

The Impact of Changes in Labor Force Structure on Inequality and Poverty in Indonesia

Original Article

Bronson Marpaung^{1*}, Aulia Keiko Hubbansyah²

¹Universitas Diponegoro, Indonesia

²Universitas Pancasila, Indonesia

Email: ¹ bronsonmrp@lecturer.undip.ac.id

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Abstract

Indonesia has demonstrated high and sustained economic growth and has transformed into an industrial and service-oriented nation. The shift of labor from the agricultural sector to non-agricultural sectors such as industry and services has become the center of economic activity. This change can be observed from the increasing contribution of non-agricultural sectors to the economy, accompanied by a decline in the contribution of agriculture in Indonesia. This study differs from others that mainly focus on structural change and its impact on poverty and sectoral inequality, by highlighting the achievement of the turning point condition. Labor surplus in the agricultural sector causes the marginal productivity of labor in this sector to become very low or even nonexistent, a phenomenon that Lewis referred to as disguised unemployment, which frequently occurs in the agricultural sector of developing countries. The aim of this study is to identify the Lewis Turning Point (LTP) and analyze the impact of changes in labor structure on inequality and poverty in Indonesia. This study utilizes secondary data from several institutions, including the World Bank, Food and Agriculture Organization (FAO), and UNCTAD, in the form of time series data for the period 1980-2020. In this study, Indonesia has not yet reached the Lewis turning point as a result of the structural change process. The transformation from the agricultural sector to the industrial sector can reduce poverty and inequality, while the transformation from the agricultural sector to the service sector has proven unable to reduce inequality and poverty.

Keywords: Agriculture, Inequality, Labor Force Structure, Poverty Reduction, Structural Transformation.

1. Introduction

The rapidly increasing population growth indicates a rising demand for available labor and contributes to one of the factors driving population mobility. Migration, or the movement of people, becomes one of the initial steps households take when seeking new employment and adapting to rapid economic changes. A person's decision to migrate is influenced, among other reasons, by economic conditions and labor market opportunities. The disparity between those living in rural and urban areas is a key factor prompting labor movement, as people seek higher incomes to meet daily needs. Economic changes in urban areas that transform cities into industrial hubs lead to changes in wage offerings, with higher wages being the main driver for labor migration to industries.

Indonesia has already undergone a transformation from a relatively poor country to one experiencing rapid development. Indonesia's economy has undergone a transformation, moving from being primarily agriculture-based to being driven by industry and services which can be seen in the contribution of agriculture, which in 2020 was at 13.3%, down from 26.9% in 1980. Meanwhile, the non-agricultural sector in 2020 contributed 86.7% (BPS, 2020). The



shift from agriculture to industry in Indonesia reflects the rapid economic structural transformations typically observed in developed nations (Bathla et al., 2019).



Figure 1. Comparison of the Contribution to Indonesia's GDP (%) from Agricultural and Non-Agricultural Sectors
 Source: World Bank

Economic growth and opportunities to earn higher incomes have driven a shift in the workforce from agriculture to non-agricultural sectors. In 2020, the share of the workforce in agriculture dropped to 30%, while the share in non-agricultural sectors increased to 70%. This transformation of the workforce from agriculture to non-agriculture will create a new economy and boost economic output (Wiggins, 2016). According to McCaig and Pavcnik (2018), a significant portion of the labor force in non-agricultural sectors will encourage the growth of both the industrial and service industries.

The transfer of labor from the agricultural sector to the non-agricultural sector does not have a major impact on reducing output or increasing wages for workers in the agricultural sector. However, this movement does lead to an increase in productivity or aggregate output in the economy. The main goal of economic development is achieved when labor-intensive sectors such as agriculture migrate to more productive industrial sectors. The slowdown in the transformation of the labor structure is caused by the marginal productivity of workers in the agricultural sector no longer being zero. The situation in which marginal productivity is zero forms the basic theory for explaining the process of economic development.

This study analyzes the macroeconomic impact of structural transformation related to inequality and poverty in Indonesia. The economic development theory proposed by Lewis in 1952 forms the theoretical framework of this research, where Lewis's theory states that the movement of labor from the labor-intensive and low-productivity agricultural sector to the high-productivity industrial sector (Şerefoğlu, 2016). This structural transformation leads to changes in the functional distribution of income, which in the early stages results in income inequality among individuals. In the thesis presented by Kuznets in 1955, this structural transformation causes higher inequality at the initial stage. Labor transformation in Indonesia affects a decrease in absolute poverty rates, but also impacts an increase in income inequality (Dartanto et al., 2017). The increase in inequality and labor transformation develop differently, because in Indonesia both relationships are influenced by the modality of structural transformation. During the industrialization period, inequality decreased, in contrast to the tertiarization period which actually increased inequality (Yusuf et al., 2021).

The achievement of a turning point condition is a very important aspect in analyzing the impact of structural transformation. Disguised unemployment occurs as a result of a labor surplus in the agricultural sector, which leads to very low marginal productivity of labor in this sector. In Indonesia, the agricultural sector is generally traditional, where workers are still family members and labor productivity has not yet reached its optimum. Although family members are involved in the workforce and appear to be working, their production output is neither efficient nor optimal since the addition of labor does not make a significant contribution.

This research is expected to provide an empirical overview of the structural conditions of the labor force in Indonesia, particularly regarding optimal labor and the achievement of the turning point in Indonesia's agricultural sector. In addition, this study is also expected to reveal the impact of the transformation of agricultural labor on economic growth, as well as to analyze the effects of labor market transformation on poverty and inequality in Indonesia.

2. Literature Review

Indonesia, as a region in ASEAN with relatively high and sustainable economic growth, has transformed from an agriculture-based economy to one focused on industry and services. The shift of economic concentration and labor to non-agricultural sectors such as industry and services has resulted in a decrease in the contribution of the agricultural sector in Indonesia. The industrialization that took place in the 1970s, which became the driver of economic growth, led to a decline in the economic output contribution from the agricultural sector (Kahya, 2012). Indonesia's industrial sector has gained prominence in the nation's economy, elevating the country to the status of a semi-industrial economy (Wie, 2006).

Several factors have driven industrialization in ASEAN countries, including a conducive domestic environment such as economic stability, investment, and stable politics; fair industrial policies such as export promotion and policies to reduce anti-export bias; and lastly, technological advancements and capital market development (Hill, 1997). The economic development strategy involves shifting labor from the labor-intensive and low-productivity agricultural sector to the non-agricultural sector, which offers higher productivity. The Lewis Turning Point (LTP) condition occurs when the agricultural sector, initially experiencing a surplus, begins to diminish, which will affect the marginal productivity of workers in agriculture so that it is no longer equal to zero. The Lewis Turning Point (LTP) will eliminate the dualistic labor market, causing it to merge into one (Chan, 2010).

The Development Theory proposed by Lewis in 1954 describes the movement of labor from the low-productivity agricultural sector to the industrial sector, resulting in a reduction of labor in agriculture. The transfer of labor to the industrial sector will improve productivity and enhance the functional distribution of income. The movement of labor and changes in the functional distribution of income will lead to increased income inequality among individuals during the process of structural transformation. In the early stage of structural transformation, there is a rise in income inequality (Kuznets, 1971). Rapid structural transformation leads to a trade-off between growth and inequality, which is referred to as the developer's dilemma (Alisjahbana et al., 2022).

2.1. Theoretical Framework

Lewis's theory is an economic development model centered on structural transformation. This theory was first put forward by Lewis in the 1950s, and a few years later, it was further developed by Fei and Ranis in 1964. Lewis's theory primarily discusses change and the process of development in developing countries that have a labor surplus. The transfer

of labor that experiences the Lewis Turning Point refers to the process of labor transformation, which results in output growth and increased labor absorption.

The Turning Point Theory (LTP) is fundamentally rooted in the dynamics of economic development, which highlights the dual nature of the economy, typically comprising the agricultural and non-agricultural sectors. The agricultural sector is characterized by its subsistence nature, whereas the non-agricultural sector is capitalistic, with a focus on capital accumulation. In the labor-intensive agricultural sector, the workforce's marginal productivity is nearly zero, indicating a significant surplus of labor. This surplus means that shifting labor away from agriculture does not impact production levels. The primary reason for labor moving from agriculture to non-agricultural sectors is the higher wages offered in the latter (Gollin, 2014). Since the transfer of labor is due to differences in income, it will lead to increased savings accumulation and per capita income in the economy. At first, sectors outside of agriculture, like industry, will continue to hire additional workers until the point where the extra output from labor matches the wage paid. The addition of labor in the industrial sector stems from the migration of surplus agricultural labor, which means there will not be a shortage of labor supply (Corsman, 2015). Absorption of labor in the industrial sector from the agricultural sector will reduce agricultural output and increase agricultural wages, this condition is what is referred to as the Lewis Turning Point (LTP).

The Lewis Turning Point, or LTP, was first proposed by Lewis. This theory forms the basis of the economic development process (Lewis, 1954). Lewis's theory centers on the existence of two sectors: the traditional and the modern sectors. The traditional sector is characterized by subsistence, often family farming, with land and labor both provided by family members. This contrasts with the modern sector, which is characterized by capital accumulation, profits earned here are greater than in the traditional sector and are used for investment or business development.

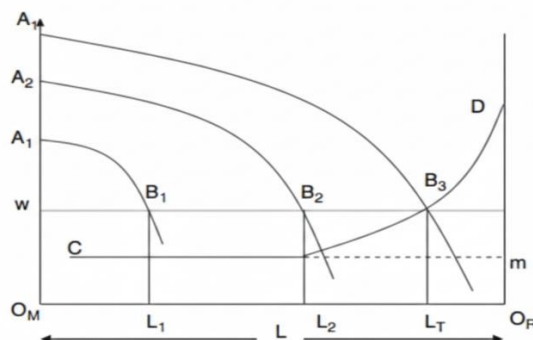


Figure 2. Two-Sector Economic Model and Lewis Turning Point

Source: Basu (2003)

The figure 2 above explains the initial development of the two-sector economic model and the Lewis Turning Point. At point B1, the onset of economic growth is depicted, with labor positioned at point L1, indicating that during the initial phase of development, most of the workforce is engaged in agriculture. In this early stage, both the traditional and modern sectors aim to maximize profits. The wages in these sectors are set based on the marginal product of labor (MPL). The excess labor in the traditional sector causes a wage gap with the modern or industrial sector and prompts workers in agriculture to move to the industrial sector. In the next stage, the economy develops, resulting in profits for the industrial sector, and the profits accumulated are used for investment and business expansion. When industrial

companies experience increased profits, it results in enhanced labor productivity (MPL) within the industrial sector. This boost in MPL causes the MPL curve to move from B1 to B2. As the curve shifts to point B2, the industrial sector requires more labor, so the movement of labor from agriculture to industry continues to point L2. When the labor force in the industrial sector reaches point L2, the marginal product of labor (MPL) exceeds that of the early agricultural sector at point M, forcing wages to continue to rise. The ongoing movement of labor from agriculture to industry, along with continuous capital accumulation for investment in the industrial sector, will move the curve to point B3, and the labor surplus in the agricultural sector will be depleted. At this stage, the industrial sector experiences an upward sloping supply curve, which will cause labor wages to keep rising in line with continuous economic growth (Ge & Yang, 2011).

2.2. Previous Research

Research conducted by Minami et al. (2014) and Bowonthumrongchai (2019) showed that changes in labor structure in Korea and Thailand had a positive impact on income distribution. In contrast, research by Dartanto et al. (2017) indicated that changes in labor structure in Indonesia would increase inequality. The study employed L Theil decomposition to investigate the link between structural transformation and inequality in Indonesia through econometric analysis. The findings indicated that (i) inequality in Indonesia is primarily driven by the impact of pure (unexplained) inequality, and (ii) factors such as the shift of labor from agriculture to industry, migration from rural to urban regions, and the transition from informal to formal employment contributed to the rise in inequality during the period from 1996 to 2014, (iii) structural transformation increased inequality in Indonesia because the industrial sector’s share in the economy is capital-intensive and demands highly skilled labor. In the capital-intensive industrial sector, only a few people benefit from growth in this sector compared to the growth experienced in the agricultural or industrial sectors.

3. Research Methods

This section will discuss the impact of changes in labor structure on income inequality. This study adopts the model developed by Dastidar (2012) and Kahya (2012) as follows:

$$y = n_A \cdot y_A + n_I \cdot y_I + n_S \cdot y_S \dots\dots\dots (1)$$

Where

$$y = (Y_A + Y_I + Y_S)/N; \dots\dots\dots (2)$$

$$y_A = P_{N\$}^I Q, y_I = P_{NI}^I Q, y_S = P_{NS}^S Q \dots\dots\dots (3)$$

$$N_A = P_{N\$}^{N\$} Q, y_I = P_{NI}^{NI} Q, y_S = P_{NS}^{NS} Q \dots\dots\dots (4)$$

$$N = (N_A + N_I + N_S) \dots\dots\dots (5)$$

Among the four equation models presented, these are simple identity equations. It is evident from these models that variations in per capita income are associated with patterns of structural change. Furthermore, the proportion of sectoral employment is linked to relative changes in output.

$$X_{AGR} + X_{IND} + X_{SER} = 100 \dots\dots\dots (6)$$

By formulating the Gini coefficient (G) as a function of sectoral output shares, the function can be written as follows:

$$G = f(X_{AGR}, X_{IND}, X_{SER}) \dots \dots \dots (7)$$

In equation (7), there are three sectors: XAGR (Agriculture), XIND (Industry), and XSER (Services). The model above also looks at the relationship between the development of a country and income inequality, which depends on sectoral market shares. Equations (6) and (7), if modified, will yield the following equation:

$$G = f(X_{AGR}, X_{IND}, (100-X_{AGR}-X_{IND})) \dots \dots \dots (8)$$

In this research model, it can be assumed that XIND is constant, and any change in the XAGR variable by 1 percent will increase XSER by 1 percent. This study adopts the model developed by Dastidar (2012); Kahya (2012); and Sen (2016) as follows:

$$G_{ini} = \alpha_0 + \alpha_1 A + \alpha_2 I + \alpha_3 Growth + \alpha_4 School + \varepsilon \dots \dots \dots (9)$$

$$G_{ini} = \alpha_0 + \alpha_1 A + \alpha_2 S + \alpha_3 Growth + \alpha_4 School + \varepsilon \dots \dots \dots (10)$$

The Gini coefficient is an indicator of income disparity, where A denotes the proportion of the workforce employed in agriculture compared to the entire labor force, I signifies the proportion of the workforce in the industrial sector relative to the total labor force, S represents the proportion of the workforce in the service sector relative to the total labor force, G stands for the Gross Domestic Product (GDP) per capita, and ε is the random error term. Equation 9 examines the effects of labor transitioning from agriculture to industry, while equation 10 assesses the effects of labor moving from agriculture to services.

$$Pov = \alpha_0 + \alpha_1 A + \alpha_2 I + \alpha_3 Growth + \alpha_4 School + \varepsilon \dots \dots \dots (11)$$

$$Pov = \alpha_0 + \alpha_1 A + \alpha_2 S + \alpha_3 Growth + \alpha_4 School + \varepsilon \dots \dots \dots (12)$$

Equations 11 and 12 show the impact of the transition from the agricultural sector to Industry and Services on the poverty rate. The estimates in the equations only consider the justification of the variables in the two stationary equations.

3.1. Types and Data Sources

This study uses secondary data obtained from various sources such as institutions between the World Bank and UNCTAD. The data used and collected are time series data gathered over the period from 1980 to 2020. To observe the impact of structural changes in the labor force on income inequality and poverty, this study utilizes models developed by Dastidar (2012), Kahya (2012), and Sen (2016), which examine the role of sectoral labor allocation using the following data:

Table 1. Types and Data Sources

Variable	Notation	Definition	Data Source
Inequality	Gini	Gini Coefficient	World Bank
Poverty Rate	pov	Percentage of Poor Population (%)	World Bank
Share of Agricultural Sector Workforce	A	Proportion of Agricultural Sector Workers to Total Workers	World Bank
Share of Industrial Sector Workforce	I	Proportion of Agricultural Sector Workers to Total Workers	World Bank

Variable	Notation	Definition	Data Source
Share of Service Sector Workforce	S	Proportion of service sector workers to total workers	World Bank
Economic Growth	Growth	Annual Economic Growth (%)	World Bank
Education Participation	School	Share of agricultural sector workers with at least a secondary education (%)	BPS

3.2. Data Analysis Method

This study employs time series data for its estimations. According to Juanda and Junaidi (2012), time series data is gathered over specific intervals. This type of data tracks economic behavior across different periods, enabling us to observe how economic participants adapt, enhance, and refine the outcomes of their past economic endeavors. Time series econometrics is an analytical method used to explore the information contained within time series data (Ekananda, 2016).

According to Gujarati (2009), research that uses time series data has several characteristics, namely: (i) empirical studies using time series data assume that the data is stationary, (ii) autocorrelation that occurs in time series data usually happens because the data is not stationary, (iii) regressing one time series variable on another time series variable usually results in a high R² value even if the variables have no actual relationship. This condition is called spurious regression; The issue arises when the estimated time series data fails to satisfy the stationarity condition required for time series analysis. At the outset of this study, a stationarity test is performed on the data using the unit root test. Time series data variables are deemed stationary if they exhibit a constant mean and variance over time, and their autocorrelation function remains consistent within the specified lag length.

This study employs the Augmented Dickey Fuller Test (ADF) and the Phillips-Perron (PP) test to assess unit roots. The PP test utilizes a non-parametric approach to address high-order serial correlation in a series. In the ADF test, high order serial correlation is corrected by adding lagged differences to the right side of the equation. In both the ADF and PP tests, determining the appropriate lag length to include in the model often presents a challenge. If the lag length is too long, it reduces the ability to reject the null hypothesis, since longer lags add more estimated parameters, leading to a failure to capture the actual error process and thus making standard error estimation unreliable. The most important step in the unit root test, whether using the ADF or PP approach, is to test the level series.

4. Results and Discussion

4.1. Analysis of the Achievement of Lewis Turning Point

In Indonesia, the agricultural industry holds a crucial position in underpinning the nation's economy (Isbah & Iyan, 2016). The average output of Indonesia's agricultural sector in the period 1980-2020 was US\$ 86.4 billion. The output of Indonesia's agricultural sector has shown an increasing trend of 3.1 percent per year with a standard deviation smaller than the mean, at around US\$ 25 billion. During the Asian financial crisis in 1998, the agricultural sector experienced a decline of about US\$ 1 billion, which was much smaller compared to the non-agricultural sector that dropped by US\$ 6 billion, making output in Indonesia's agricultural sector relatively stable.

Indonesia’s agricultural sector is more resilient because production relies heavily on domestic production factors, so it is less affected by global economic crises or shocks (Syam & Noekman, 2002). The products of agricultural production are basic necessities, so during periods of economic crisis, the demand for agricultural products remains high.

Table 2. Descriptive Statistics

Country	Sector	Statistic	Output (US\$ Million)	Labor (Thousand People)	Capital (US\$ Million)	Land (Thousand Ha)
Indonesia	Agriculture	Mean	76.239	39.554	128.877	5.488
		Max	136.645	43.042	215.186	6.722
		Min	38.281	34.790	22.067	4.1066
		Std Dev	28.557	2.002	54.610	1.151
	Non Agriculture	Mean	406.610	51.095	148.806	
		Max	915.027	91.829	349.049	
		Min	103.845	20.164	27.480	
		Std Dev	241.629	20.386	94.236	

Source: Data Processed (2025)

Although the share of agricultural production in the economy generally decreases, it continues to employ a large number of people in Indonesia. Between 1990 and 2020, the agricultural sector employed an average of approximately 39.5 million workers. When a crisis hits and disrupts the non-agricultural sector, causing its performance to falter, the agricultural sector experiences growth as a result. The financial crisis led to an increase in the agricultural workforce, which grew from 34 million in 1997 to 39 million in 1998. The additional labor in the agricultural sector was due to workers who lost their jobs because of the crisis returning to agricultural work, as agriculture such as food production remains a basic human need. During times of economic crisis, the agricultural sector becomes the best option for job seekers; in other words, The agricultural industry holds a crucial socio-economic position in maintaining economic stability.

4.2. The Impact of Structural Transformation on Inequality

The influence of structural transformation on poverty and inequality, as labor transitions from agriculture to non-agricultural sectors, is analyzed through two distinct models which are model 1 and model 2.

Table 3. The Impact of Labor Migration from Agriculture to Industry on Inequality

Model 1	Coefficient	Std Error	P> t	Robust Std Error	P> t
L _{AGR}	0.072	0.116	0.542	0.096	0.462
L _{SER}	0.288	0.152	0.066	0.112	0.014
L _{IND}	-	-	-	-	-
Growth	0.177	0.085	0.044	0.066	0.011
School	0.449	0.247	0.078	0.183	0.019
Constant	17.047	10.213	0.104	8.447	0.051
F-stat			19.350 (0.000)		
R-Square			0.683		
ADF			-3.389		

Model 1	Coefficient	Std Error	P> t	Robust Std Error	P> t
(5% Critical Value-2.986)			(0.011)		
Error Correction Term (μ_{t-1})			-0.224 (0.056)		

Model 1 in the table 3 above shows the impact of labor migration from agriculture to the industrial sector, assuming that the share of labor in the service sector remains constant. The estimation results show that the movement of labor from agriculture to agriculture does not affect the level of income inequality. In the LAGR estimation, the significance value is greater than r percent, and these results are consistent with previous studies conducted by Teguh et al. (2017), Sen (2017), and Dastidar (2012).

The lack of impact of structural labor migration on income inequality can be caused by several factors. Workers who migrate to the agricultural sector usually receive higher wages, which leads to higher incomes for these workers; this higher income can result in a more evenly distributed inequality. Second, labor migration usually encourages increased investment in education and skills training. Improved education and training open up better economic opportunities and can reduce gaps in skills and qualifications among workers. Third, labor migration can help diversify a region’s economy, reducing dependence on the agricultural sector, which is vulnerable to unstable climates and price fluctuations. Fourth, it can create greater opportunities for social mobility; workers can gain access to better jobs and more advanced work environments, which can help to address inequality related to social class.

Table 4. The Impact of Labor Transfer from Agriculture to Services on Inequality

Model 2	Coefficient	Std Error	P> t	Robust Std Error	P> t
L _{AGR}	-0.217	0.103	0.049	0.088	0.019
L _{SER}	-	-	-	-	-
L _{IND}	-0.288	0.152	0.066	0.112	0.014
Growth	0.177	0.085	0.044	0.066	0.011
School	0.449	0.247	0.078	0.183	0.019
Constant	45.903	8.986	0.000	5.903	0.000
F-stat			19.350 (0.000)		
R-Square			0.683		
ADF			-3.389		
(5% Critical Value-2.986)			(0.011)		
Error Correction Term (μ_{t-1})			-0.224 (0.056)		

Model 2 illustrates the shift of agricultural workers to the service industry, assuming that the proportion of industrial workers remains unchanged. The findings suggest that moving labor from agriculture to services positively affects and exacerbates income inequality. The higher the market share of service sector labor, the greater the increase in inequality, especially in developing countries (Baymul & Sen, 2019). The link between structural transformation and inequality in Indonesia involves a shift towards the service sector. The

movement from agriculture to services, especially after the Asian financial crisis, has led to a rise in inequality.

The movement of labor from the agricultural sector to the service sector can lead to increased income inequality due to several factors. First, because of income disparities which service sector jobs generally offer higher earning potential compared to agriculture. Jobs in the service sector typically require specific knowledge and skills. If individuals in the agricultural sector are unable to transition to the service sector because they lack the required skills, their income will decrease and the gap will widen. Second, the transition to the service sector is generally associated with urbanization, with greater economic growth occurring in urban areas. People living in rural areas usually have skills more related to agriculture and often lack access to, or training in, service sector skills, which tend to develop rapidly in cities. Third, the transition to the service sector can change the social structure of society. Jobs in the service sector require higher education and specialized expertise. Communities that have limited access to the necessary education or training will be left behind in this transition, which will further exacerbate inequality.

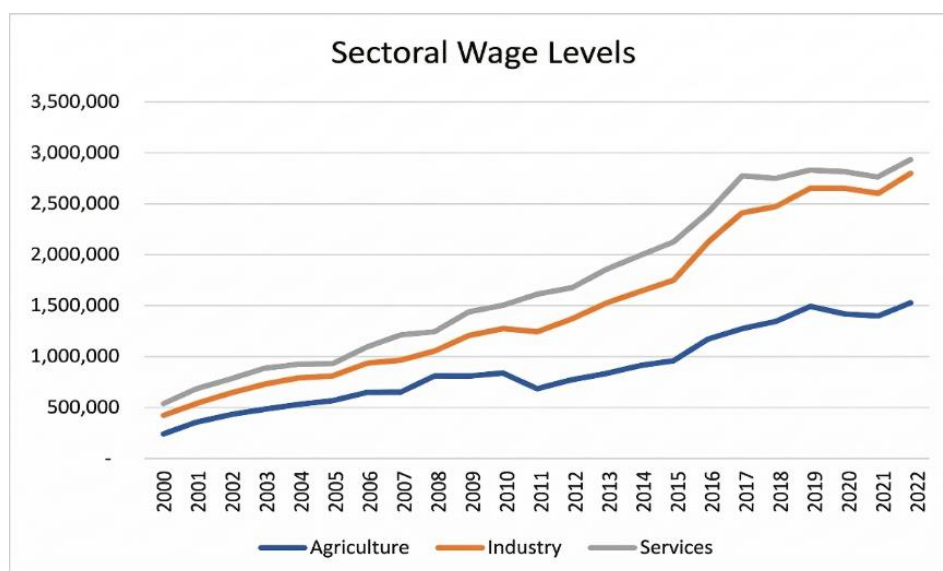


Figure 3. Sectoral Wage Level
Source: World Bank (2025)

The impact of structural transformation on increasing income inequality in Indonesia, especially after the Asian financial crisis, can be explained as follows: First, the increase in capital utilization during the economic recovery period is evident from the changes in the industrial sector following political reforms in Indonesia. Indonesia’s economic growth declined by up to 13.25% in 1998. The utilization of manufacturing sector capacity fell to less than 50% in 1999 (Yusuf et al., 2021). The manufacturing sector grew based on capital utilization without a proportional increase in labor, as seen from the strengthening of labor unions’ roles after the political reforms in 1998. After the reforms, workers had stronger bargaining power, so real wage growth after the crisis was higher than real wages before the crisis (Yusuf et al., 2021). This may explain why structural transformation following the Asian financial crisis could lead to increased inequality.



Figure 4. Development of Minimum Wage in Indonesia
Source: Central Bureau of Statistics

The second explanation relates to the magnitude of macroeconomic adjustments after the Asian financial crisis and its impact on sectoral resource allocation. The Asian crisis resulted in Indonesia experiencing both a currency and banking crisis. This was first marked by the depreciation of the rupiah against the US dollar. The rupiah’s exchange rate depreciated by nearly 80% against the US dollar during the period of August 1997, peaking in mid-1998. This significant depreciation hampered imports and stimulated exports. Furthermore, the Asian crisis also led to a banking crisis that impacted the flow of loans to domestic non-financial private companies. Lending to the private sector by domestic banks declined, resulting in an additional liquidity crisis as capital stopped flowing into Indonesia.

Both events led to a shift in economic resources after the Asian financial crisis. The industrial structure shifted from the manufacturing sector to the natural resources sector, especially raw commodity export industries that generated significant and rapid profits. This situation would then slow down the absorption of labor in low value-added informal sectors, which should have been able to absorb the transformation of labor from the rural agricultural sector.

Table 5. The Impact of Labor Migration from Agriculture to Industry on Poverty

Model 1	Coefficient	Std Error	P> t	Robust Std Error	P> t
L _{AGR}	0.581	0.169	0.049	0.200	0.006
L _{SER}	0.388	0.221	0.088	0.264	0.150
L _{IND}	-	-	-	-	-
Growth	-0.048	0.124	0.704	0.069	0.493
School	-0.017	0.360	0.962	0.419	0.967
Constant	-24.882	14.867	0.103	16.671	0.144
F-stat			33.43 (0.000)		
R-Square			0.687		
ADF			-2.621		
(5% Critical Value-			(0.09)		
2.986)					
Error Correction			-0.163		
Term (μ_{t-1})			(0.094)		

The transition of labor from the agricultural sector to the industrial sector is anticipated to contribute to a reduction in poverty levels in Indonesia, assuming that employment within the services sector remains constant. The expansion of the industrial sector is expected to enhance employment opportunities, given its labor-intensive nature since 1980. The reallocation of labor from less efficient sectors, such as agriculture, to more efficient sectors, such as industry, can stimulate economic growth, even in the absence of growth within individual sectors (McMillan et al., 2017). This structural transformation in the labor market is likely to influence poverty alleviation by increasing the incomes of workers transitioning to the industrial sector, as well as those remaining in agriculture. Structural shifts in the workforce that drive economic growth are anticipated to impact poverty reduction (Cook, 2006; Hasan & Molato, 2019; Page & Shimeles, 2015).

Table 6. The Impact of Labor Shift from Agriculture to Services on Poverty

Model 2	Coefficient	Std Error	P> t	Robust Std Error	P> t
L _{AGR}	0.193	0.194	0.327	0.259	0.463
L _{SER}	-	-	-	-	-
L _{IND}	-0.388	0.221	0.088	0.263	0.150
Growth	-0.047	0.124	0.704	0.069	0.493
School	-0.017	0.361	0.962	0.418	0.967
Constant	13.958	13.082	0.293	17.158	0.421
F-stat			33.43 (0.000)		
R-Square			0.687		
ADF (5% Critical Value- 2.986)			-2.621 (0.09)		
Error Correction Term (μ_{t-1})			-0.163 (0.094)		

The shift of workers from farming to the service industry might not influence the reduction of poverty rates, assuming that the share of industrial labor remains unchanged. The lack of a relationship between changes in labor from agriculture to services may be due to the fact that the job market share in the service sector consists mainly of low labor-intensive jobs, such as in banking, finance, consulting, and information technology, which rely more on technology for efficiency. Although the service sector is developing, job absorption in this sector is limited.

The qualifications required by the service sector are usually not possessed by workers from the agricultural sector. The specific qualifications and specialized skills needed in the service sector make it difficult for people who previously worked in agriculture, due to low levels of education. Poverty reduction through the structural transformation of the workforce into the service sector requires expanding access to education and training for the community.

The service sector comprises both informal and formal services, and generally, the formal service sector tends to develop in urban areas, thereby leading to regional disparities. Meanwhile, the informal service sector tends to offer low wages and job insecurity. Even though the service sector is growing, incomes in the informal service sector are often inadequate.

5. Conclusion

The findings indicate that Indonesia has not yet achieved the Lewis Turning Point because of ongoing structural transformation. Indonesia was close to reaching the Lewis point at the peak of industrialization, with the agricultural labor surplus ratio at 0.4% in the 1990s. The Asian financial crisis of 1997-1998 caused Indonesia's economic growth to nosedive to -13.7%, leading to deindustrialization and a shift in natural resource-based assets such as mining. During this time, the non-agricultural sector was unable to accommodate the surplus labor from agriculture, resulting in an increase in the agricultural labor surplus once again. Structural transformation has different relationships with inequality and poverty. Studies suggest that transitioning labor from agriculture to industry can help decrease inequality and alleviate poverty. However, the shift of labor from the agricultural sector to the services sector does not reduce inequality and poverty in Indonesia.

The surplus of labor in Indonesia's agricultural sector in 2020 was dominated by low-skilled workers. Specifically, 6.30% had no schooling, 22.74% did not complete elementary school, 38.39% graduated from elementary school, and 16.69% graduated from junior high school. Meanwhile, workers who graduated from high school accounted for 14.1%, those with academic education made up only 0.54%, and university graduates were just 1.24%. Based on this data, it can be concluded that the workforce in Indonesia's agricultural sector generally has low skill levels, making it difficult for them to be absorbed by the industrial and formal service sectors, which require highly skilled labor. Therefore, given the high surplus of labor in the agricultural sector, government policies are needed to balance labor availability with the development of the industrial and service sectors.

The development of the agricultural industry must take into account the locality of the village, especially in terms of its leading agricultural commodities. The existence of leading agricultural commodities in a village can strengthen the village's comparative advantages and competitiveness. Labor-intensive industries based on agriculture can be developed by establishing processing industries for food products, plantation crops, forestry products, fisheries, and livestock. The presence of these industries will form a village value chain, so that each village will have its own processed agricultural products as its main strengths. It is expected that labor-intensive agriculture-based industries like these can absorb the surplus labor in the agricultural sector.

The development of labor-intensive, agriculture-based industries requires financing facilities to support micro, small, and medium enterprises. Policies that can be implemented regarding financing facilities include: (i) eliminating taxes that may hinder small businesses, (ii) simplifying bureaucracy in financing or permitting processes, (iii) establishing or strengthening distribution chains to facilitate market access, (iv) fostering a competitive culture, and (v) providing financing facilities with low interest rates to encourage business growth. The government must formulate policies to strengthen business development services that support MSMEs so they can be integrated into global value chains (GVC) by assisting in the development of MSME products.

6. References

- Alisjahbana, A. S., Sen, K., Sumner, A., & Yusuf, A. (2022). *The Developer's Dilemma*. Oxford University Press/Oxford. <https://doi.org/10.1093/oso/9780192855299.001.0001>
- Basu, K. (2003). *Analytical Development Economics: The Less Developed Economy Revisited*. MIT Press.
- Bathla, S., D'Souza, A., & Joshi, P. K. (2019). Structural Transformation in Southeast Asian Countries and Key Drivers. *IFPRI Discussion Paper*, 01856. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3429994
- Baymul, Ç., & Sen, K. (2019). Kuznets Revisited: What Do We Know about the Relationship between Structural Transformation and Inequality? *Asian Development Review*, 36(1), 136–167. https://doi.org/10.1162/adev_a_00126
- Bowonthumrongchai, T. (2019). Lewis Turning Point and Agricultural Development in the Mekong: A Case of Thailand. *Social Science Review*, 156, 31–49. <https://doi.org/10.24561/00018613>
- Chan, K. W. (2010). A China Paradox: Migrant Labor Shortage amidst Rural Labor Supply Abundance. *Eurasian Geography and Economics*, 51(4), 513–530. <https://doi.org/10.2747/1539-7216.51.4.513>
- Cook, S. (2006). Structural Change, Growth and Poverty Reduction in Asia: Pathways to Inclusive Development. *Development Policy Review*, 24(s1). <https://doi.org/10.1111/j.1467-7679.2006.00341.x>
- Corsman, E. (2015). *Has China passed its Lewis Turning Point? - A study of regional variation*. Lund Univeristy.
- Dartanto, T., Yuan, E. Z. W., & Sofiyandi, Y. (2017). Two Decades of Structural Transformation and Dynamics of Income Equality in Indonesia. *ADB Working Papers*, 783. <https://www.adb.org/publications/two-decades-structural-transformation-and-dynamics-income-equality-indonesia>
- Dastidar, A. (2012). Income Distribution and Structural Transformation: Empirical Evidence from Developed and Developing Countries. *Seoul Journal of Economics*, 25(1), 25–56. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2020903
- Ekananda, M. (2016). *Analisis Ekonometrika Time Series: Teori Lengkap dan Pembahasan Menyeluruh bagi Penelitian Ekonomi, Manajemen, dan Akuntansi*. Mitra Wacana Media.
- Ge, S., & Yang, D. T. (2011). Labor market developments in China: A neoclassical view. *China Economic Review*, 22(4), 611–625. <https://doi.org/10.1016/j.chieco.2011.07.003>
- Gollin, D. (2014). The Lewis Model: A 60-Year Retrospective. *Journal of Economic Perspectives*, 28(3), 71–88. <https://doi.org/10.1257/jep.28.3.71>
- Gujarati, D. N. (2009). *Basic Econometrics*. McGraw-Hill Education.
- Hasan, R., & Molato, R. (2019). Wages Over the Course of Structural Transformation: Evidence from India. *Asian Development Review*, 36(2), 131–158. https://doi.org/10.1162/adev_a_00134
- Hill, H. (1997). *Indonesia's Industrial Transformation*. Institute of Southeast Asian Studies.
- Isbah, U., & Iyan, R. Y. (2016). Analisis Peran Sektor Pertanian dalam Perekonomian dan Kesempatan Kerja di Provinsi Riau. *Jurnal Sosial Ekonomi Pembangunan*, 7(19), 45–54. <https://jsep.ejournal.unri.ac.id/index.php/JSEP/article/view/4142/4000>
- Juanda, B., & Junaidi. (2012). *Ekonometrika Deret Waktu: Teori dan Aplikasi* (p. 248). PT penerbit IPB Press.
- Kahya, M. (2012). *Structural change, income distribution and poverty in ASEAN-4 countries*. Lund Univeristy.
- Kuznets, S. (1971). *Economic growth of nations: Total output and production structure*. Harvard University Press.

- Lewis, W. A. (1954). Economic Development with Unlimited Supplies of Labour. *The Manchester School*, 22(2), 139–191. <https://doi.org/10.1111/j.1467-9957.1954.tb00021.x>
- McCaig, B., & Pavcnik, N. (2018). Export Markets and Labor Allocation in a Low-Income Country. *American Economic Review*, 108(7), 1899–1941. <https://doi.org/10.1257/aer.20141096>
- McMillan, M., Rodrik, D., & Sepulveda, C. (2017). Structural Change, Fundamentals and Growth: A Framework and Case Studies. *NBER Working Paper*, w23378. https://www.nber.org/system/files/working_papers/w23378/w23378.pdf
- Minami, R., Kim, K. S., & Makino, F. (2014). China's Turning Point from an East Asian Perspective: Prospective Recapitulation BT - Lewisian Turning Point in the Chinese Economy: Comparison with East Asian Countries. In R. Minami, F. Makino, & K. S. Kim (Eds.), *Lewisian Turning Point in the Chinese Economy* (pp. 199–214). Palgrave Macmillan UK. https://doi.org/10.1057/9781137397263_11
- Page, J., & Shimeles, A. (2015). Aid, Employment and Poverty Reduction in Africa. *African Development Review*, 27(S1), 17–30. <https://doi.org/10.1111/1467-8268.12136>
- Sen, K. (2016). The Determinants of Structural Transformation in Asia: A Review of the Literature. In *Asian Development Bank Economics Working Paper Series No. 478*. Elsevier BV. <https://doi.org/10.2139/ssrn.2811507>
- Şereföğlü, C. (2016). Is Inverse Relationship a Phenomenon? *Selcuk Journal of Agriculture and Food Sciences*, 30(1), 13–16. <https://dergipark.org.tr/en/pub/selcukjafsci/article/438419>
- Syam, A., & Noekman, K. M. (2002). Kontribusi Sektor Pertanian dalam Penyediaan Lapangan Kerja dan Perbandingannya dengan Sektor-Sektor Lain. *SOCA: Jurnal Sosial Ekonomi Pertanian*, 2(1), 1–15. <https://ojs.unud.ac.id/index.php/soca/article/view/4016>
- Wie, T. K. (2006). Technology And Indonesia's Industrial Competitiveness. In *ADBI Research Paper Series*. <https://www.adb.org/sites/default/files/publication/156680/adbi-dp43.pdf>
- Wiggins, S. (2016). *Agricultural and rural development reconsidered: a guide to issues and debates*. IFAD Research Series 1. https://www.ifad.org/documents/d/new-ifad.org/01_odi_web-pdf
- Yusuf, A. A., Anglingkusumo, R., & Sumner, A. (2021). A direct test of Kuznets in a developing economy: a cross-district analysis of structural transformation and inequality in Indonesia. *Regional Studies, Regional Science*, 8(1), 184–206. <https://doi.org/10.1080/21681376.2021.1924850>