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### **Structural change and formal sector employment growth in Indonesia**

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# **Structural change and formal sector employment growth in Indonesia**

Devanto Shasta Pratomo and Chris Manning

## **Abstract**

The study provides evidence on the transition and growth of the formal sector in the Indonesian economy. It utilizes data from the National Labour Force Survey (SAKERNAS) for tracking the previous work status of workers as formal or informal workers. The study also examines the implication of formalization of employment for the different rates of earnings of formal sector workers, given their human capital characteristics and different industries of employment. The study finds that the growth of employment in the formal sector is mainly the result of entry of younger and better educated new entrants. Although there is some mobility from the informal to the formal sector, the results show that individuals who were previously working in the informal sector are less likely to move into formal sector. In terms of earnings, there is evidence of scarring effects: individuals who are initially in the formal sector earn more than individuals who are initially in the informal sector.

Key words: informal sector, job mobility, human capital, earnings differentials

JEL codes: J24, J31, J46, J62, O17 O47

# Structural Change and Formal Sector Employment Growth in Indonesia

Devanto Shasta Pratomo and Chris Manning

## Introduction

The formal-informal dichotomy is of great significance in the study of structural transformation and economic development in developing economies. From dual-sector perspective, the formal and informal sectors are fundamentally different. The informal sector tends to be more traditional, less productive, using little capital and adding less value to the economies. In contrast, the formal sector, often the modern part of the economy, is the more productive sector with a more educated and more skilled labour force (La Porta and Shleifer, 2014). Thus a large difference in labour productivity between formal and informal parts of the economy is typical in developing societies (McMillan and Rodrik, 2011). Employment in the informal sector is also characterized by insecure working arrangements, little protection for workers, and low wages (La Porta and Shleifer, 2014 and Rothenberg et al, 2016).

The structural transition from informal sector into formal sector has been considered as a key driver of the economic development (see Lewis, 1954; Fei and Ranis, 1964; Chenery 1979). In China, India and some other Asian countries, the transition has also been characterized by the expansion of the higher productivity employment in the formal sector, mainly from the low-productivity agriculture into modern manufacturing and services. Structural change of employment from the informal to formal sector has also contributed significantly to economic growth (Brandt et al, 2008; Herrendorf et al, 2014; and McCaig and Pavcnik, 2015).

Similar to other developing countries, the Indonesian labour market is divided between formal and informal sectors. Although informal sector tended to be dominant in providing employment in the earlier decades, the labour market has undergone a fundamental transition, while at the same time employment as fall in agriculture and stagnated in the non-agricultural informal sector (see Figure 1)<sup>1</sup>.

Using the individual data from the National Labour Force Survey (Sakernas), this study seeks to provide an understanding the labour market transition between formal and informal sectors, particularly focusing on the growth of formal sector jobs in Indonesia. As mentioned by McCaig and Pavcnik (2015), workers that switch to the formal sector tend to have a similar education, age, residence, and other characteristics to those already employed in the formal sector. Therefore, individuals who are poorly educated, older, female and who are living in the rural areas have less probability of moving to the formal sector. Besides potential mobility of workers from the informal sector into the formal sector, Suryahadi et al (2018) also noted that the growth of formal sector employment in Indonesia, particularly in urban industry and services, is also supported by the employment of more younger, educated workers, who are mostly new entrants to the labour market. Using data from the Indonesian Family Life Survey, they showed that only a quarter of new entrants to the formal sector started work in rural agriculture; while almost a half of new entrants to formal jobs had had prior access to non-agriculture sectors, and mostly chose the urban formal sector as their first place of employment.

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<sup>1</sup> The agriculture sector is excluded from the formal-informal definition because it has several unique characteristics (see below for further discussion).

This study then continues to examine the implication of these transitions for earnings among the job movers. Although, it contrasts the analysis on formal and informal sector earnings, it will focus more on the analysis of earnings in the formal sector, given that the earnings of the informal sectors tend to be variable from year to year in Sakernas. Besides showing that earnings in informal sector employment tend to be lower than in formal sector employment, previous studies in Indonesia suggest that the longer someone has a job in the informal sector the more likely they are to be disadvantaged in terms of earnings compared with jobs utilizing labour with similar qualification in the formal sector (Naidoo et al, 2015). In other words, the evidence suggests “scarring” effects in terms of earnings from experience of working in the informal sector, compared to movers with no experience in the informal sector or new entrants (see Manning 2018).<sup>2</sup>

The following section of the paper looks briefly at the definition of the IFS and then at the growth and share of formal-informal sectors employment in Indonesia in more detail. Then, we discuss job mobility across sectors with a focus on mobility to the formal sector. The paper subsequently examines earning differentials among the job movers, with a focus on the earnings of formal sector employees. Finally, the last section concludes.

### **Defining the Formal-Informal Sector**

The data used in the study are individual data, mostly from the National Labour Force Survey (Sakernas), covering period from 2010 to 2017. In order to examine changes over time, the formal and informal definition used in the study is mainly based on the Central Bureau of Statistics (BPS) definition using work status categories (the so-called Proxy 1). An individual is defined as working in the informal sector if they are self-employed, casual workers, or family workers, while wage employees and employers are categorized as formal sector employment. The concept of formal-informal sector used in the study therefore focuses on the labour market (employment) approach rather than the industrial or firm-based approach (see for example Rothenberg et al, 2016 for the latter approach). These categories are generally consistent with the standard practice of labour market definition of formal-informal sector used in the literature on developing countries.<sup>3</sup>

Following the practice of early authors on the subject (e.g., Hart, 1973, Mazumdar, 1976), we discuss the informal sector mainly in relation to non-agricultural work. In Indonesia, the main dynamics of the labour market for the past several decades has involved a shift of workers out of agriculture to non-agricultural sectors, into both the formal and the informal sector. While non-agricultural work was initially widely distributed in urban and rural areas, more recently it has become much more concentrated in the in the former – in the growing towns and cities.

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<sup>2</sup> Scarring refers to the situation where unemployment or employment in a low status, or low wage activity (such as informal sector work), has a negative long-term effect on future labour market prospects.

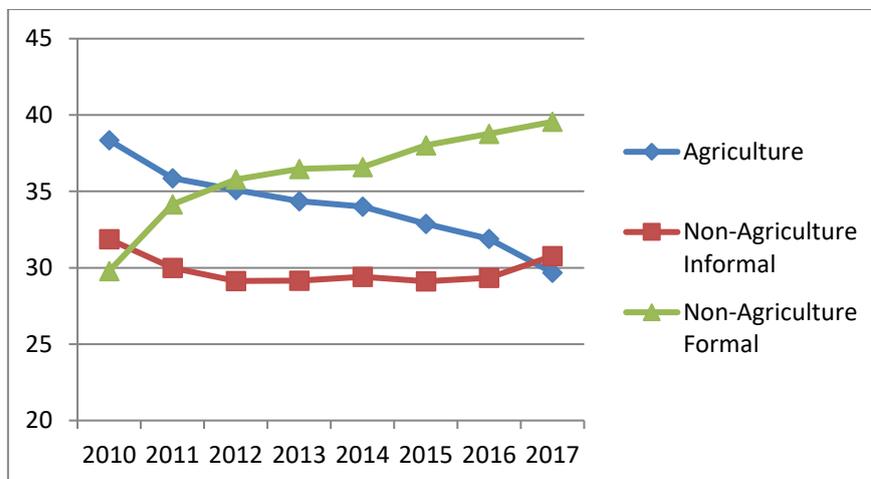
<sup>3</sup> See for example Arango and Pachon (2004) in Colombia and Gindling and Terrell (2007) in Costa Rica. BPS in the recent years has expanded the formal-informal definition to the so called Proxy 2, combining work status and occupational categories (e.g., self-employed professionals, managers and clerical workers are all considered formal according Proxy 2 whereas they are classified as informal according to Proxy 1). The Proxy 3 also takes into account type of enterprise, type of bookkeeping where the worker is employed and her/his access to social security. The Proxy 1 definition is mostly used in the paper because of data limitations regarding specific questions on workers’ previous jobs in Sakernas.

There are two main reasons for this approach. The first, is simply statistical. A very high proportion of all work in agriculture (close to 90% in urban and rural areas) is informal, as defined here, and this industry dominates the patterns and trends in informal work in the economy as a whole. However, for policy purposes our main interest in the informal sector is with raising productivity mostly non-tradable service industries. Raising agricultural productivity involves a different set of policy options. Second, the nature of many informal enterprises in the agricultural sector are very different in one key respect from many of those outside agriculture: the self-employed in agriculture own or rent (or share-farm), a valuable asset, whereas most in non-agricultural workers in the informal sector own very few fixed assets.

### Growth and Structure of the Formal-Informal Sector

The period chosen for examination covers a period of growth of formal sector employment in Indonesia, which started from 2010 (see Figure 1). During the second decade of the 2000s, the share of formal sector employment in Indonesia rose from less than 30% in 2010 into around 40% in 2017. In contrast, the share of agriculture employment declined significantly from 38% in 2010 to less than 30% in 2017, while the share of non-agricultural informal sector employment tended to be stable at around 30%. Related to the sector of activity, formal sector employees in Indonesia concentrated in manufacturing and services, while besides agriculture informal sector employees mainly worked in retail trade and small business.

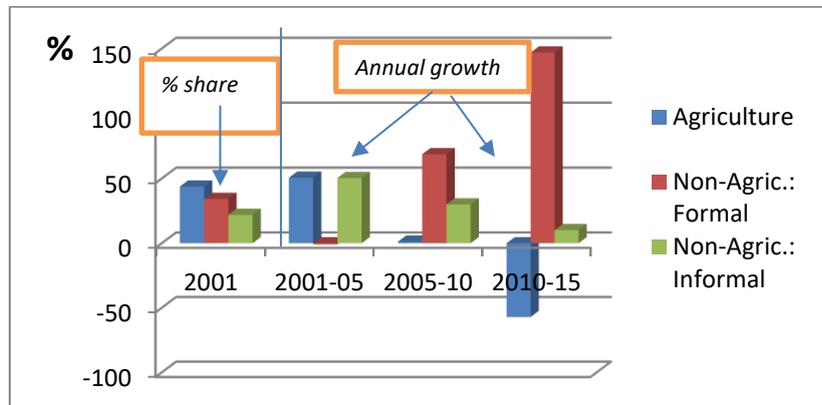
**Figure 1 Share of Employment in Agriculture, and the Formal and Informal Sectors outside Agriculture, 2010-2017 (%)**



Source: Sakernas, Various Years

The growth of the formal sector employment is important for Indonesia. This latest phase of structural change in the labour market implies that the country may have begun a little noticed transformation away from low productivity agriculture and the informal sector into higher-value formal sector employment. Data presented in Figure 2 clearly shows that while up to around 2010 many jobs were created in the informal sector, it hardly grew after that, indicating that most new jobs had been created in the formal economy. One factor that is predicted to have influenced the transition to the formal sector has been the strong labour demand from services (Manning, 2018), a pattern which is rather different from other rapidly growing export-oriented countries, such as China and Vietnam, where manufacturing has played a bigger role (McCaig and Pavncik, 2015).

**Figure 2 Share of Employment in 2001 and of Employment Growth 2001-2015 by Major Sector of the Indonesian Workforce (%)**



Source: Sakernas, Various Years

On the supply side, the improved education of the labour force has provided a work force ready to work in the formal sector (Allen, 2016; Purnagunawan et al, 2017). The transition is interesting because this has been a period when growth of the economy has slowed and when economic and social observers have continued to view creation of new formal sector jobs as a major challenge. After peaking at 6.5% per annum during the period of recovery in 2011, Indonesia’s GDP started to slow to around 5% per annum through to 2017<sup>4</sup>.

More than half of the employment is in urban areas (see Table 1). Comparing formal and informal sectors, urban areas are more dominated by formal sector employment, although there is also a significant percentage of informal sector jobs. Informal sector workers in urban areas tend to work in trade and transportation, while formal sector workers tend to be in manufacturing and services. Agriculture, predictably, is mostly found in rural areas. Comparing gender, a larger share of males work in the formal sector, although it is interesting to note that more than a half of female workers in non-agriculture are also employed in the formal sector. Most of females working in the formal sector are employed in trade and services.

Young workers make a big contribution to jobs in the formal sector. More than half of young workers (ages 15-24 and 25-34) work formally (Figure 3). As mentioned by Suryahadi et al (2018), young people or new jobseekers are no longer attracted to agricultural jobs.. Historically some of them, particularly among middle class families, also preferred to become unemployed rather than working in agriculture and informal sector jobs, related to the ‘sticky’ processes of job search in the formal sector (Manning and Junankar, 1998). On the other hand, the contribution in the informal sector and agriculture remains dominant for the older workers (age over 55).

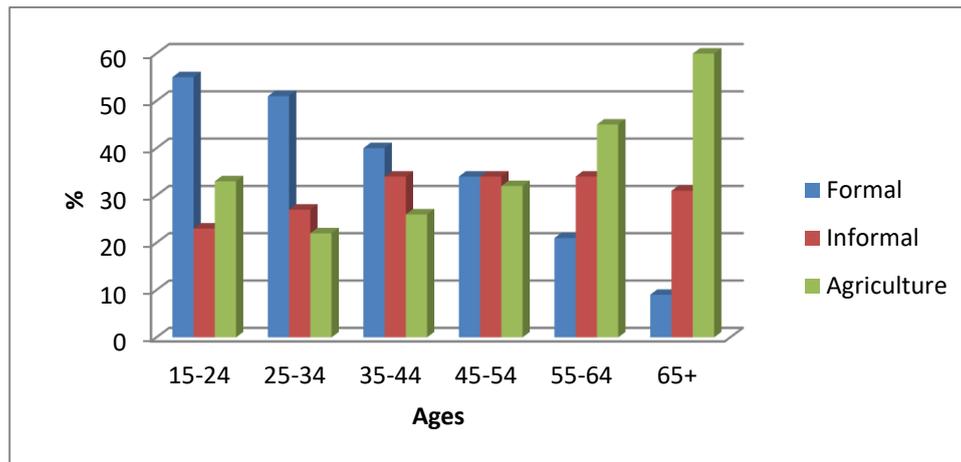
<sup>4</sup> The main reasons for this economic slowdown include sluggish global economic growth, falling commodity prices and stagnant household consumption (Shrestha and Coxhead, 2018).

**Table 1**  
**Number and Share of Jobs in Formal and Informal Sectors,**  
**and Agriculture, 2017**

Characteristics	% of Jobs				No. of jobs (m.)
	Formal	Informal	Agriculture	Total	
<b>LOCATION</b>					
Urban Areas	55	35	10	100	63.9
Rural Areas	22	26	52	100	57.1
Total	39	31	30	100	121.0
<b>GENDER</b>					
Male	41	28	31	100	74.7
Female	37	35	28	100	46.3
Total	39	31	30	100	121.0

Source: Sakernas, 2017

**Figure 3**  
**Share of Jobs in Formal, Informal, and Agriculture Sectors, by Age Group 2017 (%)**



Source: Sakernas (2017)

While construction, trade, and transport and communications are heavily informal, the formal sector is dominated by workers in services and manufacturing (see Table 2). During the period 2010-17 an increase in the share of jobs in the formal sector is found in all industries, with the highest growth in construction, mining, utilities and financial services. On the other hand, a significant decline in the informal sector is found in transportation, and communications. The informal sector continued to grow in trade and construction and even faster in mining, utilities, and finance services, though in the latter case from a very small base.

The formal sector employs more educated workers than the informal sector and agriculture. As presented in Figure 4, workers with senior high school (academic and vocational) education and above dominate formal sector jobs, although there is also a non-negligible share of senior high graduates from the academic stream who are employed in the informal sector, perhaps indicating limited job availability in the formal sector. In contrast, a low level education (primary schooling or less) continues to dominate agriculture, contributing to low productivity (Ginting et al., 2018).

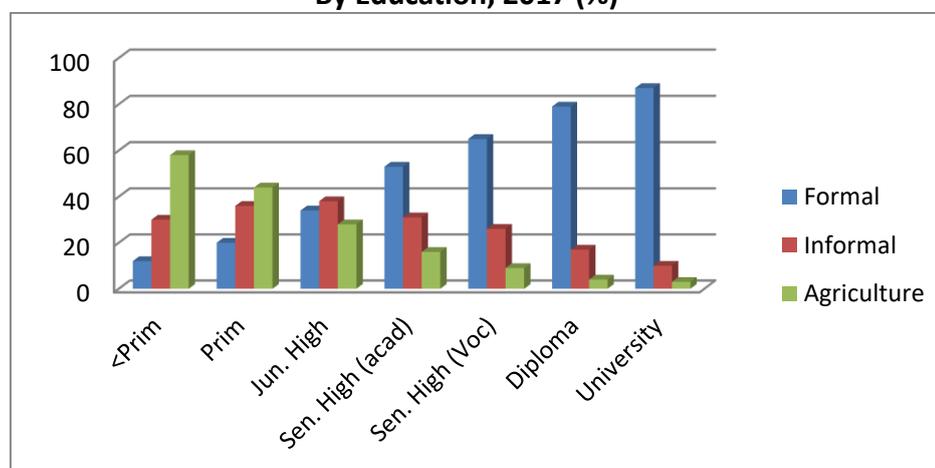
**Table 2**  
**Distribution of Formal Sector Jobs, Their Incidence in Each Industry and Growth of IFS, FS and All Jobs outside Agriculture, Indonesia 2010 and 2017**

	% of All Formal Sector Jobs	% of Industry Jobs in the Formal Sector		Growth of Jobs 2010-2017 (% p.a.)		
	2017	2010	2017	IFS	FS	Total
Manufacturing	24	57	67	-0.8	5.2	3.0
Construction	8	39	45	4	7.3	5.4
Trade, Rest. & Hotels	19	26	33	1.8	6.7	3.2
Transportation & Communication Social, Private and Government Services	7	34	47	-2.7	4.9	0.4
Services	34	76	80	0.7	4.4	3.6
Other*	8	71	80	2.3	9.4	7.7
<b>All Industries</b>	100	33	43	-0.7	5.3	1.6

\*Other includes mining, utilities and waste disposal and financial services

Source: Sakernas, 2010 and 2017

**Figure 4**  
**Share of Jobs in Formal, Informal, and Agriculture Sectors, By Education, 2017 (%)**



Source: Sakernas, 2017

### Job Mobility across Sectors in the Labour Market

Based on Sakernas 2017, just under 40% of the working age population had changed labour force status or jobs in the past, with the largest share of movers found in the formal sector (Table 3). The movers to the formal sector mostly come from the other jobs within the formal sector and also new entrants. On the other hand, agricultural workers have the lowest level of mobility (never changed jobs) compared to other sectors. Besides a low level of qualifications that prevent them from entering the formal sectors, farmers may have limited information regarding other jobs, and remain content with the only livelihood that they know (World Bank, 2010).

**Table 3**  
**Mobility of Main Labour Force Status Group, 2017 (%)**

Previous Labour Force Experience	Current Labour Force					
	Not Working		Employed			
2017	Not in LF	Unemployed	Informal	Formal	Agriculture	Total
Worked Before/Change Jobs	30.2	39.9	34.0	38.8	27.1	38.5
<i>Left Jobs in Previous Year</i>	4.4	22.7	2.7	4.4	1.6	3.4
<i>Kept Same Job in Past Year</i>	25.7	17.2	31.3	34.4	25.5	35.1
Never Worked/ Never Change Jobs	69.8	60.1	66.0	61.12	72.9	61.5
TOTAL	100	100	100	100	100	100
Million	64.0	7.0	37.2	47.9	35.9	121

Source: Sakernas (2017)

Data on job mobility across sectors are presented in Table 4, comparing current work status and the previous work status among the job movers during the period of 2010-2017. The data shows that more than half of new entrants (56%) are employed in the formal sector. The share is larger than the movement from informal to formal sector (26%) and also larger than the movement within the formal sector, from one formal sector job to another (50%). The share of new entrants who enter the formal sector is also higher than the new entrants who enter the informal sector (25%), perhaps related to the higher formal educational qualifications of new entrants.

Although, as Table 4 shows, the share of the movement from the informal sector to the formal sector is not large (26%), the share of workers who successfully make the informal sector as a stepping stone for entering formal sector jobs was significant. For some informal sector work was a pathway to gaining experience and building networks for formal sector jobs. , At the same time, the small share of this movement from informal sector to the formal sector also suggests that existing informality is a trap for most informal sector workers, who face difficulties moving to the formal sector. Also many of them are likely to have different characteristics to those workers already employed in the formal sector. Other studies find that many informal sector workers are poorly educated, older, and live in rural areas (see McCaig and Pavcnik, 2015).

**Table 4**  
**Previous Work Status of Persons Who Left their Job in the last 12 Months (%),**  
**Pooled data 2010-2017**

Previous Work Status	Current Work Status				
	Not working	Agriculture	Informal Sector	Formal Sector	Total
Not Working (New Entrants)	n.a.	19	25	56	100
Agriculture	9	45	28	18	100
Self-employed	13	23	36	27	100
Casual	9	31	36	24	100
Family Workers	17	20	33	30	100
<b>Total Informal</b>	<b>12</b>	<b>26</b>	<b>36</b>	<b>26</b>	<b>100</b>
Employer	9	25	28	38	100
Wage Employment	11	15	23	50	100
<b>Total Formal</b>	<b>11</b>	<b>15</b>	<b>23</b>	<b>50</b>	<b>100</b>

Source: National Labour Force Survey, Various Years

There are also some workers who move from formal to informal sectors (23%). Previous studies indicate that this movement provides a safety net for most workers who had recently experienced a shock, such as being laid off from a formal sector job (see World Bank, 2010). Using the Indonesian Family Life Survey data, the World Bank (2010) showed that during period of 2000-2007 almost a half of workers who moved from formal to informal jobs had involuntarily lost their formal sector jobs.

However, not all jobs in the informal sector are necessarily bad jobs. Some of the older workers are more likely to move out of the formal sector to run their own non-farm businesses using their experience and assets accumulated during their working life to apply to informal jobs. In addition, although there was also a significant share of workers in the agriculture sector who move to informal sector (28%), most of the movers among agricultural workers tended to stay in agriculture (45%).

This study uses a statistical analysis to examine the transition of workers more rigorously, particularly movements into the formal sector. The analysis continues to use the pooled data during the period of 2010-2017, although we should remind the reader that Sakernas is not an individual panel data set. Although the data are not panel, Sakernas collects data on the previous work status 12 months prior to the survey. Some important questions for job mobility which are available from Sakernas include:

- (a) whether individuals stopped working or moved into another job in the past year,
- (b) in what industry was the previous job before the worker stopped working or moved out into another job; and
- (c) what was the employment status in their previous job before stopping work or moving into another job.

Appendix 1 contains important summary statistics for the main variables among the job movers to the formal sector (non-agriculture) using the pooled data from Sakernas 2010-2017. Job movers, from all categories to the formal sector, are dominated by young workers (15-24 for new entrants and 25-34 for other categories), suggesting that the older workers are less mobile. This is reflected

in the mean share of the job movers among people aged 35 years and above, which is significantly lower than for job movers among younger workers. Moreover, new entrants are dominated by workers with a higher level of education; the majority were senior high graduates (academic stream). This contrast with the studies of Aydin et al (2010) and Tansel and Acar (2017) in Turkey which showed that the young often experience entry barriers to formal employment because most young people lack the necessary experience to find a formal job, either by taking an unpaid job or a casual workers.

The movement to the formal sector for new entrants is concentrated in trade and services, while the movement from the informal to the formal sector was spread more widely across manufacturing, construction, trade, and service industries. Males dominated the job movers in all categories. Among the job movers, married individuals are also less represented than single people. Comparing islands, Java and Sumatera have a higher share of movers to the formal sector than other islands, perhaps related to the bigger portion of jobs in the formal sector in those islands.

The transition of workers to the formal sector is firstly examined using a logit model, with a binary outcome: whether individuals are currently working in the formal sector (1) or working in the informal sector (0). Following the above discussion, the Proxy 1 definition of the informal sector is used in the estimate. The main independent variable is whether workers 12 months ago were:

- (a) new entrants (who do not have a job),
- (b) working in the informal sector or
- (c) working in the formal sector (omitted as a reference)

Following the method used by McCaig and Pavncik (2015) for Vietnam, the estimate focuses on the job movers, excluding those workers who have not changed their job in the past twelve months. The transition will also be linked to some social and demographic characteristics as control variables, consisting of the labour supply characteristics. These include age, gender, residence in urban/rural areas, highest level of completed education, whether the individual is a household head, marital status, sector of activity and the main island where the worker is living. In addition, the provincial minimum wage and the provincial share of output in services and industry are added as proxies to measure labour demand variations. An increase in provincial minimum wage is expected to attract more workers to the formal sector but also to push up labour costs, and therefore potentially affect the job movement across sectors. Dummy variables are used to control for year-specific characteristics. The logit will be examined for all jobs and non-agricultural jobs, given different characteristics of the agricultural sector with the other sectors discussed above.

As presented in Table 5, the coefficient of the new entrants (individuals who did not have a job in the previous 12 months) is positive and statistically significant. This indicates that workers who did not have a job in the past year are more likely to enter the formal sector. Compared to other categories, the result also shows new entrants have a higher probability of entering the formal sector than workers previously employed in both informal sector and formal sector. Thus, the main driving force for the formal sector expansion in the last decade has been new entrants.

Comparing the estimates of all workers and non-agricultural workers, the coefficient is higher using the all worker data, indicating that new entrants have higher also probability of entering the formal sector than workers who previously worked in agriculture. Although new entrants tend to be superior to other job movers, World Bank (2010) noted that young people are more likely

employed on fixed-term contracts rather than as permanent employees. They are thus likely to face a higher degree of income insecurity with lower earnings.

Moreover, although we know that there is some mobility of workers from the informal to the formal sector, the result shows that individuals who previously worked in the informal sector are generally less likely to move to the formal sector, and more likely to move to the other informal sector jobs. In other words, the result supports the analysis that workers who are previously working in informal sector find more difficulties in entering formal sector employment than the other categories. The difficulties are a bit more severe for work in formal, non-agricultural jobs (columns 3 and 4), suggesting some constraints to the transition, particularly to the non-agricultural jobs, as indicated by the decrease in coefficients when agricultural workers are excluded (see Table 5). The evidence suggests the existing of an 'informality trap' for most of the informal sector workers.

The result is consistent with McCaig and Pavcnik (2015) for Vietnam, showing that the transition of workers to the formal sector is dominated by younger, educated, male, and workers living in urban areas. Comparing age groups, young movers (age 15-24) are the most likely to enter the formal sector employment relative to the older workers, confirming our observation that young workers make an important contribution toward the expansion in the formal sector. The probability of moving among different age groups then declines noticeably; indicating that workers of different ages also differ in labour mobility costs, affecting their ability to move into the formal sector (see Dix-Carneiro, 2014).

The result also shows that higher levels of education are associated with easier access to the formal sector, supporting the results of Gong et al (2004) in Mexico and Tansel and Acar (2017) in Turkey. Comparing education level, there is a significant ranking of according to workers' educational attainment, meaning that among movers, those people with higher education qualifications are more likely than those with lower educational qualifications, to move to the formal sector. The highest probability is found among movers with a tertiary education. Female workers are less likely to move to the formal sector; this finding supports other evidence that females are more likely to work in the informal sector, which offers them greater job flexibility. Similarly, workers who are live in urban areas have a greater probability of entering the formal sector than those who live in rural areas. This is also supported by the fact that the movers to the formal sector tend to work in the modern sector, including finance, services, and utilities, which is more likely to be found in urban areas.

**Table 5. Logit Results for Movement to the Formal Sector from Previous Activity**

	All Workers		Non-Agriculture Jobs	
	Coef.	P>z	Coef.	P>z
<b>Previous Work Status</b>				
New Entrants	0.157	0.00	0.048	0.00
From Informal Sector	-0.619	0.00	-0.679	0.00
<b>Ages</b>				
Age15-24	1.483	0.00	1.643	0.00
Age25-34	1.108	0.00	1.217	0.00
Age35-44	0.842	0.00	0.941	0.00
Age45-54	0.612	0.00	0.719	0.00
Age55-64	0.256	0.00	0.373	0.00
<b>Education</b>				
Primary	0.227	0.00	0.183	0.00
Junior high	0.381	0.00	0.431	0.00
Senior High-Academic	0.802	0.00	0.909	0.00
Senior High-Vocational	0.693	0.00	0.825	0.00
Diploma	1.344	0.00	1.480	0.00
University	1.075	0.00	1.232	0.00
<b>Current Industry of Employment</b>				
Mining	1.520	0.00	-0.709	0.00
Manufacturing	1.643	0.00	-0.657	0.00
Utilities	2.809	0.00	0.502	0.00
Construction	1.263	0.00	-1.009	0.00
Trade	0.586	0.00	-1.722	0.00
Transportation	0.657	0.00	-1.657	0.00
Finance	2.587	0.00	0.240	0.00
Services	2.291	0.00		
<b>Other Personal Characteristics</b>				
Urban	0.401	0.00	0.365	0.00
Head HH	0.344	0.00	0.354	0.00
Males	0.114	0.00	0.121	0.00
Married	-0.609	0.00	-0.730	0.00
Ever Married	-0.455	0.00	-0.522	0.00
<b>Islands</b>				
Sumatera	0.488	0.00	0.364	0.00
Kalimantan	0.693	0.00	0.501	0.00
Sulawesi	0.436	0.00	0.398	0.00
Other	0.067	0.00	0.156	0.00
<b>Demand Side</b>				
Ln Minimum Wage	-0.354	0.00	-0.309	0.00
Share of Services	2.422	0.00	2.698	0.00
Share of Industry	2.394	0.00	2.563	0.00
Constant	0.347	0.19	1.867	0.00
No observation		176645		133474
Pseudo R square		0.25		0.20

The share of output in services and manufacturing in the region shows positive results, suggesting that both sectors are dominated by the formal sector employment. Moreover, higher annual increases in the level of provincial minimum wages are associated with a decrease in the probability of being employed in the formal sector, as expected.

To focus specifically on the transition to the formal sector, next the paper examines the transition to formal sector from each category. The multinomial logit is estimated among three possible outcomes, consisting of the following possible transitions:

- (a) from the informal sector to the formal sector,
- (b) from one formal sector job to another formal sector job, and
- (c) new entrants (without a job one year ago) who move to the formal sector.

The explanatory variables are similar to the main explanatory variables used in the first estimate, comprising labour supply characteristics, i.e. age, gender, living in urban or rural areas, educational attainment, head of households, marital status, main island of residence, year, industry dummies and year dummies. In addition, labour demand shifters are added, including share of output in services and manufacturing, and annual increases in provincial minimum wages.

Table 6 reports the multinomial logit results for transition to the formal sector. The estimate focuses on non-agricultural jobs. To facilitate interpretation of the results, the marginal effects for each explanatory variable are also reported in the result because the raw regressions are not directly informative and not comparable across the three possible outcomes. The marginal effects provide information on the change in probabilities of each outcome examined. Therefore, specifically, the change in one covariate might increase the probability of one selected outcome but might decrease the probability of another outcome, providing a zero value of total probabilities across all selected outcomes.

The results generally support the first estimate that young people (aged 15-24 years), have greater probabilities of entering the formal sector, as indicated by the positive marginal effects for new entrant outcomes (the marginal effect is 0.134). However, among the older age groups (aged 25 and above), the transition to the formal sector is more dominated by the individuals who have experienced working in the formal sector in the past, as indicated by the positive marginal effects of the transition from formal to (other) formal sector for ages 25 and above. Moreover, individuals who have previously worked in the informal sector are less likely to move to the formal sector, supporting our earlier finding that only a small share of the informal sector workers successfully use the sector as a stepping stone for entering the formal sector (see Table 4).

Although the first estimate above (logit) showed that higher education is associated with a higher probability of moving into the formal sector, interestingly, table 6 also shows that individuals who have a higher education and come from the other formal sectors have highest probability of relocating to the formal sector, as indicated by the positive marginal effect. In other words, the higher education combined with experience working in the other formal sectors provide a greater chance of entering the formal sector.

Table 6

## Multinomial Logit Result for Movers to the Formal Sector, Non-Agricultural Sectors (Proxy 1)

	Informal to Formal		Formal to Formal		New Entrant to Formal	
	Mfx	P value	Mfx	P value	Mfx	P value
<b>Ages</b>						
Age15_24	-0.097	0.00	-0.037	0.24	0.134	0.00
Age25_34	-0.036	0.00	0.096	0.01	-0.060	0.09
Age35_44	-0.015	0.10	0.093	0.01	-0.078	0.03
Age45_54	-0.009	0.33	0.070	0.05	-0.060	0.09
Age55_64	-0.025	0.00	0.082	0.03	-0.056	0.14
<b>Education</b>						
Primary	0.029	0.00	0.078	0.00	-0.107	0.00
Junior high	0.000	0.98	0.121	0.00	-0.121	0.00
Senior High-Academic	-0.028	0.00	0.163	0.00	-0.135	0.00
Senior High-Vocational	-0.045	0.00	0.148	0.00	-0.102	0.00
Diploma	-0.061	0.00	0.200	0.00	-0.139	0.00
University	-0.076	0.00	0.116	0.00	-0.040	0.05
<b>Industry</b>						
Mining	0.035	0.00	0.089	0.00	-0.125	0.00
Manufacturing	0.011	0.00	0.123	0.00	-0.135	0.00
Utilities	0.031	0.02	0.037	0.10	-0.069	0.00
Construction	0.015	0.00	0.037	0.00	-0.052	0.00
Trade	0.021	0.00	0.108	0.00	-0.129	0.00
Transportation	0.009	0.03	0.115	0.00	-0.124	0.00
Finance	0.000	0.95	0.128	0.00	-0.127	0.00
<b>Other Personal Characteristics</b>						
Urban	-0.029	0.00	0.099	0.00	-0.071	0.00
Head HH	0.031	0.00	0.138	0.00	-0.170	0.00
Males	0.059	0.00	0.063	0.00	-0.123	0.00
Married	0.043	0.00	0.065	0.00	-0.108	0.00
Ever Married	0.063	0.00	0.054	0.00	-0.118	0.00
<b>Islands</b>						
Sumatera	-0.029	0.00	-0.028	0.00	0.058	0.00
Kalimantan	-0.027	0.00	-0.030	0.00	0.058	0.00
Sulawesi	-0.045	0.00	-0.089	0.00	0.132	0.00
Other	-0.032	0.00	-0.080	0.00	0.112	0.00
<b>Demand Side</b>						
Ln Minimum Wage	0.009	0.00	0.019	0.00	-0.028	0.00
Share of Services	-0.182	0.00	0.451	0.00	-0.269	0.00
Share of Industry	-0.193	0.00	0.422	0.00	-0.229	0.00
No. observation	83414.00					
Pseudo R square	0.14					

Comparing industries, new entrants, rather than workers previously engaged in informal and the other formal sectors, have a lower probability of entering the formal sector in most sectors, especially in services (the reference category). Many are likely to be professionals in teaching and health care who have just graduated from the courses. The other interesting result is that although

females are less likely to move to the formal sector, females who are new entrants dominate the movement to the formal sector. This is indicated by the negative coefficient for new entrants who are male. In addition to entry into formal sector jobs amongst females trained in teaching and health, the other possible reason is less mobility among females who are already in the labour force in general; they are less likely to make a transition from their current job to either the formal or the informal sector.

### Earnings of Formal Sector Workers

The study then examines the implication of these transitions for the different rates of earnings between formal and informal sector and among the movers and stayers. According to Sakernas, the earnings of formal sector workers focus on earnings in wage employment, while the earnings of informal sector workers include earnings received by self-employed and casual workers. As presented in Table 7, those workers in formal employment earn most on average, with the highest earnings among workers in formal, non-agricultural work. This confirms also that workers in the informal sector appear to be at a disadvantage, consistent with the literature that informal sector workers earn significantly less than their formal counterparts. Moreover, agricultural earnings continue to be inferior, with a large gap compared with the non-agriculture formal sector.

**Table 7**  
**Employment and Earnings in the Informal and Formal Sectors by Main Industry, 2017**

Main Industries	Informal and Formal Sectors	Employment (million)	Earnings			
			Rp. 000		Index	
			Monthly	Hourly	Monthly	Hourly
			(Index=All Workers=100)			
Agriculture		14.6	1309	10.8	58	73.5
Non-Agriculture	Informal	24.5	1801	13.0	80	88
	Formal	44.7	2811	16.9	125	115
Total	Formal+Informal	83.9	2252	14.7	100	100

Source: Sakernas, 2017

Table 8 presents the cross-tabulation of current hourly earnings in non-agriculture, comparing current earnings in the formal and informal sectors for mobile workers with a different work status in the previous year. Although new entrants have a higher probability of entering the formal sector, on average they receive less of a premium than the movers who have had work experience (in both formal and informal sectors) before entering the formal sector. Compared to experienced workers, job movers from the informal sector to the formal sector receive lower earnings than the movers from the other formal sectors. This confirms the potential 'scarring' effect when they enter into formal sector jobs.

Among informal sector workers, the previously self-employed enjoy higher earnings in the formal sector than previously employed casual workers and family workers. Interestingly, job movers from the formal sector jobs receive similar earnings irrespective of whether they take up jobs in the informal sector or in another formal sector job. Moving to the informal sector was not a backward step for many workers previously employed in the formal sector.

**Table 8**  
**Hourly Earnings in Formal and Informal Sectors**  
**Based on Previous Work Status among Job Movers, Pooled data 2010-2017\***

Previous Work Status	Current Work Status	
	Informal Sector	Formal Sector
Not Working (New Entrants)	7540	6909
Self employed	8147	7641
Casual	6880	6652
Family Workers	7568	7303
<b>Total Informal</b>	<b>7557</b>	<b>7242</b>
Employer	12402	11681
Wage Employment	8788	8916
<b>Total Formal</b>	<b>8923</b>	<b>8964</b>

\* Non-agricultural workers only.

Source: Sakernas 2010-2017

Finally, the study also compares the earnings of job movers that switch to the formal sector using statistical analysis. As already explained, the study focuses on formal sector earnings because earnings are quite variable in informal sector, providing unstable coefficients in the earnings equation. The dependent variable in the estimate is the log of hourly earnings in the formal sector, calculated as the sum of monthly labour income in their main job divided by the number of hours worked during the month. Following the categories used in the previous estimate, the main independent variables include workers (a) who moved from the informal sector to the formal sector, in the same jobs (b) who moved from one formal sector job to another, and (c) people without jobs (mostly new entrants) moving to the formal sector (the omitted category). The control variables are broadly the same as in the previous section, including labour supply and labour demand shifters.

The results confirm that generally individuals who have experienced working in the other formal sectors receive the highest earnings compared with the other two categories (Table 9). The result is robust across different estimates. The coefficients for workers who moved from another formal sector is significantly higher than for individuals who moved from the informal sector, again suggesting the existence of scarring effect for those previously employed in the informal sector. Although new entrants have a higher probability of entering the formal sector, the results confirm that they receive lower earnings than the experienced job movers, either from formal or informal sector.

**Table 9. Hourly Earnings Equation for Formal Sector Jobs**

	Heckman		OLS	
	Coef.	P>z	Coef.	P>z
<b>Previous Work Status</b>				
From Formal Sector	0.106	0.00	0.107	0.00
From Informal Sector	0.015	0.09	0.018	0.04
<b>Ages</b>				
Age15-24	0.102	0.05	-0.028	0.56
Age25-34	0.220	0.00	0.126	0.01
Age35-44	0.297	0.00	0.229	0.00
Age45-54	0.354	0.00	0.300	0.00
Age55-64	0.320	0.00	0.289	0.00
<b>Education</b>				
Primary	-0.025	0.23	-0.034	0.09
Junior high	0.190	0.00	0.160	0.00
Senior High-Academic	0.398	0.00	0.342	0.00
Senior High-Vocational	0.577	0.00	0.522	0.00
Diploma	0.770	0.00	0.696	0.00
University	0.889	0.00	0.816	0.00
<b>Industry</b>				
Mining	0.432	0.00	0.468	0.00
Manufacturing	0.207	0.00	0.235	0.00
Utilities	0.249	0.00	0.234	0.00
Construction	0.242	0.00	0.293	0.00
Trade	-0.106	0.00	-0.028	0.00
Transportation	0.069	0.00	0.147	0.00
Finance	0.278	0.00	0.275	0.00
<b>Other Personal Characteristics</b>				
Urban	-0.007	0.20	-0.009	0.10
Males	0.194	0.00	0.188	0.00
<b>Islands</b>				
Sumatera	0.074	0.00	0.054	0.00
Kalimantan	0.139	0.00	0.114	0.00
Sulawesi	0.054	0.00	0.034	0.00
Other	0.061	0.00	0.052	0.00
<b>Demand Side</b>				
Ln Minimum Wage	0.435	0.00	0.451	0.00
Share of Services	1.331	0.00	1.160	0.00
Share of Industry	1.499	0.00	1.340	0.00
Constant	0.484	0.00	0.617	0.00
Lambda	0.169	0.00		
No observation		78092		78092
R square				0.252

The coefficients on most of the control variables in the earning equation were also found to be significant. In general, the results suggest that older aged movers to the formal sector enjoyed higher incomes than younger aged movers, with the highest coefficient for ages 45-54 years old. This is most likely due to greater work experience of the older movers compared with younger movers. As expected, individuals with more education enjoyed a higher labour income.. Comparing sector of activities, movers to the formal sector who are working in mining and finance enjoyed higher labour incomes than individuals who moved to other sectors. The lowest level of earnings was received by workers that moved to trade and services (the omitted category). Male movers also receive higher earnings than female movers. On the demand side, increases in minimum wages raised hourly earnings as predicted. A bigger share of industry and services in the region also supports higher earnings of the workers formerly employed in the formal sector.

## **Conclusions**

The paper has studied the job transition across sectors supporting the growth of the formal sector in Indonesia. Formalization occurred in a period of slower growth in the economy. In this respect Indonesia is different to an interesting comparator, Vietnam, which is a low-income but fast growing and industrializing country (see McCaig and Pavcnik (2015)). Using the National Labour Force Survey, the study finds that the expansion of the formal sector in Indonesia is closely correlated with the strong growth in number of younger better educated, new job entrants. This occurred in a period of increased social services, including a rapid increase in government funded education and health care in the second decade of the 2000s. Indonesia has been among the countries investing heavily in the number of schools and universities, reflected in the significant increase in the educational budget (Ginting et al, 2018). For many, education is a must for formal sector work, especially in modern sectors.

On the other hand, there is some mobility from the informal to the formal sector, particularly for workers who have the similar characteristics to those of employees in the formal sector. Although there is some mobility from informal to the formal sector, the results show that individuals who previously worked in the informal sector find moving to the formal sector difficult. In terms of earnings, there is also evidence of scarring effects, suggested by the fact that formal sector workers who initially started in the formal sector earn more than individuals who are initially started in the informal sector.

Besides education, some demographic characteristics of workers are also found to be related to job transitions. Regarding age, the study found that older workers found it harder to enter into formal sector jobs than younger people. Sector of economic activity appeared to play a significant role in explaining job mobility into the formal sector, particularly for jobs in services and manufacturing. Although the formal sector work is generally preferred in terms of earnings capacity over informal and agricultural work, some studies in Indonesia showed that jobs in the formal sector are not always superior to those in the informal sector. As discussed above, quality of jobs in the formal sector depend partly on their contract status.

If data is available, future research work could further examine the jobs' transition using the expanded definition of formal-informal sector (Proxy 2 and Proxy 3) in the national labour force survey. This is particularly relevant for the specific questions on workers' previous jobs. It will make the definition of formal-informal sectors more specific and realistic.

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## Appendix 1

### Summary Statistics for Main Variables among the Job Movers to the Formal Sector,

#### Pooled data 2010-2017

Characteristic	Informal to Formal		Formal to Formal		No Job to Formal (New Entrants)	
	Mean	SD	Mean	SD	Mean	SD
<b>Ages</b>						
15-24	0.19	0.39	0.34	0.47	0.61	0.49
25-34	0.32	0.46	0.35	0.48	0.24	0.43
35-44	0.28	0.45	0.19	0.39	0.09	0.29
45-54	0.15	0.36	0.08	0.27	0.04	0.20
55-64	0.04	0.20	0.03	0.16	0.01	0.11
>64	0.01	0.10	0.003	0.06	0.002	0.05
<b>Education</b>						
Less than Primary	0.03	0.17	0.01	0.11	0.02	0.13
Primary	0.41	0.49	0.19	0.40	0.20	0.40
Junior high	0.26	0.43	0.23	0.42	0.23	0.43
Senior High-Academic	0.24	0.43	0.39	0.48	0.36	0.48
Senior High-Vocational	0.02	0.14	0.05	0.21	0.05	0.22
Diploma	0.03	0.16	0.10	0.29	0.10	0.30
University	0.01	0.07	0.03	0.16	0.04	0.19
<b>Industry</b>						
Mining	0.08	0.27	0.04	0.20	0.03	0.18
Manufacturing	0.19	0.39	0.22	0.41	0.17	0.37
Utilities	0.01	0.08	0.01	0.08	0.01	0.08
Construction	0.19	0.39	0.10	0.29	0.08	0.28
Trade	0.21	0.40	0.27	0.44	0.26	0.44
Transportation	0.07	0.26	0.07	0.25	0.05	0.21
Finance	0.03	0.19	0.08	0.26	0.06	0.23
Services	0.20	0.40	0.22	0.41	0.34	0.46
<b>Other Personal Characteristics</b>						
Urban	0.52	0.50	0.75	0.43	0.64	0.48
Rural	0.48	0.50	0.25	0.43	0.36	0.48
Male	0.80	0.39	0.68	0.46	0.52	0.50
Female	0.20	0.39	0.32	0.46	0.48	0.50
Head of Household	0.54	0.50	0.37	0.48	0.13	0.34
Married	0.69	0.46	0.53	0.50	0.30	0.46
Ever Married	0.06	0.24	0.04	0.20	0.03	0.17
Single	0.25	0.42	0.43	0.49	0.67	0.47

<b>Islands</b>						
Java	0.36	0.47	0.45	0.50	0.33	0.47
Sumatera	0.227	0.44	0.25	0.43	0.28	0.45
Sulawesi	0.14	0.34	0.09	0.29	0.15	0.35
Kalimantan	0.11	0.31	0.11	0.31	0.10	0.31
Other	0.12	0.33	0.10	0.30	0.14	0.34
<b>Demand Side</b>						
Ln Increase Minimum Wage*	13.95	0.35	13.98	0.37	13.98	0.38
Share of Services	0.43	0.10	0.43	0.13	0.43	0.12
Share of Industry	0.38	0.14	0.41	0.15	0.38	0.16

Notes: SD : Standard Deviation;

Source: Sakernas, 2010-2017