

# Intersectoral Labor Mobility in Indonesia

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## ABSTRACT

This paper investigates the effect of labour characteristics i.e. income, living in main islands, living in urban/rural areas and migration status on inter-sectoral labour mobility in Indonesia. We employ the sample of National Labour Force Survey (Sakernas) data which cover 8,869 workers who changed jobs last year. An analysis with Multinomial Logit finds evidence that income (in quantile) significantly influences the workers' propensity for intersectoral mobility. Low income workers' are more likely to shift in the same sector as the previous one and to work in the same location as where they live. The differences of region (island) have positive link with mobility from/toward agriculture sectors because Indonesia still has a large of agricultural land. Migrant workers are shifting to sectors with higher wages but require lower mobility costs. The government should implement policies that reduce the mobility cost by improving transportation facilities, encouraging the productivity of the nonfarm sector in rural areas, and focusing on the economic empowerment of rural-based communities.

Keywords- labor mobility, income, rural-urban migration

## 1. INTRODUCTION

Labor mobility can be an optimal resource allocation strategy towards the realization of economic growth. A flexible labor market enables workers to move from less productive sectors into more productive ones [1]. Meanwhile, in developing countries, the agricultural sector continues to experience a decline in production [2] and is filled with inefficient labors [3] so that it grows into sectors with low productivity. This causes the agricultural sector to be abandoned by labors. Agricultural workers are moving towards the industrial and service sectors that offer higher wages. The movement of traditional subsistence agricultural workers in rural areas to the modern industrial sector in urban areas plays an important role in the economy growth, especially the additional labor supply in the manufacturing sector will increase its output growth [4].

Todaro's migration theory states that the expectation of getting higher income is the main reason why workers choose mobility [4]. Efforts to obtain higher wages can be achieved by moving into sectors with high productivity [5]. However, every movement of workers between sectors and regions requires mobility costs. Therefore, mobility decisions are very dependent on how much the current income of workers is able to bear the costs of mobility.

Previous researches state that the possibility of mobility occurs in middle-income households, namely those in the income class (quantile) 2, 3 and 4, while low-income / poor (quantile 1) and high / non-poor (quantile 5) workers do not do mobility [6]. The small opportunities for poor workers mobility are due to their inability to bear the costs of mobility [7], such as transportation costs when doing geographical mobility or adjusting to new jobs for those who choose inter-sector mobility. This condition leads poor workers in the agricultural sector to move into the industrial and service sectors located in the same area as their residence [8].

Besides income factors, workers' mobility decisions are closely related to the socio-demographic conditions of workers [9,10], one of which is the worker's residence status. Workers in rural

areas, especially those experiencing poverty, change their job to improve their quality of life [11]. They believe that mobility can be a ladder to escape poverty [8]. On the other hand, workers in urban areas perform mobility between formal and informal sectors to avoid income uncertainty [12]. Cross-sector mobility research in Indonesia [13-15] shows tangible evidence of the relationship between individual characteristics (gender, age, education level, and residence status), household characteristics (marital status, family size) and job characteristics (income / wages, ownership of collateral, and employment contracts) and the mobility of intersectoral workers.

Therefore, the economic centers focusing on industrial and service sectors only grow in certain regions in Indonesia, pushing the flow of mobility increasingly unstoppable. Workers who move jobs into the modern sectors often do inter-regional mobility (migration). This condition is feared to create economic problems (income inequality [16], urban poverty) and demographic problems (increased settlement needs [17] as well as uncontrolled population growth). Based on this, the study explains the tendency of inter-sector mobility based on migration status and the main island where workers live.

The purpose of this study is to determine the effect of labor characteristics, i.e. income, living in main islands, living in urban / rural areas and migration status on inter-sectoral labor mobility in Indonesia. The second part of this article reviews the methodology and data used in the research, and the third part contains research hypotheses while the fourth part will analyze the patterns of inter-sector worker mobility. Conclusions and policy recommendations are presented in the fifth and sixth sections.

## 2. RESEARCH METHODOLOGY

Using individual data from the National Labor Force Survey (SAKERNAS) for the August 2018 period, the shifting labor process between sectors in Indonesia is presented. The unit of analysis is 8,869 workers who have moved in the past year. The phenomenon of labor shifts is explained using logistic

regression analysis and models with several categories, known as multinomial logits. The multinomial logit model in this study is as follows:

$$Y_i = \alpha + \sum_{j=1}^J \beta_j X_{ji} + \sum_{k=1}^K \gamma_k X_{ki} + \delta_i X_{li} + \theta_m X_{mi} + \epsilon_i$$

(1) where  $Y_i$  has multinomial outcome (7 categories),  $X_j$  represents labor income which described with 5 quantiles,  $X_k$  represents the main island where the workers are living,  $X_l$  represents where the workers are living in urban/rural areas and  $X_m$  represent migration status. TABLE I. shows the variable definitions and descriptive statistics

TABLE I. DEFINITION OF THE VARIABLE AND DESCRIPTIVE STATISTICS

Variable	Category	Mean	SD
Mobility ( $Y_i$ )	Shifting in same sector (0)*	0,51	2,278
	Agriculture → Industry (1)	0,07	
	Agriculture → Service (2)	0,05	
	Industry → Agriculture (3)	0,08	
	Service → Agriculture (4)	0,06	
	Industry → Service (5)	0,12	
	Service → Industry (6)	0,11	
Income ( $X_j$ )	Q1 (Rp0,-)*	0,20	0,402
	Q 2 (Rp1.000,- s.d Rp1.000.000,-)	0,22	0,416
	Q3 (Rp1.008.000,- s.d Rp1.600.000,-)	0,19	0,391
	Q4 (Rp1.610.000,- s.d Rp2.440.000,-)	0,19	0,389
	Q5 (Rp2.448.000,- s.d Rp40.000.000,-)	0,20	0,399
Islands ( $X_k$ )	Java*	0,36	0,482
	Sumatera	0,28	0,447
	Kalimantan	0,13	0,33
	Sulawesi	0,12	0,322
	Other	0,11	0,316
Home ( $X_l$ )	1 = rural, 0 = urban*	0,47	0,499
Migration ( $X_m$ )	1 = workers are migrants 0 = non-migrant workers*	0,26	0,439

Note : \* base category

Source: Authors' calculation (2019)

Based on TABLE I., it is known that most workers choose the pattern of same sector mobility (51%), followed by mobility in the modern sector, namely the movement between service-industry sectors. Mobility decisions are spread equally among

all workers in each income class, or in other words workers in any income range have the same possibility of mobility. Furthermore, based on the characteristics of workers' residence, it is known that mobility is carried out by workers both in rural areas (47%) and urban areas (53%) and spread across all regions in Indonesia. Sectoral mobility is mostly practiced by workers on the island of Java (36%) followed by workers in Sumatra (28%), workers in Kalimantan (13%) and finally workers in other islands (11%). This is closely related to the development of these areas, especially in the transformation of the economic structure from the agricultural sector to the industrial and service sectors. However, only 26% of the mobility workers are migrants, meaning that most workers move into another sector located in the same regency / city as the residence of the workers.

### 3. HYPOTHESIS

Hypotheses in this study are as follows on TABLE II. The figures (+/-) are the hypotheses of the relationship between the independent variable and intersectoral labor mobility.

TABLE II. HYPOTHESIS AND REFERENCES

Hyp	Description	Sign	References
H1	There is a significant effect of income on intersectoral mobility	+/-	Syafitri (2013), Narayan and Singh (2015)
H2	There is a significant effect of residence on intersectoral mobility	+/-	McCulloch, et al (2007)
H3	There is a significant effect of migration on intersectoral mobility	+	Molloy, et al (2017), Su, et al, (2018)

Source: Authors' (2019)

A negative sign implies that the choice of probabilities shifts to lower categories when the independent variable increases. In this study we are interested in the response probabilities or marginal effects of the logit models.

### 4. RESULT AND DISCUSSIONS

Analysis of intersectoral mobility consists of 3 parts; *first*, mobility out of the agriculture sector for workers shifting from the agriculture sector to the industry and service sectors, *second*, mobility to the agriculture sector for workers shifting from the industry and service sectors to the agriculture sector, and the last, mobility across modern sectors for workers shifting between the industry and service sectors.

#### 4.1.Labor Mobility from the Agriculture Sector

Labor mobility out of the agriculture sector is an effort to get better wages to realize worker welfare. In addition, labor reallocation from the traditional sector to the modern sector is needed for increased economic growth [18]. Therefore, the analysis of labor mobility from the agriculture sector to the industry and service sectors is the main focus on the study of economic transformation as stated by Lewis in Lewis's Theory

of Unlimited Supply of Labor [19]. TABLE III. shows the estimation results (marginal effects) of labor mobility from the agriculture sector.

TABLE III. ESTIMATION RESULT ON MOBILITY (Y=1 AND Y=2)

Variable	Hypothesis	Agriculture → Industry	Agriculture → Service
		(1)	(2)
<i>Income</i>			
Quantile 2	+	0,0426***	0,01
Quantile 3	+	0,0581***	0,0048
Quantile 4	+	0,0877***	-0,0124**
Quantile 5	-	0,0515***	-0,0052
<i>Islands</i>			
Sumatera	+	0,0305***	0,0036***
Kalimantan	+	0,0357***	0,0477***
Sulawesi	+	0,0309***	0,0053
Other	+	0,0259**	0,0163*
Rural	+	0,0873***	0,0473***
Migran	+	-0,0045	0,00006
Probability		0,0598	0,0426

\*, \*\*, and \*\*\* are significant at  $p < 0,10$ ,  $p < 0,05$  and  $p < 0,01$ , respectively

Source: Authors' estimation (2019)

TABLE III. shows a significant relationship between income and residential characteristics and labor mobility out of the agriculture sector. Mobility opportunities to the industry sector are getting higher along with an increase in income. The propensity of labor mobility in the income quantile 2 increases by 4.26%, then increases to 5.81% when they are in the quantile 3 and 8.77% in the quantile 4. However, the propensity has a lower increase in the quantile 5. It is consistent with the hypothesis and [20] that the mobility opportunities decrease in the lowest and highest quantiles. The opposite occurs in labor mobility to the service sector. No significant relationship is found between income and mobility, except in the fourth income quantile (Q4). Mobility to the service sector requires lower mobility costs [13] so that even low-income workers can do mobility. Moreover, the service sector has similar characteristics as the informal sector which tends to be easier to enter.

Worker opportunities from all regions of Indonesia increase higher (positive coefficient) than workers in Java (base category) to do mobility to the industry and service sectors. It is seen that workers on Kalimantan have the highest increase in opportunities out of the agriculture sector to the industry sector (3.57%) and the service sector (4.77%). This condition is closely related to industry- and service-based city growth in Kalimantan, as occurred in Balikpapan and Banjarmasin. Meanwhile, agriculture-sector workers in rural areas try to get

better wages by conducting sectoral mobility to the industry sector (8.73%) and the service sector (4.73%). Interestingly, there is no concrete evidence of the effect of migration on intersectoral mobility. It means that sectoral mobility is followed by interregional migration. This confirms McCulloch's statement that to exit from poverty, agriculture-sector workers do not have to move to urban areas but must shift to the more productive non-agriculture sector [8]. In general, income and residential characteristics have a significant effect on workers' decisions to shift to the industry and service sectors. Mobility costs and regional development are considered by workers prior to mobility.

#### 4.2.Labor Mobility to the Agriculture Sector

The economic development model in Lewis's Theory of Structural Change emphasizes that the concept of labor surplus does not occur in countries with abundant agricultural land [21]. It means that the agriculture sector has never experienced a labor surplus. The agriculture sector is always ready to accept or become a safety net for workers leaving the industry and service sectors [13]. For this reason, the study of mobility patterns in Indonesia focuses on labor mobility to the agriculture sector, considering the vast agricultural land in Indonesia. TABLE IV. shows the estimation results (marginal effects) of labor mobility to the agriculture sector.

TABLE IV. ESTIMATION RESULT ON MOBILITY (Y=3 AND Y=4)

Variable	Hypothesis	Industry → Agriculture	Service → Agriculture
		dy/dx	dy/dx
<i>Income</i>			
Quantile 2	+	-0,0307***	-0,0356***
Quantile 3	+	-0,0492***	-0,0499***
Quantile 4	+	-0,0533***	-0,0498***
Quantile 5	-	-0,0674***	-0,0598***
<i>Islands</i>			
Sumatera	+	0,0228***	0,0231***
Kalimantan	+	0,0337***	0,0041
Sulawesi	+	0,0352***	0,0126
Other	+	0,0154	0,0122
Rural	+	0,0671***	0,0384***
Migran	-	-0,0082	-0,0066
Probability		0,0663	0,0461

\*, \*\*, and \*\*\* are significant at  $p < 0,10$ ,  $p < 0,05$  and  $p < 0,01$ , respectively

Source: Authors' estimation (2019)

Contrary to the propensity for mobility out of the agriculture sector, negative directions on the coefficient on TABLE IV.

show the amount of income in any quintile reduces labor mobility opportunities from the industry and service sectors. It means that the higher the worker income is, the more decreasing the opportunity to shift to the agriculture sector will be. Opportunities for high-income workers (Q5) to shift to the agriculture sector decrease by 6.74% (industry) and 5.98% (service), whereas opportunities for low-income workers only decrease by (3.07%) and (3.5%). This shows that workers' dissatisfaction with wages received in the industry and service sectors is not the main reason workers shift to the agriculture sector. The agriculture sector which is identical to the informal work system tends to have no income stability [22] and is believed to exacerbate poverty [23] causing workers to be reluctant to shift to the agriculture sector.

Meanwhile, the effect of residential characteristics shows the opposite phenomenon. Opportunities for industry-sector workers in Sumatra (2.28%), Kalimantan (3.37%) and Sulawesi (3.52%) and service-sector workers in Sumatra (2.31%) experience a significant increase to shift to the agriculture sector. It is related to the carrying capacity in the form of vast agricultural land in those regions. The magnitude of the possibility of opening new agricultural land attracts workers from the non-agriculture sector to the agriculture sector. Moreover, after the distribution of Village Funds 'Dana Desa' by the government since 2015, each region seeks to produce superior products mostly based on the agriculture sector. Even in some areas, local tourism is developed based on agriculture sector activities, such as offering rice planting activities, bathing livestock, etc. to tourists.

The results show opportunities to shift to the agriculture sector (TABLE IV.) from the industry sector (6.71%) is higher than the chance of agriculture-sector workers (TABLE III.) to shift to the industry sector (5.98%). The same occurs for intersectoral mobility in the agriculture-service sectors. This finding is consistent with Lewis's claim that the agriculture sector remains a mobility destination as long as land scarcity does not occur.

**4.3.Labor Mobility Across Modern Sectors**

The development of technology towards digitization and automation in the industry and service sectors raises the risk of labor replacement [24], causing labor mobility flows in both sectors to occur quite dynamically. Referring to TABLE I. it is known that Indonesian workers prefer mobility from/to the industry and service sectors rather than shifting from/to the agriculture sector, as seen from their average values of 0.12 and 0.11 which are far higher than the value of other mobility. The demand of the modern industry sector for high-skilled workers forces low-skilled workers to be out of the labor market. Conversely, the rapid growth of the service sector up to ten-fold since 1990 [25] has attracted Indonesian workers to shift to the service sector. These conditions have led to an increase in mobility flow of the industry-service sector.

**TABLE V. ESTIMATION RESULT ON MOBILITY (Y=5 AND Y=6)**

Variable	Hypothesis	Industry → Service	Service → Industry
		dy/dx	dy/dx
<i>Income</i>			
Quantile 2	+	-0,0123	0,0571***
Quantile 3	+	-0,0172*	0,0993***
Quantile 4	+	-0,0424***	0,1060***
Quantile 5	-	-0,0472***	0,0977***
<i>Islands</i>			
Sumatera	+	-0,0481***	-0,0220***
Kalimantan	+	-0,0444***	-0,0434***
Sulawesi	+	-0,0216**	0,0114
Other	+	-0,0506***	-0,0314***
Rural	+	-0,0578***	-0,0185***
Migran	+	0,0154*	-0,0130*
Probability		0,1205	0,1081

\*, \*\*, and \*\*\* are significant at  $p < 0,10$ ,  $p < 0,05$  and  $p < 0,01$ , respectively

Source: Authors' estimation (2019)

TABLE V. shows a significant relationship with diverse directions (+/-) between income and mobility. Mobility opportunities of industry-sector workers to the service sector decline across all income quantiles. It means that regardless of the wages received by industry-sector workers, they are reluctant to shift to the service sector. This phenomenon occurs because most industry sectors have certainty of the wage systems and employment contracts and offer insurances for health, work safety, old age, etc. It also causes opportunities for workers to shift from the service sector to the industry sector to continue to increase across all income quantiles.

The explanation of the effect of worker origin (island) on intersectoral mobility in the previous section shows a positive direction. Different results are shown in industry-service intersectoral mobility patterns. Negative coefficients in each region indicate a decrease in mobility opportunities (except mobility from the service sector to the industry sector in Sulawesi). It means that in almost all regions of Indonesia, industry- and service-sector workers tend to shift to the same sector as their previous jobs than shifting to a different sector. It is related to the high skills of workers in the industry and service sectors, in which the higher the worker skills are, the less likely they will do job mobility due to the limited labor market demand for these special qualifications [26]. A similar fact also occurs in workers in rural areas. Job mobility opportunities between the industry-service sectors are slightly

smaller than mobility opportunities in the same sector as previous jobs.

Important findings regarding the sectoral mobility of migrant workers can be seen from the significant relationship between migration status and industry-service intersectoral mobility. Workers who decide to do interregional migration have a 1.54% greater chance of shifting from the industry sector to the service sector. Whereas workers who previously worked in the service sector have a 1.30% lower tendency to shift to the industry sector. Migrant workers tend to be more selective in choosing a job as a destination for sectoral mobility. It is related to the amount of mobility costs they have sacrificed. In similar conditions, mobility costs incurred by migrant workers are higher than non-migrant workers. Migrant workers incur physical costs such as transportation costs as well as psychological costs of leaving family and friends [9]. Thus, they tend to choose sectors that have high productivity and offer better wages but require lower mobility costs, such as the service sector.

## 5. CONCLUSION

The results show evidence of the effect of income, residential characteristics, and labor migration status on intersectoral mobility. In contrast to previous research showing that low income will always encourage mobility [27], this study shows the effect of income on mobility varies. Income can encourage or inhibit mobility, depending on income quantiles and choice of mobility patterns. Workers in the lower income quantiles have a higher tendency to shift in the same region and the same sector as their previous job because of their inability to bear mobility costs. Whereas, high-income workers able to afford mobility costs choose to be out of the agriculture sector.

Workers in all regions of Indonesia tend to do mobility from/to the agriculture sector, in which mobility opportunities to the agriculture sector are higher than mobility out of the agriculture sector. The difference in islands where workers live has a significant effect on intersectoral mobility choices. Industry- and service-sector workers on islands having vast agricultural land tend to shift to the agriculture sector than shifting to the same sector as their previous jobs.

Workers doing interregional migration tend to be more selective in choosing a new job as a destination for intersectoral mobility. Migrant workers choose a more productive sector offering higher wages but requiring lower mobility costs, i.e. the service sector.

## 6. POLICY IMPLICATIONS

The findings of this study have important policy implications. High mobility costs inhibit low-income workers to do mobility, thereby losing the opportunity to get better wages. The government can provide a cheap and convenient transportation infrastructure able to facilitate migrant workers and commuter workers to do mobility to sectors with high productivity. The magnitude of mobility flows to the agriculture sector in rural areas is an opportunity for the government to develop a village-based economy, such as developing tourist villages. Besides increasing the growth of the service sector, tourist villages will need the carrying capacity of the agriculture sector, especially in the marketing of agricultural products.

Lastly, the distribution of village funds is expected to focus more on village community empowerment in creative economy activities such as the one village one product program. In addition to encouraging rural communities to be more creative, the program creates new jobs able to absorb local workers without having to migrate to other regions.

## Acknowledgements

This research was funded by Indonesian Ministry of National Development Planning (Bappenas) in 2019.

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