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**Reducing Spatial Inequality In Indonesia: Off-The-Job
Training As A Special Treatment For Underdeveloped
Regions**

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Abstract

This study aims to compare the rate of return to schooling of both regions and analyse the causes. Furthermore, I examine the differences in the effects of formal education and job training on people in both regions to decide what kind of human resources treatment is more effective for each region. This research's data is collected from the National Labor Force Survey (SAKERNAS) 2014. I used modified Mincer earnings function to analyze the differences between regions. Cross-sectional regression analysis was done by using Ordinary Least Square (OLS) method. I split the data based on groups of the region to compare both rates of return to schooling. The results showed that there are differences in the rate of return to schooling between the two regions for each education level. The effect of training on income level also differ for both regions. Education gives a promising return to income in Java while job training doing it well in outer regions.

Keywords: education level, mincer earnings function, off-the-job training, rate of return to schooling, spatial inequality

INTRODUCTION

Every human has a different human resource quality. The quality mentioned is referring to their ability to work, their skills, and their knowledge. Human quality often said as Human Resources (HR). HR quality will give an enormous impact on a state's economic development. HR quality also can be indexed by an index named Human Development Index (HDI). One of HDI components is education. Education is said to be the main measurement of HDI. Education

itself has several stages within, where in Indonesia, we have 12 years-schooling policy which consists of 3 stages of education; elementary, Junior-high, and Senior-high. This policy was made to create an equality of HR quality all over Indonesia without any region left behind.

In labor economics, HR quality may affect someone's job and wage. A good education is believed to promote someone's productivity, ability, and manner. Those things are positive for someone's job. Therefore, it will also positively affect someone's income. Basically, education is an intangible investment in form of human resource. It differs from a tangible investment such as stock, land, and bonds. Education has a longer return time compared to other form of investment. It takes at least 12 years from the first investment in elementary school until someone finishes his school and gets into the labor force. Even though it takes more time to give back the return, education is more promising than the other form of investment (Atlanta, 2005). Once the state invests in people's education, then the return will last until their retirement age. Fortunately, as Indonesia has adopted 12 years schooling policy, education is now merit goods. The objectives are to ensure citizen's rights on education and equalize the basic education participation which will lead to less income inequality.

Indonesia to date has not been able to overcome the inequality of inter-island development. In 2010, according to central bureau of statistic (BPS), the island of Java has a share of 57.6% of Gross Domestic Product (GDP) and the rest is divided into 4 other large islands. The inequality of development is in line with the educational inequality that also occurs between Java and outside Java. This imbalance resulting from various factors; Elementary schools outside Java are still short of teachers, the difficulty of access to school for remote communities, the lack of technology applications, national exam score ranking for schools in Kalimantan, Sulawesi, and eastern Indonesia has never reached the top 25 nationally, and the quality of universities that can be seen from accreditation conducted by BAN-PT, where only 223 study programs outside Java get A score, while in Java reaches 1.478.

In the 2016 Budget Planning Budget (APBN), the education budget records history by achieving a 20% share of state expenditure. This figure shows that the government is getting serious to invest in the education of the next generation. It is known that since 2014, the education budget is allocated more for the development of educational facilities outside Java, especially eastern Indonesia. This shows that the government notice the inequality of education in Indonesia.

This inequality makes it hard for the government to rely only on education for equalization between islands. An alternative needed as an addition to 12 years schooling. Off-the-job training is one of income determinant factor which has a positive effect on income. But until now, Indonesia has not utilized this alternative well. This means there is a gap for future improvement that needed an empirical study as a foundation to create a new policy.

Following up the information, in this research, I will confirm the existence of educational gap between Java region with the area outside Java by doing a

comparison on the return of education investment (rate of return to schooling). In addition, this study also examines the ability of alternative human resource development in addition to merit education, named job training. This study uses national labor force survey data (SAKERNAS) in 2014.

The aim of this research are (1) to know the differences in the return to schooling between Java and outside Java, and (2) to analyse the potential of off-the-job training to become an alternative to increase outside Java people's income

LITERATURE REVIEW

Labor Theory

The rate of return to schooling is the percentage change in income as a result of additional investment in term of additional one year of education. While the Wage-Schooling Locus is a curve or pattern that shows the wage rate in the labor market based on the number of years of schooling of a person (Borjas, 2013). At Wage-Schooling Locus, found that the additional income earned will decrease as the year increases in schooling (diminishing returns). Therefore, the curve shape is concave. The reason behind this is higher education only provides additional knowledge and not essential knowledge as found in basic education.

Mincer earnings function is a job income function proposed by Jacob Mincer. Mincer earnings function calculates the influence of human capital as the main factor determining a person's wage change (Wannakrairoj, 2013). The function denoted as:

$$\log w = a + bs + ct - dt^2 + \text{other variables} \quad (2.1)$$

Educational factor denoted as b show the magnitude of the rate of return to schooling. Experience factors as denoted by c and d show the estimated increase in income as the experience increases and the squared experience. Experience can be interpreted as an outcome of On-the-job training (OJT). This function is still open to additional variables such as off-the-job training.

Off-the-job Training

Job training can be divided into two groups, on-the-job training, and off-the-job-training. On-the-job training is the training that is gained while carrying out the work. Workers are not dismissed and taken out of the workplace to get training, but the training itself is in the work process of the workers. While off-the-job training is training conducted outside the work of workers. To attend the training, the worker must take the time to attend the training class. In this study, the author uses the concept of off-the-job training. Off-the-job training is a complement of education because when combined it will provide a greater rate of return, this contrasts with on-the-job training which is a substitution of education (Ariga and Brunello, 2006). Off-the-job training is relatively more general and not specific to the type of work in a company, therefore off-the-job

training tends not to withstand labor mobility between firms as a result of on-the-job training (Lynch, 2016).

Previous Research

This study also reviewed previous studies that already existed from various sources both papers from international scientific journals, national scientific journals, and thesis. Atmanti (2005) suggests that education is a long-term investment with a rate of return that exceeds the rate of return on physical capital investment. But the benefits of investment in education will come later when students have become worker years after. Therefore, the priority of financing should be directed to education as a long-term investment instrument that will provide benefits to the future generations.

Wannakraij (2013) found that there is a difference in the rate of return to schooling in rural and urban communities in Thailand with the tendency of urban communities to have a higher return. This is analyzed as an impact of the development patterns of developing countries that are still concentrated in urban areas. Ariga & Brunello (2006) found that off-the-job training can become an additional supplement for 12 years schooling. Both complement each other. So, if education combined with training then we are expecting a positive result on return to schooling. In the case of Indonesia, educational gap is not only exist between urban and rural areas, but also the inter-island gap where development is still concentrated in Java island. Development gap is analyzed to have a direct impact on educational inequality in both regions. But other researchers have not determined the comparative study on the rate of return to schooling as an indicator of inter-island inequality in Indonesia.

Research Hypotheses

Based on the previous explanation of education and job training, the author hypothesizes:

- H₁ : The level of education has a positive influence on income.
- H₂ : Work experience has a positive influence on income
- H₃ : Off-the-job training has a positive influence on income
- H₄ : Interaction effect between education and living in Java island has a positive influence on income
- H₅ : Interaction effect between off-the-job training and living in Java island has a negative influence on income.

METHODS

Model specifications

This research will use an econometric model as follows:

Model 1

$$Income = \beta_0 + \beta_1 EDUC + \beta_2 EXP - \beta_3 EXP^2 + \beta_4 OFFJT + \beta_4 ISLANDS \dots \dots (3.1)$$

From model 1 above, the author wants to know the income difference between seven main islands in Indonesia.

Model 2

$$Income = \beta_0 + \beta_1 EDUC + \beta_2 EXP - \beta_3 EXP^2 + \beta_4 OFFJT + \beta_5 EDUC * JAVA + \beta_6 OFFJT * JAVA \dots \dots \dots (3.2)$$

From model 2 above, the author would like to confirm the inequality of return on education between Java island and outer regions as developed and underdeveloped regions. Also from this model, the author would like to measure the potential of off-the-job training as an income generating factor of outside Java people.

List of Variables:

- | | | |
|------------|---|---|
| lnincome | = | Income (in logarithm) |
| EDUC | = | Education level (SD (Elementary), SMP (Junior High School), SMA (Senior High School), Universitas (University)) |
| EXP | = | Work experience (in years) |
| OFFJT | = | off-the-job training (dummy) |
| JAVA | = | living on Java island (dummy) |
| ISLANDS | = | seven main islands in Indonesia (dummy) |
| EDUC*JAVA | = | Interaction effect between education level and living in Java island |
| OFFJT*JAVA | = | Interaction effect between off-the-job training and living in Java island |

Definitions of variables

The dependent variable used in this study is income in the logarithm. Logarithm transformation is done to anticipate the bias caused by the inequality of inter-island nominal income in Indonesia. Analyzing the effect in percentage will provide a stronger result.

Independent variables in this research are:

- The level of education (EDUC) is the level of individual education that includes equivalent general, vocational and religious education measured in

dummies based on the level. I use the no-education group as the basic category used as a comparison. Dummies for education level can be seen in Table 1.

Table 1. The level of education dummies

Dummy	D1	D2	D3	D4
SD (Elementary)	1	0	0	0
SMP (Junior High School)	0	1	0	0
SMA (Senior High School)	0	0	1	0
Universitas (University)	0	0	0	1

- b. Islands (ISLANDS). The data separated into seven groups based on seven main islands in Indonesia. Java group is used as the basic category for comparison matter. The result will show the difference of other islands from Java island. Dummies can be seen in Table 2.

Table 2 The island dummies

Dummy	D5	D6	D7	D8	D9	D10
Sumatera	1	0	0	0	0	0
Nusa Tenggara	0	1	0	0	0	0
Kalimantan	0	0	1	0	0	0
Sulawesi	0	0	0	1	0	0
Maluku	0	0	0	0	1	0
Papua	0	0	0	0	0	1

- c. Duration of work (EXP), the number of years a person has been in a job. Sakernas data does not cover how long a person has entered the workforce but includes how long it has been working in the present job. This component can be an experiential proxy because each job will require different skills.
- d. Job training (OFFJT), job training is participation in vocational training both held by private and government. This variable is a dummy variable, that is
 D4 = 1 if the individual has a job training certificate
 D4 = 0 if the individual does not have a job training certificate
- e. Living in Java island, spatial information of individual residence. Grouping between regions divided into two into Java and outside Java with the aim of simplification model. It is suspected that areas outside Java are lagging behind in various aspects. This variable is a dummy, that is:
 D5: 1 if the individual living in Java island.
 D5: 0 if the individual does not live on Java island.

- f. Interaction variable of educational level and living in Java island (EDUC*JAVA), it is assumed that education will give a higher rate of return to society in Java island.
- g. Interaction variable of training and living in Java (OFFJT*JAVA), it is suspected that job training will provide a lower rate of return on Java communities. This is a reversal of initial assumption that job training will provide greater returns to outsiders.

DATA COLLECTION METHOD

Source of The Data

This study uses quantitative methods based on the use of secondary data. Data to be used in this research is National Labor Force Survey (SAKERNAS) data in 2014. Author gets the data from the department of economics, faculty of economics and business Universitas Indonesia. The data is then analyzed using two econometric models that have been prepared.

Data Analysis Method

This research uses descriptive and inferential analysis techniques. Descriptive analysis is used to describe the condition of income inequality and inter-island education in Indonesia. Inferential analysis was conducted to test the hypotheses about the effect of education and job training on the income of the community in both groups by using Ordinary Least Square (OLS) regression. The unit of analysis of this study is individuals aged between 15-64 years old.

FINDINGS

Regression Diagnostics

Regression analysis was performed on model 1 and 2 using STATA14. The results show that most independent variables are significant at 99% confidence level. The problem test in OLS regression is done by testing normality, homoscedasticity, multicollinearity, and model specification. All test results show that both models have no problem and can be used as a basis for further analysis

Income Difference

Multiple linear regression analysis using OLS method was used to see the difference between inter-island income. The Author used Java as the basis for comparison to the dummies of six other large islands. With a 99 percent confidence level, the islands of Sumatra, Kalimantan, Maluku, and Papua have a higher income inclination than the people in Java. While the Nusa Tenggara and Sulawesi tend to be lower. This is slightly contrary to the imbalance of economic income and the share of inter-island GDP. Note, however, that the income data in the SAKERNAS is nominal income. therefore, the regression

results on these revenues are still not adjusted to the level of prices into real income. It is logical if Maluku and Papua have higher nominal incomes because their average price of goods is higher than the western part of Indonesia.

Table 3. Regression results for model 1

salary_log	Adj R-squared 0.1867 Prob>f 0.0000			
	OLS Coef.	Robust Std. Err	Heckman Coef.	StdErr.
***	.04896	.0005	-.03157	.0004746
EXP***	-.00093	.0000	.00008	0.000
OFFJT***	.35401	.0070	.43715	.0140
EDUC_SD***	.06668	.0067	.04480	.0081
EDUC_SMP***	.22908	.0071	.23867	.0094
EDUC_SMA***	.44659	.0063	.51808	.0087
EDUC_Universitas***	.68679	.0073	1.096	.0130
ISLANDS_Sumatera***	.10682	.0049	-.08766	.0074
ISLANDS_Nusatenggara***	-.07324	.0079	-.30650	.0110
ISLANDS_Kalimantan	.34579	.0068	.00003*	.0105
ISLANDS_Sulawesi***	-.0101638	.0064	-.21216	.0093
ISLANDS_Maluku***	.018913	.0120	-.15582	.0175
ISLANDS_Papua***	.3699943	.0111	-.52058	.0139

Note: *** significant at 99% confidence level.

Checking with Heckman selection was done to know the inter-island job opportunity difference. Income data in sakernas used as a proxy to identify a person has a job while the empty income data means that someone does not have a job. From the result of Heckman selection, it is seen that all islands have lower job opportunities except Kalimantan. From Table 3, It is known that the Heckman selection coefficient for the island of Borneo is not significant. It can be said that although the return to schooling in Sumatra, Maluku, and Papua is higher than Java, the opportunity to earn that income is smaller.

The Effect of Education and Job Training

Regression results in table 4 show that work experience and training have positive effects as hypothesized. When viewed further, to complete the compulsory education of 12 years, the effect of lower education is felt by the Javanese community than the people outside Java. But at the higher education level, Javanese people feel higher benefits. This research would like to see how the influences of education and job training affect income as a complement, not a substitution.

Table 4. Regression results for model 2

		R-squared 0.1727
		Prob>f 0.0000
salary_log	Coef.	Std. Err.
EXP***	.0490403	.0006191
EXP_sqd***	-.0009447	.000018
OFFJT***	.4181117	.0095228
OFFJT*JAVA***	-.2118996	.018845
EDUC_SD***	.1359492	.0071513
EDUC_SD*JAVA***	-.2183413	.0078255
EDUC_SMP***	.2869034	.0077738
EDUC_SMP*JAVA***	-.1795846	.0090522
EDUC_SMA***	.4443598	.00702
EDUC_SMA*JAVA***	-.0283801	.0074269
EDUC_Univ***	.6237341	.0093997
EDUC_Univ*JAVA***	.1528086	.0144547

Note: *** significant at 99% confidence level.

From Table 4 we know that off-the-job training has a lower impact on Java people. The 12-year education period is compulsory education, which will not be reduced or added. The lower return on primary education in Java is not only related to the relatively low nominal incomes of the Javanese community but also on how much basic education is valuable in Java. The impact of primary school education is very low compared to outside Java shows that with the same level of education, the elementary school graduates in Java only able to generate a much lower income than elementary school graduates outside Java. This shows that labor market in Java is demanding a higher level of education than elementary school graduates. At the SMP level, the relative comparison of junior secondary education returns between Java and outside Java is not as great as primary school education with Javanese communities getting lower returns. One level higher, at high school level (SMA), the difference in the rate of return is getting lower. This shows that labor market in Java assesses the level of education slightly higher than the work world outside Java. This may be further analysed in terms of inter-regional specialization which is not included in this study.

At the higher education level (Univ), the influence on income tends to be better in Java than outside Java. This may due to the required skill differences between the types of employment available in both areas. Education, in this case higher education, provides its best benefit for Java people, not the other islands. There are two possible causes of this condition, firstly, the quality of education on the island of Java is indeed better to provide a higher rate of return. Second, types of employment in Java need a better education so the

rate of return in the form of wages among the educated felt more by the people in Java, whereas outside Java, most jobs requiring less educated workers compared to Java. This is related to regional development and and natial GDP share which still concentrated in Java.

The problem of education gap between Java and Outer regions should be anticipated immediately. The government's step to help outside java catch up by giving more budget allocation for outside regions will give an impact in the long-run. Then the necessary alternative is a quality improvement for human resources which has a short-term effect. Job training can be divided into two types, off-the-job training provided by both government and the private sector. Those who have received job training will be awarded a training certificate as evidence of job training participation

Off-the-job training has a positive effect on income in general. When the author creates an interaction between training and living in Java, it appears that someone who has a job training certificate and lives in Java has a lower income than those outside the category. This is consistent with the initial assumption, where author estimate better training for outsiders. in other words, people's income outside Java is more sensitive to ownership of job training certificates. Off-the-job training is usually aimed at industrial jobs that require specialized technical skills. Better returns indicate that this type of work is more needed outside of Java than a job that requires higher education.

Job training is not part of formal education, but its existence can be utilized well. Job training should be provided by the government as a supplement to improve the quality of human resources outside Java. With full financing or even merit goods for vocational school graduates, it is expected that job training can sharpen the ability of secondary education graduates in order to improve the welfare of people outside Java. And of course, open access to all classes of society will ensure that welfare in the outer regions is distributed equally in its own territory.

CONCLUSION

Education is proven has a positive impact on people's income level in Indonesia. So, it is logical if education is the focus in developing Indonesia. Indonesia as a developing country still facing a communal problem of inequality, in this case, spatial inequality. Development in Indonesia concentrated in Java island and left the other islands behind. The result for other islands is not only low economic capacity but also low quality of education. The regression result showed that education that benefits Java the most is higher education. A gap in quality of education is found to be parallel with the higher education return to Income. Education as a long-term investment does not give an equal return for all regions, in this case, both Java and outer regions. But this research also found that people outside java received a higher return on job training compared to people in Java. From two factors that determine income level, outer java regions receive lower from higher education but receive higher from job training.

This condition is an opportunity for the government to improve human resource quality of outside java regions. A right policy as explained in the discussion section is optimizing the potential of job training as a main short-term leverage of income. If the government can be able to increase outside Java's human resource quality, then it will lead to a better income level. It will also ease the future government to increase the education quality in the future. Then by doing so, we can help outer regions to catch up java's education quality and economic development. By solving problems behind inequality, then we can achieve a spatial equality in Indonesia.

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