



Factors Influencing Labor Absorption in Micro and Small Industries on Java Island (2017-2022): An Analysis of Provincial Minimum Wage, Industrial Units, and Economic Output

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Increasing population growth has led to an abundant labor force. The micro and small industries are among the jobs that can absorb this workforce. Therefore, this study analyzes factors affecting labor absorption in the Mirko and small industries. Research samples were taken from six provinces on Java Island from 2017 to 2022. The independent variables are Provincial Minimum Wage, Number of Micro and Small Industry Units, Output Value, and Input Value—analysis using panel data regression by processing using Eviews 12. The research's findings show that independent variables substantially influence labor absorption in micro and small industries. Partially, the provincial

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minimum wage negatively impacts the labor absorption of micro and small industries in Java Island during 2017-2022, while the number of Micro and Small Industry units, output value, and input value have a positive effect.

Keywords: *Labor absorption of micro and small industry; provincial minimum wage; number of micro and small industry units; output value; input value.*

1. INTRODUCTION

The population growth in Indonesia is quite significant. Indonesia's population in mid-2023 will reach 275,773.8 million people, with a growth rate of 1.13% (BPS, 2023). This large population will certainly impact economic development in the form of successful development or even the burden of sustainable development. A large population can cause small employment and an increase in unemployment in the working-age population [1]. Labor absorption describes accepting labor to work on available jobs [2]. This negative impact can occur if it is not balanced with the availability of jobs as large as the population. The labor force in 2022 increased by 3.570 million people compared to 2021. The increase in the labor force or population with working age can impact job offers that also increase. Such conditions create the need for jobs that can absorb labor. However, it should be underlined that the labor market also has problems regarding derived demand. That is, the size of the demand for labor depends on the market demand for the goods and services produced [3-7].

One way that can be done is by providing or expanding employment opportunities for the community. Based on data from the Central Bureau of Statistics, business fields that can absorb a relatively high workforce in Indonesia are the micro and small industry sectors. The industrial sector, famous for its labor-intensive nature, can absorb 9.42 million Indonesian workers in 2022 (BPS, 2023). The success of Micro and Small Industries in absorbing labor is supported by the robustness of this sector in maintaining its business during turbulent economic conditions. The 1998 crisis and the recent economic turmoil caused by the COVID-19 pandemic have proven that Micro and Small Industries can become pillars of support for the country's economic recovery [8-12]. Workers who cannot enter the formal sector, where most require a level of education and special skills, can be absorbed in this micro and small industry. Even though they are small in scale, labor-intensive characteristics can make micro and

small industries become one of the strategies that can be used to absorb the increasing labor force and prevent unemployment. The centralization of micro and small industries in Java Island based on the most significant number of micro and small industries in 2022, which is 62.58%, is the basis for selecting this research sample. The assumption is that when there are many micro and small industries, the available jobs also increase to absorb more labor. Absorption of labor is accepting the labor force into existing jobs [13-16].

The size of labor absorption can be influenced by several factors, one of which has been described, namely the number of business fields themselves. Based on research conducted by Atiyatna [17] and research by STIE Labuhanbatu lecturers (2018), the number of micro and small industries has a positive effect on employment. Another factor is the provincial minimum wage. Based on research conducted by Dirta Pratama et al. (2023), increasing the minimum wage will burden production costs. It means that the variables have a negative effect. Next the next factor is the output value. If there is an increase in production capacity due to increased market demand for goods or services, this will also have an impact on increasing labor demand [18]. In addition to the output value, another factor is the input value, or in terms of production, an intermediate cost incurred in the production process consisting of raw material costs, fuel costs, and rental costs, both building or machine rental for production (BPS). How the influence of these factors on the absorption of micro and small labor is the formulation of this research problem [19-21]. This study is expected to analyze the provincial minimum wage, the number of micro and small industry units, and the output value and input value of the absorption of micro and small industry labor.

2. MATERIALS AND METHODS

2.1 Materials

This research uses several theories as the basis for hypothesis development. The theory used is:

- 1) **Micro and Small Industry:** One of the pillars of the Indonesian economy comes from the industrial sector. The industry itself is a business unit that carries out economic activities to produce goods or services (BPS, 2023). The industrial sector in Indonesia consists of 24 types of business fields, and four types are based on the number of workers. Micro and small industries are industrial classifications with a workforce of 4-19 people [22].
- 2) **Labor:** According to Law No. 13 of 2003, labor is defined as everyone who can do work to produce goods and services both to meet their own needs and for the community. Labor enters into the discussion of Cobb Douglas's theory of production, which is expressed in the equation $Q = A L^{\alpha} K^{\beta}$. Employment in this economic sector can occur due to demand. When there is a high demand for goods or services by the market, the inputs used to achieve optimal productivity, including labor, are also high.
- 3) **Provincial Minimum Wage:** Wages, according to Law No. 13 of 2003, are rewards to workers from employers or business owners in the form of money according to mutually agreed provisions. The theory of labor demand is the relationship between the level of wages (labor prices) and the quantity of labor desired to be employed in a certain period. The graph of labor demand slopes negatively, which means that if wages rise, labor demand will shift to the left or, in this case, decrease.
- 4) **Number of Micro and Small Industrial Units:** Micro and small industries are business units with a workforce of 4-19 people who carry out economic activities through their authority, intending to obtain product results in the form of goods and services (BPS, 2023). Chenery's Pattern of Development theory shows how industry has an essential role in economic growth. There are structural changes in economic growth, industry, and institutions in developing countries, from the main sector that supports the economy, the developing agricultural sector, to the industrial sector (Sudarmono, 2006). The more industries, the more the need for labor.
- 5) **Output Value:** Statistics Indonesia (BPS) defines the output value as the output value or result of industrial processes. Cobb Douglas's production function

explains that the value of output or production is influenced by several factors, such as labor and capital. Through this production function, it can also be seen that the value of output and labor are related. If the amount of demand for production results increases, companies tend to increase their production capacity, and then the industry will increase the use of its labor

- 6) **Input Value:** Input value can also be called input costs or intermediate costs, which consist of raw material costs, teaching material costs, building rental costs, and machinery and equipment for non-industrial services. The value of the input of production can be included in Cobb Douglas's production capital, which states $Q = A L^{\alpha} K^{\beta}$, where the value of the input goes into the capital or capital. When the value of inputs rises, capital will rise; this will be a consideration for the industry to reduce labor to maintain its profit.

2.2 Methodology

The data processing technique used to solve the problem in this study is a regression analysis technique with the panel data method. Eviews 12 is a data processing tool with a pooled data procedure. Starting with the determination of regression models through three approaches: Panel Least Square (PLS), Fixed Effect Model (FEM), and Random Effect Model (REM). The next step is to test the suitability of the model with the Chow test, Hausman test, and Lagrange test. After finding the suitable model, it enters into statistical analysis, which consists of partial and simultaneous statistical analysis, both hypothesis tests and significance tests. The next stage of analysis is the classical assumption test. This test consists of a normality test, autocorrelation test, multicollinearity test, and heteroscedasticity test.

This study used quantitative associative research. Associative research can be interpreted as research that aims to determine the influence and relationship between two or more variables [23]. Quantitative type research is a research method by proving and testing hypotheses. The data used is secondary data with a panel data type. Each variable of micro and small industry labor absorption, provincial minimum wage, number of micro and small industry units, output value, and input value is sourced from publications and Statistics Indonesia (BPS) data. The panel regression

model is derived from the natural logarithm model (Ln). This is the reason for scaling down the data. Considering that data on independent variables have different units and overcome excessive data fluctuations. In addition, through this Ln transformation, research results can be interpreted more efficiently using percentage changes.

The panel data regression in this study is:

$$\text{LnPTKit} = \beta_0 + \beta_1 \text{LnUMPit} + \beta_4 \text{LnUNTit} + \beta_2 \text{LnNOit} + \beta_3 \text{LnNIit} + e$$

Information:

- β_0 : Constant
- $\beta_1 \dots \beta_4$: regression coefficient
- PTK : Micro and Small Industry Labor
- Ln : Natural Logarithms
- UMP : Provincial Minimum Wage
- UNT : Unit Number of Micro and Small Industries
- NO : Output Value
- NI : Input Value
- e : error
- i : Provinces in Java Island
- t : The year 2017-2022

3. RESULTS AND DISCUSSION

3.1 Panel Regression

Based on the analysis using three approaches, namely the Chow test, Hausman test, and Lagrange multiplier test to determine the suitable model, the following results were obtained:

- 1) **Chow Test:** The chow test is used to select the suitable model between the

Common Effect Model (CEM) or Fixed Effect Model (FEM). The regression result in an F cross-section probability of 0.0000 at the alpha(a) level used is 5% or 0.05. The probability value of 0.0000 < alpha 0.05, so rejecting Ho in the selected model is a fixed effect.

- 2) **Hausman Test:** Based on the results of the Hausman test, when the probability of a random cross-section is smaller than 5% or 0.05, the selected model is the Fixed Effect Model. The results of this study's Hausman test obtained a probability of random cross-section of 0.4751 with an alpha of 5% or 0.05. The probability value is 0.4751 > an alpha value of 0.05, so accepting Ho as the selected model is a random effect.

- 3) **Lagrange Multiplier Test:** The Lagrange Multiplier Test is used to compare the Common Effect Model with the Random Effect Model. LM test results where the probability value of Breusch-Pagan < 0.05 is 0.0000. This means that receiving H1 means that the model selected based on the LM test is a random effect. The suitable model for processing this research data is the Random Effect Model (REM).

3.2 Random Effect Model (REM)

The results of data processing with the Random Effect Model approach are as follows:

The equation model can be written as follows:

$$\text{LnPTKit} = 3,835,424 - 0.23 \text{LNUMPit} + 0.75 \text{LnUNTit} + 0.17 \text{LnNOit} + 0.02 \text{LnNIit} + e$$

Table 1. Model selection test result

Test	Cross-section/statistics	Probability
Chow Test cross-section F	27.827.665	0.0000
Hausman Test cross-section random	3.518.027	0.4751
LM Test Breusch-Pagan	3.534.342	(0.0000)

Source: Data Eviews 12, 2024 processed

Table 2. Random effect model result

Variabel	Koefisien	Standar eror	t-Statistik	Probabilitas
C	3.835.424	2.098.984	1.827.276	0.0773
LNUMP	-0.239379	0.116098	-2.061.879	0.0477
LNUNT	0.754455	0.084023	8.979.171	0.0000
LNNO	0.179055	0.070601	2.536.172	0.0165
LNNI	0.026545	0.046887	0.566161	0.5754

Source: Data Eviews 12, 2024 processed

- a. Depending on the panel data regression's outcome in a Random-Effect Model, it can be seen that the Provincial Minimum Wage, Number of micro and small industry units, Output Value, and Input Value are constant, the Micro and Small Industry Labor Absorption in Java Island during 2017-2022 is 3.835.424.
- b. Based on the result of the panel data regression output of a Random-Effect Model, it can be seen that the provincial minimum wage variable has a statistical value of -2.061879. At a significant level of $\alpha = 0.05$ percent, a ttable value of 1.6955 is obtained, and an absolute statistical value of $> ttable$ ($2.061879 > 1.6955$) means that H_a is accepted and H_0 is rejected. Shows that the provincial minimum wage variable has a significant effect and is negatively related to the absorption of micro and small industry labor. Based on the t-statistic probability value, the provincial minimum wage variable has a result of 0.0477. This value is smaller than the significant level of $\alpha = 0.05$ or 5%, so it can be interpreted that the provincial minimum wage variable has a significant influence on the variable of micro and small industry employment. Also, the minimum wage variable negatively and significantly influences the variable labor absorption of the Mirko industry and six small provinces in Java. The probability value is 0.0477 and less than the value of $\alpha = 0.05$ or 5%. Through these results, it can be interpreted that if there is a 1% increase in the provincial minimum wage variable, it will reduce the absorption of micro and small labor by a variable constant of 0.23%. The study's results are also similar to the results of research from (Atiyatna et al., 2023). As explained in the theory of labor demand, wages and the amount of labor have a negative effect. When wages fall, the industry can pay more labor, while wages rise, and the industry reduces labor to maintain stable profits.
- c. Based on the result of the panel data regression output of a Random-Effect Model, it can be seen that the variable number of micro and small industrial units has a statistical value of -8,979,171. At the significant level of $\alpha = 0.05$ percent, obtained a ttable value of 1.6955, the absolute statistical value of $> ttable$ ($8,979,171 > 1.6955$) means that H_a is accepted and H_0 is rejected. Shows that the variable number of micro and small industry units has a significant effect and is positively related to the absorption of micro and small industry labor. Based on the probability value of t-statistics, the variable number of micro and small industrial units has a result of 0.0000. The value is smaller than the significant level of $\alpha = 0.05$ or 5%, so it can be interpreted that the variable number of micro and small industrial units significantly influences the variable absorption of micro and small industry labor. This research resulted in the number of micro and small industrial units having a positive and significant effect on the absorption of micro and small industry workers with a coefficient of 0.7544. When there is a 1% increase in the number of micro and small industrial units, the absorption of micro and small industry workers also increases by 0.7544%, and when there is a decrease, These results are to the hypothesis of this study and previous research by Rochmani et al. [24]. As the number of micro and small industrial units grows more and more, the need for labor to meet industrial productivity also increases. So, the assumption is that the existence of micro and small industries will open up jobs that require labor in the production process. The greater the number of units, the greater the absorption of labor. Supported by previous research from STIE Labuhanbat lecturers (2018) and Habibi et al. [18].
- d. The output value variable has a statistical value of 2.536172. At a significant level of $\alpha = 0.05$ percent, a ttable value of 1.6955 is obtained, and an absolute statistical value of $> ttable$ ($2.536172 > 1.6955$) means H_a is accepted and H_0 is rejected. Shows that the variable output value has a significant effect and is positively related to the absorption of micro and small industry labor. The variable output value of micro and small industries also has a t-statistic probability of 0.0165. The value is smaller than the significant level of $\alpha = 0.05$ or 5%, so it can be interpreted that the variable output value significantly influences the variable absorption of micro and small industrial labor. Based on the results of the regression random effect model, it was found that the output value had a significant positive influence on the

absorption of micro and small industry labor with a variable coefficient of 0.1790. This result means that when there is a 1% increase in the variable output value, the variable absorption of micro and small industry labor will also increase by 0.1790%. This can happen because, in addition to the increasing demand for products by consumers, the industry increases its production capacity. When the output or production value increases, the industry will increase its production capacity, which means there is a need for labor to carry out the production process. The same results were in the research of Isra Habibi [18] and Elwita Syafrilia [25].

- e. The input value variable has a statistical value of 0.566161. At the significant level of $\alpha = 0.05$ percent, obtained a t-table value of 1.6955, the absolute value of statistics $<$ t-table ($0.566161 < 1.6955$), which means H_0 is accepted. Shows that the input value variable does not significantly affect the absorption of micro and small industry labor. The variable input value of micro and small industries also has a t-statistic probability value of 0.5754. This value is greater than the significant level of $\alpha = 0.05$ or 5%, so it can be interpreted that the input value variable does not have a significant influence on the variable of micro and small industry labor. Regression analysis shows that the input value has an insignificant influence on the absorption of micro and small industrial labor. This significance is evidenced by a probability value of 0.5754, which is greater than alpha 5% or 0.05. This can happen due to technological developments in the production process. Through technological advances that occur, one of which is in production machines, the industry can make efficient so that labor absorption decreases.

The calculated F value is 65.95557, and the table F is 2.68. Based on these results, F counts $>$ F table ($65.95557 > 2.68$), thus receiving H_a . That is, simultaneously, the variable variations of the Provincial Minimum Wage, the Number of Micro and Small Industry Units, the output value of micro and small industries, and the input value of micro and small industries together affect the variable variations in the absorption of micro and small industry labor significantly. The statistical F probability value is $0.000000 < 0.05$ (5%). This shows that the variable variation of the Provincial

Minimum Wage, the number of micro and small industry units, the output value of micro and small industries, and the input value of micro and small industries together affect the variation of micro and small industry labor absorption variables significantly.

Then is the Goodness of Fit, which is an indicator that can be seen from the adjusted R-squared magnitude in the analysis results. This study obtained an adjusted R-squared value of 0.8812, which shows that the provincial minimum wage, number of micro and small industry units, output value, and input value can explain the variation of the dependent variable by 88%. The 12% is explained by other variables not included in the model or can also be described in terms of error (e).

This study did not conduct a classical assumption test analysis. This is because the selected model is a regression with a random effect model (REM) approach. The random effect model (REM) approach in panel data regression has considered variation or diversity among individuals in the data. Therefore, it is assumed through the random effect model to have fulfilled classical assumptions such as normality, homoscedasticity, and autocorrelation.

4. CONCLUSION

1. The provincial minimum wage has a negative and significant influence on the micro and small industry labor variable in Java Island for 2017-2022. If the provincial minimum wage increases by 1%, it will reduce the absorption of micro and small labor by a variable constant, which is 0.23%.
2. Several micro and small industrial units variable has a positive and significant influence on the variable of micro and small industry labor in Java Island for 2017-2022. When there is a 1% increase in the number of micro and small industrial units, the absorption of micro and small industry workers also increases by 0.7544%, and when there is a decrease,
3. The output value variable has a positive and significant influence on the micro and small industry labor variable in Java Island for 2017-2022. When there is a 1% increase in the variable output value, it will also increase the variable absorption of micro and small industry labor by 0.1790%

4. The input value variable does not significantly influence the variable of micro and small industry labor in Java Island for 2017-2022.

The analysis that has been carried out shows that the absorption of labor in micro and small industries on Java Island is jointly influenced by four independent variables. Suggestions for what can be given by the author are (1) Supervising and Protection related to provincial minimum wage, (2) Training and Mentoring for micro and small industries, (3) Marketing Assistance for micro and small industries, (4) Subsidies on input goods for micro and small industries.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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