agricultural workforce employment is significantly influenced by the explanatory variables simultaneously (F statistic) with a value of 85.80. The results showed that agricultural workforce employment is significantly influenced by District/municipal Minimum Wage, agricultural GDP, workforce, district/municipal dummy and previous year’s agricultural workforce employment, with the sign in accordance with the hypothesis. Further, the equation parameter estimation of agricultural workforce employment can be seen in the following Table 1.

The minimum wage of district/municipality (UMK) has a negative sign towards the agricultural workforce employment. Seen from the elasticity, the effect of UMK changes on the increase of the agricultural workforce employment in short term was unresponsive (inelastic), but in the long term it was responsive (elastic). In the short term any increase in UMK by 10% led to reduced demand for farm labor at 9.47%. While in the long term any increase in UMK by 10% led to the reduction of agricultural sector employment by 16.65%. This can happen due to the low quality of agricultural human resources, thus very susceptible to the termination of employment (PHK) as a result of an increase in UMK, as proposed by Ramos (1970). The increase in agricultural GDP has a significant and positive effect in improving agricultural workforce employment with a relatively small magnitude, both in the short and long terms. In the short term, any increase in agricultural GDP by 10% will increase agricultural employment by 1.75%. This is similar to the research conducted by Nanga (2006).

Increased workforce also has positive and significant effect in increasing agricultural employment. In the short and long term, agricultural workforce employment has an inelastic response towards the total work force. This result is in line with research conducted by Rindayati (2007). In the short term, any increase in the work force by 10% will increase the agricultural workforce employment by 3.41%.

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District/municipal dummy has a negative and significant sign towards agricultural workforce employment. This indicates that agricultural employment are more prevalent in the district (which is identical to the agricultural area) compared to the municipality. Considering the low quality of workforce in agricultural sector, the government has an obligation to improve the quality of farmers through a range of counseling and training on technologies that can improve the productivity of farmers.

The estimation result of equation parameter on industrial workforce employment has a coefficient of determination (R2) of 66.418%. Industrial employment is significantly affected by the explanatory variables, jointly indicated by the F statistic with the value of 52.61. The results showed that the industrial workforce employment is significantly influenced by industrial GDP, workforce, time trend, and previous year’s industrial workforce employment, with a sign in accordance with the hypothesis. The complete result of equation parameter estimation on industrial workforce employment can be seen in table 2.

As is the case with the agricultural sector, the increase in industrial GDP has a positive effect in increasing the industrial workforce employment. In the short and long-term, the industrial employment has an inelastic response to industrial GDP. Every 10% increase of industrial GDP will increase industrial employment by 1.58%, lower than the agricultural sector.

The increase in workforce will increase the industrial employment that is inelastic both in the short and long terms. In the short-term, the increase in workforce by 10% will increase the industrial employment by 4.33%. Compared to agriculture, industrial employment is more responsive to the increase in workforce. It can be interpreted that the increase in a more educated workforce will better encourage the increase in industrial than agricultural employment.

The estimation result of equation parameter on service workforce employment has a coefficient of determination (R2) of 86.7%. The service employment is significantly affected by the explanatory variables, jointly indicated by the F statistic with the value of 174.34. The results showed that the service workforce employment is significantly affected by the services GDP, workforce, district/ municipal dummy, and previous year’s service employment with a sign in accordance with the results of the hypothesis. The complete detail on the estimation result of equation parameter on service workforce employment can be seen in the following table 3.
Similar to agricultural and industrial sectors, the increase in services GDP has a significant and positive influence to the increase in service workforce employment. In the short and long-term, services employment has an inelastic response to changes in services GDP. In the short term, the increase in services GDP by 10% can improve service workforce employment by 0.86%, lower than the agricultural and industrial sectors.

Increased workforce has a significant and positive effect on services workforce employment. In contrast to the agricultural and industrial sectors, services employment in the short and long term has an elastic response to changes in workforce. In the short term, any increase in workforce by 10% will increase the services employment by 10.28%, while in the long term any increase in workforce by 10% will increase services employment by 11.71%.

District/municipal dummy has a positive and significant sign towards the services workforce employment. This suggests that services employment are widely available in urban than rural areas. This condition is different from the agricultural and industrial sectors that employ more workforce from rural areas.

The estimation result of poverty equation parameter indicates the coefficient of determination (R²) of 88.8%. Poverty is significantly influenced by the explanatory variables, jointly indicated by the F statistic with the value of 128.5. The estimation result of the parameter indicates that poverty is significantly influenced by household expenditure per capita, income distribution, poverty line, population number, the share of agricultural workforce, district/municipal dummy, time trend, and previous year’s poverty with the sign consistent with the hypothesis. Further details on the estimation result of poverty equation parameter can be seen in table 4 below.

In terms of elasticity magnitude, the increase in the household expenditure per capita has the greatest magnitude in reducing poverty. Poverty has an elastic response to the household expenditure per capita, both in short and long terms. In the short term, any increase in household expenditure by 10% will reduce poverty by 15.95%. This may imply that the increase in the household expenditure per capita will lead to reduced poverty. It is quite logical considering the household expenditure is a function of household income.

Income inequality (Gini index) has a significant and positive effect on poverty, with a relatively small magnitude (inelastic). In the short term, any reduction in the Gini index by 10% will reduce poverty by 4.22%. These result is in line with research conducted by Nanga (2006).

Increased poverty line was responsive in increasing poverty, both in short and long terms. In the short-term, any increase in the poverty line of 10% will increase poverty by 11.47%. In the long-term, any increase in the poverty line by 10% will increase poverty by 16.99%. The poverty line that is too low will make the poverty number seem small, although in reality it is not. It can be used by the rulers (government) to claim their success in reducing poverty.

The increase of population number has a significant and positive effect on the increasing poverty in Central Java. Although in the short term poverty is not responsive to the population number, in the long run it will be responsive. In the short term, any increase in the population number of ten 10% will increase poverty by 8.26%. In the long term, any increase in the population number of ten 10% will increase poverty by 12.23%. These conditions suggests that the increase in the population number in Central Java is still a burden for the development. Considering its important role for the success of regional/central development, the improvement of human resources then must get serious treatment from both regional/central governments.

Based on the elasticity, the share of agricultural workforce has a positive effect in increasing the number of poor people, despite having a relatively small magnitude. In the short term, any increase in the share of agricultural workforce of 10% will increase poverty by 1.63%. Compared to the industrial and services sectors, the agricultural sector has the lowest level of workforce productivity. The low productivity of agricultural workforce has an impact on the low income and welfare of farmers. Such result supports the research by Pradhan et al. (2000), affirming that agriculture is a sector that has the highest poverty rate than other sectors.

The first simulation, the increase in educational expenses of twenty billion rupiahs will result in the following effects (table 5).

Table 5 shows that an increase in educational expenses does not directly influence the increase of GDP, all sectors employment, and the reduction of unemployment and poverty. Increased workforce employment is mostly enjoyed respectively by industrial sectors of 2.56%, services sector of 0.85% and agricultural sector of 0.67%. Overall, the increase in educational expenses by 20 billion rupiahs, led to the increase of workforce employment from 452,779 people to 458,268 people (a
Table 5. The Simulation Result of the Increased Government Expenses for Education by 20 Billion Rupiahs towards Workforce Employment and Poverty

<table>
<thead>
<tr>
<th>Endogenous Variable (unit)</th>
<th>Basic value</th>
<th>Simulation Value</th>
<th>Change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP (billion IDR/year)</td>
<td>4248.1</td>
<td>4556</td>
<td>7.25</td>
</tr>
<tr>
<td>Agricultural workforce (people)</td>
<td>170549</td>
<td>171690</td>
<td>0.67</td>
</tr>
<tr>
<td>Industrial workforce (people)</td>
<td>113944</td>
<td>116865</td>
<td>2.56</td>
</tr>
<tr>
<td>Services workforce (people)</td>
<td>168286</td>
<td>169713</td>
<td>0.85</td>
</tr>
<tr>
<td>Total workforce employment (people)</td>
<td>452779</td>
<td>458268</td>
<td>1.21</td>
</tr>
<tr>
<td>Unemployment (people)</td>
<td>32662.5</td>
<td>27173.2</td>
<td>-16.81</td>
</tr>
<tr>
<td>Poverty (people)</td>
<td>102503</td>
<td>81716.6</td>
<td>-20.28</td>
</tr>
</tbody>
</table>

1.21% increase). The result suggests that an increase in educational expenses was more lucrative for industrial and services sectors in urban areas than agricultural sector in rural areas. If the government aims to reduce poverty, the regional government should increase the budget allocation for education in rural areas.

The improved economic performance due to an increase in educational expenses resulted in the increase of public welfare. It is characterized by the declining unemployment number, from 32,662 people into 27,173 people, reduced by 16.81% and the number of poor people fell from 102,503 people into 81,716 people, reduced by 20.28%. The results of this study suggest the importance of government intervention in improving public welfare through allocating the effective educational budget in order to improve the quality of life and well-being of society.

The second simulation, the increase in government expenses for Health of twenty billion rupiahs will result in the following (table 6).

In Table 6 it appears that the increase in health expenses has no direct effect in increasing the GDP and all sectors employment, as well as reducing unemployment and poverty. The increase in GDP caused the company to increase its production capacity and increase the number of new jobs to boost workforce employment. This policy is most beneficial for the industrial sector since when viewed from the percentage of changes, it causes the greatest industrial workforce employment, absorbing 113,944 people than previously only 117,656 people, up by 3.26 %. The service sector followed, then, rising 1.09 %, shadowed by the agricultural sector that rose by 0.82%. Overall, the increase of health expenses by twenty billion rupiahs led to the increased workforce employment from 452,779 people to 459,718 people, or up by 1.53%. In line with the first simulation, the increase in health expenses is also much more profitable for industrial and services sectors (non-agricultural sector) as compared to agricultural sector. The result also supports the notion that compared with the non-agricultural sectors, the agricultural sector was the least benefited from the success of development.

The improved economic performance resulted in the increased well-being of society, as can be seen from several indicators, i.e. the declining unemployment number from 32,663 unemployed people into 25,724 people, reduced by 21.24% and a decrease in the number of the poor from 102,503 people into 74,554 people, reduced by 27.27%.

The third simulation, the increase in expenses for infrastructure of twenty billion rupiahs will result in the following effects (table 7).

Table 7 states that an increase in infrastructure expenses was indirectly influential in increasing the output (GDP). The increase in output causes increased employment, thus resulted in increased workforce absorption. The result suggests that the industrial sector was the most benefited in workforce employment, from 113,944 people to 118,111 people, or up by 3.66%; followed by the agricultural sector, experiencing an increase of 1.57%, shadowed by services sector, with an increase of 0.76%. In terms of workforce employment, different from the educational and health expenses, the increased

Table 6. The Simulation Result of the Increased Government Expenses for Health by 20 Billion Rupiahs towards Workforce Employment and Poverty

<table>
<thead>
<tr>
<th>Endogenous Variable (unit)</th>
<th>Basic value</th>
<th>Simulation Value</th>
<th>Change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP (billion IDR/year)</td>
<td>4248.1</td>
<td>4639.8</td>
<td>9.22</td>
</tr>
<tr>
<td>Agricultural workforce (people)</td>
<td>170549</td>
<td>171947</td>
<td>0.82</td>
</tr>
<tr>
<td>Industrial workforce (people)</td>
<td>113944</td>
<td>117656</td>
<td>3.26</td>
</tr>
<tr>
<td>Services workforce (people)</td>
<td>168286</td>
<td>170115</td>
<td>1.09</td>
</tr>
<tr>
<td>Total workforce employment (people)</td>
<td>452779</td>
<td>459718</td>
<td>1.53</td>
</tr>
<tr>
<td>Unemployment (people)</td>
<td>32662.5</td>
<td>25724</td>
<td>-21.24</td>
</tr>
<tr>
<td>Poverty (people)</td>
<td>102503</td>
<td>74554.3</td>
<td>-27.27</td>
</tr>
</tbody>
</table>

Table 7. The Simulation Result of the Increased Government Expenses for Infrastructure by 20 Billion Rupiahs towards Workforce Employment and Poverty

<table>
<thead>
<tr>
<th>Endogenous Variable (unit)</th>
<th>Basic value</th>
<th>Simulation Value</th>
<th>Change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP (billion IDR/year)</td>
<td>4248.1</td>
<td>4631.6</td>
<td>9.03</td>
</tr>
<tr>
<td>Agricultural workforce (people)</td>
<td>170549</td>
<td>173229</td>
<td>1.57</td>
</tr>
<tr>
<td>Industrial workforce (people)</td>
<td>113944</td>
<td>118111</td>
<td>3.66</td>
</tr>
<tr>
<td>Services workforce (people)</td>
<td>168286</td>
<td>169558</td>
<td>0.76</td>
</tr>
<tr>
<td>Total workforce employment (people)</td>
<td>452779</td>
<td>460898</td>
<td>1.79</td>
</tr>
<tr>
<td>Unemployment (people)</td>
<td>32662.5</td>
<td>24544.1</td>
<td>-24.86</td>
</tr>
<tr>
<td>Poverty (people)</td>
<td>102503</td>
<td>80848.2</td>
<td>-21.13</td>
</tr>
</tbody>
</table>
The improved economic performance due to increased infrastructure expenses was implicated to increased public welfare. It can be seen from several indicators, i.e. reduced unemployment from 32,663 people to 24,544 people, declined by 24.86% and declined poverty from 102,503 people into 80,848 people, reduced by 21.13%.

The aforementioned three policy simulation results conclude that similar absolute value, and the increase in health expenses give the best result in increasing GDP, and services workforce employment, as well as reducing poverty. While the increase in infrastructure expenses gives the best result in improving the industrial and agricultural workforce employment and reduce unemployment. The required economic growth is one, capable not only to increase output, but at the same time can also reduce unemployment and poverty. The results of this study indicate that the policy of increasing educational, health and infrastructure expenses, in addition to increasing the output can also increase all sector workforce employment and reduce poverty in Central Java.

CONCLUSION

Agricultural workforce employment is significantly influenced by District/municipal Minimum Wage, agricultural GDP, workforce, district/municipal dummy and previous year’s agricultural employment. The increase in agricultural GDP by 10% will increase agricultural workforce employment by 1.75%.

Industrial workforce employment is significantly affected by industrial GDP, workforce, and previous year’s industrial employment. The increase in industrial GDP by 10% will increase industrial workforce employment by 1.58%, lower than the agricultural sector.

Services workforce employment is significantly affected by services GDP, workforce, district/municipal dummy, and previous year’s services employment. The increase in services GDP by 10% will improve services workforce employment by 0.86%, lower than the agricultural and industrial sectors.

Poverty is significantly influenced by household expenditure per capita, income distribution, poverty line, population number, the share of agricultural workforce, district/municipal dummy, time trend and previous year’s poverty. Increased household expenditure per capita of 10% will reduce poverty by 15.95%. The simulation results of educational, health and infrastructure expense policies with similar nominal value showed an increase in GDP, and all sector workforce employment, as well as a reduction of poverty.

The increased health expenses has the most significant contribution to the increased GDP, services workforce employment and the reduced poverty. While the policy of increasing infrastructure expenses most significantly improves industrial and agricultural workforce employment, and reduces unemployment.

Policies to increase educational and health expenses give the greatest effect on the workforce employment, most widely enjoyed by respectively sectors of industry, services and agriculture. While the policy of increasing infrastructure expenses most significantly affects the workforce employment in respectively sectors of industry, agriculture and services.

Poverty needs to be reduced by a variety of programs that can improve people’s productivity and income. The implication of policy for addressing poverty is to improve the quality of human resources by opening access to education and training as much as possible for the community, so that they are able to manage the existing natural resources, increase their productivity, improve their economic welfare and expand employment opportunities, as well as control the population number.

For subsequent research, it is recommended to conduct treatment differentiation (disaggregation) on districts and municipalities to determine the effect of policies for the two areas, and to include all aspects of Human Development Index as part of the assessment of development performance, in addition to forecasting through historical simulation.

REFERENCES


