

# Will Finding Employment be Easier for Higher Education Graduates?

## Evidence from Job Mismatch in Indonesia

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### ABSTRACT

This paper is aimed to investigate whether higher education graduates are easy to get a job, and also whether their job is in accordance with their level of education or not. The expansion of higher education inline with the number of labor force making this research highly relevant for Indonesia. We use individual-level data from Survei Angkatan Kerja Nasional (Sakernas 2020) and constructing two logistic regression models: 1) probability of getting a job or not getting a job and 2) probability of working in match or mismatch qualification. This study finds that higher education graduates in Indonesia are easier to find a job, with a working probability of 94.46%, but among those employed, we find 62.64% probability of job mismatch. It implies that higher education increases the possibility of working, but does not determine that job is always in accordance with the qualifications of the worker's educational level. The existence of a job-mismatch indicates a lack of compatibility of supply and demand for educational qualifications in the labor market.

**Keywords:** *Employment, Job Mismatch, High Education.*

### 1. INTRODUCTION

The literature related to education - employment relations is an all-time interesting issue in labor economics. Survei Angkatan Kerja Nasional (Sakernas) noted that the percentage of the population who completed their undergraduate education to doctoral education in February 2021 increased by 2.2 times compared to the previous 10 years. In 2010, only 6.4 million or about 3,77 percent of total population aged 15 years and over had completed their bachelor's to doctoral degrees. Moreover, based on the results of the 2021 Sakernas, the population of Indonesia who has successfully completed education at the same level is 17.06 million or 8.31 percent of the total population aged 15 years and over. It means that the supply of young educated job seekers entering Indonesia labour market undergone a sharp increase. The augmentation in higher education has become a peculiar feature in the twentieth century caused by several macro-sociological causes such as the increase in the demand for labour with a higher level of education due to the globalization [1].

When the rise and the stock of higher education graduates are smaller, job seekers who hold higher education degree can secure satisfying and rewarding jobs easier or in the other words they make a higher employability. A graduate earns his/her employability when he/she can access a job, maintain it, or find another one [2]. In the literature, the employability level is assumed to rely on factors such as the readiness for work that influence the probability of getting a job and the individuals' characteristics [3]. In relation to the expansion of interest in tertiary education, fresh graduates may find it more difficult to get jobs with good circumstances than those who graduated and entered the labor market earlier. A common example is that labor may be offered similar positions, but with lower starting salaries or on short-term contracts, or they will even have to accept lower positions at work [4].

In relation to education and employment, the role of higher education institutions such as colleges and universities is becoming wider. In addition to delivering knowledge and skills and ensuring that graduates will get a decent job after graduation. These institutions are expected to create prospective

graduates who are ready to work with skills that can be useful and can be applied to their work [5]. With the previous explanation, it can be said that higher education and work are attached to individuals' expectations to increase career opportunities and expand networks that are beneficial for their future. Higher education allows students to find out career opportunities before graduating and expect their high qualifications through education as a factor that makes it easier to get a job [6, 7]. It was also found that the relationship between higher education and employment was significantly positive and it was proven that higher education greatly influences and is applied as a determinant of getting a job.

However, the high number of graduates with higher education sometimes creates problems in the job market, for example in the form of job-mismatch. The literature on job mismatch indicates that the imbalance between supply and demand for educated workers occurs because supply growth exceeds demand growth in both developed and developing countries. This disequilibrium condition can be caused by the slow adjustment of the company, the rigidity of labor wages, and market frictions [8, 9]. This kind of excess supply will result in a job mismatch in the form of over-education. In short, with a rapid increase in the number of graduates of higher education while on the other hand quality assurance mechanisms are still weak, or if many students choose higher education fields of study with limited job prospects, there is concern that this oversupply of educated workforce will end up in jobs requiring lower qualifications. This paper aims to investigate the possibility of finding employment in higher education graduates and the possibility of an education-job mismatch between them. Despite the expansion in interest in higher education and the size of the workforce, this research is a very relevant issue for Indonesia.

## **2. LITERATURE REVIEW**

### ***2.1. Education as an Investment***

The theory of human capital is relevant to the discussion of the effects of education and training on the labor market [10]. The bottom line is that individuals invest in education and training, which ultimately provides them with a skill set that an employer could need. In other words, education and training provide individuals with valuable skills returns that increase their productivity and income.

The principles emphasized by human capital theorists apply to investment in all forms and levels of education, including informal education such as training and university or college level [11].

The expansion of higher education is beneficial for increasing labor productivity and income in the labor market. However, on the other hand this phenomenon raises concerns about the possibility of the growth of vertical mismatch (over-education) arising from two aspects. First, the increasing number of students participating in diploma and undergraduate programs, which are also growing in number and variety, led to a greater increase on the supply side than on the demand side for a qualified workforce. As a result, a number of recently graduated job seekers will find jobs that do not require a bachelor's degree. Second, it is worried that universities' curriculum of study programs will be of less value to entrepreneurs. Diploma signaling ability is declining because many programs in higher education provide fewer job-specific and subject-oriented competencies. Teaching staff cannot invest enough time and effort to educate more students. The quality of higher education and study programs is a relevant factor in explaining over-education [12].

### ***2.2. Job Education Mismatch***

Job-education mismatch is usually measured by comparing the education achieved with the requirements for employment, both in terms of level of education and field of study. In the case of a vertical mismatch, workers who have attained a higher level of schooling than required are considered as over-educated. On the other hand, if the educational attainment of a graduate is lower than what is required, it can be called under-educated. This type of mismatch is also referred to as vertical mismatch [13]. Case studies, determinants, and consequences of vertical mismatches have been well looked after in many previous studies [see 14, 15, 16, 17, 18, 19], and various studies have provided useful summaries for reference in these studies [see 20, 21, 22, 23].

Overeducation can be defined as a condition if the level of education achieved by a person is higher than the level of education required for a job. This situation shows that individual human resources in terms of knowledge and skills are underutilized in the labor market, indicating that a highly educated but over-educated workforce is not allocated efficiently for their jobs [24].

For a long time, the literature on job-mismatch has observed the phenomenon of supply and demand imbalances for educated workers emerging in developing countries as supply growth is observed to outpace demand growth, mainly due to lags in firm adjustment and wage rigidity or labor market friction [8, 9]. Freeman first observed the problem of overeducation in 1976. In his macro-scale study in the United States, he found that many people in the workforce do not work in jobs that match their educational qualifications. Rumberger and Duncan and Hoffman then continued similar research in 1981, the difference being that the analysis was carried out at the micro level. Although their studies differ in terms of coverage, both studies found that overeducation experienced an increasing trend during the 1970s and 1980s in the United States [25, 26].

In the context of the higher education workforce, the education-job mismatch mostly refers to overeducation meaning that individuals are employed in jobs requiring a lower level of education than they managed to graduate. Job task theory stipulates that the fit between worker and job influences return to education. Thus, higher education determines higher productivity, but productivity is also determined by suitability for work. If a person works in a job that requires a lower level of education, the worker is not using his or her skills as a whole, which results in lower productivity [27]. On the other hand, job search theory states that mismatch is caused by imperfect information between job seekers and employers and that is why mismatches are so frequent among those who have just graduated.

**3. METHOD**

**3.1. Data Source**

The data for this research is sourced from individual data from the 2020 National Labor Force Survey (*Survei Angkatan Kerja Nasional/Sakernas*) which shows labor conditions in Indonesia. The research sample is limited to higher education graduates (consist of diploma to postgraduate) and at the time of the survey they may or may not have worked. Based on the data search, a sample of 61.345 person was obtained, and 57.888 of them were working.

**3.2. Measuring the Variables**

**3.2.1. Determining Mismatch**

For the classification of mismatch conditions in higher education graduates, descriptive analysis was used through crosstabulation between the education level attained and the type of work. Mismatch analysis regarding education and type of work can be done on the basis of the Presidential Regulation of the Republic of Indonesia (KKNI) or based on the Indonesian Standard Classification of Occupations (Klasifikasi Baku Jenis Pekerjaan Indonesia/KBJI) sourced from BPS. The Indonesian National Qualifications Framework (Kerangka Kualifikasi Nasional Indonesia/KKNI) shows nine qualification levels, level 1 indicates the lowest qualification and level 9 indicates the highest qualification. The following is the KKNI table:

**Table 1.** Educational Level and Job Qualification in KKNI

Education	KKNI Level	Job Title
Elementary, Middle School	1	Operator
High School, Vocational	2	Operator
High School	2	
Diploma I	3	Operator
Diploma II	4	Technician / analyst
Diploma III	5	Technician / analyst
Diploma IV/Bachelor degree	6	Technician / analyst
Profession	7 or 8	Expert
Magister	8	Expert
Specialis	8 or 9	Expert
Doctoral	9	Expert

Source: Presidential Regulation of the Republic of Indonesia No. 8 Year 2012

Based on table 1, there are 9 levels in the KKNI with job positions that are in accordance with the level of education. However, the division of higher education graduates (diploma up to doctoral) into 3 job positions in the table above is still lacking in detail. The division of types of work in detail can be seen through the Standard Classification of Types of Work in Indonesia (KBJI) by BPS. So based on the 2014 KBJI, there are 10 main types of work, ranging from professionals to operators and others. KBJI also showing types of work from the lowest to the highest qualification. So that the combination between the KKNI and the 2014 KBJI can be linked, namely between the type of work and the minimum level of

education required. The following is a crosstab between the education level attained and the type of work.

Mismatch will occur if there is the educational qualifications of the workforce is not match the work

being carried out. In this case the labor mismatch is divided into two, overeducation and undereducation. Overeducation is a condition where there is an excess of education needed in a certain type of work. Meanwhile, undereducation is the vice versa. In this study, three categories were used, namely:

**Table 2.** Occupation Mis(match) Category According to KBJI

No.	Main Group KBJI 2014	Completed Education					
		Elementary school	Middle school	High school	Diploma	Bachelor	Postgraduate
1	Manager	<i>Under</i>	<i>Under</i>	<i>Under</i>	<i>Under</i>	<i>Matched</i>	<i>Matched</i>
2	Professional	<i>Under</i>	<i>Under</i>	<i>Under</i>	<i>Under</i>	<i>Matched</i>	<i>Matched</i>
3	Professional Technicians and Assistants	<i>Under</i>	<i>Under</i>	<i>Under</i>	<i>Matched</i>	<i>Over</i>	<i>Over</i>
4	Administration Personnel	<i>Match</i>	<i>Match</i>	<i>Match</i>	<i>Over</i>	<i>Over</i>	<i>Over</i>
5	Service Business Personnel and Sales Personnel	<i>Match</i>	<i>Match</i>	<i>Match</i>	<i>Over</i>	<i>Over</i>	<i>Over</i>
6	Skilled Workers in Agriculture, Forestry, and Fisheries	<i>Match</i>	<i>Match</i>	<i>Match</i>	<i>Over</i>	<i>Over</i>	<i>Over</i>
7	Processing and Craft Workers	<i>Match</i>	<i>Match</i>	<i>Match</i>	<i>Over</i>	<i>Over</i>	<i>Over</i>
8	Machine Operators and Assemblies	<i>Match</i>	<i>Match</i>	<i>Match</i>	<i>Over</i>	<i>Over</i>	<i>Over</i>
9	Blue-collar workers	<i>Match</i>	<i>Match</i>	<i>Over</i>	<i>Over</i>	<i>Over</i>	<i>Over</i>

Source: KBJI 2014, modified

1 = undereducation (a condition where the education completed is lower than that required in a job).

2 = matched (condition in which the education completed is in accordance with what is needed in a job).

3 = overeducation (a condition where the education completed is higher than that required in a job).

### 3.2.2. The Independent Variables on Individual Characteristics

This study uses a series of predictor variables to determine the tendency to work and the tendency to experience job-mismatch for graduates of higher education. All independent variables are individual characteristics consisting of: 1) Gender, which is a dummy variable that distinguishes male and female samples; 2) Length of school measures the average time needed to complete the last education, measured in years representing diploma, bachelor, master, and doctoral education; 3) Age, stating the age of the respondent when surveyed; 4) Place of residence differentiates the classification of respondent's residence based on village and city; and lastly 5) Training that describes informal education that can improve the skills of graduates. This variable is a

dummy variable that indicates whether or not the graduate has a certain training certification.

### 3.3. The Data Estimation: Logistic Regression

The use of logistic regression in this study was based on the objective of the study whether a person with a higher education level has a higher tendency to work and how he or she tends to mismatch when they work. The following is the logistic regression model in this study.

Model 1:

$$\ln\left(\frac{Working_i}{1-Working_i}\right) = Y_i = \beta_0 + \beta_1 gender_i + \beta_2 yearofschooling_i + \beta_3 age_i + \beta_4 Ruralurban_i + \beta_5 training_i$$

Model 2:

$$\ln\left(\frac{Mismatch_i}{1-Mismatch_i}\right) = Z_i = \lambda_0 + \lambda_1 gender_i + \lambda_2 yearofschooling_i + \lambda_3 age_i + \lambda_4 ruralurban_i + \lambda_5 training_i$$

The estimated coefficients from the model above cannot be interpreted directly, so it is necessary to calculate the antilog value for each coefficient (odds ratio) using the formula below:

$$Odds\ Ratio\ Model\ 1 = \frac{Working_i}{1 - Not\ Working_i} = e^{\beta_0 + \beta_1 gender_i + \beta_2 yearofschooling_i + \beta_3 age_i + \beta_4 ruralurban_i + \beta_5 training_i}$$

$$Odds\ Ratio\ Model\ 2 = \frac{Mismatch_i}{1 - Mismatch_i} = e^{\lambda_0 + \lambda_1 gender_i + \lambda_2 yearofschooling_i + \lambda_3 age_i + \lambda_4 ruralurban_i + \lambda_5 training_i}$$

Using the coefficients of the logistic regression estimation results, the amount of someone's chance of working and someone's chance of mismatch can be calculated using the following formula.

$$P_i = \frac{1}{1+e^{-Y_i}}$$

$$P_i = \frac{1}{1+e^{-Z_i}}$$

#### 4. DISCUSSION

To determine the employability trend of higher education graduates, logistic regression analysis is used in model 1. Table 3 below shows the results of the logistic regression estimation in Model 1:

**Table 3.** Estimation Results of Model 1 Logistics Regression

Independent variables	β	S.E.	Wald	Prob	Exp (β)
Constant	1.083 ***	0.178	6.07	0.000	2.953 ***
Gender	0.119 ***	0.035	3.36	0.001	1.127 ***
Year of schooling	0.068 ***	0.010	6.81	0.000	1.070 ***
Age	0.011 ***	0.001	6.87	0.000	1.011 ***
Rural - Urban	-0.029	0.035	-0.83	0.406	0.970
Training	0.188 ***	0.035	5.32	0.000	1.207 ***
Pseudo R <sup>2</sup>	0.0061				
Prob Chi <sup>2</sup>	0.0000				

Note: significance level \*\*\*1%, \*\*5%, \*10%

The estimation results show that gender, years of schooling, age, and training have a significant positive effect on the likelihood of working at =1%, while place of residence has no significant effect on the likelihood of working. By looking at the prob chi2 value, it can be concluded that simultaneously all independent variables have a significant effect on the possibility of working. Pseudo R2 value indicates the ability of the independent variable to explain the dependent variable is 0.0061 or 0.61%, while other variables outside the model explain the rest. The use of logistic regression often results in a low R2 value, this is due to the limited data variation on the dependent variable which is between 0 and 1. The interpretation of each variable is as follows:

1. Gender. The probability of working for men is 1,127 times higher than for women.
2. Year of Schooling. If the year of schooling is increased by 1 year, the probability of working will increase by 1,070 times.
3. Age. If graduate's age increases by 1 year, the probability of working will increase by 1,011 times.
4. Rural - urban variable has no significant effect on the possibility of working.
5. Training. The probability of working for those who attended the training was 1,207 times higher than those who did not.

Employers usually see graduates with high GPAs and tend to select job applicants and prioritize experienced and skilled graduates who already have job skills. This is supported by [28] which states that a high GPA does not always guarantee employment because employers seek job applicants with theoretical and practical skills and are ready to work. This is because a perfect score does not reflect a lack of skills and abilities and does not reflect graduates' employability. A study conducted by [29] reported that industrial training programs help graduates to improve technical skills and gain practical experience so that they are more job-ready.

**Table 4.** Results of Marginal Effects After Logit on Model 1

Marginal Effects After Logit y = Pr (Working) (predict, p) = 0.9446 = 94.46%							
Independent variable	dy/dx	S.E.	Wald	Prob	95% C.I. for Exp (β)		X
					Lower	Upper	

Gender	0.0062 ***	0.0 01	3.3 7	0.0 01	0.0 02	0.0 09	0.47 93
Year of schooling	0.0035 ***	0.0 00	6.8 4	0.0 00	0.0 02	0.0 04	17.0 45
Age	0.0005 ***	0.0 00	6.9 1	0.0 00	0.0 00	0.0 00	38.9 39
Rural - Urban	- 0.0015	0.0 01	- 0.8 3	0.4 04	- 0.0 05	0.0 02	0.60 1
Training	0.0099 ***	0.0 01	5.2 7	0.0 00	0.0 06	0.0 13	0.56 5

Note: significance level \*\*\*1%, \*\*5%, \*10%

Based on the results of the marginal effects after logit in model 1, it can be concluded that the opportunity to work is 94.46%. These findings indicate a high probability of working in Indonesia. The value of the opportunity is obtained based on the following calculation.

$$Y = 1.083 + 0.119 \text{ Gender} + 0.068 \text{ Yearofschooling} + 0.011 \text{ Age} + 0.188 \text{ Training}$$

$$Y = 1.083 + 0.119 \times 0.4793 + 0.068 \times 17.045 + 0.011 \times 38.939 + 0.188 \times 0.565$$

$$Y = 2.833$$

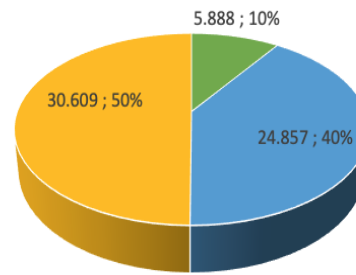
The Y value of 2.833 still shows the magnitude of the logistic probability, so the calculation is carried out as follows to find out the magnitude of the probability of working.

$$P = \frac{1}{1+e^{-Y_i}}$$

$$P = \frac{1}{1+2.718281828\dots^{-(2.833)}}$$

$$P = 0.9446 \equiv 94.46\%$$

As in many developing countries, such as Indonesia for example, one of the most remarkable developments in recent decades has been an increase in the number of tertiary education graduates and a consequent increase in the average education level of the workforce. However, among employed higher education graduates, the number of job mismatches in Indonesia is quite high. This study found that around 60% of workers were unfit (Figure 1), with the classification of 50% having overeducation and another 10% having undereducation.



■ Under Education ■ Matched ■ Over Education

**Figure 1** Higher Education Graduates Job Mismatch in Indonesia

Generally, the phenomenon of overeducation has been studied in Poland [30], Brazil [31], and other countries. In Indonesia, [32] found that vertical mismatch is closely related to labor wage with the propensity of workers who are overeducated to earn lower wages or it is known as wage penalty. To determine the tendency of highly educated workers to mismatch, logistic regression is used. Table 5 below shows the results of the logistic regression estimation in Model 2:

**Table 5.** Estimation Results of Model 2 Logistics Regression

Independent variables	$\lambda$	S.E.	Wald	Prob	Exp ( $\lambda$ )
Constant	10.442* **	0.13 1	79.7 1	0.00 0	34300.36* **
Gender	0.659** *	0.01 8	36.0 4	0.00 0	1.934***
Year of schooling	- 0.536** *	0.00 7	- 74.3 5	0.00 0	0.585***
Age	- 0.025** *	0.00 0	- 31.2 2	0.00 0	0.974***
Rural - Urban	0.291** *	0.01 8	15.8 6	0.00 0	1.338***
Training	- 0.484** *	0.01 8	- 26.4 1	0.00 0	0.616***
Pseudo R <sup>2</sup>	0.1284				
Prob Chi <sup>2</sup>	0.0000				

Note: significance level \*\*\*1%, \*\*5%, \*10%

The estimation results show that all independent variables have a significant effect on the probability of mismatch at =1%. By looking at the prob chi2 value, it can be concluded that simultaneously all independent variables have a significant effect on the possibility of mismatch. The Pseudo R2 value indicates the ability of the independent variable to

explain the dependent variable is 0.1284 or 12.84%, while the rest is explained by other variables outside the model. The use of logistic regression often results in a low R2 value, this is due to the limited data variation on the dependent variable which is only spread between 0 and 1. The interpretation of each variable is as follows:

1. Gender. The probability of mismatch for men is 1,934 times higher than for women.
2. Year of Schooling. If Length of School is increased by 1 year, then the probability of mismatch will decrease by 0.585 times.
3. Age. If Age increases by 1 year, then the chance of mismatch will decrease by 0.974 times.
4. Rural - Urban. The probability of mismatch for those who live in cities is 1,338 times higher than those who live in villages.
5. Training. The probability of mismatch for those who attended the training was 0.616 times lower than those who did not.

**Table 6.** Results of Marginal Effects After Logit on Model 2

Marginal Effects After Logit y = Pr (Mismatch) (predict, p) = 0.6264 ≡ 62.64%							
Independent variables	dy/dx	S.E.	Wald	Prob	95% C.I. for Exp (λ)		X
					Lower	Upper	
Gender	0.1527 ***	0.004	36.73	0.000	0.144	0.160	0.4793
Year of schooling	-0.1254 ***	0.001	78.05	0.000	-0.128	-0.122	17.045
Age	-0.0060 ***	0.000	31.24	0.000	-0.006	-0.005	38.939
Rural - Urban	0.0685 ***	0.004	15.80	0.000	0.060	0.077	0.601
Training	-0.1120 ***	0.004	26.86	0.000	-0.120	-0.103	0.565

Note: significance level \*\*\*1%, \*\*5%, \*10%

Based on the results of the marginal effects after logit in model 2, it can be concluded that the chance of mismatch is 62.64%. These findings indicate a fairly high probability of mismatch in Indonesia. The value of the opportunity is obtained based on the following calculation.

$$Z = 10.442 + 0.659 \text{ Gender} - 0.536 \text{ Yearofschooling} - 0.025 \text{ Age} + 0.291 \text{ Rural} - \text{Urban} - 0.484 \text{ Training}$$

$$Z = 10.442 + 0.659 \times 0.4793 - 0.536 \times 17.045 - 0.025 \times 38.939 + 0.291 \times 0.601 - 0.484 \times 0.565$$

$$Z = 0.5172$$

The Z value of 0.5172 still shows the magnitude of the logistic probability, so the calculation is carried out as follows to find out the magnitude of the mismatch probability.

$$P = \frac{1}{1+e^{-Zi}}$$

$$P = \frac{1}{1+2.718281828.....^{-(0.5172)}}$$

$$P = 0.6264 \equiv 62.64\%$$

Based on the literature, the company wants at least four aspects that its workers own. These aspects are learning content, participation skills, social skills, and methodological skills [33]. At the beginning of their careers, many graduates are not equipped with soft skills, such as communication skills, systematic thinking, leadership attitudes, or teamwork [34]. Employers also often see that new graduates do not have the basic skills to complete simple routine tasks, which gives the impression that their certification is still just a formality [35]. Another opinion states that university graduates are poorly trained and unproductive in work, and still lack skills in oral and written communication and technical skills on the job [36]. Various criticisms on the output of higher education graduates indicate the importance of various competencies that higher education institutions must improve in producing graduates. These improvements can be made by linking and matching university curricula that must align with and follow current business demands [33].

## 5. CONCLUSION

In the end this research found that in a case study in Indonesia, higher education increased the employability of graduates. However, it was also found that there was a tendency to experience mismatch at work by 62.64%. It cannot be taken for granted that employability directly links to individual characteristics and abilities. In developing countries, social inequalities still affect individual opportunities to access education, especially up to higher education levels. This stratification of higher education institutions and the labor market can hinder the gains gained through increased education and job skills, even if a worker has a high level of education. If the abundant supply of highly educated workers is not matched by adaptation to the labor market and wage system, more workers will experience overeducation and receive a wage penalty. Therefore, policy makers and higher education institutions need to take steps to effectively develop the employability of graduates

and the suitability of graduates' competencies with the needs of the job market.

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