WORKER TRANSITION ACROSS FORMAL AND INFORMAL SECTORS: A PANEL DATA ANALYSIS IN INDONESIA

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ABSTRACT

This paper examines the transition of workers between formal and informal jobs based on socio-demographic and employment characteristics. The study identifies factors that increase the likelihood of workers remaining in formal employment. The multinomial logistic regression model is incorporated to analyze labor transitions based on data from Indonesia's National Labor Force Survey *(Sakernas)* of 2017–2018. The findings show that 56.34% of workers were in informal activities and 30.58% were in formal jobs. Workers who transition from informal to formal jobs made up 6.84%, while 6.24% transitioned from formal to informal occupations. Informal workers were reluctant to move to the formal sector. Workers who are younger, unmarried, male, living in urban areas, and more educated are more likely to relocate from the informal to the formal sector. Work experience and participation in certified training can help shift workers to the formal sector, especially within the manufacturing industry.

Contribution/Originality: Using a large and unique dataset on labor force in Indonesia, this study examines the role of socio-demographic factors, employment characteristics, training, and work experience as drivers of labor mobility. The study highlights that labor transition is significantly explained by demographic characteristics (i.e., age, gender, location, and marital status), employment status, sectoral activity, work experience, and training. Factors explaining workers' transitions between informal and formal activities, and between sectors, are different, suggesting that policy makers need to take into account such factors when designing labor policies.

1. INTRODUCTION

The high degree of labor informality in developing countries has attracted the attention of scholars, especially after the concept of informal labor was introduced by Hart (1973). This phenomenon is widely studied in developing countries where a large unskilled labor force exists, wages are deficient, jobs are insufficient, and informal economic activity is common. Although informality exists in all nations regardless of socioeconomic development, it is more abundant in developing countries where labor markets tend to be undeveloped. The International Labor Office (2018) reported that in 2018 more than 61% of the working population in the world were informal workers. Indonesia, the fourth largest labor market in the world (with nearly 130 million workers), has experienced a decline

in informal employment during the past ten years, from 69% in 2009 to nearly 58% in 2018 (see Figure 1). Still, 58.22% of workers in Indonesia are informal, and more than 50% of these are male and mostly live in rural areas (BPS, 2018).

It is important to analyze whether the status of informal workers is merely temporary, a waiting phase before they switch to the formal sector, or whether the status of informal workers is permanent. Workers in the informal sector tend to be poorly educated, have low skills, and lack access to financial sources (Todaro & Stephen, 2012). Informal workers are associated with unattractive jobs, low disposable income, high risk of falling into poverty, and lack of social security/protection (International Labor Office, 2010). Furthermore, informality has dangerous impacts on workers' rights and compromises the permanence of firms due to low labor productivity (International Labor Office, 2018). Hence, the transitioning of informal workers to formal economic activity occupies a central position in the international labor agenda. The ILO has promoted decent work in recommendation No. 204, widely adopted by policymakers in the developing world. Other international initiatives endorsed under the banner of the United Nations Sustainable Development Goals (SDGs) of 2015 also aim to promote inclusive and sustainable economic growth and to create productive and decent work for everyone (target number eight).
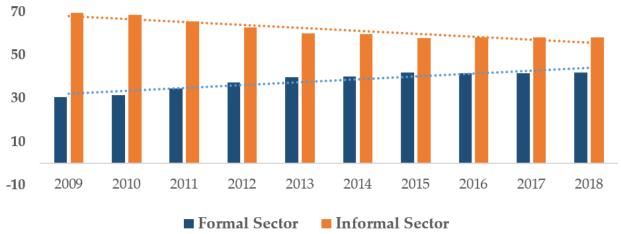

Figure 1. Trend of formal and informal workers in Indonesia 2009–2018.

Source: Indonesia Statistics.

Several studies on determinants of labor mobility have examined whether socio-demographic variables help explain the movement of workers between formal and informal sectors (Bernabè & Stampini, 2009; Essers, 2017; Gong, Van Soest, & Villagomez, 2004; Taufiq & Dartanto, 2020). Education and age variables are commonly found to significantly affect the transition of workers from the informal to the formal sector in countries such as Indonesia. Individuals with higher education attainment have a greater chance of transitioning from the informal to the formal sector (Taufiq & Dartanto, 2020). Other studies have analyzed employment variables such as work experience and job training as drivers of labor transition (Funkhouser, 1997; Ju & Li, 2019; Lehmann & Pignatti, 2018; Tansel & Elif, 2017). Both training and the length of work experience are believed to increase permanence in the workplace, particularly in formal employment.

Unfortunately, most of the previous studies on formal–informal worker transition in Indonesia focus on inter-regional mobility (Kataoka, 2019; Vidyattama, 2016), sectoral migration (Moeis, Dartanto, Moeis, & Ikhsan, 2020), urban–rural mobility (Rudiarto, Hidayani, & Fisher, 2020), and mainly provide only a static analysis. Although it is expected that informal employment would be temporary, as workers gain experience and acquire skills, transitioning to formal employment has not been entirely successful in Indonesia. The slow formalization of the informal work in Indonesia can be related to uneven growth in labor opportunities, as jobs for more educated workers have larger dynamism than those for workers with a lower level of education (Wong, 2019; Yasin,

Esquivias, & Arifin, 2022). Mobility from rural to urban areas, where better jobs flourish, remains risky for workers as the cost of moving is high and asymmetries in information remain high (Calì, Hidayat, & Hollweg, 2019). Labor matching across both formal and informal positions remains low as job rotation in some sectors is high, the cost of searching for new jobs is high, and a number of workers are hired for jobs that do not match their skills (Calì et al., 2019; Tentua & Edi, 2020).

The slow formalization of jobs and the existing numbers of informal workers suggest that further studies on labor mobility are needed. This study applies a dynamic analysis to a large panel of data from Statistics Indonesia, which allows the tracing of individuals over time. The dataset taken from the National Labor Force Survey (*Sakernas)* is particularly interesting as it is designed to report on dynamic aspects of the labor market. The Sakernas survey collects data on job training, work experience, and former employment. Earlier versions of *Sakernas* have been applied to studies on female labor participation (Schaner & Smita, 2016) and has proven to be a useful dataset.

Therefore, this paper examines employment transition from both informal to formal, and formal to informal jobs in Indonesia based on socio-demographic characteristics (i.e., urban or rural location, geographic region, age, gender, and sector) and employment status. Similarly, this study tests whether education, training, and work experience are drivers of labor mobility, either from informal to formal or from formal to informal, and whether such factors can explain the likelihood of workers staying in formal activities. Informal workers include informal entrepreneurs, casual employees, and family workers. Formal laborers include formal entrepreneurs and registered employees.

The structure of this research is as follows: Section 2 presents a literature review on labor transition; Section 3 presents the methodology and data; Section 4 explicates the results and provides the discussions; and Section 5 contains the conclusion.

This study contributes to the literature of labor mobility in the following ways. First, we provide evidence based on longitudinal data on mobility across formal–informal activities, and the permanence of workers. Earlier studies have looked at mobility across sectors, regions, and locations (Calì et al., 2019; Kataoka, 2019) but have not provided estimates based on formality level. Second, we study the nexus between socio-demographic variables and labor mobility aimed at identifying sectors where policy efforts can bear fruit in supporting formality and identifying vulnerable groups (or slow movers) toward formality who may require additional policy support (Pitoyo, Aditya, Amri, & Rokhim, 2021). Third, we test whether improving skills development and training may help to increase mobility toward formal activities and increase permanence in formal employment. Finally, we provide insights into entrepreneurship, which is often overlooked in labor mobility studies in Indonesia. Entrepreneurship is critical in Indonesia as a large majority of workers are self-employed and formal entrepreneurship remains notably low.

2. LITERATURE REVIEW

This section presents empirical evidence from studies addressing worker transitions. The main intention of the literature review is to provide support for the logic behind the model proposed in this paper and highlight empirical gaps in the literature.

Several studies on determinants of labor mobility across formal–informal sectors involve socio-demographic variables; for example, Bernabè and Stampini (2009); Essers (2017); Gong et al. (2004) and Taufiq and Dartanto (2020). In a study using four waves of data from 2008 to 2015 in South Africa, Nackerdien and Yu (2019) found that only 27% of informal sector workers in the first wave had transitioned to the formal sector in the fourth wave; 38% remained in the informal sector; and 33% changed status to non-labor force or unemployed. They also found that male workers had a 10% greater chance of transferring from the informal to the formal sector than females, similar

to the findings of Tansel and Elif (2017) in Turkey. Furthermore, marital status indicated that individuals living with a spouse have a 10% higher chance of transitioning to the formal sector.

Another strand in the literature of labor mobility analyzes the roles of education, work experience, and job training in labor mobility (Anand, Ingle, Meena, Kishore, & Yadav, 2015; Funkhouser, 1997; Lehmann & Pignatti, 2018; Tansel & Elif, 2017). In labor transition, the role of education has been widely recognized as an indicator for assessing worker quality as it reflects labor knowledge and skills. In general, educational success extends opportunities for entering formal employment (Cano-Urbina, 2015; Essers, 2017; Gong et al., 2004; Maloney, 1999; Pagés & Stampini, 2009). Nackerdien and Yu (2019) found that education had a positive non-linear relationship with formal job opportunities in South Africa. In the context of Indonesia, education appears to significantly prompt the transition of workers from the informal to the formal sector (Kataoka, 2019; Wong, 2019).

The literature on labor mobility in Indonesia hints that labor formalization has not proceeded smoothly (Kataoka, 2019). The descriptive statistics derived from the *Sakernas* survey indicate the transition dynamics across sectors, which show that only 12% of the total informal laborers transitioned to the formal sector in the 2017–2018 period. Most workers stayed in their previous sector. This phenomenon indicates that entering the formal sector remains challenging and that labor mobility in the country is low. Earlier studies in Indonesia have pointed out a decrease in labor mobility, particularly from the primary to the secondary sector as demand for low-skilled workers was falling and higher-skilled workers were required (Moeis et al., 2020; Tentua & Edi, 2020). The cost of labor mobility has increased for some industries and also for the urban–rural mobility (Calì et al., 2019) partly due to property cost, risk, and uncertainty. Increasing prices of property increases the cost of workers' mobility. Labor mismatching and the low impact of systems to pair workers and firms also lower the effectiveness of labor mobility (Calì et al., 2019; Tentua & Edi, 2020).

Regarding labor transition between formal and informal activities, evidence suggests that gender, education, and employment status significantly affect the labor transition pattern across developing countries. Female workers often have less chance of transferring from informal to formal labor as noted in cases in Turkey (Tansel & Elif, 2017), South Africa (Nackerdien & Yu, 2019), and Indonesia (Cameron, Diana, & William, 2019; Comola & De Mello, 2009; Kataoka, 2019). Individuals with university degrees have a greater chance of transitioning to the formal sector (Tansel & Elif, 2017) compared to workers with basic education. Workers within the agricultural, service and construction industries have a lower tendency to transition to the formal sector than workers in secondary industries. Unemployed people have the lowest opportunities to access the formal sector, suggesting that workers may opt for informal jobs as entry to the labor market, as noted in the case of workers in Turkey (Tansel & Elif, 2017) and Indonesia (Pitoyo et al., 2021).

Earlier studies also show that labor mobility patterns in the developing world may be changing too slowly, with large gaps in the population as to who can access the formal sector. It seems that the opportunity to remain in one's initial sector (either informal or formal) is greater than the opportunity to transition between industries. However, to devise more effective policies, it is crucial to understand how large the gaps are among those most likely to move away from informal jobs to formal positions. Similarly, it is important to identify services that can, or may, facilitate transition toward formality [see, for example, services in Krstić and Sanfey (2007)].

The logic within the labor market is not as straightforward as it may appear. While it may be natural to think that the more experienced workers may be those most likely to transition to formal employment, several studies have shown that individuals with work experience tend not to transition to the formal sector (Funkhouser, 1997; Galli & Kucera, 2004; Maloney, 1999). This is a signal that the rate of return of work experience may be larger in the informal sector than in the formal sector (Tansel & Elif, 2017). Similarly, often job training has no direct effects on the transition across industries but instead has an impact on the income of trained workers (Friedlander, Greenberg, & Robins, 1997).

Labor policy in countries such as Indonesia, where promoting training and skill development is taking a central role in the formality agenda (Suharno, Pambudi, & Budi, 2020), may be self-defeating. Although the impact of training on the welfare of workers may be positive because it increases labor returns (Manning & Pratomo, 2018), it may discourage labor mobility toward formality as informal activities may offer higher returns for increasing labor skills. This remains an empirical question as recent studies (Ju & Li, 2019) support the claim that job training significantly affects employee turnover and permanence in jobs, although it is unclear whether the impact can lead to a larger transition from labor informality to labor formality. Bobba, Flabbi, Levy, and Tejada (2021) noted that training and human capital accumulation has a larger impact on labor productivity in the formal sector in countries such as Mexico, although policies can lead to an increase in informality cancelling out effects from training and experience. We test whether training and skills development (on-the-job human capital accumulation) may foster formality in the current context of Indonesia.

3. MATERIALS AND METHODS

3.1. Methodology

This study on worker transitioning in 2017–2018 uses the concept of formal/informal sector workers provided by Statistics Indonesia or *Badan Pusat Statistik* (BPS), the national bureau of statistics. Formal sector workers include self-employed (formal entrepreneurs) and employees. Informal sector workers include informal entrepreneurs, casual employees, and family workers. To identify labor mobility (dependent variable), four categories of labor situation are proposed: 1) workers who stayed in the informal sector during 2017–2018 (as a reference category), 2) workers who transitioned from the informal to the formal sector, 3) workers who moved from the formal sector in 2017 to the informal sector in 2018, and 4) workers who stayed in the formal sector in 2017–2018. There are seven main categories of employment status: 1) self-employed, 2) self-employed assisted by temporary workers, 3) self-employed assisted by permanent workers, 4) laborers/employees/staff, 5) casual agricultural workers, 6) casual non-agricultural workers, and 7) family workers.

Meanwhile, the independent variables in the model are divided into social-demographic variables and employment variables. Social-demographic variables include age (15–35 or 36–55 years old), gender (male or female), marital status (single, married, or divorced), residential area (urban or rural), and educational level (primary, secondary, or tertiary education). Employment variables consist of main industry (agricultural, manufacturing, or services), work experience (years), and job training. Multinomial logistics regression is incorporated to estimate the parameters of the model. The general form of the multinomial logistics regression can be written as follows:

$$Ln\ (P_j/P_0) = \beta_j + \sum_{k}^{K} \beta_{jk}\ x_k \tag{1}$$

where,

$j = 1, 2, 3, \dots, J$; j is the number of dependent variable categories.

$k = 1, 2, 3, \dots, K$; k is the number of independent variables.

Equation 1 can be rewritten as follows:

$$Ln\ (P_j/P_0) = \beta_j + \sum_{k}^{K} \beta_{jk}\ x_k \tag{2}$$

$$Ln\ (P_2/_0) = \beta_{20} + \beta_{21}\ x_1 + \beta_{22}\ x_2 + \dots + \beta_{2p}\ x_p + \varepsilon_i\ (Pj/P0) = \beta_j + kK\ \beta jk\ \ xk \tag{3}$$

$$Ln\ (P_{J-1}/_0) = \beta_{(J-1)0} + \beta_{(J-1)1}\ x_1 + \beta_{(J-1)2}\ x_2 + \dots + \beta_{(J-1)p}\ x_p + \varepsilon_i \tag{4}$$

The parameters in the model can be estimated using the maximum likelihood estimation method. The magnitude of the probability for each category is as follows:

$$P_0 = Pr\ (Y = 0 \mid x) = \frac{1}{1 + e^{z_1} + e^{z_2}} \tag{5}$$

$$P_1 = \Pr\,(Y = 1 \mid x) = \frac{e^{z_1}}{1 + e^{z_1} + e^{z_2}} \qquad\qquad (6)$$

$$P_2 = \Pr\,(Y = 2 \mid x) = \frac{e^{z_2}}{1 + e^{z_1} + e^{z_2}} \qquad\qquad (7)$$

To ensure that the formed logistical model is meaningful, the authors tested its significance, both as a whole and partially (Gujarati, 2011) and the parameters were analyzed and interpreted in terms of the odds ratio.

3.2. Data

The study employs two data sets from the *Sakernas* labor survey conducted by Statistic Indonesia, covering 2017 and 2018. Based on these two data sets, a panel data set was formed to ensure the same people were represented in each. Workers selected in an observation unit by Statistics Indonesia included people aged 15 years and older with working status in 2017 and 2018. Since there were individuals who worked in 2017 but did not work in 2018, or vice versa, it was necessary to conduct an observation unit selection. Finally, 69,676 observational units (individuals to be followed) across all districts/cities in Indonesia became involved in this study.

4. RESULTS

4.1. Formal or Informal Transition Based on Socio-Demographic Characteristics

Table 1 describes the transition pattern between formal/informal sectors in 2017-2018 according to the four proposed transition categories. A total of 56.34% of workers stayed in the informal sector. 30.58% of workers remained in the formal sector. 6.84% of informal workers transitioned to the formal sector, and 6.24% of formal workers changed status to informal workers. The number of workers in the informal sector in 2018 remains substantially larger than the number of workers formally employed. Workers are more inclined towards the informal sector either as a result of labor market failure or because of a voluntary decision to stay in the informal sector. The result shows that the formalization of the informal sector, which is one of of Indonesia's development goals, has not yet been running well.

Similarly, previous studies (Krstić & Sanfey, 2007; Tansel & Elif, 2017; Taufiq & Dartanto, 2020) also found that the number of formal workers who transitioned to informal status was relatively small. Most informal workers, however, reported having worked for more than five years. As an example, 7.08% of workers in urban areas changed from the informal to the formal sector, while 6.41% transitioned from the formal to the informal sector. A similar pattern in urban areas is also found in rural regions. During 2017–2018, 46.15% of urban workers stayed in the formal sector, whereas only 31.49% of rural workers remained formally employed. This indicates that the availability of formal sector employment was greater in urban than in rural areas, and it was easier for individuals to find formal sector employment in urban areas.

A larger rate of younger workers (15–35 years old) generally shift from the informal to the formal sector, and vice versa, compared to older workers (36–55 years old). This finding is similar to that of Borjas (2013) and Ehrenberg and Robert (2012), who stated that younger workers tend to have higher employment transition rates. Male workers have greater transition rates than females. Women's domestic role quite likely causes their limited mobility in the labor market and their greater permanence in the informal sector, as 63.43% of women stayed in their informal jobs in 2018. The large share of women's participation in informal jobs reinforces the notion that informal workers often look for flexible occupations. Women seek more flexible jobs than men, although this tendency is often misunderstood as the flexibility stigma, that is, the belief that employees who work with flexible work arrangements for care purposes are less productive and less committed to the organization (Borjas, 2013). In Indonesia, women living in households with a high dependency ratio are less likely to join the labor market. This is similar to the case of females in their most fertile years, who are more likely to be economically inactive than other females (Comola & De Mello, 2009). Schaner and Smita (2016) found that women with a lower level of education

have been reducing their labor participation in recent years, mostly opting out of informal or family jobs, while more educated women have increased participation in the labor market.

Table 1. The distribution of the sample based on socio-demographic and employment characteristics, and type of transition.

Characteristics		Types of Transition				Total
		Stay in the Informal Sector	Informal Sector Transition	Formal Sector Transition	Stay in the Formal Sector	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Area of Residence	Urban	40.36	7.08	6.41	46.15	100.00
	Rural	68.51	6.66	6.12	18.71	100.00
Island	Java and Bali	51.62	6.74	6.19	35.45	100.00
	Others	58.72	6.89	6.27	28.12	100.00
Age	15−35	44.13	7.71	6.70	41.46	100.00
	36−55	57.43	6.76	6.32	29.49	100.00
	> 55	77.93	5.29	5.07	11.71	100.00
Sex	Male	51.85	8.35	7.97	31.83	100.00
	Female	63.43	4.45	3.51	28.61	100.00
Education Level	Secondary school or below	71.78	7.11	6.41	14.70	100.00
	High school	39.28	7.69	7.10	45.93	100.00
	College	10.90	3.64	3.60	81.86	100.00
Work Experience	Experienced	53.78	7.82	7.29	31.11	100.00
	None	58.72	5.92	5.27	30.09	100.00
Certified Training	Participated	22.44	4.77	4.83	67.96	100.00
	None	62.46	7.21	6.50	23.83	100.00
Total (%)		56.34	6.84	6.24	30.58	100.00
Number of observations (people)		39.321	4.773	4.358	21.344	69.796

It is noticeable that jobs within the formal sector are mainly dominated by workers with higher education Table 1. Among workers who completed college education, 81.86% remained in the formal sector, while only 10.9% remained as informal workers. By contrast, among workers with only elementary education (less than high school), 71.78% stayed as informal workers and only 14.70% remained as formal workers. The figures are in line with those of earlier studies in Indonesia, substantiating the claim that demand for workers with higher education has been on the rise (Kataoka, 2019; Schaner & Smita, 2016), although a large share of workers in Indonesia have only primary education. Furthermore, experienced workers tend to transition into formal and informal jobs more than workers with no employment experience. Similarly, it is noticeable that the informal sector comprises workers with no previous work experience (58.72%). By contrast, most experienced workers are in the formal sectors (68.89%). Additionally, most workers who participate in certified training (67.96%) are employed in the formal sector.

4.2. The Dynamics of Main Employment Status

Table 2 shows the transitions of workers according to formality and employment status. Workers in the informal sector have various types of work and different characteristics that affect their transitioning behavior. In 2018, most workers were informal entrepreneurs, followed by employees (33.33%), family workers (14.15%), casual employees (7.39%), and formal entrepreneurs (4.09%). In general, there was little employment transition from 2017 to 2018. More than 50% of workers remained at their initial employment status, except for casual workers, who experienced more mobility. Casual workers were the most mobile type of occupation, most likely as they had no permanent contracts. The lack of stable employment relations encourages more frequent job transition. Bilocal activity has also been identified in Indonesia, where temporary workers move from urban to rural areas on a regular basis (Rudiarto et al., 2020).

By contrast, most formal employees (84.87%) do not transition. Permanence provided in formal jobs is accompanied by stable income and secure contractual relationships. Thus, workers may be reluctant to transition across employment types when secure payment may be compromised (Tansel & Elif, 2017). The second-highest section of those who did not transition was family workers (70.28%). Family members (i.e., wives, children, or second layer of workers) support the economic activity of the head of household, suggesting that as long as the economic activity continues, they may remain as support.

Table 2. Worker transition based on main employment status.

| Main Employment Status 2017 | Main Employment Status 2018 | | | | | Total |
| | Informal | | | Formal | | |
	Entrepreneur	Casual Employee	Family Worker	Entrepreneur	Employee	
Informal						
Entrepreneur	79.45	4.53	5.93	3.65	6.44	100.00
Casual employee	26.87	43.45	7.25	1.85	20.57	100.00
Family worker	18.71	4.14	70.28	1.08	5.78	100.00
Formal						
Entrepreneur	34.52	3.07	2.85	51.61	7.95	100.00
Employee	7.68	4.52	2.00	0.93	84.87	100.00
Total (%)	41.04	7.39	14.15	4.09	33,33	100.00

Regarding transition among entrepreneurs, 6.44% of informal entrepreneurs transition to become employees, 26.87% of casual workers become informal entrepreneurs, and 20.57% of formal entrepreneurs transition to employee status. Meanwhile, 18.71% of family workers became informal entrepreneurs. On the other side, 34.52% of formal entrepreneurs became informal businesspersons in 2018. Perhaps, employers who at first were able to offer permanent contracts eventually experienced a situation that was non-conducive to business, forcing them to shift to informal economic activity. Finally, in 2018, 7.68% of employees transitioned to informal entrepreneur status. Employees losing permanent contracts may enter the informal sector, which is considered the easiest to access (lower qualifications needed). Alternatively, employees may turn to entrepreneurial activities, initially in informal businesses. Thus, it is shown that workers mostly targeted informal entrepreneurship as a transition step to a permanent job or formal entrepreneurial activity. This finding aligns with that of Todaro and Stephen (2012) as well as with that of Pitoyo et al. (2021), who noted that it is relatively easy to access the informal sector because it requires lower capital and fewer skills than the formal sector. In addition, Meng (2001) found that informal entrepreneurs possibly have a higher income than that gained from other activities within the formal or informal sectors in China.

4.3. The Dynamics of Main Industry

Regarding the status of labor formality and economic activity (see Table 3), the agriculture sector absorbed most of the informal workers (34.45%) in 2018. On the other hand, the service sector absorbed the largest share of formal workers (23.90%). The transition across industries shows a similar pattern to the transition across employment statuses. Most workers stayed in their initial jobs and did not transfer to other jobs or industries. The service sector shows the greatest permanence of workers as 85.16% of employees remained in the same position in 2018. Similarly, workers within casual agriculture reported considerable permanence, as 83.19% of them remained in the same economic activity and with the same job status. Other activities where low transition was observed were informal services, where 77.70% of workers stayed at the *status quo*; formal manufacturing, where 67.77% remained at the same status; informal manufacturing (54.34%); and formal agriculture (54.22%).

Table 3. Worker transition by main industry.

Employment in 2017		Employment in 2018						Total
		Informal			Formal			
		Agriculture	Manufacturing	Services	Agriculture	Manufacturing	Services	
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)
Informal	Agriculture	83.19	4.17	4.41	4.16	1.88	2.19	100.00
	Manufacturing	15.10	54.34	10.97	0.89	14.62	4.09	100.00
	Services	6.05	4.21	77.70	0.59	2.01	9.44	100.00
Formal	Agriculture	31.42	2.80	3.62	54.22	4.33	3.62	100.00
	Manufacturing	6.82	11.48	4.71	1.51	67.77	7.72	100.00
	Services	2.58	1.08	7.35	0.71	3.13	85.16	100.00
Total (%)		34.45	7.95	20.18	4.16	9.36	23.90	100

Surprisingly, there was a high transition from formal to informal activities within the same industry between 2017 and 2018. Within agriculture, 31.42% of formal agricultural workers shifted to casual farming. On the other hand, 15.10% of workers moved from informal manufacturing to informal agriculture, most likely due to a worsening in manufacturing activities that forced workers to seek employment in informal farming. Casual agriculture may have been the most accessible economic activity to enter since it requires relatively low skills and competencies (Todaro & Stephen, 2012). Casual agricultural workers may also temporarily work in urban areas and return to agricultural activities on demand (Rudiarto et al., 2020).

4.4. Multinomial Logistics Regression Results

Three models are incorporated into the logistic regression to assess specific aspects influencing labor mobility, and the results are reported in Table 4. Model 1 captures the transitioning of workers from informal to formal activities. Model 2 looks at transitioning workers from the formal to the informal sector. Model 3 focuses on the permanence of workers within the formal sector. The OR column indicates the odds ratio.

Table 4. Estimation results of multinomial logistic regression.

Independent Variables	Transitioning from Informal to Formal Sector			Transitioning from Formal to Informal Sector			Staying in the Formal Sector		
	(Model 1)			(Model 2)			(Model 3)		
	Coeff	SE	OR	Coeff	SE	OR	Coeff	SE	OR
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Constant	-2.47	0.01***	0.08	-3.27	0.00***	0.04	-1.44	0.02***	0.24
Age (15−35 years old = 1)	0.84	0.13***	2.32	0.65	0.11***	1.92	1.28	0.15***	3.59
Age (36−55 years old = 1)	0.53	0.83***	1.7	0.40	0.07***	1.50	0.87	0.09***	2.38
Sex (Male = 1)	0.85	0.86***	2.35	1.14	0.12***	3.11	0.71	0.05***	2.03
Marriage Status (Married = 1)	-0.24	0.39***	0.79	-0.12	0.05**	0.88	-0.35	0.02***	0.7
Marriage Status (Divorced = 1)	-0.03	0.08	0.97	0.16	0.1*	1.18	-0.17	0.05***	0.84
Urban	0.39	0.05***	1.5	0.03	0.04	1.03	0.51	0.04***	1.66
Education (Low = 1)	-1.11	0.03***	0.33	-1.06	0.02***	0.35	-2.59	0.00***	0.08
Education (Middle = 1)	-0.75	0.04***	0.47	-0.78	0.03***	0.46	-1.67	0.00***	0.19
Sector (Manufacturing = 1)	0.73	0.09***	2.08	1.88	0.3***	6.55	2.29	0.35***	9.9
Sector (Service = 1)	0.12	0.05***	1.12	1.09	0.13***	2.97	1.82	0.20***	6.18
Work Experience	0.24	0.04***	1.27	0.16	0.04***	1.17	-0.02	0.02	0.98
Training	0.17	0.06***	1.18	0.23	0.07***	1.26	0.77	0.07***	2.16
Pseudo R2	0.2184								
Prob > chi2	0								
Number of observations	69.796								

Note: The reference category of dependent variable is staying in the informal sector; OR is the odds ratio; SE is the standard error; Coeff is the regression coefficient; *** = significant at α = 0.01; ** = significant at α = 0.05; * = significant at α = 0.1.

Generally, workers across age groups prefer to stay in a formal activity, as the transition from informal to formal sectors is larger than the opposite direction, and the transition from formal to informal jobs is lower than the

other way around. Still, the probability of younger workers (15–35 years old) transitioning from the informal to the formal sector, or from the formal to the informal sector is greater than for the older group (36–55 years old). Younger workers, who are generally more productive and open to acquiring new knowledge, have a greater chance of transitioning to other activities. Older workers, by contrast, tend to remain in the same sector since they perceive a cost (risk) of shifting to a different job. This phenomenon supports the findings of Borjas (2013), who noted that young workers tend to do *job shopping*, which is defined as someone accepting one job offer while continuing to apply for other jobs or waiting for other offers that may be more favorable. Younger workers are less averse to risk, are more oriented toward maximizing utility in the short run, and generally have lower wages than their more experienced peers. A better salary in a different job may be enough to instigate a change of employment. However, the probability of transitioning from the informal to the formal sector is greater than the other way around, suggesting that formal jobs are still preferable for young workers. Previous studies have also indicated that younger personnel are more likely to transition from the informal to the formal sector than older workers (Krstić & Sanfey, 2007; Taufiq & Dartanto, 2020).

Another finding from Model 3 is that the tendency of older workers to stay in the formal sector is lower than that among younger workers (see Table 4). A possible reason is the retirement age in the formal sector (which is relatively early in Indonesia at 55 years old), suggesting that older workers will get jobs more easily outside the formal sector once they approach or reach retirement age. The likelihood of people being hired for formal positions decreases with age, helping to explain the low presence of mature workers in formal jobs. In the context of Indonesia, Wong (2019) found that younger workers (who are generally more educated than older workers) have better prospects of entering the formal market and have higher professional mobility.

Regarding gender, males tend to transition from the informal to the formal sector 2.35 times more than females. Similarly, males are 3.11 times more likely to shift from the formal to the informal sector than females. By contrast, the probability of males staying in the formal sector is 2.03 times lower than for women. This finding is in line with the results of Tansel and Elif (2017), who pointed out that females have a lesser chance of succeeding in a job transition than men, and that females are more likely than males to stay in the informal sector. Sousa-Poza and Fred (2004) also found similar results in a cross-country analysis, noting that the mobility of male workers is notably greater than for females. In Indonesia, several studies have identified that male workers also experience greater occupational mobility (Rudiarto et al., 2020; Wong, 2019), while women are less mobile (Cameron et al., 2019; Comola & De Mello, 2009).

Royalty (1998) provides several explanations regarding this matter. First, the glass ceiling phenomenon seems to be associated with female workers, making males dominant in particular carrier/job positions. Second, women often take dual roles, whereby professional life and family need to be compatible, leading them to seek employment that matches their needs, even though it may offer lower premia. Commonly, women are considered second breadwinners when dual roles apply at home. Risk in mobility can also be a reason why fewer women work far from home in addition to the issue of the wage gap (Cameron et al., 2019) that may not compensate for their risk in searching for jobs far from home. Women in households with a large number of family members, or those of a fertile age, are more likely to remain out of the labor market (Comola & De Mello, 2009) or, at least, be less mobile.

Single and divorced individuals have more freedom to decide whether to seek jobs in other regions, sectors, or firms. Single and divorced workers are expected to be more flexible in transitioning from formal to informal sectors and are less likely to stay in the formal sector. It is also suggested that this group is more likely to be in the informal sector. However, not being married nor being divorced, has a significant effect on transitioning from the informal to the formal sector in Indonesia. At the same time, married workers have a lower tendency to transition from the informal to the formal sector than single workers.

Workers in urban areas tend to have a greater probability of transitioning from informal to formal positions and staying in the formal sector. This phenomenon indicates that the formal sector is preferable in urban areas. It is

also logical, since formal jobs are often available in urban rather than rural areas. This may explain the large migration of workers from rural to urban areas as they look for more permanent jobs and higher wages (Moeis et al., 2020). However, as noted by Kataoka (2019), employment opportunities in urban areas are skewed toward more skilled and more educated workers, signaling that less educated workers remain in rural areas (Vidyattama, 2016). Decisions to migrate from rural to urban areas differ between women and men. As noted by Mulyoutami, Lusiana, and van Noordwijk (2020), job opportunities for unmarried women in urban areas are better than for married women, likely influencing young and unmarried women to move to urban areas than older women.

Moreover, workers with low education (less than junior school) are less likely to transition from formal to informal jobs and are also less likely to transition from informal to formal jobs. Generally, workers with low education are less likely to transition. As educational attainment increases, it increases the probability of transitioning, from either informal to formal or formal to informal. These findings are in line with the evidence provided by Vidyattama (2016), who noted that workers in larger employment inflows and outflows across provinces have more years of education than the average labor force. In addition, the likelihood of staying in the formal sector was found to be greater as education level increases. This result shows that the higher educational attainment group has more job alternatives and better opportunities to improve their competence. More educated workers have an increased chance of entering a formal sector. These findings are similar to those of Tansel and Elif (2017) in Turkey, Taufiq and Dartanto (2020) in Indonesia, and Gong et al. (2004) in Mexico, among others. Education increases the chance for an individual to work in the formal sector, which is in line with findings in the capital of Indonesia (Wong, 2019) and at the regional level (Kataoka, 2019; Vidyattama, 2016).

Workers with low educational attainment are more likely to work in the informal sector. Bernabè and Stampini (2009) explained several reasons for this: 1) workers with high educational attainment will be negatively stigmatized if they work in an informal sector; and 2) those with low educational attainment tend to choose jobs that are loose and paid with commission rather than work stably in formal labor. Similarly, labor opportunities in Indonesia have expanded more rapidly for workers with higher skills and education than for less educated workers (Kataoka, 2019).

We break employment status into three categories: services, manufacturing, and agriculture. Workers in the manufacturing and service sectors have a higher probability of transitioning across formal and informal activities than those in agriculture. Similarly, workers within services and manufacturing are more likely to remain in formal positions. Job characteristics in the manufacturing and services sectors are more varied than in agriculture, so generally, changes in a job are more flexible in these two industries. Related to the skill aspect, Bernabè and Stampini (2009) stated that low-skilled workers in manufacturing and services are usually susceptible to redundancy. In that event, they are likely to enter the informal sector.

This finding supports Model 2, which shows that manufacturing workers tend to transition from formal to informal sectors 6.5 times more than agriculture workers do (see OR ratio in Table 4). Similarly, manufacturing workers are 2.08 times more likely to move from the informal to the formal sector compared to agricultural workers. In comparison, workers within services are 1.12 times more likely to transition from informal to formal jobs compared to agricultural laborers, and 2.97 times more likely to transition from formal to informal jobs than in the agriculture sector. Moreover, the probability of staying in the formal sector in manufacturing and services is 9.9 and 6.18 times greater, respectively, than in the agriculture sector. Calì et al. (2019) noted that low labor mobility cost within manufacturing (and some low productivity service activities) is one of the reasons why mobility is significant within the sector.

The lower probability of mobility among workers within agriculture in Indonesia has been a focus of previous studies. Moeis et al. (2020) noted that although agricultural workers are willing to move into non-agricultural and formal sectors, they lack the necessary skills to be absorbed into manufacturing and service activities. Rudiarto et al. (2020) pointed out that the majority of workers involved in bilocal activities (urban and rural work) keep their

families in rural areas, suggesting that labor mobility from rural to urban areas does not entail full transfer of families. Tentua and Edi (2020) noted a decline in demand for a workforce from the agricultural sector shifting to the industrial sphere.

Our third research objective is to determine whether work experience and skills play a significant role in labor mobility, specially toward formality. Work experience significantly affects inter-sectoral transition models (Models 1 and 2), but it has no significant impact on staying in the formal sector. Experienced workers tend to transition more than those who do not have any work experience. However, in Model 3, work experience has no significant effect on the probability of workers staying in the formal sector. This result contradicts previous studies (Funkhouser, 1997; Maloney, 1999; Tansel & Elif, 2017), which claimed that work experience is negatively related to job transition (inter-formal/informal statuses).

Meanwhile, the job training variable has a significant and positive effect on the whole model, but it has a larger marginal effect on the probability of staying in the formal sector. It suggested that training is important, particularly in the formal sector. Workers who have participated in job training will gain additional skills that make them more valuable for employment. Therefore, job training increases the chances of accessing a wider variety of jobs both in the formal and informal sectors. Training can increase job satisfaction and employee intention to stay in a firm. Training increases the probability of retaining workers in formal positions. Our findings indicate that labor policies promoting training and continuous education for workers can be an effective means of increasing formality.

5. CONCLUSIONS

This study analyzes labor transition in Indonesia from 2017 to 2018 by employing a longitudinal survey (*Sakernas*) undertaken by Statistics Indonesia. The study first tests whether socio-demographic aspects related to age, gender, location, and education matter for labor transition, especially toward formality. Second, the study tests whether differences in the rate of transition exist within sectors (agriculture, manufacturing, and services). Finally, the study tests whether work experience and training influence labor mobility.

Based on the results of this study, the following conclusions can be highlighted. First, in terms of socio-demographic characteristics, most of the workers stayed in the informal sector (56.34%) compared to the 30.58% of workers who stayed in the formal sector. Only 6.84% of informal workers transitioned to the formal sector, and 6.24% of formal workers changed status to informal workers. Formalization of labor has been slow. Therefore, the informal sector is still the preferred choice for most Indonesian workers or is the only available option for workers.

Most urban workers (46.15%) stayed in the formal sector, suggesting that it is easier for individuals to find formal employment in urban areas. A worker in an urban area is 1.5 times more likely to move toward formality (and 1.66 times more likely to remain in a formal job) than workers in rural regions. Workers in urban areas have greater labor opportunities as more formal jobs are available in urban areas.

Younger workers are more flexible in transitioning from the informal to the formal sector, and vice versa. Younger workers (15–35 years old) are 2.3 times more likely to move to formal jobs and 3.6 times more likely to remain in formal activities compared to older workers. Policies to promote formality should take advantage of the higher likelihood of young workers being employed in the formal sector while considering how to protect older workers who are more exposed to informal labor conditions.

Furthermore, there is a strong correlation between education and informality, as most informal workers (71.78%) are in the lower educated group. However, the likelihood of moving toward formality (or remaining formal) increases with higher education, suggesting that the group with higher educational attainment have more job alternatives and more opportunities to improve their competence in the formal market than poorly educated workers. Male workers tend to have a higher transition rate than females, being substantially more likely to transition. The domestic roles commonly taken by women most likely limit their mobility in the labor market,

suggesting that options for women in the labor market may be more limited than for men. In addition, 63.43% of women stayed in the informal sector, with significant likelihood of remaining informal or transitioning into informal employment compared to males.

Second, informal sector workers were mainly absorbed into the agricultural sector (34.45% of total labor force), whereas the service sector mainly involved formal workers (23.90%). The transition of workers across sectoral activities shows that most employees stay in their jobs and do not transition to other occupations. The informal agricultural sector seems to be the easiest to enter since it requires fewer special skills and competence than other sectors. However, workers within manufacturing are more likely to transition toward formality, informality, or remain in a formal job compared to those from agriculture. Similarly, service sector workers are likely to move, although to a lesser extent than manufacturing workers.

Moreover, work experience has a significantly positive effect on inter-sectoral transition models, but it has no significant effect on workers staying in a formal model. Training is important, particularly in the formal sector. It can be understood that those who have participated in certain job training will gain additional skills and have more job options in both the formal and informal sectors. According to the human capital aspect, education, experience, and job training determine labor quality simultaneously. It is assumed that if those three components improve, then productivity will improve, as will workers' income level. Policies aimed at increasing continuous education and training should be developed and adopted, as they can help to improve formalization and widen labor opportunities for workers.

Finally, policies should pay attention to those workers who are more exposed to labor informality (women, older workers, laborers in rural areas, agricultural workers, and the less educated). Helping vulnerable workers to gain skills and improve education is of value to Indonesia. Vulnerable groups may require more flexible options in contracts and transition mechanisms that can lower the perceived risk in shifting jobs while the matching process takes place. Policies aimed at improving entrepreneurship are needed, as large numbers of individuals are self-employed but remain informal. Becoming a formal entrepreneur in Indonesia is unlikely (low probability), even though this group is expected to be an important driver of employment creation in the near future.

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