



# Return to Education Estimation on Self-Employment Entrepreneurs and Their Comparison with Workers in Indonesia

D Wahyudi<sup>1,2</sup>, M Hanri<sup>3</sup>

<sup>1</sup> BPS Provinsi Sulawesi Selatan, Indonesia

<sup>2</sup> MEKK FEB UI, Indonesia

<sup>3</sup> LPEM FEB UI, Indonesia

\*Corresponding author's e-mail: [dwi.wahyudi@bps.go.id](mailto:dwi.wahyudi@bps.go.id)

**Abstract.** Entrepreneurship in various pieces of literature is mentioned as one aspect that adds value to a country's economy. Using Sakernas August 2019 data and the Mincer income model, this study estimates the educational investment in self-employed entrepreneurs. The results show a positive effect between years of schooling and income earned. Compared to workers, the level of assessment of entrepreneur education looks lower. In addition, this study also looks at how income among entrepreneurs. The Gini coefficient shows 0.47 for self-employed entrepreneurs and 0.41 for workers. There is a sizeable amount of income inequality for self-employed entrepreneurs.

## 1. Introduction

Entrepreneurship is one aspect that provides added value and affects the economic growth of a country and has the potential to absorb the workforce to reduce unemployment [1–3]. Entrepreneurship is not only seen as a source of increased income, but also a potential cause of poverty for others, due to the large proportion of entrepreneurs who are at the lower-end of the income distribution [4].

Compared to the last 30 years, the percentage of the population who are entrepreneurs in Indonesia has shown a decline. Based on Sakernas data, it shows 45.07 percent in 1991, the lowest in 2012 at 37.28 percent, and in the last five years has increased to 39.16 percent in 2020. Increasing entrepreneurship is one of the strategic policy objectives in the related development sector utilization of the demographic bonus, as stated in the 2015-2019 RPJMN Indonesia [5]. In this regard, increasing competitiveness and community business growth is one of the things that are in the government's spotlight.

On the other hand, in the last decade, human development in Indonesia has continued to improve. This improvement in development conditions is shown by increasing the HDI from 66.53 in 2010 to 71.94 in 2020 [6]. Education is one of the dimensions that consistently increases every year. Through the indicator of expected years of schooling and the indicator of the average length of schooling which continues to increase, it illustrates the progress in terms of education in Indonesia.

Education is one of the most important human capital, because education can improve the quality of employment and overall quality of life. In the long term, investment in the form of education has a positive contribution to the country's economy, through improving the quality of human resources [7]. This investment in education increases work productivity and income, which is related to the addition



of knowledge, skills, and problem solving in their work [7,14]. One form of measure of return on investment in education is through increased skill and productivity, which will indirectly have an impact on the monetary aspect of income earned by a person [9].

The rate of return on education is often used to describe educational options and their benefits on productivity at work. Several studies have examined the positive relationship between human capital in the income received, both for entrepreneurs and workers, where the higher the education, the higher the income received by a person [8–12]. Iversen et al., (2010) show that the return on education for self-employed entrepreneurs is lower than for workers, which is associated with the less usefulness of higher education in business activities [12]. Vijverberg (1995) in his research in Ghana, where developing countries are dominated by entrepreneurs in the agricultural sector, the rate of return on education tends to be lower [11].

Nevertheless, due to the different contexts of the analysis area, some kinds of literature give different magnitudes and results between the rate of return and between entrepreneurs and workers. By understanding how the rate of return on education to entrepreneurs in one place, it is hoped that it can help to implement the right policy decisions related to investments that must be made by policy makers.

This study uses employment data from the August 2019 Sakernas in Indonesia, and aims to see how the influence of education on the income of self-employed entrepreneurs in Indonesia. Furthermore, this study aims to describe the differences in income structure between entrepreneurs and workers in Indonesia.

## 2. Literature Review

The main drivers in entrepreneurial activities are economic incentives and motives for economic profit [13]. The inner drive of the individual is associated with economic benefits that become the motive for doing something. Incentives and benefits are considered as conditions for starting an entrepreneurial activity.

The human capital theory views human capital as the added value when a person acquires knowledge, skills, and other assets, which affects a person's ability in the labor market [7,14]. Human capital affects the increase in one's work productivity, also the income earned by a person will be affected [7]. Having a high level of education will increase the skills needed in business activities, such as the ability to understand risk and understand market prospects.

Parker (2004) sees that the magnitude of self-employment in developing countries is higher than in developed countries due to the sector that dominates the economy [15]. The dominance of the self-employed workforce in developing countries is illustrated by the existence of the agricultural sector as a major player in the traditional economy, as well as the limited development of the formal economy and financial markets. Parker (2004) also explains the high inequality in self-employed income [15]. This is related to the presence of a person's natural talent. The entrepreneurship skill also depends on factors outside of formal education, such as motivation and trading skills which are non-academic in nature.

Mincer (1958) in his study used an equation model that explained income as a function of school and experience [16]. Someone will choose the level of education (level of schooling) that provides a present value with a certain individual discount rate ( $r$ ) that maximizes lifetime earnings.

Several studies related to the rate of return on entrepreneurial education show that the educational return to entrepreneurs is different than the paid workers [8,9,11,12,17–19]. The higher the level of education of the individual, the income of the entrepreneur tends to be higher because it is associated with fewer organizational constraints, which lead to more personal control that utilizes human capital, compared to workers [19]. In the other hand, in the developing countries and countries are dominated by small entrepreneurs, the level of tendency of educational return will be lower [11,12]. Age reflects the accumulation of experience and workability of a person, so the effect on income is described as an inverted U pattern [9]. In addition, other things related to differences include work experience, area of residence, income distribution, and gender.



### 3. Methods

The source of the data used in this research is the Sakernas data for the August 2019 period by the BPS - Statistics Indonesia. The sample covered reached 300,000 households with a response rate of 99.73 percent spread across 34 provinces of Indonesia.

The main unit of analysis in this study is the self-employed entrepreneur. In addition, a comparative analysis was carried out with workers, which in general consisted of laborers/employees/employees, casual workers in agriculture, and casual workers in non-agriculture. The variables that will be used in this study, along with operational definitions are presented in table 1.

**Table 1.** Variable Establishment and Operational Definition

No	Variabel	Operational Definition	Scale/category
<b>Dependent variable</b>			
1	ln(earning)	Income earned by self-employed entrepreneurs	Continuous
2	ln(income)	Wages received by workers with the status of laborers/employees/employees, freelance workers in agriculture, and independent workers in non-agriculture	Continuous
<b>Independent variable</b>			
3	(ys)	Years of schooling	Continuous
4	(age)	Age	Continuous
5	(age2)	Age squared	Continuous
6	(urban)	Classification of living place	1=Rural 0=Urban
7	(marital1)	Dummy for marital status	1=Married 0=Single
8	(marital2)	Dummy for marital status	1=Divorced 0=Single
9	(internet)	Internet usage status in business	1= Using the Internet 0=Not using the Internet
10	(industry_sector)	Dummy for job	1= Industry 0= Agriculture
11	(service_sector)	Dummy for job	1= Service 0= Agriculture
12	(gray_collar)	Dummy for type of work	1= Gray collar 0= White collar
13	(blue_collar)	Dummy for type of work	1=Blue collar 0=White collar
14	(recentwork)	Previous work experience	1= Have work experience 0= No work experience

The method of analysis is descriptive and inferential. Descriptive analysis is used in the form of graphic analysis. While the inferential in the form of OLS analysis with the Mincer Earnings Function model approach. In the basic model developed by Mincer (1958), income in the labor market is described as a function of years of schooling, work experience, and work experience squared [16]. The basic model developed is as follows:



$$\ln W = f(S, X) = \beta_0 + \beta_1 S + \beta_2 X + \beta_3 X^2 + \varepsilon \quad (1)$$

where  $\ln W$  is the logarithm of present income,  $S$  represents the years of schooling,  $X$  represents work experience, and  $X^2$  represents the diminishing returns on the quality of human resources. The coefficients on the model,  $\beta_0$  is the logarithm of present income in the absence of experience and education,  $\beta_1$  describes the rate of return on educational investment for  $S$  years of schooling,  $\beta_2$  and  $\beta_3$  describes the rate of return from work experience, and  $\varepsilon$  is the disturbance term [16].

Furthermore, in this study, modifications were made by adding control variables to increase the accuracy of the results. The model specifications applied in this study are:

$$\ln w = f(ys, age) = \beta_0 + \beta_1 ys + \beta_2 age + \beta_3 age^2 + \beta_4 X_{control} + \varepsilon \quad (2)$$

where  $w$  is income,  $\beta_0$  is the intercept of a person with no education and no experience,  $ys$  years of schooling,  $age$  and  $age^2$  is used as a proxy for experience, and  $X_{control}$  is another variable used as a control. To fulfill the homoscedastic assumption, in this study, the standard error (SE) of the estimated regression coefficient was corrected using robust SE.

This study only analyzes those who are self-employed and compares them with workers. Therefore, one of the crucial issues that may arise is selection bias which results in the estimation of the coefficient of education variable being overestimated. Ideally, this condition is handled using the method proposed by Heckman (1976). However, the limited information in this study causes the method cannot be applied. Besides, the education variable may have endogeneity, which is caused by the correlation of education with several unobserved individual characteristics. Ideally, it is necessary to apply instrument variables to overcome this problem. To maintain the analysis in this study, so as not to get caught up in the complexity of the econometric model used, this study will only use ordinary least squares (OLS) by ignoring the issue of sample selection bias and endogeneity.

## 4. Results and Discussion

### 4.1. Overview on Self-employed Entrepreneurs

The main unit of analysis in this study is the self-employed entrepreneur. In table 2 below, the main characteristics of the unit used for analysis are shown.

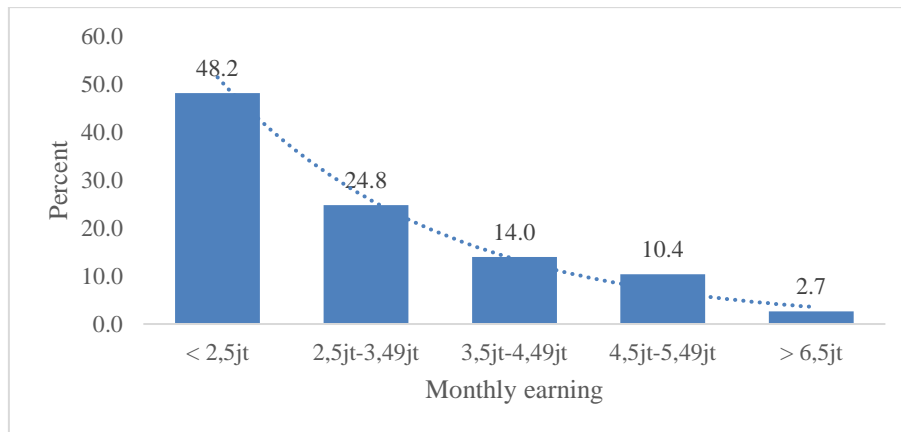
**Table 2.** Description of Research Sample

Characteristics	N	Percent
Education		
Below elementary school	23690	21.56
Elementary school	32076	29.19
Middle school	21012	19.13
High school	27674	25.19
above high school	4783	4.36
Age Group		
15-19 years	1559	1.4
20-24 years	4607	4.2
25-29 years	7605	6.9
30-34 years	10845	9.9
35-39 years	14303	13.0
40-44 years	14977	13.6
45-49 years	14951	13.6
50-54 years	12878	11.7
55 years and over	28144	25.6

Source: Sakernas August 2019 (author's calculation)



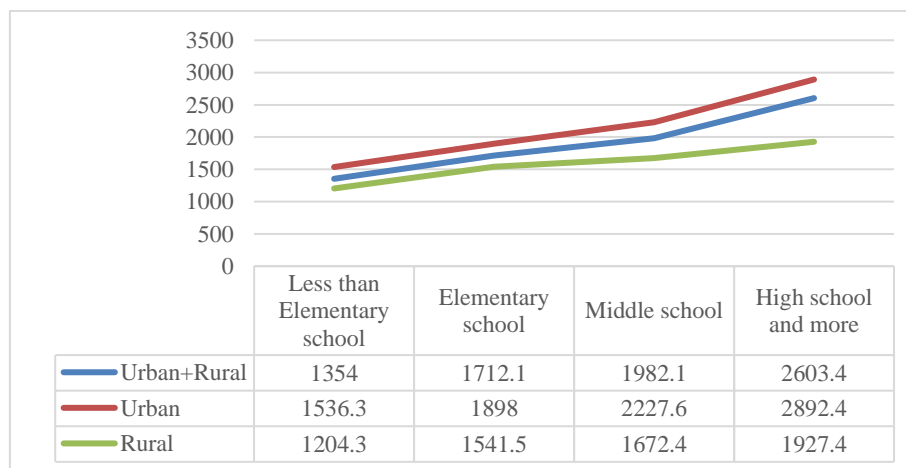
Based on table 2, it can be seen that most of the self-employed entrepreneurs are educated below high school, which is 70.5 percent. Meanwhile, those with high school education and above are 25.2 percent and 4.4 percent respectively. Judging from the age group, there is an increasing pattern. The higher the age group, the more entrepreneurs who are self-employed.



Source: Sakernas August 2019 (author’s calculation)

**Figure 1.** Self-employed Entrepreneur Income Distribution

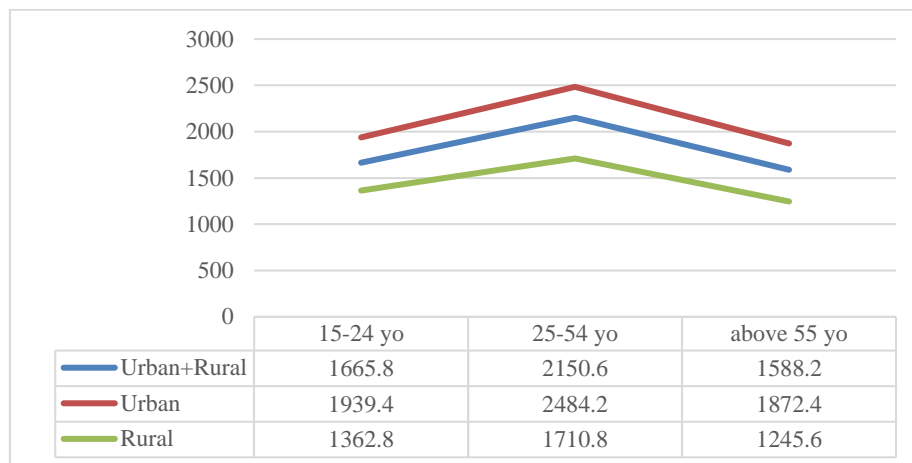
In the labor market, there is inequality in income, while some earn high incomes and others earn low incomes. The income distribution of self-employed entrepreneurs shows an asymmetric pattern with a skewed distribution to the right. It shows that the income distribution is dominated by entrepreneurs with low incomes. Only a few entrepreneurs earn a very large amount of income from the overall income distribution.



Source: Sakernas August 2019 (author’s calculation)

**Figure 2.** Average Income of Self-employed Entrepreneurs by Education

According to the level of education completed, it is seen that the level of education is positively correlated with the income of self-employed entrepreneurs. The higher a person's level of education, the higher the income earned. The difference in entrepreneurial income is caused by the investment in human capital, where the investment increases the capabilities needed in entrepreneurial activities such as understanding risks and understanding market prospects [15].



Source: Sakernas August 2019 (author's calculation)

**Figure 3.** Average Income of Self-employed Entrepreneurs by Age

The comparison between the age group and the income of self-employed entrepreneurs shows that age forms an inverted U-pattern. Young entrepreneurs are still accumulating investments in human capital (such as education), which returns increase with age. Then after reaching a certain age, the return decreases because of the diminishing effect on return.

#### 4.2. Rate of Return on Education

The estimated rate of return on education for self-employed entrepreneurs using OLS regression is shown as follows:

**Table 2.** Estimation Results of the Effect of Education on (log) income and (log) wages

Variable	Self-employed Entrepreneur	Workers
Year schooling	0.023 (0.001)***	0.055 (0.001)***
Age	0.061 (0.003)***	0.035 (0.002)***
Age squared/100	-0.061 (0.000)***	-0.020 (0.000)***
Residence place	0.146 (0.011)***	0.281 (0.005)***
Gender	0.523 (0.011)***	0.337 (0.005)***
Marital status (married)	0.165 (0.018)***	0.095 (0.007)***
Marital status (divorced)	0.187 (0.026)***	0.036 (0.013)***
Internet usage	0.092 (0.011)***	0.197 (0.005)***
Sector (industry)	0.046 (0.023)***	0.044 (0.011)***
Sector (service)	0.213 (0.019)***	-0.255 (0.010)***
Collar (grey)	0.097 (0.081)	-0.043 (0.006)***
Collar (blue)	-0.168 (0.018)***	-0.076 (0.006)***
Work experience	-0.100 (0.010)***	-0.055 (0.005)***
Constant	12.252 (0.065)***	12.677 (0.032)***

Note:

\*\*\* significant at the level 5%

The estimation results show that the impact of education on the income of entrepreneurs is positive and significant at the 95 percent confidence level. The estimated rate of return on education is 2.3 percent. This means that, on average, each additional 1 year of schooling will have implications for an increase in the income of self-employed entrepreneurs by 2.3 percent (*ceteris paribus*). These findings



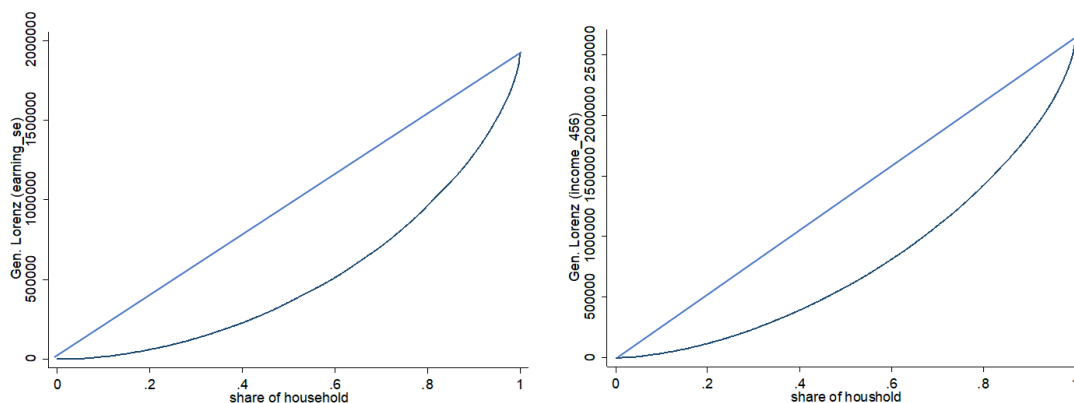
indicate that increasing the length of education can increase income. This result is in line with research by Vijverberg (1995) stating that the existence of education becomes increasingly useful in the economic rationalization of every decision taken by entrepreneurs [9]. The higher the education it will increase productivity and have an impact on the increasing income of entrepreneurs.

In line with education, the effect of the age variable (as an estimate from experience) on the income of self-employed entrepreneurs is positive and significant at the 95 percent confidence level. While the age variable squared is negative. It confirms that the positive influence of age (experience) on income decreases (diminishing return) with increasing experience or a person's age. The effect of age or experience follows an inverted U pattern. In line with the study of Hessel et al (2003), the longer the experience or the older the age, the lower the productivity [8]. This productivity is related to physical abilities that decrease as a person ages.

Compared to earnings from workers, the estimated rate of return on education yields higher returns than self-employed entrepreneurs. This indicates that the education of entrepreneurs in Indonesia is still not able to boost the productivity of their businesses. Entrepreneurs tend to work in a small scale, so the return on education is not as big as that of the workers. In addition, it also indicates that there may still be other things outside of education and variables in the model that affect the rate of return on entrepreneur. This finding confirms the research by Parker (2004) and Gustina (2020) that states entrepreneurial ability also depends on factors outside of formal education, which include motivation, non-academic trading skills and the influence of unmanageable family background through the modeling of this study [15-20].

#### 4.3. Entrepreneurial Income and Worker Wages Structure

The wage structure in the labor market is determined by the law of supply and demand, with some earning more than others. This difference in income illustrates the difference in productivity and the variation in the rate of return among workers [7]. In terms of structure, there is a fairly large income gap among self-employed entrepreneurs. The Gini coefficient of income for self-employed entrepreneurs in 2019 shows a figure of 0.47. In the same year, the percentage difference in income between self-employed entrepreneurs at the 90th and 10th percentiles was 12.33 percent, with a ratio of 13.33.



Source: Sakernas August 2019 (author's calculation)

**Figure 4.** Income Gap of Self-employed Entrepreneurs and Workers Wages

Meanwhile, when compared to workers, those who are self-employed tend to show a larger gap. The Gini coefficient for workers wages in 2019 was 0.41, lower than the income coefficient for self-employed entrepreneurs. The ratio of wage differences between workers at the 90th and 10th percentiles is 8.33.

There is a large disparity between the income of self-employed entrepreneurs and the wages of workers in Indonesia. The wage gap between the 90th and 10th percentiles tends to be larger for self-employed entrepreneurs. These results are in line with the research of Halvarsson et al. (2018) which



found a large disparity among entrepreneurs who are self-employed [4]. Most self-employed entrepreneurs are very low-income and widen the lower end of the overall income distribution. Those with low incomes are identified as micro-level entrepreneurial.

## 5. Conclusion

The estimation of the return on education model for self-employed entrepreneurs shows a positive impact. Each additional year of schooling affects an increase in income of 2.3 percent. The effect of education on workers also shows a positive impact and is greater than that of self-employed entrepreneurs, which is 5.5 percent. The lower rate of return on education in entrepreneurship is thought to be due to other factors in the academic aspect that are more influential, and cannot be measured in this model.

When viewed from the income structure, it can be seen that there is a large disparity among self-employed entrepreneurs. The Gini coefficient among self-employed entrepreneurs shows a value of 0.47 and the ratio of the difference between the 90th and 10th percentile wages is 12.33. When compared to workers, the Gini coefficient among workers is 0.41 and the ratio of the difference between the 90th and 10th percentile wages is 8.33. There is a fairly large income gap between self-employed entrepreneurs compared to workers in Indonesia.

For further research, it is necessary to improve in terms of methodology. The issue of selection bias in the data sample used, as well as the endogeneity of education needs to be studied more deeply in order to produce a more accurate estimate.

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