Effect of Economic and Demographic Factors on Educational Mismatch Probability of Sectoral Workers

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Effect of Economic and Demographic Factors on Educational Mismatch Probability of Sectoral Workers

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Abstract: This paper analyzes effect of economic and demographic factors on probability of overeducated workers in Southern Sumatra. Research using binary logistic regression model to estimate probability of overeducation workers. The data used came from the National Labor Force Survey (SAKERNAS) 2018. Unit of analysis is the workers in Southern Sumatra, including South Sumatra Province, Jambi, Bengkulu, Lampung and Bangka Belitung. Sample consisted of 13 683 workers. Estimation results show that income, sector or business field, age and area of residence affect probability of workers being overeducated. Income is the most dominant factor determining probability by providing a positive effect, but vice versa with age factor. Changes in area of residence from rural to urban areas give greater possibility of overeducation but this is not the case if there is a change in employment sector from primary to non-primary. The phenomenon of overeducation implies that workers can more easily adapt and understand their work so that productivity is more easily increased. The possibility of over-education mismatch in the regional labor market in South Sumatra is very unique because although the absorption of workers is still dominated by the primary sector, when there is a change of work to the primary sector, the possibility of overeducation actually decreases.

Keywords: Overeducation, binary logistic regression, Income, Economic sector, age, region

Introduction

There has been a rising trend in the last decade in the percentage of the working age population who have higher education in Indonesia in general and Southern Sumatra in particular. It is also in line with the number of highly educated labor force that works. Implicitly, this situation also shows that investment in human capital through education has increased. A large number of studies have found that there is a part of the working

population is working at a job that requires a level of education below the level of their education (Groot & Maassen van den Brink, 2000; Hartog, 2000; Leuven & Oosterbeek, 2011; Rubb, 2003; Sloane, 2003; Wronowska, 2017). The phenomenon in this situation is called "overeducation". This is a sign for the economy that the labor market has run incorrectly. Overeducation role as a market signal is derived from the inefficiency and the deviation of the individual rational behavior, for overeducation provide wages lower than those earned by workers educate in accordance with his work. For companies, this overeducation labor force resulted in lower productivity, lower job satisfaction and higher levels of absenteeism. In turn, the community residents overeducation bring on a lower growth rate and waste resources.

Overeducation a voluntary decision of workers, companies benefit in assessing individual ratings based on their ability (Green et al., 2002) or an indication of an individual's capacity to adjust is the criterion of selection of workers (Léné, 2011). Charlot et.al, (2005) developed a model in which the advantages of education increases the probability of an individual to not be an unemployed. Finally, Albrecht and Vroman (2002) and Verhaest and Omey (2009) suggests that being unemployed makes a bigger stigma than work at a job where the individual is over-educated.

The purpose of this paper is to examine the possible role of economic and demographics factors of the phenomenon of educational mismatch in the Southern Sumatra labor market. Common topics in the literature about the return of education as human theory capital bring in predictive positive correlation between education and income. At issue overeducation, faced with the problem of how to define overeducation and how to measure it. Thus, this paper distinguishes overeducation and undereducation first, second, how to measure the chances of overeducation based on economic and demographic variables.

Literature Review

Overeducation a specific and complex phenomenon. Currently a problem in labor market in many countries around the world. Overeducation meaningful as education diplomas held beyond educational qualifications required for the job is taken. It also means situation where there is no compatibility between existing professional structures and needs of the market structure of higher education graduates. Thus there is an excess of graduates in labor market leading to decreased value of a diploma to below their qualification for a job.

Overeducation is characterized by a significant reduction in returns from higher education worker. This reduction is associated with increased supply of more educated workers in labor market. Overeducation also be identified through information from workers about its education and training required to perform the work (Ramírez 1993)

Educational mismatch is predictable through some theories. Rigid wage model states that labor market adjustment to shocks related to changes in workers' tasks in an occupation rather than changes in wages. To match the new, changing employers' selection criteria and recruitment; whereas for matching existing ones, workers assigned to another job or be fired. In addition, job search models predict that long duration of quest to encourage job seekers to temporarily accept a simple job and to pursue a job search. As already mentioned, empirical evidence does not confirm that cyclical fluctuations is important to

explain overeducation on a macro level. Other than that, micro-economic studies often get no or only partial evidence for hypothesis that differences in regional unemployment rate affects probability of being overeducated. However, unemployment rate measures only business cycle indirectly (Verhaest & Omey, 2009). Overeducation variation based on data cross various countries showed that problem overeducation first job pinned caused difference between science demanded and supplied in job market. For workers in the first five years after graduation, this is never so important factor possibility for workers to decide fill the shortage of special skills from field of science through additional training. However, quality and orientation of study program is important, especially to explain difference overeducation country. Obtained a positive impact on quality of program to opportunities to find a match on first job, probability to remain in job matching as well as probability of using overeducation as a stepping stone to get a suitable job.

Overeducation phenomenon is also connected with problem of structural economic structure and non-conformance in labor market. This means that overeducation is result of differences in education and economic structures. In Poland, for example, number of people with secondary and vocational education is systematically decreasing, while number of people with higher education are dynamically increased. This rapid growth associated with expansive development of private educational services at higher education level, more extensive and ease of access to higher education, desire to obtain a higher income, desire to get a better job (Wronowska, 2017).

In developing countries including Indonesia, overeducation arise partly because a person does not have much choice. Limited choice or lack of jobs that match their education encourage workers choose to work any more even though education is higher than that should be required rather than become unemployed. Or work in any sector as long as earn (Safuan & Nazara, 2005)

Labor market in Spain is characterized by a large number of workers overeducated, high unemployment, a powerful segmentation and declining returns from education. Using three alternative test methods overeducation signal role. First, compare the returns of education among workers of different groups and different degrees of mismatch job. Second, analyze the relationship between educational mismatch and job satisfaction, job search and job mobility. Lastly, using exogenous variation in education legislation. The results showed that return overeducation on group that is where signal is not important is lower. However, overeducated found to be low in work satisfaction and more courage to look for another job, indicated that they favored a more appropriate job (García-Mainar & Montuenga-Gómez, 2020)

Methods

In this paper we focus on worker aged 15 years and over who have status of workers in Southern Sumatra. Source of data from Sakernas (National Labor Force Survey) in 2018 that a special survey conducted by Central Statistics Agency (BPS). The Sakernas data used is a sampling of Southern Sumatra which includes the provinces of Jambi, South Sumatra, Bengkulu, Lampung and the Bangka Belitung Islands. The sample data used is data on workers as many as 13683 people. The first technique is to reduce the individual sample to the workforce sample (age > 15 years). Second, reduce the labor force data back into data for formal sector workers who have a number of working hours more than 40

hours by filtering questions in the employment module so that a sample of formal sector workers in Southern Sumatra is obtained.

Research model to estimate probability of educational mismatch is shown by multivariate regression model (Greene, 2012) Educational mismatch common functions are given as follows:

$$Y_i = f(X_1, X_2, \dots X_n) \tag{1}$$

Where the subscript $i\dots.1,2\dots,n$ refers to sample workers; Y refers to educational mismatch; $Y = 1$, if overeducation and $Y = 0$, if other. and X refers to various economic and demographics variables are income Ln (Inc), economic sector (Sec); 1 if the work in the primary sector (Agriculture, Forestry, and Fisheries and Mining and Quarrying) and 0 if it works in other sectors, Age (Ag), Region of residence (Reg); 1 if live in urban areas and is 0 if other.

in this case is a logit model with following equation:

$$Pr(Y = 1 \mid x) = \ln[p/(1-p)] = b_0 + b_1 Inc + b_2 Sec + b_3 Ag + b_4 Reg + e \tag{2}$$

Tests of significance on parameters are done by looking p value Compared with (level of significance) used in two tail null hypothesis. As for overall significance statistics using the likelihood ratio (LR statistics). LR statistic follows the 2 distribution (Chi-square) with df equal to number of independent variables (Gujarati, 2003) To assess the goodness of fit of mode, two criteria are used items, namely (Sujarweni, 2014):

1. Hosmer and Lemeshow's Goodness of Fit Test, ie, if the probability value is> 5%, it means the binomial logistic regression models was unfit for further analysis.
2. Assess the fit model items, namely the reduction in the value -2Log Likelihood Likelihood -2Log initial value in the next step will mean the hypothesized model fit to the data.

Educational mismatch measurement using Matched Realized (RM). In general, this research model developed from research conducted by Safuan and Nazara (2005), Saputra and Junaidi (2011), which calculates educational mismatch is overeducation and undereducation manner: First determine required education, in this research is to average seek time school (LS) for each type of job. The second refers to measurement method Matched Realized (RM), then a worker is classified overeducation on certain types of work where workers have a level of education (LS) is higher than average level of education for type of work. Instead undereducation occurs when worker education levels are lower than average level of education for type of work. Average level of education required for each type of work is as shown in Table 1 below. Types of work is a collection of jobs that have a series of concurrent tasks. The types of work in the KBJI are a collection of jobs that have quite the same main task so that they can be combined together in one group in the overall classification system.

Table 1. **The average education level by Type of Work**

Indonesia Occupation Qualification Standard (KBJI)	KBJI code	The average education level
Indonesian National Army (TNI) and Indonesian National Police (POLRI)	0	High School
Manager	1	Diploma
Professionals	2	Bachelor
Technicians and Assistants Professionals	3	Diploma
Power Administration	4	Diploma
Power Enterprises and Services and Sales Force	5	Junior School
Agriculture, Forestry and Fisheries Skilled workers	6	Primary School
Processing and Handicraft Workers	7	Junior School
Machine Operators and Assemblers	8	Junior School
Blue-collar workers	9	Primary School

Source: BPS, Sakernas 2018, processed data.

Findings

Table 2 shows that average income of workers in Southern Sumatra was Rp. 2,251,909.85 per month. Thus there are 62.8 percent of workers earn below average it means also a third of number of workers earning above the average. While connected to Provincial Minimum Wage (UMP) in 2018, Rp. 2595995 (South Sumatra); Rp. 2074673 (Lampung); Rp. 1888741 (Bengkulu); Rp. 2243718 (Jambi) and Rp 2,755,443 (Bangka Belitung), average income of workers on the basis of this survey is lower than minimum wage in the province of South Sumatra and Bangka Belitung but higher than in other three provinces. Also found that a quarter of workers earning above minimum wage the highest in Southern Sumatra.

Table 2. **Frequency Distribution of Income Workers**

Income	Amount	Percentage
≤Rp 1.200.000	3735	27.3
Rp 1.200.001 - Rp 1.900.000	3120	22.8
Rp 1.900.001 - Rp 2.600.000	3079	22.5
Rp 2.600,001 - Rp 3.300.000	1642	12.0
Rp 3.300.000≥	2107	15.4
Total	13683	100
Average	Rp. 2,251,909.85	

Source: BPS, Sakernas 2018, processed data.

Economic factors also determine probability of overeducated workers are business field or sector of employment. Absorption of workers in southern Sumatra in general is still dominated by primary sector (28.6 percent). While level of education high school educated workers by almost half to top (45 percent). It is sufficient to indicate that overeducation problem occur in this regional labor market.

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Table 3. **Frequency Distribution of Workers by Sector**

Sector	Amount	Percentage
Agriculture, Forestry, and Fisheries	3262	23.8
Mining and excavation	651	4.8
Processing industry	1199	8.8
Procurement Electricity and Gas	59	0.4
Water Supply, Waste Management, Waste and Recycling	49	0.4
Construction	1677	12.3
Wholesale and Retail Trade; Repair and Car Care	2663	19.5
Transportation and Warehousing	887	6.5
Accommodation and Eat Drink	510	3.7
Information and Communication	89	0.7
Financial Services and Insurance	208	1.5
Real estate	20	0.1
Company services	138	1.0
Administration, Defense and Social Security	974	7.1
Education services	483	3.5
Health Services and Social Activities	277	2.0
Other services	537	3.9
Total	13683	100

Source: BPS, Sakernas 2018, processed data.

Table 4. **Distribution Frequency owned by Education Level**

Level of education	Amount	Percentage
Not completed in primary school	1706	12.5
Primary School	3253	23.8
Junior School	2552	18.7
High School	4478	32.7
Diploma	455	3.3
Bachelor	1239	9.0
Total	13683	100

Source: BPS, Sakernas 2018, processed data.

Worker characteristics can also be observed from demographic factors such as age and region of residence. Based on the age of workers in regional areas of Southern Sumatra is a worker with an average age of highly productive is 38.7 years. Half of the sample of workers aged above this average. Similarly, if workers observed from the area where he lives. There is a balanced ratio between workers in rural areas with workers living in urban areas.

Table 5. **Frequency Distribution of Workers by Region**

Typology Region	Amount	Percentage
Rural	6838	49.97
urban	6845	50.03
Total	13683	100

Source: BPS, Sakernas 2018, processed data

Table 6. **Frequency Distribution of Workers by Age**

Working age	Amount	Percentage
15-19	546	4.0
20-24	1453	10.6
25-29	1548	11.3
30-34	1812	13.2
35-39	2056	15.0
40-44	1859	13.6
45-49	1657	12.1
50-54	1206	8.8
55-59	816	6.0
60+	730	5.3
Total	13683	100
Average	38.7	

Source: BPS, Sakernas 2018, processed data.

Overeducated workers probability is estimated using binary logistic models as shown in Table 7. Table 7 shows that feasibility of logit regression models seen from significance which is 0.104 greater than 0.05. This means that binomial logistic regression models is suitable for further analysis because there is no real difference between predicted and observed classification.

Table 7 **Result of Logistic Model Estimation**

Variable	B	SE	Wald	Sig	Exp (B)
LnInc	0.362	0,028	170.653	0,000	1,436
sector	-0.274	0,047	34.553	0,000	.760
Age	-0.043	0,002	677.999	0,000	0.958
Region	.518	0,040	167.790	0,000	1,679
Constant	-1.576	0,397	120.841	0,000	0,013

Initial -2 Log Likelihood: 17897,627; -2 Log Likelihood 16603,782
Chi Square Model: 13 233 (Df = 8; sig = 0,104)
Source: Processed Data

To evaluate fit model is by reducing the initial value to -2Log -2Log Likelihood value in next step. It is also shown in this study that there is a decrease in initial -2Log Likelihood value (in block 0) of 17897.627 with - 2 Log Likelihood in next step (in block 1) that is equal to 16603.782, Thus, hypothesized a model is fit with data.

Based on estimates, all statistically significant independent variables affect probability of overeducated workers. There is positive change in revenue to possibility of overeducated workers, are each 100 percent increase in revenue will increase 43.6 percent chance of becoming overeducated workers. Otherwise, the utility consequences of overeducation cannot be compensated for by reasonable wage increases. These results also suggest that when entering the labor market, overeducation is largely unintentional (Verhaest & Omey, 2009).

With rising incomes lead to more voluntary workers of education has far exceeded job qualification is practiced opposite if age increased one hundred percent then it will most likely be overeducated workers decreased 4.2 percent. The argument is that aging workers are not necessarily accept a job that educational qualifications below level of education they have.

Furthermore, sector with a value of B -0.274 give fact that any change in the work of non-primary sector to primary, assuming other variables constant, making possibility of becoming overeducated workers decreased by 24 percent (0.760 to 1). In other words, probability of becoming overeducated workers is smaller when affected because workers are employed in primary sector. This is consistent with fact that dominant primary sector to absorb labor in Southern Sumatra with educational qualifications for these types of jobs in this sector is low. Whereas if it is based on region of residence, possibility of becoming overeducated workers increased by 67.9 percent each occurred change of residence from rural to urban areas. The implication is that there are urban jobs categorized KBJI 5 to 9. It means that average educational qualifications to work on these types are elementary and junior high school. Indirectly it shows that workers in rural areas have at least junior high school or high school. The results of this study indicate that the problem of overeducation is something that has permanent and factual characteristics in the labor market, as is also the case in Poland (Wronowska, 2017).

Conclusion

Labor market in Southern Sumatra showed phenomenon of overeducational mismatch. Overeducated workers probability be significantly influenced by economic factors such as income and sector or field of business and demographic factors such as age and region of residence. Of these factors cause changes in income dominates the greater probability of overeducated workers, but on contrary if it is affected by age. The opposite condition is also demonstrated by effect of changes in residential areas and sectors or field of work. Overeducated workers become more likely because of changing area is determined by residence rather than changes in business sector or field workers.

Employers may benefit from the results of this research that phenomenon of mismatch overeducational this as a signal to empower workers more leverage because of educational qualifications that exceed requirements of job worker productivity could be encouraged to rise higher. Levels higher adaptation and knowledge of workers be factor that enables increased productivity. As for government it is also a signal that primary sector is still dominated by workers with low educational qualifications can therefore be done to improve quality by providing more training or even provide more opportunity for workers

to continue their education to a higher level. It is possible to add classes A, B and C packages in rural areas.

The policy implies that what educational structure is appropriate or optimal for the efficient functioning of the labor market is important. This efficient function may be related to minimizing or eliminating if imbalances in the labor market. This information will be very helpful in making national education policies for all levels of education and will provide the possibility to fully use the existing resources in the economy, especially human resources, in the future.

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