

Artikel 15

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1 Workers' Commuting Migration from District to City of Semarang by Rapid Transit Busses

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1 Abstract

Migration phenomena, especially internal migrations which are usually called commuting migration, take place almost in the entire parts of Indonesia. One commuting migration phenomenon is shown by workers of Semarang District. The purpose of this study is to partially analyze the influence of income, education, marital status, land ownership, sex, and age variable upon workers' commuting decision of Semarang District. This study uses both primary, obtained from questionnaires of 100 respondents, and secondary data. The results of binary logistic regression model analysis in this study show that two independent variables of income and education significantly influence workers' commuting decision while marital status, land ownership, sex, and age variable do not influence workers' commuting decision. Assuming that income expected from city is higher, it results in workers' commuting flows. Indicates that the higher their educational level, the greater their probability to commute to the city, and vice versa. This is relevant with Ravenstein's migration theory that people with higher educational level usually mobilize more than those with lower educational level. From the calculations, it shows that workers' commuting probability may increase as respondents' income and education increase as well.

Keywords: commuting migration; binary logistic regression; commuting decision

INTRODUCTION

One socio-economic development challenge in developing countries such as Indonesia is on population problems, such as explosion and uneven distribution of population (Prajanti, 2015). Rural and urban areas' development gaps lead to uneven distribution of population. Such conditions encourage people to move or migrate. Mantra (2003: 186) explains that people's main motivation

to move from rural to urban areas is the economic reasons. These motives develop due to regional economic gaps. Based on rational consideration, individuals' mobility to urban areas is the expectations to have better job and income than those in rural ones.

Migration phenomena, especially internal migrations which are usually called commuting migrations, take place almost in the entire parts of Indonesia. Internal

Table 1. Over 15 year- old people in Work Force period of Semarang, Demak, and Kendal District of 2013

| No | District | Work Force Period | | Total |
|----|----------|-------------------|------------|---------|
| | | Working | Unemployed | |
| 1 | Semarang | 511,957 | 20,718 | 532,675 |
| 2 | Demak | 493,169 | 37,371 | 530,540 |
| 3 | Kendal | 452,169 | 31,043 | 483,212 |

Source: National Work Force Period Survey (SAKERNAS), BPS

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Table 2. MSE comparison of Semarang City with Demak, Kendal, and Semarang District of 2011 – 2013

| Year | Semarang City | Demak | Kendal | Semarang District |
|------|---------------|---------|---------|-------------------|
| 2011 | 961,323 | 847,987 | 843,750 | 880,000 |
| 2012 | 991,500 | 893,000 | 904,500 | 941,600 |
| 2013 | 1,209,100 | 995,000 | 953,100 | 1,051,000 |

Source: Manpower, Transmigration, and Population Department of Java Province

Table 3. Number of Trans Semarang RTBs Passengers in Corridor II of Sisemut (Ungaran)-Terboyo

| Month | Year | Number of Passengers | | |
|-----------|------|----------------------|----------|---------|
| | | Public | Students | Total |
| Januari | 2013 | 60,893 | 13,233 | 74,126 |
| Februari | 2013 | 61,869 | 15,293 | 77,162 |
| Maret | 2013 | 82,746 | 14,101 | 96,847 |
| April | 2013 | 87,162 | 16,231 | 103,393 |
| Mei | 2013 | 99,115 | 16,379 | 115,494 |
| Juni | 2013 | 108,354 | 12,687 | 121,041 |
| Juli | 2013 | 123,831 | 19,940 | 143,771 |
| Agustus | 2013 | 127,382 | 15,304 | 142,686 |
| September | 2013 | 133,256 | 26,158 | 159,414 |
| Oktober | 2013 | 133,207 | 27,372 | 160,579 |
| November | 2013 | 135,916 | 26,501 | 162,417 |
| Desember | 2013 | 142,996 | 21,821 | 164,817 |

Source: Public Service Agency (BLU) of Semarang City on RTBs

migrations or commuting migrations are considered as natural processes distributing surplus of work forces from urban to modern sectors in rural areas which absorb more work forces (Todaro, 2006: 401). One commuting migration phenomenon is shown by workers of Semarang District. Due to limited conditions of employment but surplus in work forces, those encourage people to commute from rural to urban areas to work or get a job.

Table 1 shows a comparison between numbers of work force period in areas directly close to Semarang city. District categorized in the highest work force period in 2013 is Semarang with 511,957 people. It can be concluded that commuting migration may highly occur in Semarang district due to its highest number of Work forces. The work forces in this area may not be entirely absorbed that the workers move to urban areas to work or get a job.

City/District Minimum Salary (MSE)

difference is another main reason for workers deciding to commute beside limited job opportunities factor in rural areas. Rationally, they will not move to urban areas if salary in rural areas is higher or equal to that in urban areas (Todaro, 2006: 407).

Table 2 shows that residents of Semarang District will obviously decide to move to Semarang city as Semarang MSE is always higher than that of Semarang district and others in Central Java such as, Demak and Kendal.

In addition, the availability of transportation facilities and infrastructure such as Rapid Transit Busses (RTBs) also supports people from Semarang District to commute to Semarang city. The availability of transportation adequately gives a tendency to increase commuting migration rate (Aryanti, 2015).

Based on RTBs data of Public Service Agency (BLU) Semarang city (2013), stating that the number of public passengers inc-

reases. This increasing trend condition of Rapid Transit Busses (RTBs) Passengers in Semarang district shows that most people in that region consider that commuting is a rational choice for someone to have better job and salary.

Commuting migration is very much interesting to be observed and studied. This study aims to figure out some social phenomena related to someone's consideration either remaining in their own region or commuting to other regions to work. The purpose of this study is to analyze the influence of income, education, marital status, land ownership, sex, and age variable upon workers' probability to commute.

RESEARCH METHODS

Population of this study is the work forces settled and having Personal Identification Card (ID) of Semarang District. The samples are taken with *incidental sampling* technique. According to Sugiyono (2009: 85), in-

cidental sampling is a sampling technique based on a coincidence, that is, anyone who incidentally/by chances meets researchers is then considered to be the samples since they have qualifications to be the data sources. The total number of samples used in this study is 100 respondents obtained from workers met by chance taking Rapid Transit Busses (RTBs) departing from Ungaran bus station.

Types of data used in this study are primary and secondary data. The primary data are obtained by conducting direct surveys to the studied areas and interviews based on questionnaires given to the qualified respondents. The secondary data are obtained from relevant departments/agencies such as Bappeda of Semarang district, RTBs of BLU Semarang City, BPS of Semarang District, Manpower and Transmigration Department of Semarang District.

The analysis used in this research is *Logistic Regression Model*, in which depen-

$$Y_i = \frac{e^u}{1 + e^u}$$

Where Y_i is probability estimated with number of cases ($i = 1, \dots, n$) and "u" is common regression equation:

$$u = A + b_1X_1 + b_2X_2 + \dots + b_kX_k$$

With Constanta A, coefficient b_i and independent variable X_j with a number of k ($j = 1, \dots, K$). Thus, this study is formulated with a function equation model as follows:

$$Y = f(X_1 + X_2 + X_3 + X_4 + X_5 + X_6)$$

While econometric shape model is formulated as follows:

$$Y = \beta_0 + \beta_1 \text{WAGE} + \beta_2 \text{EDU} + \beta_3 \text{MAR} + \beta_4 \text{LAND} + \beta_5 \text{SEX} + \beta_6 \text{AGE} + \mu$$

Where:

- Y = migrating decision
- WAGE = income per month
- EDU = education level
- MAR = marital status
- LAND = land ownership
- AGE = age
- SEX = sex
- β_0, β_1 = intercept
- $\beta_{1,2,3,4,5,6}$ = regression coefficient
- μ, μ = error terms

dent variables are in non-parametric or categorical forms. The goal of logistic regression test is to identify variables which are able to distinguish two different groups. Number 1 is given to respondents who commute regularly, and number 0 is given to others.

The dependent variable used in this study is commuting decision measured using *dummy* with value 1 for commuting and 0 for others. The independent variables are income which they receive monthly after working in a destination of commuting area in rupiah; education is length of time required in completing respondents' last education; marital status which is measured using *dummy* number, 1 for married and 0 for others; land ownership which is measured using *dummy* variable, 1 for owning a land and 0 for not owning a land; sex which is measured using *dummy* variable, 1 for male and 0 for female; age which is based on respondents' date of birth measured in year.

Logistic regression with two options is frequently called *Binary Logistic Regression*. Since models resulted from logistic regression is nonlinear, the equation used to describe them is a little more complex than multiple regression. Variable Y is the probability which obtain two or more outcomes based on non-linear function of linear combination upon a number of independent variables (*predictors*) (Kuncoro, 2007: 236). The general equation for logistic regression with two-option (*Binary Logistic Regression*) results is shown as follows (Kuncoro, 2007: 236).

RESULTS AND DISCUSSION

Respondent Characteristics

Based on results of data processing, the highest number of respondents who receive income of 1,500,000-1,999,999 is 29 percent while the lowest who receive 1,000,000-1,499,999 is 5 percent. Number of respondents who receive the highest income of "≥6.000.000" are 9 percent. Based on educational level, it shows that 46 percent respondents graduate from three-year diploma, 41 percent from Senior/Vocational High School, 8 percent from Junior High School, and 5 percent from Elementary

School. Based on marital status, it shows that 60 respondents are married while the other 40 respondents are not. As most respondents are married, they are motivated to earn more income to fulfill their family needs. Based on a land ownership, it shows that 82 percent respondents do not own or cultivate a land while the other 18 percent respondents own or cultivate a land. Based on sex differences, it shows that 57 respondents are females while the other 43 respondents are males. Based on age differences, it shows that 25 percent respondents are at the age of 20-24. In this productive age, they are motivated to work, have better job and more salary. The other 4 percent respondents are at the age of 50-54.

Results of Binary Logistic Regression Analysis

Model Feasibility (*Goodness of Fit*)

From the test results, the value of *Chi Square (Hosmer and Lameshow Test)* is 5.758 with the Sig value of 0.674. The Sig value is greater than the alpha (0.05). It means that there is no difference between the predicted and the observed classification. It means that the logistic regression model is sufficient to explain the data and may be used for further analysis.

The *logistic regression* test results formed may explain classifications in value interpretation of dependent variables shown in *overall percentage*. The overall predictive power is 93 percent. 97.7 percent respondents deciding to commute may be predicted accurately with this logistic regression model while those who do not decide to commute may be accurately predicted by 61.5 percent.

Overall Fit Test

The number of initial *-2 Likelihood (Block Number: 0)* is 77,277 while the second *-2 Likelihood (Block Number: 1)* is 42,396. It means that *-2 Likelihood 1 < -2 Likelihood 0*. Thus, the regression model may be interpreted better (Ghozali, 2011: 341).

The test results of *omnibus tests of model coefficients* show the *chi square of*

34 882 with a significance of 0.000. As the significance value is less than 0.05, it can be concluded that the decision to commute may be predicted from variable of income, education, marital status, land ownership, sex, and age. While Nagelkerke measure shows only 54.7 percent of decision varia-

tions in commuting which may be predicted from income, education, marital status, land ownership, sex, and age.

Partial Test

From the results of Binary Logistic Regression models with SPSS 17 analysis device, it shows the following results:

Table 4. Variables in the Equation

| Variable | B | S.E. | Wald | df | Sig. | Exp(B) |
|----------|---------|-------|-------|----|------|--------|
| wage | .000003 | .000 | 4.397 | 1 | .036 | 1.000 |
| edu | .355 | .171 | 4.278 | 1 | .039 | 1.427 |
| mar | .303 | 1.082 | .078 | 1 | .780 | 1.353 |
| land | -1.852 | 1.004 | 3.146 | 1 | .076 | .157 |
| sex | .607 | .911 | .443 | 1 | .506 | 1.835 |
| age | -.076 | .049 | 2.446 | 1 | .118 | .926 |
| Constant | -4.814 | 2.749 | 3.067 | 1 | .080 | .008 |

a. Variable (s) entered on step 1: wage, edu, mar, land, sex, age.

Source: Primary data, processed, 2015

Parameters used for the partial test this study is by comparing the significance value with the real standard of 5%. The data show that income and education variable significantly influence workers' decision to commute while marital status, land ownership, sex, and age variable have no significant influences. Exp (B) shows that the value of odds ratio, if other variables in constant state, independent variable may influence the dependent variables as much as the value of odds ratio (Imam Ghozali, 2011).

Income Variable Influence Test Results upon Workers' Commuting Decision

Income variable has a coefficient value of 0.000003 with the significance value of 0.036 which is greater than $\alpha=5\%$. It shows that income variable significantly influences workers' commuting decision. The odds ratio value or Exp (B) of income variable is 1.000. It means that respondents with more income who decide to commute are once higher than those with lower income. The coefficient positive (+) sign indicates that the higher the income the higher the probability of workers to commute to the city, and vice versa. This is relevant with Todaro's theory that there are income level differences between those in rural and urban areas.

Assuming that income expected from city is higher, it results in workers' commuting flows.

Education Variable Influence test results upon workers' commuting decision

Education variable has a coefficient of 0.355 with a significance value of 0.039 which is smaller than $\alpha=5\%$. It shows that education variable significantly influences workers' commuting decision. Exp (B) of education variable is 1.427. It means that respondents with higher educational level interested in commuting are 1.427 times higher than those with lower educational level. The coefficient positive (+) sign indicates that the higher their educational level, the greater their probability to commute to the city, and vice versa. This is relevant with Ravenstein's migration theory that people with higher educational level usually mobilize more than those with lower educational level.

Income and Education Variable Test Results upon workers' commuting decision

From the results of analysis, a logistic regression equation model is formulated as follows:

$$\ln \left[\frac{p}{1-p} \right] = -4.814 + 0.000003 \text{ wage} + 0.355 \text{ edu}$$

or in the form of p:

$$p = \frac{e^{-4.814 + 0.000003 \text{ wage} + 0.355 \text{ edu}}}{1 + e^{-4.814 + 0.000003 \text{ wage} + 0.355 \text{ edu}}}$$

This model may be interpreted, for example, to determine someone's probabili-

ty to commute (1) the received income is Rp. 2,000,000 with high school educational level; (2) the received income is Rp. 3,000,000 with high school educational level; (3) the received income is Rp. 2,000,000 with university educational level; (4) the received income is Rp. 3,000,000 with university educational level. Those questions may be immediately answered with the estimation results of the equation above:

So, someone's chance to commute as

$$p = \frac{e^{-4.814 + 0.000003 (2,000,000) + 0.355 (12)}}{1 + e^{-4.814 + 0.000003 (2,000,000) + 0.355 (12)}} \quad (1)$$

$$p = 0.995$$

So, someone's chance to commute as his income is Rp. 2,000,000 with high school educational level is 0.995.

$$p = \frac{e^{-4.814 + 0.000003 (3,000,000) + 0.355 (12)}}{1 + e^{-4.814 + 0.000003 (3,000,000) + 0.355 (12)}} \quad (2)$$

$$p = 0.999$$

So, someone's chance to commute as his income is Rp. 3,000,000 with high school educational level is 0.999.

$$p = \frac{e^{-4.814 + 0.000003 (2,000,000) + 0.355 (16)}}{1 + e^{-4.814 + 0.000003 (2,000,000) + 0.355 (16)}} \quad (3)$$

$$p = 0.998$$

So, someone's chance to commute as his income is Rp. 2,000,000 with university educational level is 0.998.

$$p = \frac{e^{-4.814 + 0.000003 (3,000,000) + 0.355 (16)}}{1 + e^{-4.814 + 0.000003 (3,000,000) + 0.355 (16)}} \quad (4)$$

$$p = 0.999$$

his income is Rp. 3,000,000 with university educational level is 0.999.

From above calculations, it shows that workers' commuting probability may increase as respondents' income and education increase as well. Thus, other conditions may also be calculated with logistic regression equation estimated above.

CONCLUSION

Based on results of data analysis and discussions upon factors which influence the probabilities of commuting decision (a case study on workers of Semarang district commuting to Semarang city by RTBs), it can be concluded that income and education variables significantly and positively influence workers' commuting decision to while

marital status, land ownership, sex, and age variable do not significantly influence workers' commuting decision. Assuming that income expected from city is higher, it results in workers' commuting flows. Indicates that the higher their educational level, the greater their probability to commute to the city, and vice versa. This is relevant with Ravenstein's migration theory that people with higher educational level usually mobilize more than those with lower educational level. From the calculations, it shows that workers' commuting probability may increase as respondents' income and education increase as well.

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