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Education, Informal Turnover and Poverty Dynamics in Indonesia

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ABSTRACT

The presence of informal and unskilled workers are the two major characteristics of the Indonesian labor market, representing around 57.27% of the total workers in 2019. Moreover, many studies on poverty dynamics have highly emphasized education attainment as an essential factor against poverty. However, how education can influence poverty especially through the labor market has not been deeply explored. Theoretically, people having higher educational levels would have greater chances to be hired in formal jobs that provide better incomes, enabling workers to move out of poverty. This study aims to analyze the effect of education on employment mobility from informal to formal workers (informal turnover), as well as its effect on the poverty dynamics in Indonesia. The exploration of the National Panel Socio-Economic Survey (2011-2013) revealed that those with improved education tended to move out of the informal sector, indicating that education had a significant effect on the tendency of moving out of informality. The study also found that the predicted informal turnover decreased the probabilities of being transient poor and always poor by 69% and 14%, respectively.

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INTRODUCTION

The increasing number of Indonesian workers makes employment an essential issue in the development of that sector, where the formal employment sector is still unable to absorb all labor force. This result is indicated through Indonesian labor market conditions in which most of the labor force represents informal workers, reaching 57.27% with a low educational level (BPS, 2019b). Consequently, one of the challenges in the Indonesian labor market at the moment is the high level of informality. According to the International Labor Organization (ILO), informal employment in Indonesia is 72.5% of the total employment (ILO, 2016). This figure is higher in Indonesia compared to other countries such as China and Thailand. The level of informality in Indonesia is almost parallel to those of India and Pakistan with the highest global levels of informality (ILO, 2016)[1]. On the other hand, the Indonesian government has allocated 20% of the national budget to education without significant impacts on primary education (Jasmina and Oda, 2018). Consequently, this measure raises the question of whether or not this result is linked with the informal sector.

The informal sector in Indonesia is still regarded as an essential sector since it is required in the development process and the modernization of society (mainly traditional or semi-traditional). According to Bappenas (2009), the informal sector is vital for a country with a large number of workers since it absorbs the labor force a higher amount of labor. On the other hand, the informal sector is often associated with the unorganized or unregistered sector and tends to be small scale businesses. Besides, working in the informal sector still uses simple technology, resulting in low levels of productivity compared to the formal sector (Noeraini, 2015). According to ILO (2010), working in the informal sector is associated with jobs involving inadequate working situations, low-income levels, intricate and high-risk jobs (low levels of security and job protection).

Working in the informal sector is often linked to poverty because it generally has low levels of education and skills as well as low-income, leading to workers vulnerable to poverty (Bappenas, 2009). ILO (2010) added that the high level of informality in a country could lead to losses as significant obstacles for developing countries in achieving global development goals regarding poverty reduction. Empirical studies also revealed that informal workers tend to be more vulnerable to poverty compared to formal workers (Loayza, Servén and Sugawara, 2009; Nazier and Ramadan, 2015; Eroğlu, 2017; Dartanto, Moeis and Otsubo, 2019).

Poverty issue remains an issue in many countries of the world as its eradication along with hunger is still a primary goal of sustainable development. One of the main challenges in tackling poverty is associated with labor represented by a large number of informal workers with low skills. These challenges can be solved through decent job creation and sustainable enterprises, with one key point is the economic transition from informal to formal economy (ILO, 2016). This economic transition is a challenge and a key to realizing decent work as a global development goal. Even if economic growth in a country is unable to encourage an economic transition from the informal economy to the formal economy and improve the condition of informal workers, it will only accentuate the problem of inequality and vulnerability of poverty (ILO, 2013).

In developing countries, the low level of education and skills of informal workers contribute to low levels of productivity and income; thus, increasing the education and skills of informal workers is also an essential point in improving capabilities along with opportunities for decent and productive employment (ILO, 2008). According to Becker (2009), education is one of the most important influencing factors in determining the quality of human capital. Through improved education and better skills of informal workers, it is expected that opportunities for employment in the formal sector will increase. Improving the education and skills of informal workers is considered a strategic element in improving work capacity and productivity, reducing poverty, and gaining new skills to cope with the formal sector (ILO, 2013; Lupeja and Gubo, 2017; Gregg, Macmillan and Vittori, 2019).

Based on the description above, the present research has two main objectives. First, it contributes to the literature on how education and its changes affect the job mobility of workers from informal to formal sectors. Second, it studies the effects of job mobility of workers, especially the shift from informal to formal sector on household welfare status based on the poverty dynamics.

[1] ILO (2016) report that the number of informal employment in several countries in Asia is as follows India (83.6%), Pakistan (78.4%), Indonesia (72.5%), Philippines (70.1%), Thailand (42.3%) and China (32.6%).

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Education, Job Mobility and Earnings

Borjas (2016) stated that labor turnover is a human capital investment. Human capital investment views the movement of labor as an investment that requires costs in hopes of getting a better future return. If the value of the benefits due to turnover is higher than the costs incurred, both in the form of monetary and psychological costs, then it can encourage someone to take on a labor turnover (Ehrenberg and Smith, 2012). Ehrenberg and Smith (2012) suggested that the movement or mobility of labor may occur even if the place or location of work does not geographically move (still called a turnover). Schettkat (1996) explained that there are several types of turnover in the labor market: (1) the movement from one job to another; (2) the change from one employer to another; (3) the shift from one industry to another; (4) the movement from one region to another; (5) the change of working status from work to non-work; and (6) the movement status from work to non-labor force.

Ehrenberg and Smith (2012) showed that the tendency of job mobility is highly selective, meaning that not all individuals have the same opportunity to make job mobility. Besides, they specifically mentioned that the tendency to make job mobility is higher in younger and highly educated individuals. Education is considered the best predictor of a person's tendency for job mobility. As pointed out by Ayyoub and Gillani (2017) and Barati et al. (2017), the achievement of higher education plays a vital role in poverty alleviation. The population at a young age has a higher tendency to change jobs because of two things: First, at a young age, the longer the benefits of human capital investment to be obtained, the higher the present value of benefits of changing jobs. Second, as people get old, the relationship or bond with the work community will also be more reliable, resulting in higher costs of moving jobs, because most of the costs of migration are psychological costs. So, the drive to change jobs also decreases with increasing age.

Perry et al. (2006) pointed out that education has a powerful impact on the potential for income improvement through the opportunity of job mobility. There are positive effects of education on earnings in Malaysia (Nahar, 2016; Yunus, 2018). The impact of education on earnings is seen from the marginal rate of returns. Higher education at a marginal rate of return is the highest compared to other lower qualifications. Lee and Wie (2017) found that adult skills have a positive and significant impact on individual income and job opportunities. Functional skills are obtained through higher education.

Informal Workers and Poverty

Most of the poor population in developing countries work as informal workers with self-employment status. Poor people usually respond to lack of adequate employment opportunities by creating their own independent employment opportunities (Fields, 2019). According to Devicienti et al. (2009), the decision to work in the informal sector is an option because of the lack of opportunities to access work in the formal sector. The lack of opportunities for employment in the formal sector is due to the limitation of formal employment so that workers do not quickly enter the formal sector. An alternative is the informal sector jobs that are relatively easier to access or exit (Amuendo-Dorantes, 2004).

The informal sector is often associated with an increased incidence of poverty and weak employment conditions due to work characteristics, which are jobs with limited access to capital and inadequate levels of education and skills (Diallo and Beckline, 2017). Furthermore, limited access to technology and exacerbated by poor infrastructure conditions increasingly make the informal sector less likely to prosper. Several studies showed that there is a positive correlation between the informal sector and poverty (Chen, 2001; Katungi, 2006; Dartanto, Moeis and Otsubo, 2019). Paillaud (1998) and Diallo and Beckline (2017) stated that the average income earned by workers in the informal sector is lower than that of workers in the formal sector.

Based on the income level, there is an income gap between formal workers and informal workers where the difference in average income between workers is around 30 percent (IDB, 2004). The income gap between informal workers and formal workers comes primarily from the low skills of informal workers. The two-thirds of the gap in the average income of workers in the informal and formal sectors can be explained by worker skills (Pianto et al., 2005). Perry et al. (2006) stated that to reduce the income gap and an essential point for informal workers to get out of poverty is to move jobs to the formal sector.

The description of the condition of informal workers characterized by low levels of income and productivity is one of the causes of poverty in the poverty cycle theory proposed by Nurkse (1953). This poverty cycle theory illustrates the low productivity of work affecting the low real income earned. This condition leads

to low savings and investment and purchasing power, resulting in a lack of capital and capital formation. The next stage, with the lack of capital and capital formation, will contribute to the low productivity that will ultimately impact back again on the low level of real income, spinning in the cycle of poverty.

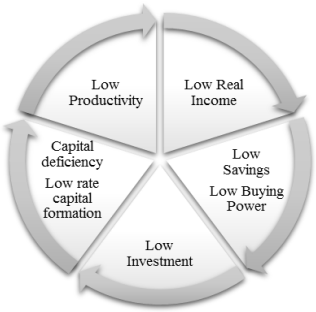


Figure 1 The Theoretical Framework of the Poverty Circle According to Nurkse (1953)

Gimpelson and Slonimczyk (2013), in their research about Informality and Mobility in Russia, revealed that the existence of the informal sector is a negative phenomenon for several reasons, namely: First, the informal sector is an economic activity that leads to inefficient activities, low investment rates, use of simple technology and no innovation in production. Second, income in some informal activities tends to be low and irregular, so that it connects informality with poverty. Third, informal workers face higher social exclusion because they are not covered by social security programs (except guarantees that are only provided by their own family or friends).

Concepts and Measurement of Chronic and Transient Poverty

According to Barrientos (2007), the primary definition of chronic poverty is based on the duration of poverty by defining chronically poor households as households with the income levels or expenditure levels at or below the poverty line in any or most of the household observation points (continuously below the poverty line). Meanwhile, transient poor households are households with income or expenditure that vary around the poverty line. Haughton and Khandker (2009) stated that chronic poor households are households with an average per capita expenditure during the study period, always below the poverty line, while temporary poor households are households with an average per capita expenditure above the poverty line. However, they have been poor in the period of study, and households that have never been poor are households with an average per capita expenditure that is always above the poverty line.

According to Yaqub (2000), the method often used in grouping the poor according to the poverty dynamics status of chronically poor and transient poor is a method of poverty decomposition with spells approach based on panel data. Based on the spells approach, chronically poor households are identified based on changes in poor and non-poor status over time determined by the comparison between the standard of living (income or expenditure) of the poverty line. So, in this case, all poor households are classified into always poor households or transient poor households. Meanwhile, households are categorized as always poor if, within the period of household observation, it still has an inferior status. Households are classified as transient poor if at least once in the period of the observation period, it did hold the status of poor households (Dartanto and Nurkholis, 2013).

Concept of Informal Economy

The concept of informality has been known since the 1970s. The term informal sector generally refers to the provision of fieldwork and production of small companies, either trying to own status or trying to have a small number of workers, or not officially registered. Then, at the 17th International Conference on Labor Statistics (ICLS) in 2003, the concept of the informal sector was developed into the "Informal Economy." Through this broader concept, informality can be found both in jobs that generate wages and self-employment in various economic sectors, appearing in informal and formal economic units. Although most informal jobs still appear in the informal sector, there are also formal sector workers employed informally.

In general, ILO (2013) defines informality in three main concepts, namely: 1) The informal sector refers to production and employment in companies that are not officially registered; 2) Informal employment focuses

on work outside the local labor protection regulations, both formal and informal companies; 3) An informal economy includes all companies, workers and activities taking place outside the local labor regulatory framework and the output they produce.

Previously, the Indonesian Central Bureau of Statistics (BPS) had long used the definition of the formal and informal sectors through questions about employment status divided into seven indicators, namely: 1) Self-employed; 2) Businesses assisted by temporary workers/unpaid laborers; 3) Businesses assisted by permanent/paid laborers; 4) Workers/employees; 5) Casual worker on the agriculture; 6) Casual worker in the non-agriculture; 7) Family workers/not paid worker. The business category assisted by permanent/paid workers and the category of workers/employees generally refers to workers in the formal sector. In contrast, the other categories are workers in the informal sector. This category is often used by BPS so that it can be used to see how the informal sector is developing in Indonesia.

RESEARCH METHODOLOGY

The analysis unit in the present study was the head of the household in 2011, whose development was observed until 2013 from the National Panel Socio-Economic Survey 2011-2013. The univariate analysis presented in Appendix A provides an overview of the characteristics of the head of the household based on education and the employment status changes, including other variables used in this study. Overall, the number of household heads as the analysis unit was 7,123 individuals consisting of 88.29% men and 11.71% of women spread almost evenly between urban and rural areas.

As much as 7.85% moved from informal workers to formal workers (informal turnover) from 2011 to 2013. Based on the poverty status[2] dynamics, most of them had never experienced poverty between 2011-2013, about 79.81% of households. Besides, the majority of household heads aged between 36 and 55 years with the level of education of lower secondary with a small proportion having improved education (as seen from the increase in the year of schooling) during that period.

Overview of Job Mobility and Poverty Dynamics in Indonesia 2011-2013

Based on the National Panel Socio-Economic Survey 2011-2013, there was a turnover or mobility of the head of household in that period. Overall (in 2013), more than half of the heads of households worked informal jobs at 57.4 (Table 1). In urban areas, there were 18% of household heads who changed jobs from informal to formal, whereas 20.7% of household heads changed jobs from formal to informal. A similar pattern is seen in rural areas where there were 11.4% of household heads moving jobs from informal to formal. Conversely, there were 37.1% of workers who entered informal jobs from formal jobs.

Table 1 The Job Mobility of the Household Head in 2011 and 2013

2011		2013			
		Does not work	Informal	Formal	Total
Urban	Does not work	281 (66.7)	92 (21.9)	48 (11.4)	421 (100)
	Informal	90 (6)	1142 (76)	270 (18)	1502 (100)
	Formal	78 (4.9)	328 (20.7)	1177 (74.4)	1583 (100)
Rural	Does not work	147 (60.7)	78 (32.2)	17 (7)	242 (100)
	Informal	116 (4.6)	2140 (84.1)	289 (11.4)	2545 (100)
	Formal	26 (3.1)	308 (37.1)	496 (59.8)	830 (100)
Java & Bali	Does not work	176 (61.5)	75 (26.2)	35 (12.2)	286 (100)
	Informal	79 (5.4)	1172 (80.5)	205 (14.1)	1456 (100)
	Formal	47 (5)	237 (25.5)	647 (69.5)	931 (100)
Outside Java & Bali	Does not work	252 (66.8)	95 (25.2)	30 (8)	377 (100)
	Informal	127 (4.9)	2110 (81.4)	354 (13.7)	2591 (100)
	Formal	57 (3.8)	399 (26.9)	1026 (69.2)	1482 (100)
National	Does not work	428 (64.6)	170 (25.6)	65 (9.8)	663 (100)
	Informal	206 (5.1)	3282 (81.1)	559 (13.8)	4047 (100)
	Formal	104 (4.3)	636 (26.4)	1673 (69.3)	2413 (100)
Total		**738 (10.4)**	**4088 (57.4)**	**2297 (32.2)**	**7123 (100)**

[2] Poverty is measured based on the ability to meet basic needs (basic needs approach). With this approach, poverty is seen as an economic inability to meet basic food and non-food needs measured through the poverty line.

This condition illustrating the pattern of job mobility from informal to formal is less than the mobility from the formal to informal. The latter result is in line with Gong, Van Soest and Villagomez (2004), who found that the level of entry into the informal sector in Mexico's urban areas was higher than the level of entry into the formal sector. Also, this situation illustrates that entering a formal sector is more complicated than an informal sector. Another opinion states that the lack of opportunities to get a job in the formal sector is due to the limitation of entering the formal sector as an alternative. Jobs in the informal sector are relatively more straightforward (Amuendo-Dorantes, 2004).

Based on the geographical locations, there were relative differences in the heads of households moving jobs from informal work to formal work, namely 14.1% for those living in Java − Bali and 13.7% outside Java−Bali. The opposite condition was observed for household heads living outside Java – Bali, those moving jobs from formal to informal were higher, i.e., 26.9% compared to those living in Java − Bali (25.5%). Based on this empirical data, entering formal sector jobs is more complicated than entering employment in the informal sector.

Table 2a Job Mobility in Indonesia, 2011-2012

Year/ Job Status		**2012**			
		Does not work	Informal	Formal	**Total**
2011	Does not work	443 (66.8)	171 (25.8)	49 (7.4)	**663 (100)**
	Informal	153 (3.8)	3386 (83.7)	508 (12.6)	**4047 (100)**
	Formal	76 (3.1)	561 (23.2)	1776 (73.6)	**2413 (100)**
	Total	**672 (9.4)**	**4118 (57.8)**	**2333 (32.8)**	**7123 (100)**

Table 2b Job Mobility in Indonesia, 2012-2013

Year/ Job Status		**2013**			
		Does not work	Informal	Formal	**Total**
2012	Does not work	480 (71.4)	143 (21.3)	49 (7.3)	**672 (100)**
	Informal	181 (4.4)	3433 (83.4)	504 (12.2)	**4118 (100)**
	Formal	77 (3.3)	512 (21.9)	1744 (74.8)	**2333 (100)**
	Total	**738 (10.4)**	**4088 (57.4)**	**2297 (32.2)**	**7123 (100)**

The job mobility from 2011 to 2013 showed that the tendency to remain in the previous sector, whether or not in the informal or formal sectors, was higher than those moving between jobs during the 2011-2012 and 2012-2013 periods (Table 2a and Table 2b). This finding is in line with Tansel and Acar (2017) report, which states that the probability of remaining in initial job is higher than the probability of transition into another. Table 2 revealed some critical information, namely the distributions of informal workers, formal workers, and those who did not work in 2011-2013 and the magnitude of the shifting in each group, as well as those who did not work from 2011-2012 and 2012-2013. There where 83.7% of those previously informal workers in 2011 remain informal workers in 2012 and 83.4% of those previously informal workers in 2012 remained informal workers in the year 2013.

Generally the formalization process of the informal sector, which is a transition process of the previously informal business status into a formal or the mobility of workers who previously worked in the informal sector to the formal sector, has not as expected. This result indicated by the small number of those who mobile from informal workers to formal workers, which is about 12% of the total informal workers. This finding is in line with Bappenas (2009) report, which states that in general, the formalization of the informal sector in Indonesia is not well, the opposite is the increasing number of businesses in the informal sector, especially small and home industries.

This study also revealed that households, household heads who worked as informal workers during 2011-2013, had an average growth of real per capita consumption expenditure of 8.35% from Rp. 504,663 to Rp. 546,811. Meanwhile, those who moved into formal employment in 2013 had an average growth in real per capita consumption expenditure of 25.10% (from Rp. 504,663 to Rp. 631,344) and 22.10 % (from Rp. 597,567 to Rp. 729,628) for those who moved from informal workers to formal workers in 2012. These results indicated an increase in the level of well-being based on the growth in the real per capita consumption level of households with household heads moving from informal workers to formal workers.

Furthermore, Table 3a and Table 3b shows the dynamics of household mobility through poverty vulnerability status from 2011-2013. According to BPS (2016a), the vulnerability to poverty (regarding expenditure) can be divided into five household groups, i.e., very poor, poor, near-poor, vulnerable poor, and

not poor. It also reveals some important information, namely the distribution of households (very poor, poor, near poor, vulnerable poor and not poor) in 2011-2013 and the shifting ratio in each group in 2011-2012 and 2012-2013. Besides, these tables also display the fact that there were still many Indonesian households falling into the categories of near-poor and vulnerable poor. Although a few can move into non-poor households, most of them are kept in vulnerability or poor and very poor households.

A similar pattern occurred in 2011-2012 and 2012-2013, illustrating that most of the poor Indonesian households (based on the conceptual poverty line) managed to get out of poverty with only a few slightly moving above the poverty line. So, the near-poor or vulnerable poor falls into poverty. Inter-year poverty dynamics can be seen using a poverty sequential transition matrix. This matrix may indicate a change in household poverty status in 2011-2013 (Figure 2). In 2011, 10.66% of households lived in poverty, and the remaining 89.34% did not experience poverty. Of those classified as non-poor in 2011, there was 93.54% in the non-poor category in 2012 (equivalent to 83.57% of total households in 2012). Then, in the non-poor household category in 2011 and 2012, there were 95.50% of them still in the non-poor by 2013. The households that had experience poverty in 2011-2013 were 79.81% of the total households.

Tabel 3a Household Mobility Pattern Based on Poverty Status in Indonesia, 2011-2012

Year/ Job Status		**2012** (%)					
		Very Poor	Poor	Near Poor	Vulnerable	Not Poor	**Total**
2011	Very Poor	86 (32.8)	65 (24.8)	46 (17.6)	43 (16.4)	22 (8.4)	**262 (100)**
	Poor	54 (10.9)	125 (25.2)	117 (23.5)	123 (24,7)	78 (15.7)	**497 (100)**
	Near Poor	31 (4.3)	125 (17.4)	180 (25.1)	215 (30.0)	166 (23.2)	**717 (100)**
	Vulnerable	38 (2.9)	115 (8.7)	237 (17.8)	460 (34.6)	478 (36.0)	**1328 (100)**
	Not Poor	23 (0.5)	79 (1.8)	202 (4.7)	730 (16.9)	3285 (76.1)	**4319 (100)**
	Total	**232 (3.3)**	**509 (7.1)**	**782 (11.0)**	**1571 (22.1)**	**4029 (56.6)**	**7123 (100)**

Table 3b Household Mobility Pattern Based on Poverty Status in Indonesia, 2012-2013

Year/ Job Status		**2013** (%)					
		Very Poor	Poor	Near Poor	Vulnerable	Not Poor	**Total**
2012	Very Poor	92 (39.7)	52 (22.4)	45 (19.4)	28 (12.1)	15 (6.5)	**232 (100)**
	Poor	79(15.5)	133 (26.1)	113 (22.2)	117 (23.0)	67 (13.22)	**509 (100)**
	Near Poor	44 (5.6)	120 (15.3)	211 (27.0)	255 (32.6)	152 (19.4)	**782 (100)**
	Vulnerable	34 (2.2)	104 (6.6)	264 (16.8)	574 (36.5)	595 (37.9)	**1571 (100)**
	Not Poor	8 (0.2)	61 (1.5)	118 (2.9)	554 (13.8)	3288 (81.6)	**4029 (100)**
	Total	**257 (3.6)**	**470 (6.6)**	**751 (10.5)**	**1528 (21.5)**	**4117 (57.8)**	**7123 (100)**

Based on total poor households in 2011 (10.66%), 43.48% were poor in 2012 or equal to 4.63% of the total households in 2012. From all poor households in 2011 and 2012, 57.27% were still poor in 2013. The always poor households in 2011-2013 reached 2.65% of the total households observed. This group of the household can be categorized as chronic poor in the end. Some households categorized as poor or non-poor in 2011 changed their poverty status between 2012 and 2013 and were referred to as transient poverty. In total, there were 17.53% of households changed their poverty status in that period. So, the total number of households as a whole from always poor and transient poor households during the 2011-2013 period was 20.18%. The relative poverty rate was higher than the poverty rate in 2013, based on a static approach of 10.2%.

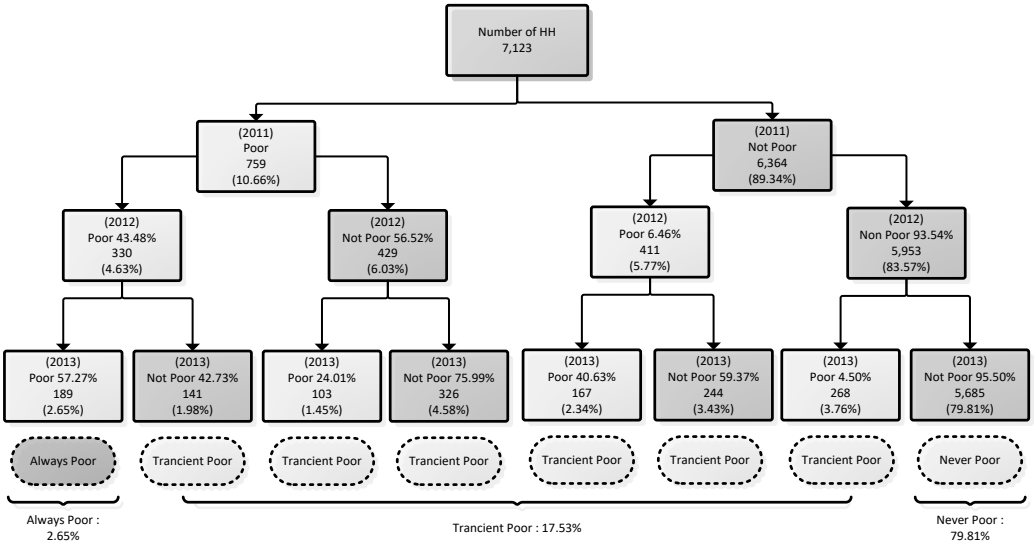


Figure 2 Sequential Transition Matrix of Household Poverty Dynamics in Indonesia

Data and Unit of Analysis

Research on informality and poverty can be done using the household head as a unit of analysis representing the measurements of poverty at the household level along with informality or other individual variables (Amuedo-Dorantes, 2004; Devicienti et al., 2009; Canelas, 2015). Therefore, the unit of analysis to be used in this study is the head of the household. The total household samples analyzed in this study were 7,123, representing the same households that could be found from 2011-2013. The target number of the National Panel Socio-Economic Survey 2011-2013 households was 10,000 households, and there were 2,877 households in 2011-2013 recorded as moving or not responding. Thus, there were 7,123 households in 2011-2013.

Model Specification

An ordered logit model was used to examine the impact of education on informal turnover and household poverty dynamics. The independent variables in this model were mostly divided into two groups: the 2011 primary variables and the 2011–2013 changed variables. The primary variables represented household conditions and positions that might change working and household poverty status in the next period.

This research will use inferential analysis with two approach models to find out more about how the primary independent variable affects the dependent variable. In the first model, an approach will prove that education influences the informal turnover, and the second model approach will demonstrate that based on the predicted probability value of informal turnover (the results of the first model influence the poverty dynamics). Independent variables in the model considered the data available in the National Panel Socio-Economic Survey 2011-2013. The econometric model of the ordered logit models (equation (1) and (2)) follows previous studies such as Dartanto, Moeis and Otsubo (2019), Gregg, Macmillan and Vittori (2019), Chetty and Hendren (2018), Tansel and Acar (2017), Dartanto and Nurkholis (2013):

$$job\_mob_{11-13} = \beta_1 educ_{11}(1) + \beta_2 educ_{11}(2) + \beta_3 \Delta\_educ_{11-13} + \beta_4 sex_{11} + \beta_5 age_{11} + e \quad (1)$$

$$poverty_{11-13} = \delta_1 jobmob_{11-13} hat_{|2} + \delta_2 t\_work_{11} + \delta_3 toddler_{11} + \delta_4 \Delta\_toddler_{11-13} + \delta_5 listrik_{11} + \delta_6 \Delta\_listrik_{11-13} + \delta_7 dtt_{11} + \delta_8 island_{11} + e \quad (2)$$

where:

$job\_mob_{11\text{-}13}$ = dependent variable (Household head job mobility status in 2011-2013): 0 = others mobility; 1 = always informal; 2 = informal to formal; 3 = formal to Informal; 4 = always formal;

$educ_{11}(1)$; $educ_{11}(2)$ = education dummy variables in the initial year as instrumental variables

$\Delta\_educ_{11\text{-}13}$ = changing in year of schooling 2011-2013 as instrumental variables

$poverty_{11\text{-}13}$ = dependent variable (Householed poverty dynamics status in 2011-2013): 0 = never poor; 1 = transient poor; 2 = always poor.

$jobmob_{11\text{-}13}hat_{|2}$ = predicted probability of moving from informal to formal workers (Informal turnover)

e = an error term

Note: *See Appendix B for details of all the variables

RESULT AND DISCUSSION

Inferential analysis in this study was carried out in two stages. The first stage was used to determine the effect of education as the leading independent variable on job mobility. This regression modeling was also carried out to obtain the predicted probability of job mobility controlled by changes in the year of schooling, age, and sex variables. Then, the next stage was carried out to determine the effect of job mobility based on predicted probability as the main independent variable towards the poverty dynamics.

Based on the results of the ordered logistic regression model in Table 4, the educational variables observed according to the highest diploma (in the category of non-school/not completed SD and SD-SMP equivalent grade for the initial condition, 2011) had adverse and significant effects on the jobs of household head mobility between the years 2011 and 2013 compared to high school education and above.

Table 4 Ordered Logit Model Estimation Results of Education in Job Mobility

Variables	Model 1a	Robust SE	Model 1b	Robust SE
(1)	(2)	(3)	(4)	(5)
Level of Education (2011)				
No school / no primary school	-1.964***	0.068	-1.453***	0.075
SD-SMP	-1.300***	0.061	-1.235***	0.064
SMA and above (ref.)				
Change in Year of Schooling (11-13)			0.054***	0.012
Sex (2011)				
Male			1.179***	0.087
Female (ref.)				
Age (2011)			-0.049***	0.002
/cut1	-3.166***	0.067	-4.442***	0.149
/cut2	-0.739***	0.052	-1.674***	0.143
/cut3	-0.352***	0.051	-1.265***	0.142
/cut4	0.163***	0.049	-0.729***	0.142
Observations	7123		7123	
Log pseudolikelihood	-9342.84		-8810.05	
Wald Chi-square	816.84		1713.67	
Pseudo R^2	0.053		0.107	

Note; ***) Significant at 1%; **) Significant at 5%; *) Significant at 10%

Table 5 Marginal Effects Education Ordered Logit Regression Model on Job Mobility

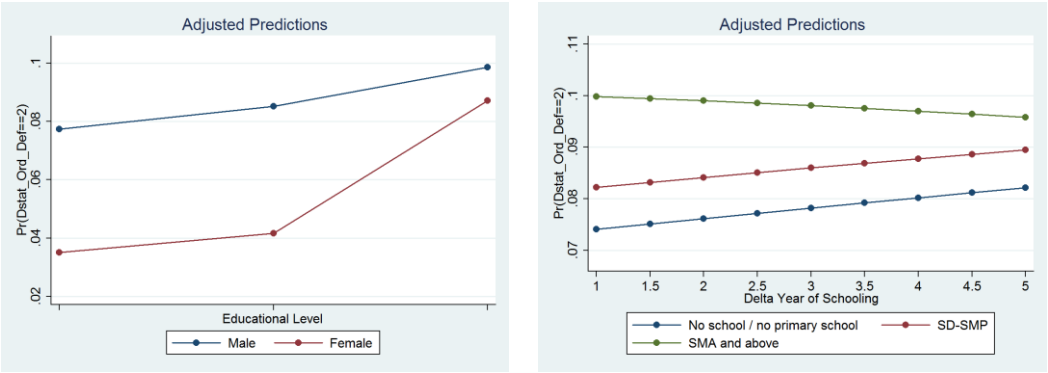
Variables	(dy/dx) Dynamics of Job Mobility				
	Others*	Always Informal	Informal to Formal	Formal to Informal	Always Formal
(1)	(2)	(3)	(4)	(5)	(6)
Educational level (2011)					
No school or no primary school	0.121	0.185	-0.016	-0.041	-0.249
SD-SMP Graduated	0.095	0.168	-0.010	-0.032	-0.221
SMA above Graduated (ref.)					
Change in Year of Schooling (2011-2013)	-0.005	-0.005	0.001	0.001	0.008
Sex (2011)					
Male	-0.152	-0.057	0.025	0.039	0.145
Female (ref.)					
Age (2011)	0.005	0.005	-0.001	-0.001	-0.007

Note: * Description: Other categories include not working

The marginal effects of job mobility from informal workers to formal workers for those who did not attend school/complete elementary school was -0.016. This result indicated that the moving opportunities of the head of the household, who did not complete school/ graduate from elementary school, from informal workers to formal workers decreased by about 1.6 percentage points compared to heads of households with high school education and above. On the other hand, the opportunity for household heads who did not attend a school or did

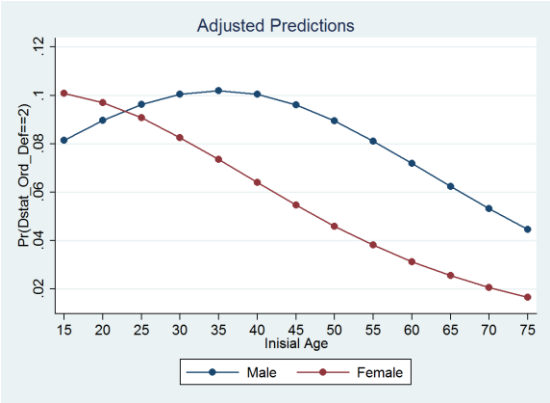
not finish primary school to keep working as informal workers increased by 18.5 percentage points compared to those with high school education and above. Based on the predicted value of the probability of a tendency to change jobs, the higher level of education, the more significant opportunity to move from informal workers to formal workers (Figure 3).

Besides, the level of education and changes in the year of schooling affected job mobility. Other variables that also affected job mobility are age and sex. When age and sex are linked, the opportunity to change jobs from informal workers to formal workers differs between women and men. For men, the tendency to perform informal turnover forms a pattern like the inverted U-letter, the increasing age goes along with the chances of changing jobs from informal workers to formal workers for about 35 years (after that, the chances gradually decrease). Meanwhile, the women tendency decreases with age (see Figure 4). These findings are in line with Ehrenberg and Smith (2012) and Akgündüz et al. (2019), suggesting that the tendency for the job change is highly selective in the sense that not every individual has the same opportunity to make specific job mobility. The tendency to make such job mobility is much higher in young, educated, and male individuals.



Note: *Analysis Model 1

Figure 3 Predicted Probability of Informal Turnover According to Education and Sex



Note: *Analysis Model 1

Figure 4 Predicted Probability of Informal Turnover According to Education and Sex

Table 6 Ordered Logit Model Estimation Results of Informal Turnover in Poverty Dynamics

Variables	Model 2a	Robust SE	Model 2b	Robust SE
(1)	(2)	(3)	(4)	(5)
Informal Turnover (Predicted Probability)	-3.021***	1.164	-5.523***	1.284
Working hours (2011)			-0.005***	0.001
Number of HH members 0-4 years old (2011)			0.823***	0.054
Change in HH members 0-4 years old (2011-2013)			0.331***	0.056
Electrical access (2011)				
Not Accessing Electricity			0.970***	0.129
Accessing Electricity (ref.)				
Electrical access (2011-2013)				
Not Electricity to Electricity			-0.086	0.163
Others (ref.)				
The geographical location (2011)				
Java and Bali			0.217***	0.066
Outside Java and Bali (ref.)				
Residential Areas (2011)				
Urban			-0.454***	0.065
Rural (ref.)				
/cut1	1.144***	0.093	1.079	0.102
/cut2	3.373***	0.116	3.395	0.124
Observations	7123		7123	
Log pseudolikelihood	-4139.06		-3933.62	
Wald Chi-square	6.73		432.91	
Pseudo R^2	0.0008		0.050	

Note: ***) Significant at 1%; **) Significant at 5%; *) Significant at 10%. **(**Analysis Model 2)

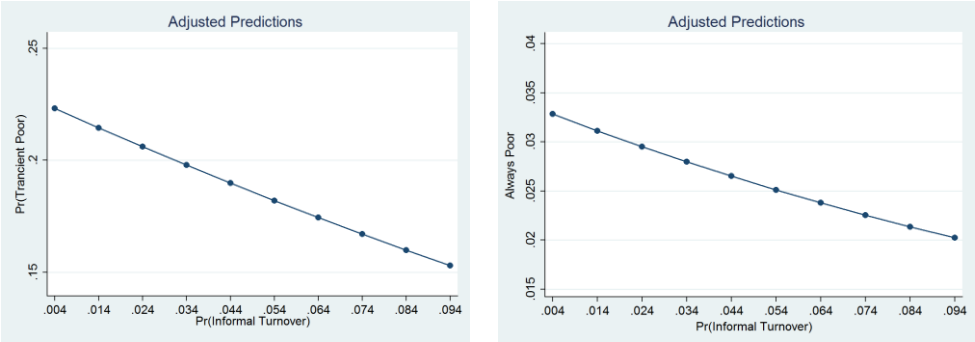
Table 7 Ordered Logit Model Estimation Results and Marginal effect of Informal Turnover on Poverty Dynamics

Variables	Model			dydx		
	Coefficient		Robust SE	Never poor	Transient poor	Always poor
(1)	(2)		(3)	(4)	(5)	(6)
Predicted Probability of Informal turnover	-5.523	***	1.284	0.834	-0.694	-0.140
Working hours (2011)	-0.005	***	0.001	0.001	-0.001	-0.0001
Number of HH members 0-4 years old (2011)	0.823	***	0.054	-0.124	0.103	0.021
Change in number of HH members 0-4 years old (2011-2013)	0.331	***	0.056	-0.050	0.042	0.008
Electrical access (2011)						
Not Accessing Electricity	0.970	***	0.129	-0.180	0.144	0.035
Accessing Electricity (ref.)						
Change in electrical access						
Not electricity to electricity	-0.086		0.163	0.013	-0.011	-0.002
Others (ref.)						
The geographical location (2011)						
Java and Bali	0.217	***	0.066	-0.033	0.027	0.006
Outside Java and Bali (ref.)						
Residential Areas (2011)						
Urban	-0.454	***	0.065	0.069	-0.057	-0.011
Rural (ref.)						
/cut1	1.079	***	0.102			
/cut2	3.395	***	0.124			
Number of observations	7123					
Log pseudolikelihood	-3933.6					
Wald Chi-square	432.9					
Pseudo R^2	0.050					

Note: ***) Significant at 1%; **) Significant at 5%; *) Significant at 10%

The results of the ordered logit model in Table 6 and the value of predicted probability (Figure 5) generally indicated that the tendency to move a job from informal workers to formal workers had a negative and significant impact on opportunities for both transient and chronic poor. The study found that (as predicted) informal turnover decreased the probability of being transient poor and always poor by 69 percentage points and 14 percentage points, respectively. The findings are in line with Okidi and Mugambe (2002) in their research on chronic poverty in Uganda. They found that people working as informal workers (as their primary activity)

had a higher chance of experiencing chronic poverty problems. It also mentioned that those moving jobs to formal employment outside the agricultural sector have a smaller chance of experiencing poverty. The characteristics of heads of households working as informal workers are low income and productivity with low skills that have implications for poverty, increasing the poverty incidence rate by 8 percentage points among male-headed households and by 4 percentage points in female-headed households (Amuendo-Dorantes, 2004; Devicienti et al., 2009).



Note: *Analysis Model 2

Figure 5 Predicted Probability of Transient and Always Poor Opportunities According to Informal Turnover Probability Trends.

CONCLUSION

Based on the results of the present research, education has a positive and significant impact on the tendency of heads of households to move from informal workers to formal workers. Also, the study found that the higher the propensity to change jobs from informal workers to formal workers, the lower the chances of experiencing transient poverty and chronic (always poor) poverty.

Education is an investment in human capital that not only describes the level of knowledge but also reflects the skills possessed. Therefore, the high levels of education indicate the vast knowledge and skills for dealing with works in the formal sector. In addition to the increased education and skills reflected in the increase in school length, the opportunity of moving from the informal sector to formal one had an impact on increasing productivity. High productivity affects income (high wages or better income) reflected in a better standard of living. The chances of experiencing transient or chronic poverty will be even smaller.

One of the mechanisms in poverty alleviation is the increase in human capital, especially education. Besides human capital, there is also a knowledge capital in the form of science and technology that increase productivity. This approach sees education as a means of increasing productivity. With better education for all, everyone has knowledge and skills along with the option to get a more relevant job and become more productive to increase income. In the end, this process shows that education can break the poverty chain, realizing the quality of life and welfare of a better society.

Given the importance of the linkage between education and employment, the government is also expected to pay attention to the transition from school to work. According to Adioetomo and Indrayanti (2018), this transition is a crucial stage that determines the success of the next life path (to old age) and always provides educational services for all. It should seek to improve the distribution of education, especially for the poor not able to go to school or drop out for various reasons. Moreover, education is a supporting factor in taking advantage of demographic bonus opportunities. Also, the government through the Ministry of Manpower should continue to encourage the expansion of employment opportunities and the provision of decent work in the formal sector through the improvement of a conducive investment climate embodied with sound governance system to absorb labor through the provision of high productivity (contributing to economic growth as a critical driver in poverty alleviation).

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APPENDICES

Appendix A Sample Distribution According to Its Characteristics

Characteristics	**Number (N)**	**Percentage**
(1)	(2)	(3)
Job Mobility (2011-2013)		
Other (including not working)	973	13.66
Always Informal	3282	46.08
Informal to Formal	559	7.85
Formal to Informal	636	8.93
Always Formal	1673	23.49
Poverty Dynamics (2011-2013)		
Never poor	5685	79.81
Transient poor	1249	17.53
Always poor	189	2.65
Educational level (2011)		
No school or no primary school	1969	27.64
SD-SMP Graduated	3138	44.05
SMA above Graduated	2016	28.31
Year of Schooling (2011-2013)		
Increased	1995	28.01
Not increased	5128	71.99
Sex (2011)		
Male	6289	88.29
Female	834	11.71
Age (2011)		
15-35 years old	1572	22.07
36-55 years old	3799	55.33
> 55 years old	1752	24.60
Electrical access (2011)		
Do not have access to electricity	544	7.64
Have access to electricity	6579	92.36
Change in electrical access (2011-2013)		
Not electricity to electricity	337	4.73
Others	6786	95.27
The geographical location (2011)		
Java and Bali	2673	37.53
Outside Java and Bali	4450	62.47
Residential Areas (2011)		
Urban	3506	49.22
Rural	3617	50.78

Source: Authors' calculations

Appendix B. Table Description of Variables in Model

Variables	Notation	Definition	Scale/Category	Question Code
(1)	(2)	(3)	(4)	(5)
Job Mobility	job_mob	The dynamics of the head of household work in 2011-2013	0 = Others 1 = Always informal 2 = Informal to formal 3 = Formal to informal 4 = Always formal	B5R31.11-B5R31.13
Poverty Dynamics	poverty	The dynamics of poverty status households in 2011-2013	0 = Never poor 1 = Transient poor 2 = Always poor	-
Educational level	educ	The last education that the head of the household rescued in 2011	1 = No school or no primary school 2 = SD-SMP Graduated 3 = SMA above Graduated*	B5R17.11
Changes in the year of schooling	Δ_educ	Changes in the year of schooling heads of households in 2011-2013	Numeric	-
Sex	sex	The sex of the head of the household	1 = Male 2 = Female*	B4AK4.11
Age	age	Age of household head in 2011 (initial condition)	Numeric	B4AK5.11
Working hours	t_work	Working hours of the head of household in 2011 (initial condition)	Numeric	B5R28B.11
Number of Household members aged 0-4 years	toddler	Number of Household members aged 0-4 years (initial condition)	Numeric	B2R2.11
Change in number of Household members aged 0-4 years	Δ_toddler	Change in number of Household members aged 0-4 years in 2011-2013	Numeric	-
Electrical access	listrik	Status of household lighting source 2011 (initial condition)	1 = Do not have access to electricity 2 = Have access to electricity*	B6R14A.11
Change in electrical access	Δ_listrik	Change in status of household lighting source 2011 2011 -2013	1 = Already accessing electricity in 2013 but 2011 yet 2 = Others *	B6R14A.11-B6R14A.13
Residential Areas	dtt	Residential Areas in 2011	1 = Urban 2 = Rural *	B1R5
Geographical location	island	The geographical location of the household is located (initial condition)	1 = Java & Bali 2 = Outside Java & Bali *	-

Source: Authors' calculations