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## ANALYSIS OF CHANGES SENSITIVITY IN SECTORAL EMPLOYMENT OPPORTUNITIES TO ECONOMIC GROWTH AND MINIMUM WAGES

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### ABSTRACT

This study aims to analyze the differences in sensitivity to changes in employment opportunities in the agricultural, industrial and service sectors that occur due to changes in economic growth rates, wage rates and labor force participation rates in Indonesia. Analysis was performed using panel data regression method. The results of the analysis show that economic growth has a positive effect on employment opportunities in the industrial and service sectors, with a lower rate of change in employment opportunities than the rate of economic growth. This means that economic growth has not been sufficient to absorb labor growth in the industrial and service sectors. Economic growth has a negative effect on employment opportunities in the agricultural sector. The minimum wage rate has a positive effect on employment opportunities in agriculture, but has a negative effect on employment opportunities in the industrial sector, and has no significant effect on employment opportunities in the service sector.

### KEY WORDS

Employment opportunity, economic growth, minimum wage, labor force, participation rate.

Unemployment and poverty are social problems that must be fought anywhere in the world. Unemployment occurs because the number of labor force is not balanced with available job opportunities. According to Tran (2021), unemployment has an important role in increasing the 'shadow economy', which Smith defines as all economic activities and transactions that circumvent government regulations and do not comply with tax regulations. Smith describes the shadow economy as economic activity that is not identified in official output calculations, making it difficult for policy makers. According to Hart (in Tran, 2021) the shadow economy is the informal sector. Tran also found that Gross Domestic Product (GDP) per capita can reduce the shadow economy, but government spending, bank credit and inflation actually increase the shadow economy.

The unemployment rate can be reduced if more job opportunities are created. Job opportunities can be created with more economic activity. The increase in macroeconomic activity can be measured from the level of economic growth. The conducive economic situation encourages business people to be more active in their business. This of course requires more factors of production, including labor. It can be said that economic growth can provide additional employment opportunities in many sectors, but with different levels.

Muslihatiningsih (2020) analyzes the effect of economic growth, wages, and population on employment in East Java Province. Using panel data for the 2010-2017 period, Muslihatiningsih found that these three variables had a positive effect on employment absorption in East Java. The increase in wages reflects an increase in the welfare and productivity of workers. Muslihatiningsih believes that economic growth in East Java needs to be encouraged so that it has a more real impact on job creation and employment so that it can reduce unemployment.

The economy was hampered when the Covid-19 pandemic hit the world and entered Indonesia since early March 2020. This virus, which is very dangerous for human life, spreads very easily, forcing the government to make a policy of Large-Scale Social Restrictions from 31 March 2020 to early January 2021 to be replaced with a policy Enforcement of Community Activity Restrictions (PPKM). This is done to prevent the spread of an increasingly massive disease. As of September 2021, Indonesia has reported more



than 4.2 million cases with 140 thousand deaths (Ridhwan et al. 2021). This PPKM policy has halted the mobility of goods and people, and hampered economic activity. The economy experienced an extraordinary distortion in the first quarter of 2020, declining to -5.3% but the following quarter was still restrained and overall in 2020 the economy was distorted -2.3% (Bank Indonesia, 2021). The economic downturn occurred in all regions, which was also followed by a decrease in employment opportunities and an increase in the unemployment rate.

Kashni (2021) analyzes the impact during the lockdown period due to the Covid-19 outbreak on employment in India. This virus was discovered on January 27 2020 and increased rapidly throughout the first quarter of 2020, so that the local government declared a state of emergency and workers worked from home. This immediately had a significant impact on the decline in the economy and employment opportunities. Kashni found that during the Covid-19 pandemic, unemployment had reached its highest level since the great depression that hit India. This situation poses a real threat to worsening poverty and inequality.

In Indonesia, even though overall there has been economic disruption due to Covid-19, however, there are 7 sectors that have survived and even contributed positive growth (Ridhwan et al, 2021). The seven sectors are health services and social activities (growth 11.6%), information and communication (10.58%), clean water and waste treatment (4.94), financial services and insurance (3.25%), services education (2.63%), real estate (2.32%) and agriculture (1.75%). Suryahadi (2021) found that during a pandemic the agricultural sector absorbed the most workers, but most of them were informal workers. On the other hand, the sector that experienced the greatest decline in employment was the industrial sector, many of whom were formal workers. Ridhwan found that the Covid-19 pandemic has made e-commerce services increasingly high. Workers who have lost their jobs in the formal sector have turned to e-commerce businesses that can increase their income. Ridhwan found that the development of e-commerce can significantly increase employment opportunities in the informal sector, but not significantly in formal employment opportunities.

Unlike Ridhwan and Muslihatiningsih's research, this study aims to measure, compare, and analyze differences in the elasticity of employment opportunities in the agricultural, industrial and service sectors in Indonesia during the 2019-2022 period.

## **METHODS OF RESEARCH**

Indonesia consists of 37 provinces since July 2022, an increase from the previous 34. There are 3 new provincial regions, namely South Papua, Central Papua and Highlands Papua. The three new provinces are divisions of the Papua Province. The area covered in the research is 34 provincial regions during the 2019-2022 period. The use of coverage of 34 provinces is due to adjusting to the availability of data which still uses the recording of 34 provinces.

The data used in this study are quantitative data sourced from online publications from the Central Bureau of Statistics ([www.bps.go.id](http://www.bps.go.id)), Bank Indonesia ([www.bi.go.id](http://www.bi.go.id)) and from related agencies. The data used includes, among others, the population aged 15 years and over working in various sectors (as a proxy for employment), Gross Regional Domestic Product (GRDP), provincial minimum wage rate (W) and Labor Force Participation Rate (TPAK). The data used is at the provincial level during the 2019-2022 period.

Sectors included in the agricultural sector according to the Central Bureau of Statistics are agriculture, forestry, fisheries. The industrial sector includes mining and quarrying, processing industry, electricity and gas procurement, water supply, waste management, waste and recycling, and construction. The service sector includes wholesale and retail trade, car and motorcycle repair, transportation and warehousing, provision of food and drink accommodation, information and communication, financial and insurance services, real estate, company services, government administration, defense and social security, educational services, health services and social activities, as well as other services.



The analytical method used is the panel data regression model, with the equation model:

$$KK_i = a + b_1 PDRB + b_2 W + b_3 TPAK + \mu$$

- Note:  $KK$  = Employment Opportunities;  $i$  = Economic sectors: (1) Agriculture; (2) industry; (3) services;
- Variables of employment opportunity, GRDP and wage rates are in rupiah units converted in logarithmic values, while TPAK is in percent. By using multiple logarithmic values, the resulting coefficient can be interpreted as elasticity (Gujarati, 2009).

The model above is estimated with the dependent variable employment opportunities in the agricultural, industrial and service sectors, so there are 3 equation models. In the panel data regression method, there are three types of models that can be used, namely (1) Common Effect Model (CEM); (2) Fixed Effect Models (FEM); and Random Effect Models (REM). The three kinds of models are then tested which is the best. The Chow test was used to compare CEM with FEM, and the Hausman test was used to compare FEM with REM.

Hypotheses for the Chow's Test:  $H_0$  CEM is better, if the probability significance is  $> 0.05$ ;  $H_a$ : FEM is better, if prob. significance  $< 0.05$ .

Hypotheses for the Hausman Test:  $H_0$ : REM is better, if the probability significance is  $> 0.05$ ;  $H_a$ : FEM is better, if prob. significance  $< 0.05$ .

## RESULTS AND DISCUSSION

Estimation was carried out on all models, both CEM, FEM and REM in all equations (employment opportunities in the agricultural sector, industrial sector and service sector).

Table 1 – Estimation of the Common Effect Model, Fixed Effect Model and Random Effect Model

Coefficient	Method		
	CEM	FEM	REM
<b>Agriculture Sector</b>			
Constant	16,861 (0,000)***	2,995 (0,011)***	1,261 (0,197)
PDRB	0,421 (0,000)***	-0,480 (0,001)***	0,028 (0,754)
Wages	-2,582 (0,000)***	0,941 (0,000)***	0,564 (0,0001)***
TPAK	0,029 (0,004)***	0,010 (0,000)***	0,0098 (0,0002)***
Adj R <sup>2</sup>	0,50	0,997	0,18
F	45,932	1,148,927	10,932
Prob (F-statistic)	0,000	0,000	0,000
Durbin-Watson	0,446	1,860	1,237
<b>Industrial Sector</b>			
Constant	15,088 (0,000)***	-0,813 (0,462)	1,819 (0,066)*
PDRB	0,797 (0,000)***	0,927 (0,000)***	0,881 (0,000)***
Wages	-2,381 (0,000)***	-0,228 (0,029)**	-0,603 (0,0001)***
TPAK	-0,012 (0,021)**	0,003 (0,088)*	0,0058 (0,044)**
Adj R <sup>2</sup>	0,879	0,995	0,608
F	327,215	805,117	70,689
Prob (F-statistic)	0,000	0,000	0,000
Durbin-Watson	0,699	1,796	0,354
<b>Services Sector</b>			
Constant	9,602 (0,000)***	-2,844 (0,000)***	1,819 (0,066)*
PDRB	0,795 (0,000)***	0,897 (0,000)***	0,881 (0,000)***
Wages	-1,531 (0,000)*	0,183 (0,177)	-0,603 (0,0001)***
TPAK	-0,005 (0,251)	0,004 (0,037)*	0,0058 (0,044)**
Adj R <sup>2</sup>	0,901	0,996	0,687
F	410,727	940,599	70,689
Prob (F-statistic)	0,000	0,000	0,000
Durbin-Watson	0,724	2,177	0,354

Note: \* $p < 0,10$ ; \*\* $p < 0,05$ ; \*\*\* $p < 0,01$ . Source: Authors' calculations.



The Chow test to compare CEM with FEM, yielded a Cross-section F value of 611.7 in the agricultural sector; 101.46 in the industrial sector; and 96.6 in the service sector. All equations produce prob values. sign. 0, so it can be concluded that FEM is preferred over CEM.

Then the Hausman test was carried out to choose between FEM or REM. The Hausman test uses the Chi-Square distribution, and produces calculated values for the agricultural, industrial and service sectors respectively: 54.2; 35.04; and 32.47 with prob. sign 0 for all equations. This means that the hypothesis which states that REM is better is rejected, so the chosen model is FEM.

The estimates generated using the Fixed Effect Model with Cross-Section panel data method are shown in Table 2.

Table 2 – Estimates of the Coefficient of Employment Opportunity Elasticity

Coefficient	Sector		
	Agriculture	Industry	Service
Constant	2,995 (0,011)**	-0,813 (0,462)	-2,844 (0,000)***
PDRB	-0,480 (0,001)***	0,927 (0,000)***	0,897 (0,000)***
Wages	0,942 (0,000)***	-0,228 (0,029)**	-0,183 (0,177)
TPAK	0,01 (0,000)***	0,003 (0,088)*	0,004 (0,037)**
Adj R <sup>2</sup>	0,997	0,995	0,996
F	1148,927	805,117	940,60
Prob(F-statistic)	0,000	0,000	0,000
Durbin-Watson	1,860	1,796	2,177

Note: \* $p < 0,10$ ; \*\* $p < 0,05$ ; \*\*\* $p < 0,01$ . Source: Authors' calculations.

The estimation results give a high Adj R<sup>2</sup> value of around 99%, which means that the model is trustworthy. Simultaneous testing using the F distribution shows a significant value that is very sufficient to be able to conclude that the independent variables simultaneously have a significant effect on employment opportunities. Testing the partial effect using t student resulted in the conclusion that economic growth has a significant effect on employment opportunities in all sectors. The provincial minimum wage rate has a positive and significant effect on employment opportunities in the agricultural sector and a negative effect on industrial employment opportunities, but does not significantly affect employment opportunities in the service sector.

The Durbin-Watson value for  $k=3$   $df=136$  is about  $dL=1.66$ ;  $dU=1.76$  and  $4-dU=2.24$ ;  $4-dL=2.34$ . The DW values for equations 1, 2, and 3 are 1.86; 1,796; 2,177; is between the range  $dU < DW < 4-dU$ , which indicates that the model does not contain autocorrelation. The correlation coefficient between independent variables is shown in Table 3. The relationship between GRDP and wage levels is only 0.11; GRDP with TPAK of 0.14 and W with an TPAK of 0.33. It can be said that there is no multicollinearity in this model. Heterogeneity is common in panel data models. However, this can be overcome by using the right model. In this study the appropriate model is the FEM with cross-section.

Table 3 – Correlation Coefficient

n/n	PDRB	W	TPAK
GRDP	1.000000	-0.115434	-0.142181
W	-0.115434	1.000000	-0.332941
TPAK	-0.142181	-0.332941	1.000000

Source: Authors' calculations.

A well-developed economy can bring about structural changes in creating job opportunities, reducing unemployment and lowering poverty rates. How much economic growth can create employment opportunities can be measured by employment elasticity, namely the percentage change in employment opportunities caused by each percent of economic growth.



The coefficient of employment elasticity on economic growth was found to be positive in the industrial and service sectors, but negative in the agricultural sector, namely 0.927 in the industrial sector, 0.897 in the service sector and -0.48 in the agricultural sector. The value is less than 1, which indicates that the pace of economic growth is faster than changes in available job opportunities in the industrial and service sectors.

The agricultural sector has a negative coefficient of elasticity of employment opportunities for economic growth, meaning that economic growth actually reduces employment opportunities in the agricultural sector. When the economy experienced distortions during the 2020 Covid-19 pandemic, Indonesia experienced an economic downturn of up to -2.03%. When Indonesia was experiencing an economic downturn, many companies laid off employees and even laid off their employees, thereby increasing the number of unemployed people. The agricultural sector is able to accommodate workers who have been affected by layoffs, most of whom are formal workers from the industrial sector, in fact the absorption of agricultural labor has actually increased by 10.5% in 2020. The agricultural sector is one of the sectors that grew positively during the Covid-19 pandemic. This is supported by government regulations that loosen the movement of sectors that are considered essential to meet daily life, including health and food support sectors. After the economy began to revive and grow in 2021, employment in the agricultural sector actually decreased by 2.86%, while the industrial and service sectors grew positively by 5.71% and 3.36% respectively. This shows that some workers are returning to work in industry and services as the economy begins to improve.

Ridhwan et al (2021) found that during the Covid-19 pandemic, the Indonesian economy experienced distortions and led to increased unemployment, especially in the formal sector. On the other hand, there has been an increase in digital-based economic activities, which we know as e-commers. The increase in e-commerce has mostly occurred in the service sector which is effective enough to accommodate workers who have lost their formal jobs.

Spatially, the Indonesian economy is dominated by the Java Island region (BI, 2022). National output is still spread unevenly between regions. The highest national output as reflected in the value of the Gross Regional Domestic Product (GRDP) during the 2019-2022 period was in the province of DKI Jakarta, followed by East Java, West Java and Central Java. Economic growth also looks different between regions. During the Covid-19 pandemic in 2020, the biggest decline in the rate of economic growth was experienced by the Province of Bali, reaching -9.3%, far exceeding the national economic downturn which was 'only' -2.03%. The economic downturn was accompanied by a decrease in employment opportunities (-0.27%), but not as big as the decline in economic growth.

Table 4 – Growth in Employment Opportunities and Economic Growth 2020-2022

Years	Job Opportunity Growth				Economic growth
	Agriculture	Industry	Service	Total	
2020	10.55	-6.77	0.49	1.53	-2.03
2021	-2.86	5.71	3.36	2.02	3.69
2022	4.24	2.46	3.53	3.49	5.36

Source: BPS, data processed.

The contribution of sectors in absorbing labor differs in each region. Nationally in 2022 the contribution of the agricultural sector will absorb 28.6% of the workforce, the industrial sector 22.2% and services 49.2%. The agricultural sector has a large contribution to employment in 2022 in the regions of Papua (71.5%), West Sulawesi (50%), East Nusa Tenggara (49.4%), Jambi (47.96%), South Sumatra (46.44%), and Bengkulu (48.16%). In DKI Jakarta Province, the agricultural sector only absorbs 0.5%.

The contribution of the industrial sector is more evenly distributed throughout Indonesia in absorbing labor, with the exception of Papua which only absorbs 4.73%. The Riau Archipelago, Banten and Central Java provinces are 3 provinces whose industrial sector contributes relatively large in absorbing labor, namely between 31-34%.



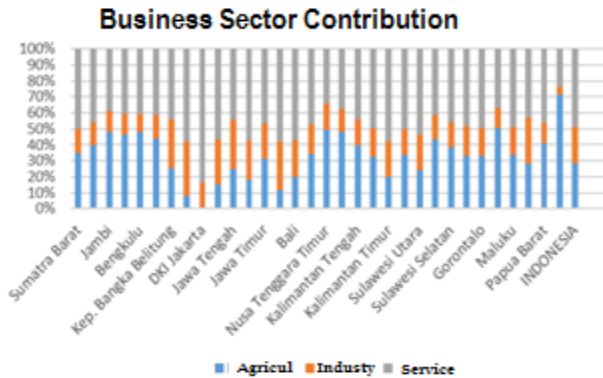


Figure 1 – Sector Contribution in Labor Absorption in 2022 (Source: BPS 2023, data processed)

Figure 1 illustrates the relatively large contribution of the service sector to employment. There are 10 provincial areas where the service sector absorbs more than 50% of the workforce, including DKI Jakarta which absorbs 83.7%, followed by East Kalimantan and the Riau Islands, where the service sector absorbs 58% of the workforce.

Government policies on employment will influence the behavior of economic actors. Rules that guarantee the welfare of workers/workers, for example, can be considered a burden for business owners (although they might increase worker productivity). The government made a minimum wage setting policy as an effort to realize workers' rights to a decent living. The minimum wage is the lowest monthly wage set by the Governor as a safety net. The minimum wage consists of wages without benefits or basic wages and fixed allowances (Ministry of Manpower Regulation No. 18 of 2022). If the increase in the enacted minimum wage is seen as a burden on the business sector, then this will reduce the interest of employers to increase their workforce.

The Provincial Minimum Wage (UMP) is a standard minimum wage per month, the amount of which is determined by policy makers in the local area, in this case the governor and the Regional Wage Council. The UMP value depends on economic conditions (including inflation) and regional employment. Indonesia's average UMP in 2022 is Rp. 2,729,463. The highest UMP in 2022 is in DKI Jakarta Province Rp. 4,641,854 followed by Papua Rp. 3,561,932, and North Sulawesi Rp. 3,310,723. While the lowest UMP is found in Central Java Rp. 1,812,935, DIY Rp. 1,840,916, West Java Rp. 1,841,487 and East Java Rp. 1,891,567 (BPS, 2023).

Table 5 – Average Minimum Wage Increases and Changes in Employment Opportunities

Year	Wage Increases (%)	Changes in Employment Opportunities (%)
2020	8.82	1.53
2021	0.57	2.02
2022	1.55	3.49

In general, the minimum wage rate increases every year, but with a different amount in each region. The increase in the average minimum wage in Indonesia by 8.82% during the 2020 Covid-19 pandemic was relatively large compared to normal situations. This is a form of government support for workers in facing difficult times of economic limitations.

The parties directly related to the UMP are companies that use paid labor services (employees) and also residents who are classified as the workforce (employees). Labor wages are a component of costs that must be paid by companies to their workers, so that an increase in the UMP can make producers reduce or at least maintain the number of workers. An increase in wages can reduce the demand for labor for two reasons, namely the substitution effect and the output effect (O'Sullivan, 2006). A substitution effect occurs when an increase in wages forces employers to switch to other inputs such as machinery or equipment. The output effect occurs if an increase in wages is considered to increase



production costs so that output prices are more expensive, consumers reduce their purchases, so producers reduce production and workers. Meanwhile for the working age population, an increase in the UMP can motivate them to work more actively or even enter the labor market for those who were previously unemployed.

Table 2 shows that the coefficient of elasticity of employment to the provincial minimum wage rate is 0.94 in the agricultural sector; -0.23 in the industrial sector, and 0.18 in the service sector, but the service sector is not significant. The positive coefficient in the agricultural sector indicates that the greater the minimum wage, the greater the absorption of agricultural labor. The increase in the minimum wage encourages more people to work and are accommodated in the agricultural sector. A 10% UMP increase can increase the absorption of agricultural labor by 9.4%. According to Ridhwan et al (2021), most people who work in agriculture are informal workers, who are not paid by other parties. This situation shows that most of the agriculture is still in the form of family farming.

The coefficient of elasticity of employment to wages in the industrial sector is -0.23 which means that if the local government raises the minimum wage standard it will make employers restrain themselves due to rising costs so that they are more stringent in providing employment opportunities. A 10% increase in wages can reduce industrial employment opportunities by 2.3%.

The Labor Force Participation Rate (TPAK) measures the proportion of the population aged 15 years and over entering the labor market. A person's decision to choose to enter the labor market or not depends on his perception of the time resources he has, whether at a certain wage level he prefers to work and earn income or use it to carry out other activities and obtain utilities other than income.

In this study, there was not enough correlation between the minimum wage level and the labor force participation rate, so that it can be interpreted that the decision to offer oneself to the labor market is not influenced by the minimum wage level but by other factors.

The coefficients of the Labor Force Participation Rate all show a positive magnitude but with a small value. This means that the addition of labor supply can affect employment in both the agricultural, industrial and service sectors but in very small amounts, namely 0.01 points in the agricultural sector, 0.003 points in the industrial sector and 0.004 points in the service sector.

Table 6 – The coefficients of the Labor Force Participation Rate

Years	TPAK (%)	TPT (%)
2019	67,66	5,28
2020	68,05	7,07
2021	68,13	6,49
2022	68,64	5,86

Source: BPS, data processed.

As shown in Table 6, the average LFPR during the Covid-19 pandemic increased 0.39 points from 67.66% in 2019 to 68.05% in 2020. However, in 2021 the TPAK increased only 0.08% to 68.13 % and will increase again by 0.52 points in 2022 after the economy grows to improve to 68.64%. The difficult situation in 2020 has made more people choose to work and look for work but the available business fields are limited, so many are unemployed. The 2020 open unemployment rate rose to 7.07% from the previous 5.28%.

## CONCLUSION

This study found that during the 2019-2022 period, economic growth had a positive effect on employment opportunities in the industrial and service sectors, but had a negative effect on employment opportunities in the agricultural sector. This situation indicates a shift in employment opportunities from the industrial and service sectors to the agricultural sector when there is a decline in economic growth. The increase in employment opportunities in the industrial and service sectors has been slower than the pace of economic growth. The



percentage decrease in employment opportunities in the agricultural sector is lower than the percentage increase in economic growth.

This study also found that an increase in the provincial minimum wage had a positive effect on employment opportunities in the agricultural sector, but had a negative effect on employment opportunities in the industrial sector. The increase in the provincial minimum wage has no effect on employment opportunities in the service sector. The percentage increase/decrease in employment opportunities in the agricultural and industrial sectors is lower than the percentage increase in the provincial minimum wage.

In this study, the labor force participation rate is not correlated with the provincial minimum wage rate. An increase in the labor force participation rate affects employment opportunities in all sectors but in very small numbers.

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