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Analysis of Micro and Small Industry Employment in Indonesia Before and After Covid-19

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ABSTRAK

Penelitian ini bertujuan untuk menganalisis pengaruh jumlah Industri Mikro dan Kecil (IMK), Penanaman Modal Dalam Negeri (PMDN), dan nilai output IMK terhadap penyerapan tenaga kerja di tingkat provinsi di Indonesia sebelum dan sesudah Covid-19. Data yang digunakan merupakan data panel dari 30 provinsi di Indonesia selama periode 2018–2023 yang diperoleh dari Badan Pusat Statistik (BPS). Metode penelitian menggunakan analisis regresi data panel dengan model Fixed Effect Model (FEM) yang dipilih berdasarkan uji Chow dan uji Hausman. Selain itu, penelitian ini juga menguji asumsi klasik, termasuk uji multikolinearitas, heteroskedastisitas, dan autokorelasi untuk memastikan validitas model. Variabel dummy Covid-19 dimasukkan untuk mengukur dampak pandemi terhadap penyerapan tenaga kerja. Hasil penelitian menunjukkan bahwa jumlah IMK, PMDN, dan nilai output IMK berpengaruh positif dan signifikan terhadap penyerapan tenaga kerja, mengindikasikan bahwa peningkatan jumlah usaha, investasi domestik, dan output produksi mendorong peningkatan tenaga kerja yang diserap. Sebaliknya, variabel dummy Covid-19 memiliki pengaruh negatif dan signifikan, menunjukkan bahwa pandemi berdampak negatif terhadap pasar tenaga kerja sektor industri mikro dan kecil. Penelitian ini memberikan implikasi kebijakan bagi pemerintah dalam mendorong investasi domestik dan meningkatkan kapasitas produksi industri mikro dan kecil sebagai strategi utama untuk mempercepat pemulihan tenaga kerja pasca-pandemi serta memperkuat ketahanan sektor industri mikro dan kecil di Indonesia.

ABSTRACT

This study aims to analyze the effect of the number of Micro and Small Industries (MSI) Domestic Investment (PMDN), and output value on employment at the provincial level in Indonesia before and after Covid-19. The data used is panel data from 30 provinces in Indonesia during the period 2018-2023 obtained from the Central Agency Statistics. The research method uses panel data regression analysis with the Fixed Effect Model (FEM) model selected based on the Chow test and Hausman test. In addition, this study also tested classical assumptions, including multicollinearity, heteroscedasticity, and autocorrelation tests to ensure the validity of the model. A variable Covid-19 dummy is included to measure the impact of the pandemic on employment. The results show that the number of MSI, PMDN, and MSI output value have a effect positive and significant on labor absorption, indicating that an increase in the number of businesses, domestic investment, and output production leads to an increase in absorbed labor. In contrast, the Covid-19 dummy variable has a has a negative and significant effect, indicating that the pandemic negative impact on the micro and small industry sector labor market. This study provides policy implications for the government in encouraging domestic investment and increasing the production capacity

of micro and small industries as the main strategies to accelerate post-pandemic labor recovery and strengthen the resilience of the micro and small industry sector in Indonesia.

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1. INTRODUCTION

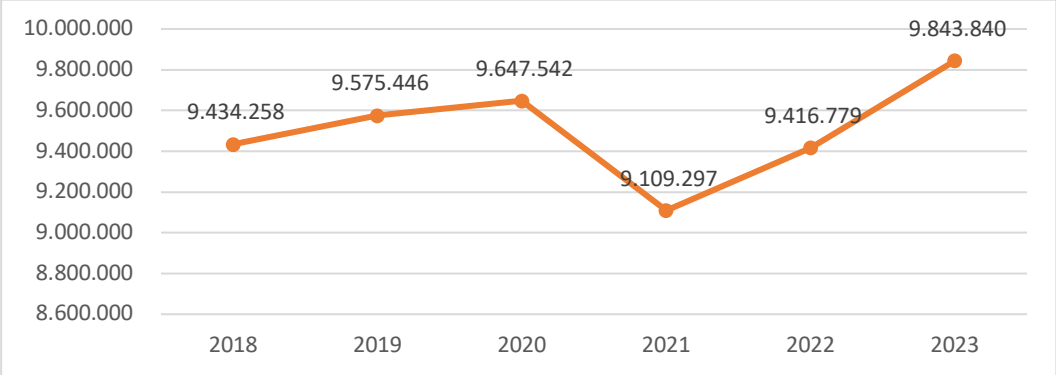
Micro and Small (MSI) Industries play a strategic role in the Indonesian economy as a key driver of the local and national economy. sector This not only contributes to a more equitable income distribution, but is also a major source of job creation, especially in the informal sector [1]. The flexibility of MSI allows the to sector survive amidst economic uncertainty. However, the Covid-19 that pandemic hit the world in 2020 had a significant impact on various economic sectors, including micro and small industries. Business closures and workforce reductions are evidence of the vulnerability of micro and small industries in the face of the global crisis Atmaja & Novitaningtyas [2].

The Covid-19 pandemic, which was first discovered in Wuhan, China, in, December 2019 and declared a global by WHO on March 11, 2020, pandemic has had widespread impacts on economic sectors in Indonesia [3]. Despite their vulnerability to the crisis, micro and small industries continue to contribute to economic recovery through job creation and increased productivity. OECD Thein 2023 emphasized that the sector plays a role in maintaining economic stability, driving innovation and supporting sustainable growth amidst global change.

History records that micro and small industries have strong resilience to economic shocks, as seen in the 1998 monetary crisis when the sector was able to survive while many large businesses went bankrupt [4]. During the Covid-19 pandemic, micro and small industries experienced sharp fluctuations. Data from the Central Bureau of Statistics shows that the number of micro and small industries experienced a sharp decline in 2020 and 2021, before finally increasing again in 2022 and 2023, along with economic recovery and recovery policies implemented by the government.

In addition to the number of operating businesses, the number of workers absorbed in the micro and small industry sector has experienced also significant changes during the pandemic. Based on data from the Central Agency Statistics, the number of workers in the micro and small industries has experienced a downward trend during the pandemic, as shown in Figure 1 below:

Figure 1. Number of Workers in Micro and Small Industries in Indonesia (2018-2023)



(Source: Central Bureau of Statistics, 2024, data processed)

In Figure 1, it can be seen that before the pandemic, the number of workers workers in the micro and small industry sector was relatively stable at around 9.5 million. However, when the pandemic occurred in 2020, the workforce experienced a drastic decline, reaching its lowest point in 2021. This impact was caused by various factors, including restrictions on economic activity, reduced demand, and operational difficulties experienced by micro and small industry businesses. After economic conditions began to improve in 2022 and 2023, the number of workers increased again as industrial activity and investment recovered.

In theory, an increase in the number of micro and small industries in a region can boost productivity and increase labor demand. Porter (1990) emphasizes that industrial competitiveness is determined by national policies and economic conditions that affect business development and competition. On the other hand, investment especially Domestic, also Investment plays an role important in increasing production capacity and employment [5]. And in the determining labor decisions, [6] highlights that growth in number of firms can increase the value of output and the need for labor. Meanwhile, production theory explains how various inputs are combined to produce output, covering manufacturing to distribution processes [7].

This picture shows that the number of micro and small industries, domestic investment, and the value of industrial output play a role in determining the level of employment in Indonesia. However, the impact of the Covid-19 pandemic on labor market dynamics is still an important question that needs to be analyzed further. Therefore, this study aims to analyze the effect of the number of MSI, PMDN, and MSI output value on employment at the provincial level in Indonesia before and after the Covid-19 pandemic.

2. METHOD

2.1 Data Type and Source

This research is a descriptive study with a quantitative approach that aims to analyze the effect of the Number of Micro and Small (MSI), Industries Domestic (PMDN), MSI Output Value, Investment and the impact of Covid-19 on Labor Absorption in the micro and small industry sector in Indonesia during the period 2018-2023. The data used is panel data that combines time series (2018-2023) and cross-section (30 provinces in Indonesia), sourced from the Central Agency Statistics (BPS).

The research sample initially included 34 provinces but there were extreme data in West Java, Central Java, DI Yogyakarta, and East Java. To overcome the extreme data, this study utilizes a robust that is regression approach effective in evaluating contaminated data [8]. Therefore, the presence of extreme data is considered to ensure a more accurate interpretation of employment in the micro and small industry sector.

2.21 Data Analysis Method

The analysis was conducted using panel data regression with three approaches: Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). model The best is determined through the Chow test, Hausman test, and Lagrange Multiplier test [9]. [10] emphasize that differences in the scale of variables can cause heteroscedasticity. Therefore, this study uses a logarithmic (Double-Ln) model to overcome the problem and evaluate the elasticity of the variables. model The regression used is:
with:

$$LnTK_{it} = a + \beta_1 LnIMK_{it} + \beta_2 LnPMN_{it} + \beta_3 LnOPT_{it} + \beta_4 Dummy\ Covid_{it} + eit$$

Description:
TK : Employment absorption in Micro and Small Industries (MSI).
a : Constant.
IMK : Number of Micro and Small Industries (MSI).
PMN : Domestic Investment (PMDN).
OPT : Output Value.
Dummy Covid: 0 = before Covid, 1 = after Covid.
$\beta_1\beta_2\beta_3\beta_4$: Regression coefficients X_1, X_2. X_3, and the Covid dummy.
e : Residual term (error term).
i : Province.
t : Year.

The analysis was conducted using E-Views 12 to obtain the best model estimation and interpret the influence of variables on employment in micro and small industries in Indonesia.

3. RESULT AND DISCUSSION

Table 1. Statistical Analysis

	TK	IMK	PMN	OPT
Mean	121146.8	60832.22	10615.24	7079854.
Median	94697.50	48453.50	5741.000	4642560.
Maximum	337949.0	168002.0	95202.00	28766892
Minimum	9449.000	4558.000	51.00000	545059.0
Observations	180	180	180	180

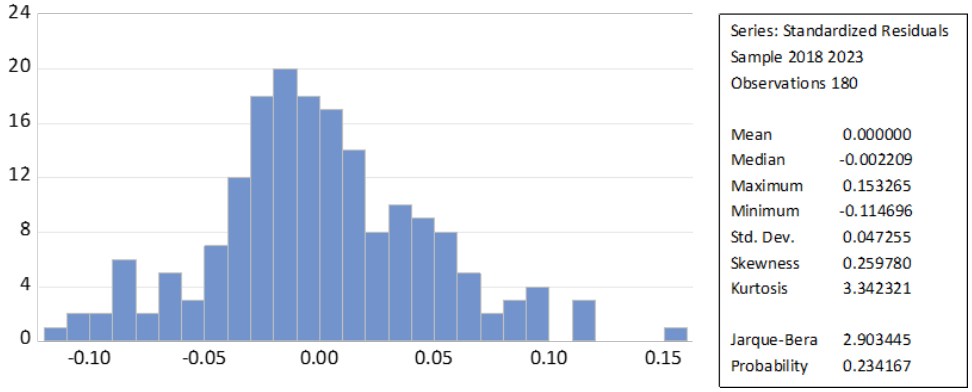
Source: Eviews results, 2024

Table 1, shows that this study uses 180 observations from 30 provinces in Indonesia over the period 2018-2023. The average employment of micro and small industries (MSI) reached 121,146 people, with West Nusa Tenggara Province having the the highest average and West Papua lowest. The number of average MSI was recorded at 60,832 units, with East Nusa Tenggara as the highest province and West Papua the lowest. Domestic investment (PMDN) averaged 10.62 trillion rupiah, the highest in Jakarta and the lowest in West Papua. MSI output value averaged 7,079,854 rupiah, the highest in South Sulawesi and the lowest in North Kalimantan. In general, the provinces with the lowest values are mostly in Indonesia eastern, reflecting the economic inequality between regions. This highlights the need for more inclusive policies to to support the MSI, sector including increasing production capacity, business efficiency, and optimizing investment improve industrial competitiveness in a sustainable manner [11].

3.1 Classical Assumption Test

3.1.1 Normality Test

Figure 2. Normality Test



Source: Eviews results, 2024

The test results Jarque-Bera normality show a P-value of 0.234167 > 0.05, so the data in the model meets the normality assumption. This normal distribution ensures the validity and reliability of the research analysis results.

3.1.2 Multicollinearity Test

Table 2. Multicollinearity Test

Correlation				
	LNIMK	**LNPMN**	**LNOPT**	**CVD19**
LNIMK	1.000000	0.406979	0.861931	0.001311
LNPMN	0.406979	1.000000	0.603239	0.204146
LNOPT	0.861931	0.603239	1.000000	0.026617
CVD19	0.001311	0.204146	0.026617	1.000000

Source: Eviews results, 2024

The estimation results indicate the absence of multicollinearity, as all independent variables have a correlation below 0.90. Thus, the model regression can be analyzed without the risk of bias due to multicollinearity.

3.1.3 Heteroscedasticity Test

Table 3. Heteroscedasticity Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.079830	0.175752	0.454223	0.6503
LNIMK	-0.017575	0.016600	-1.058699	0.2915
LNPMN	-0.004861	0.004038	-1.203750	0.2306
LNOPT	0.012094	0.011400	1.060827	0.2905
CVD19	5.15E-05	0.004649	0.011067	0.9912

Source: Eviews results, 2024

The test results Glejser show that all independent variables have a probability above 0.05, so this is model free from heteroscedasticity problems. Thus, the assumption of homoscedasticity is met, ensuring efficient and unbiased regression estimation.

3.1.4 Autocorrelation Test

Table 4. Autocorrelation Test

Log likelihood	**294.4879**	**Hannan-Quinn criter.**	**-2.649773**
F-statistic	1645.269	Durbin-Watson stat	1.850575

Source: Eviews results, 2024

The test results autocorrelation show a Durbin-Watson (DW) value of 1.8505, which is within the range of DU (1.8017) and 4-DU (2.1495). This indicates that there no ispositive or negative autocorrelation in the model.

3.1.5 Selection of Panel Data Regression Estimation Model

The Chow Test and Hausman Test are used to determine the regression model that best fits the characteristics of the panel data used. In the Chow Test, the hypothesis is H0: Pooled Least Squares (PLS) and H1: Fixed Effect Model (FEM). If the probability (P-value) of the than the F test is is rejected smaller significance level of 0.05, then H0 , so the FEM model is more appropriate.

The Hausman Test compares the Fixed Effect Model with the Random Effect Model to determine the more efficient model. The hypotheses are H0: Random Effect and H1: Fixed Effect. If the P-value is is rejected smaller than than 0.05, then H0 , which indicates that the Fixed Effect model is more appropriate Random Effect because it overcomes potential bias due to correlation between independent variables and unobserved individual effects [9]

Table 5. Regression Model Estimation

	Prob.	**Kesimpulan**
Uji Chow	0.0000	FEM
Uji Hausman	0.0396	FEM

Source: Eviews results, 2024

The Chow test showed a probability of 0.0000 < 0.05, so the Fixed Effect Model (FEM) was chosen as the most model suitable. Furthermore, the Hausman Test produces a probability of 0.0396 < 0.05, so the FEM is still used. Thus, this study uses the Fixed Effect Model (FEM) as the optimal panel data model.

3.1.6 Regression Results

Table 6. Results FEM Regression Estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.971231	0.330966	2.934534	0.0039
LNIMK	0.895350	0.031261	28.64129	0.0000
LNPMN	0.016234	0.007604	2.134761	0.0345
LNOPT	0.044963	0.021469	2.094350	0.0380
CVD19	-0.034285	0.008755	-3.916024	0.0001
	R-squared		0.997318	
	F-statistic		1645.269	
	Prob(F-statistic)		0.000000	

Source: Eviews results, 2024

The following regression model describes the relationship between the number of micro and small industries, domestic investment, output value of micro and small industries, and the impact of the Covid-19 pandemic on employment in the micro and small industry sector in Indonesia. The equation obtained is as follows:

$$LNTK_{it} = 0.971231 + 0.895350LNIMK_{it} + 0.016234LNPMN_{it} + 0.044963LNOPT_{it} - 0.034285CVD19_{it} + eit$$

The that the regression equation shows number of micro and small industries (MSI), domestic investment (PMDN), and MSI output value have coefficients of 0.895350, 0.016234, and 0.044963. A respectively 1% increase in the number of MSI increases employment by 0.895%, while a 1% PMDN increase in increases employment by 0.016%, and a 1% increase in IMK output value increases employment by 0.044%. The result Covid-19 dummy variable has a coefficient of -0.034285, which indicates a decrease in employment compared to the pre pandemic. This period indicates that although the main production factors encourage an increase in employment, the pandemic still has a negative impact on the micro and small industry sector.

3.2 Hypothesis Test

3.2.1 T test

Based on the t-test, the results variable number of micro and small industries (t-count = 28.6419), domestic investment (t-count = 2.1348), and output value of micro and small industries (t-count = 2.0944) have t-count values greater than the t-table (1.65356 and probabilities of 0.0000, 0.0345, and 0.0380, which are respectively smaller than the significance level of 0.05. This shows that the three variables are statistically significant in influencing labor absorption in the micro and small industry sector. Meanwhile absorption, the Covid-19 dummy variable has a t-count of -3.9160 with a probability of 0.0001, which is also smaller than 0.05, indicating a significant negative impact on employment. Thus, although the number of industries, investment, and output contribute to the increase in employment, the Covid-19 pandemic still has a considerable effect in reducing the level of employment in the micro and small industry sector in Indonesia.

3.2.2. F test

Testing with n = 180, $\alpha = 0.05$, dfl = 4, and df = 176 results in an f-table value of 2.42. results Theshow that the independent variables simultaneously affect employment in micro and small industries, with an f-statistic value of 1645.269 > f-table 2.42. This finding indicates that the variables in the research model have a significant influence on employment in the sector.

3.2.3 Coefficient of Determination

The coefficient of determination (R^2) of 0.997318 indicates that the independent variables in the model explain 99.73% of the variation in micro and small industry employment in Indonesia before and after Covid-19, while 0.27% is influenced by factors outside the model. [12] states that high R^2 in the Fixed Effect Model is common because this model emphasizes variation units rather than between units.

3.2.4 Individual Effect

This study analyzes the effect of the number of micro and small industry businesses (MSI), domestic investment (PMDN), and output value on employment in 30 Indonesian provinces through an individual effect approach. The results estimation show that each province has different characteristics in response to the independent variables. value The highest individual effect is found in DKI Jakarta (1.443938), which reflects more advanced economic conditions with better access to resources, raw materials, and markets major. In contrast, Maluku Province has the lowest individual effect value (0.732946), indicating that limited production factors and access to infrastructure are still the main obstacles.

The superiority of Java Island as the center of the national economy can be seen from the dominance of micro and small industries, which account for 62.06 percent of the national total. This is concentration supported by better infrastructure, access to capital, and ease of distribution of goods and services. In contrast, regions outside Java, especially Eastern Indonesia, have a much smaller contribution (2.18 percent). High transportation and distribution costs, as well as limited access to technology and capital, are the main challenges for businesses in region this.

The differences in individual effects between provinces also reflect variations in regional policies in supporting the micro and small industry sector. Provinces with a high concentration of micro and small industries tend to have more proactive development strategies, such as the provision of production facilities, increased access to capital, and programs workforce training. Meanwhile, provinces with low individual effect values face constraints in sub-optimal development policies and minimal interventions to improve small business competitiveness.

Differences in the quality of labor also contribute to disparities in labor absorption between regions. Western Indonesia Indonesia has a more qualified workforce, while Eastern still suffers from limitations in terms of education and skills training. The government needs to focus on improving the capacity of human resources in regions underdeveloped to reduce the development gap. Appropriate policy support can help accelerate the growth of the micro and small industry sector and increase its contribution to the national economy.

3.3. Discussion

3.3.1 The Effect of the Number of Micro and Small Industries on Labor Absorption in Industries Micro and Small

This study shows that the number of micro and small industries has a effect positive and significant on labor absorption at the provincial level in Indonesia. This is in line with Demand demand Theory which states that an increase in the number of businesses increases the for labor, especially in labor-intensive industries [6]. In addition, Theory Production also supports this finding, where an increase in the increase number of firms reflects an in production capacity that requires more labor[13]. Result This is in line with research by [14] in Semarang City and [15] in Sumbawa Regency, which that the growth of business units contributes to the creation of new jobs. Therefore, it is important for the government to not only support businesses affected by the pandemic, but also strengthen business groups that are able to survive so that they can serve as examples for others.

3.3.2 The Effect of Domestic Investment on Labor Absorption in Industries Micro and Small

This study found that domestic investment (PMDN) has effect a positive and significant on the employment of micro and small industries in Indonesia. In accordance with Production Theory, an increase in capital increases production capacity which requires additional labor [13]. In addition, Theory Labor Demand explains that higher investment encourages an increase in labor needs in supporting the production process [16]. This finding is supported by research [14], well as [17], which confirms that investment has a positive correlation with employment studies. Other such as [18] in Berau Regency, show that PMDN increases employment and economic growth in the region.

3.3.3 Effect of Micro and Small Industry Output Value on Labor Absorption in Industries Micro and Small

The results showed that the output value of micro and small industries has a effect positive and significant on labor absorption in Indonesia. In line with Labor Demand Theory, an increase in output reflects the increasing demand for goods and services, which has an impact on the increasing need for labor [16]. In addition, Theory Production explains that labor is the main input in the production process, so that an increase in the output of micro and small industries will expand the scale of production and

increase labor efficiency [13]. This finding is supported by by research [19] in Indonesia, which identified a positive relationship between output and labor.

3.3.4 Impact of Covid-19 Pandemic on Labor Absorption

This study shows that the Covid-19 pandemic has effect a negative and significant on the employment of micro and small industries in Indonesia. In accordance with Labor Demand Theory, the pandemic causes a decrease in demand for micro and small industry products due to economic restrictions and a decrease in people's purchasing power [20]. From a Production Theory perspective, the pandemic disrupts the reduces production function, efficiency, and forces many firms to reduce labor to reduce operational costs [13]. The results of this study are supported by the study of [21] which found that Covid-19 had a negative impact on employment in Malang City. Therefore, government policy responses and business adaptation are important factors in mitigating the impact of the pandemic on the micro and small industry labor market.

4. KESIMPULAN

Based on the description in the previous chapters that have explained the independent variables affecting employment in micro and small industries at the provincial level in Indonesia before and after the Covid-19, pandemic the following conclusions can be drawn::

1. The number of business units has a effect positive and significant on employment, indicating that the more micro and small industries, the greater the employment opportunities created.
2. Domestic (PMDN) Investment has effect a positive and significant on labor absorption. This means that increasing domestic investment in this sector enlarges production capacity and increases demand.
3. The output value of industries micro and small has a effect positive and significant on labor absorptionIndicating that an increase in output value encourages greater labor demand, reflecting economic growth and job creation.
4. The impact of the Covid-19 Pandemic has a negative and significant effect on employment in the micro and small industry sector in Indonesia. This means that although conditions after the pandemic have has begun to recover, the negative effects are still being felt, indicating that this crisis left a long-term impact on the labor sector, especially in the micro and small industries.

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