

## Analysis of Variables Determining Labor Absorption in Micro and Small Industries on the Island of Java

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### Abstract

*Micro and small industries have a crucial role in the economics. This research aims to determine the magnitude of the roles of micro and small industries in labour absorption on the islands of Java. The data analysis method uses panel data analysis with a random-effects model. The type of data in this research is panel data, namely a combination of cross-section and time-series data covering six provinces on the islands of Java in 2017-2022. The research results show that the variables of several industries and the production value of micro and small industries have a positive and significant effect on labour absorption on the islands of Java.*

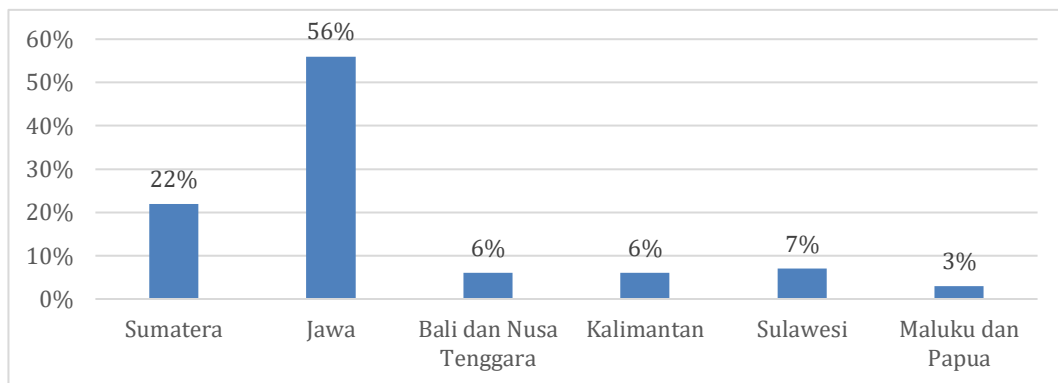
## INTRODUCTION

National development and regional development cannot be separated from the development of human resources and employment opportunities. This is because employment opportunities are a benchmark for the success of regional development. Economic development must be felt by all levels of society to improve the welfare of life (Jaya et al., 2021). In essence, economic development is an effort to improve the quality of life of society. The economic development process of a country can be measured by looking at the high amount of energy absorbed, which will support the development process of developing countries. The implementation of development, especially in the economic sector, cannot be separated from increasing employment opportunities.

National development and providing employment opportunities is a major concern for policymakers and parties with influence at various levels, including corporate, national, regional, and international. The importance of providing employment opportunities is widely recognized as a means of ensuring equal distribution of income, harnessing human potential, and encouraging social and economic participation. Job creation is considered a sustainable approach to reducing poverty and is a major concern for society. John Maynard Keynes emphasized the need to put unemployed workers to work to reduce inequality, and poverty and improve individual welfare.

Providing employment opportunities is crucial because the population continues to increase every year. Adequate employment opportunities are needed so that the workforce is absorbed in economic activities. The main challenge in Indonesian employment is the level of employment opportunities. The imbalance between the growth of the working-age population and the available job opportunities can lead to high unemployment rates. Therefore, increasing the number of workers is considered important to offset the growth that will enter the labour market (Putri et al., 2022).

**Figure 1. Population by Island in 2022**



Based on data sourced from BPS Indonesia, in 2022 the largest population by island will be on Java Island with a percentage of 56% of the total population in Indonesia. In second place is Sumatra Island with a percentage of 22%. Then in the next position is Sulawesi Island at 7%, followed by Bali Island Nusa Tenggara and Kalimantan with 6% each. And the smallest population is on the islands of Maluku and Papua with a percentage of 3%. The large population on the island of Java must be balanced with the availability of sufficient employment opportunities.

The imbalance between population and employment is a significant problem. The rapid increase in population, especially in urban areas, has led to a lack of employment opportunities, especially in the agricultural sector. The imbalance of development between rural and urban areas, as well as between Java and other islands, limited employment opportunities, and uneven economic growth also contribute to the imbalance in the distribution of employment opportunities and the existing population. Steps that can be taken to increase employment opportunities for the community are to build labour-intensive industries. This industry is not only limited to large scales with large factories but also includes micro and small industries.

In the context of the labour market, market principles such as demand and supply still apply. Demand and supply also influence the labour market. However, the labour market is not only influenced by supply and demand dynamics alone. This is caused by the close relationship between the demand for labour and the demand for products or services produced by labour. In other words, the demand for labour in the labour market is very dependent on how much demand there is for goods or services produced by labour (Mankiw, 2007).

Labour absorption includes a large number of jobs that have been filled, which is reflected in the number of employed people. The working population has been absorbed and spread across various economic sectors, and this has happened because of the demand for labour. Therefore, labour absorption can be interpreted as a demand for labour. Labour demand is related to the number of workers needed by industry. The labour demand function establishes the relationship between labour used by the firm and changes in wages. This can be visualized through a labor demand curve which represents the willingness of employers to employ workers at different wage levels within a certain period (Kuncoro, 2002).

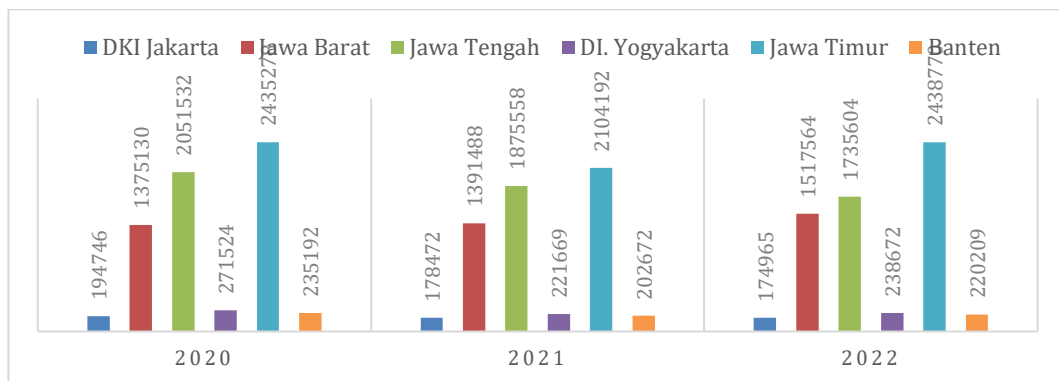
Overall, the concept of demand for labour is almost the same as the concept of demand for goods and services in economics. Labour demand refers to how many companies need workers at a certain wage level, while in economics, demand refers to the number of goods or services demanded by consumers at a certain price level. The increase in demand for labor is very dependent on the increase in public demand for the goods produced by the company (Sumarsono, 2003).

The demand for labour from entrepreneurs is different from the public's demand for goods and services. People buy goods and services to meet their needs and obtain satisfaction, while entrepreneurs recruit workers because they play a role in the process of producing goods and services which are then sold to the public. Thus, the growth in demand for labour is closely related to the increase in public demand for the goods and services produced. Therefore, the demand for labour is also often referred to as " *derived demand* ", where an increase in demand for goods and services will cause an additional need for labour. (Simanjuntak, 2001).

Labour demand is related to the number of workers needed by industry. The labour demand function establishes the relationship between labour used by the firm and changes in wages. This can be visualized through a labor demand curve which represents the willingness of employers to employ workers at different wage levels within a certain period. Labour demand is a production function consisting of two input factors, namely capital (K) and labour (L), which is expressed as  $Q = f(K, L)$ .

Micro and small industries have a crucial role in developing a country's economy by making a significant contribution to job creation, economic growth, and reducing regional inequality. This industry provides significant employment opportunities at lower capital costs, fosters entrepreneurship, and contributes to overall development. The growth of micro and small industries is very important for the development of the national economy and has the potential to become a productive and competitive main actor in the economy (Uma & Anbuselvi, 2023). Micro and Small Industry (IMK) is one of the sectors that makes a large contribution to Indonesia's GDP. Based on data from the Ministry of Cooperatives and Small and Medium Enterprises in 2022, IMK contributed 61.97% to Indonesia's GDP, which was able to absorb a workforce of 9.42 million people. The island of Java occupies the first position in terms of the number of IMK workers and the lowest number of IMK workers is in Maluku and Papua. Measuring labour absorption uses employment data because it provides information about labour use in various sectors and regions. Employment data allows researchers to analyze factors that influence labour absorption (Prihatini et al., 2020).

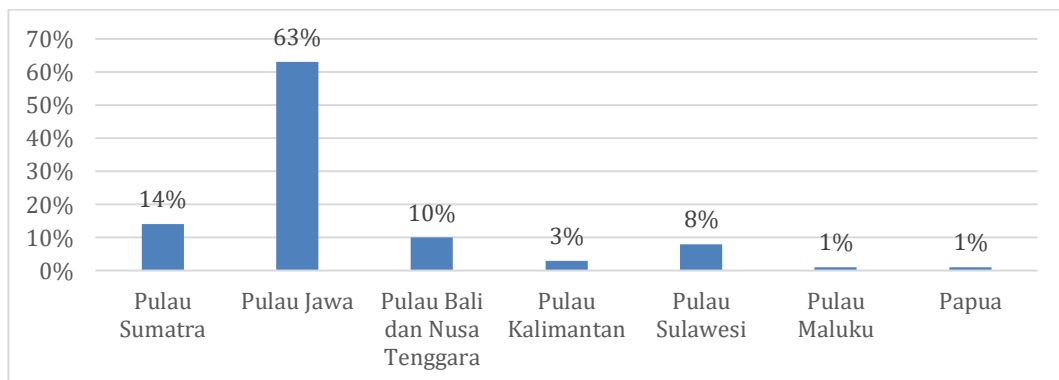
**Figure 2 Labor Absorption**



Source: BPS Indonesia

Based on data sourced from BPS Indonesia, labour absorption in micro and small industries as indicated by the number of workers in five provinces on the island of Java shows fluctuations. East Java Province has the largest number of workers among the six other provinces, with Central Java occupying second place. DKI Jakarta Province has continued to experience a decline in the last three years. Meanwhile, Central Java Province has experienced an increase in the last three years. The rise and fall of labour absorption in an area depends on the number of industrial units available. An increase in the number of units in an industry will tend to be followed by an increase in job vacancies in that area. The influence of the number of industries on labour absorption has been widely researched, for example, studies conducted by [Ilma Nur Fauziah et al \(2021\)](#) and [Rosalia Agista Nur Wulansari et al \(2021\)](#). Growth in the number of industries tends to increase production which triggers capital expenditure to increase production output.

**Figure 3 Distribution of the Number of Micro and Small Industries in 2022**



Source: BPS Indonesia

Java Island is still the industrial centre of Indonesia. One of them is micro and small industry which is still concentrated on the island of Java. Based on Figure 1.2, around 63 per cent of the total micro and small industries throughout Indonesia are on the island of Java. On the other hand, the number of micro and small industries in the eastern region of Indonesia is the smallest, amounting to 1 per cent each in Papua

and Maluku Islands. Java Island, which is the centre for the distribution of micro and small industries, will be able to create more jobs and contribute to employment absorption on Java Island.

One of the crucial factors that can influence labour absorption is production value. Several studies show that production value has a positive and significant impact on labour absorption (Pokrovskii, 2012). In particular, the production value is a key factor in labour absorption because it represents the total value of goods produced. The amount of labour required to produce output is directly proportional to the amount produced and is usually influenced by market demand. However, not all studies find a significant relationship between production value and labour absorption. For example, a study conducted by Muhammad Fadel et al (2021) shows that production value also does not have a significant effect on labour absorption in the industrial sector.

The novelty of this research is that it only considers two variables that are thought to have an influence on the employment of micro and small industries on the island of Java, namely the number of industries and production value, one of which is the production value, which has a different influence in previous studies. Therefore, researchers want to analyze the influence of the number of industries and the production value of micro and small industries on the employment of micro and small industries on the island of Java. This study is expected to show how big the influence is on the number of industries and the value of micro and small production on the island of Java. Also, what factors determine labour absorption?

## RESEARCH METHODS

This research uses a quantitative approach. The data collection method used is secondary data sources which refer to secondary data which refers to data obtained by researchers indirectly through intermediary media. This secondary data is in the form of evidence, notes, or historical reports that have been compiled in the form of archives or documentary data. The data source was obtained from the Indonesian Central Statistics Agency (BPS). The data source is the Indonesian Central Statistics Agency (BPS) in the form of labour data, the number of industries, and the production value of micro and small industries.

The data analysis used is panel data regression analysis. Panel data refers to a combination of time series and *cross-data sections*, which allows the analysis of variables over time and across sectors or individuals. Panel data analysis involves estimating regression models to understand the relationship between independent and dependent variables across different sectors or individuals over a certain period. Panel data analysis provides more accurate estimates, helps identify causal relationships, and makes it possible to track changes in behaviour over time (Vomberg & Wies, 2021). Panel data provides richer information, with more variation, lower (Baltagi, 2005) collinearity between variables, a higher number of degrees of freedom, and better efficiency. The research regression model equation which assumes each independent variable influences the dependent variable is written as follows:

$$TK_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \text{eit} \dots \dots \dots (1)$$

$$\text{LogTK}_{it} = \beta_0 + \beta_1 \text{LogX}_{1it} + \beta_2 \text{LogX}_{2it} + \text{eit} \dots \dots \dots (2)$$

Log: Natural logarithm; TK: Labor absorption; i: Year studied (2017-2022); t: Province;  $\beta_0$ : Constant;  $\beta_1, \beta_2$ : Coefficient; X1: Number of Micro and Small Industries; X2: Production Value of Micro and Small Industries; eit: error term.

There are several analysis tools for panel data, including *Common Effect Model (Pooled Least Square)*, *Fixed Effect Model (Least Square Dummies Variables)*, and *Random Effect Model (Generalized Least Square)* that associates the examination of the model selected for the study. However, several tests were previously carried out to determine the best model, namely the Chow test, Hausman test, and Lagrange test multiplier. After determining the best model among the three models, one model will be determined which will then be used to test classical assumptions, test hypotheses, and test the coefficient of determination ( $R^2$ ).

## RESULTS

Based on panel data regression estimates, namely *Common Effect Model*, *Fixed Effect Model*, and *Random Effect Model*, it will be determined which model is most appropriate for estimating the regression equation model using the Chow Test, Hausman Test, and Lagrange Test Multiplier (LM) as follows:

### Test Chow

**Table 1. Chow Test Results**

| Effect Test              | Statistics | df.    | Prob.  |
|--------------------------|------------|--------|--------|
| Cross-section F          | 25.992399  | (5.28) | 0.0000 |
| Chi-square cross-section | 62.285398  | 5      | 0.0000 |

From the table, the estimation was obtained with a probability worth 0.0000. By using level significance 5% (0.05), then probability the more lower rather than an alpha of 5% (0.05), which resulted in the rejection of H0. As a result, the suitable model is the *Fixed Effect Model*.

### Hausman test

**Table 2. Hausman Test Results**

| Test Summary         | Chi- Sq. Statistics | Chi- Sq. df. | Prob.  |
|----------------------|---------------------|--------------|--------|
| Cross-section random | 0.749490            | 2            | 0.6875 |

From the table, the estimation was obtained with a mark probability of 0.6875. With a use level significance of 5% (0.05), was found that probability the more tall rather than an alpha of 5% (0.05), which resulted in acceptance of H0. The result is a suitable model is *Random Effect Models*.

### Lagrange test Multiplier (LM)

**Table 3. LM Test Results**

|                | Test Hypothesis      |                      |                      |
|----------------|----------------------|----------------------|----------------------|
|                | Cross-section        | Time                 | Both                 |
| Breusch -Pagan | 54.86081<br>(0.0000) | 2.359820<br>(0.1245) | 57.22063<br>(0.0000) |



From the table, the estimation of the results shows a probability of 0.0000. By using a significance level of 5% (0.05), this probability is lower than an alpha of 5% (0.05), thus causing H0 to be rejected. Thus, the appropriate model is the *Random Effect Model*.

**Estimation of Panel Data Regression Models**

The results of data processing with *Random The Effect Model* in this research are in the following table:

**Table 4. Random Model Effect (RE)**

| Variable             | Coefficient | Std. Error | t-Statistics | Prob.  |
|----------------------|-------------|------------|--------------|--------|
| C                    | -0.136615   | 0.373656   | -0.365619    | 0.7170 |
| X1                   | 0.753392    | 0.075647   | 9.959296     | 0.0000 |
| X2                   | 0.244320    | 0.065125   | 3.751559     | 0.0007 |
| R- squared           | 0.905040    |            |              |        |
| Adjusted R- squared  | 0.899285    |            |              |        |
| F- statistic         | 157.2574    |            |              |        |
| Prob (F- statistic ) | 0.000000    |            |              |        |

The results of this research used *random The Effect Model* can be made into a regression model equation as follows:

$$\text{LogTKit} = -0.136615 + 0.753392X_{1it} + 0.244320X_{2it} + \text{eit} \dots \dots \dots 3$$

Based on the model above, the following interpretation can be made:

With a constant value of -0.136615, this indicates that when the number of industries and the production value of micro and small industries are both zero (0), labour absorption will decrease. The coefficient for the number of micro and small industries is 0.753392, with a positive sign. This shows that every 1% increase in the number of micro and small industries will cause an increase of 0.75 in labour absorption in that sector. Meanwhile, the coefficient value for the production value of micro and small industries is 0.244320, also with a positive sign. This means that every 1% increase in the production value of micro and small industries will result in an increase of 0.24 in labour absorption in that sector.

**Classical Assumption Test**

**Normality Test**

Normality Test aims to test whether the sample used is normally distributed or not. A good regression model is a model that has data that is normally distributed or close to a normal distribution.

**Table 5. Normality Test Results**

|              |          |
|--------------|----------|
| Jarque -Bera | 3.260872 |
| Probability  | 0.195844 |

the normality test analysis using Jarque Bera, shows a value of 3.260872, while the probability value is 0.195844, where this value is greater than 0.05 or 5%. If the probability is > 0.05 then the data used is normally distributed. The test results show

that the probability of Jarque - Bera is  $0.195844 > 0.05$ , which means the data is normally distributed.

### Multicollinearity Test

Multicollinearity test can used To identify correlation between variable independent.

**Table 6. Multicollinearity Test Results**

|    | X1       | X2       |
|----|----------|----------|
| X1 | 1,000000 | 0.870789 |
| X2 | 0.870789 | 1,000000 |

The table above shows the correlation value of variable amount industry micro and small (X1) and value production industry micro and small show mark not enough from of 0.9 then No happen multicollinearity.

### Hypothesis Testing

#### Partial t Test

The t-test is used to evaluate the influence of the number of micro and small industries, as well as the value of micro and small industries on labour absorption on the island of Java. Based on the results of the processed data in Table 4, it shows that there are partial t-test results that the number of micro and small industries (X1) has a positive and significant effect on the employment of micro and small industries on the island of Java which is calculated from the results of processed statistical data with a value  $t_0$  of  $9.959296 > t_{0.05(36)}$  whose value is 2.03452 and the probability is  $0.0000 < 0.05$ . The production value of micro and small industries (X2) has a positive and significant effect on the employment of micro and small industries on the island of Java which is calculated from the results of processed statistical data with a value  $t_0$  of  $3.751559 > t_{0.05(36)}$  a value of 2.03452 and a probability value of  $0.0007 < 0.05$ .

#### Statistical F Test

The statistical F test is carried out to determine whether all the independent variables included in the regression model together have a significant influence on the dependent variable, as explained by Ghozali & Ratmono (2013). The F test results in Table 4 show that the calculated f value is  $157.2574 > \text{table } f$ , which is 3.28 and the significance value is  $0.000000 < 0.05$ . This can provide the conclusion that the variable number of micro and small industrial companies (X1), and the production value of micro and small industries (X2) simultaneously have a significant effect on the employment of micro and small industries (Y) on the island of Java.

#### Coefficient of Determination Test (R<sup>2</sup>)

R- Squared or coefficient of multiple determination is a metric used to evaluate how well a model can explain variations in its dependent variable. Based on test results using a *random model effect* Table 4, obtained an R- R-squared value of 0.905040. This indicates that around 90.50% of the variation in labour absorption in the micro and small industrial sectors on Java Island can be explained by variations



in the two independent variables, namely the number of industries and the production value of micro and small industries. Meanwhile, the remaining 9.5% was explained by other factors not included in the study.

## **DISCUSSION**

### **The Influence of the Number of Micro and Small Industries on Labor Absorption**

These findings support the hypothesis that the number of micro and small industries has a positive and significant influence on labour absorption in the micro and small industrial sectors on the island of Java. This finding is in line with previous research conducted by [Tongam Sihol Nababan \(2017\)](#) and [Novia Dani Pramusinto & Akhmad Daerobi \(2020\)](#), which confirmed that the number of industries has a positive and significant impact on labour absorption. In general, an increase in the number of business units in a sector in a region will have an impact on increasing the number of workers. The number of business units has a positive influence on the number of workers. In other words, if the number of business units increases, then the number of workers needed by those business units will also increase. These findings are also in line with studies conducted by [Ilma Nur Fauziah et al \(2021\)](#). The study found that the number of industries and investments has a positive and significant influence on labour absorption in the medium-large textile industry sector in East Java Province. Growth in the number of industries tends to increase production which triggers capital expenditure to increase production output. Some of this capital is used to expand production factors, including labour so that increasing labour capacity contributes to increasing production capacity.

The number of industries in a region reflects the distribution of economic activities that can significantly contribute to the economic growth and prosperity of the local population ([Maksimilianus Gai et al., 2023](#)). The presence of micro and small industries on the island of Java has a significant impact on the economy. These industries play an important role in supporting economic growth in the region as well as making a positive contribution to efforts to reduce poverty and increase employment opportunities ([Aminy, 2022](#)). In this research, the number of industries is considered the main indicator of productivity and employment potential. The establishment of an increasing number of industrial companies reflects the high level of economic activity which has the potential to have a significant positive impact on a region. The number of industries and employment have a positive and significant relationship, indicating that industrial growth contributes directly to increasing employment. When the number of industries increases, the need for labour to fulfil production and operational activities automatically increases. Therefore, the increase in the level of labour absorption can be considered as an impact on industrial progress in the regional sector.

### **The Influence of Micro and Small Production Values on Labor Absorption**

These findings support the hypothesis that micro and small production values have a positive and significant impact on labour absorption in the micro and small industrial sectors on the island of Java. This finding is in line with previous research conducted by [Rizqi Haedzar P et al \(2022\)](#) and [Nur Idha Aroda \(2021\)](#) which shows

that production value has a positive and significant influence on employment in micro and small industries.

Production value or what can also be called output value represents the monetary value of the goods or services produced by the industry. It is a measure of economic activity and industrial productivity (Shao, 2022). This is because when there is an increase in demand by consumers it will cause an increase in production value. To achieve the required level of production, industry tends to open new jobs. Conversely, when consumer demand is high, production tends to decrease, resulting in a decrease in labour requirements. The production value of micro and small industries on the island of Java has a positive impact on labour absorption. These industries have a crucial role in the Indonesian economy by contributing to Gross Domestic Product (GDP) and creating jobs (Jannah et al., 2021). Having more workers will also increase the output produced. In particular, micro and small industries that are labour-intensive require a significant amount of labour to meet their production levels. The labour-intensive nature of micro and small industries refers to the reliance on a high proportion of manual labour compared to capital investment.

## **CONCLUSION**

Based on the research results, it can be concluded that partially the variables of the number of industries and the production value of micro and small industries have a positive and significant effect on labour absorption on the island of Java. This finding shows that as the number of industries or business units increases, the demand for labour also increases so the level of employment also increases. This highlights the importance of industrial development and expansion in creating job opportunities and absorbing the workforce. Apart from that, the production value is also a factor that influences labour absorption because it reflects the level of economic activity and production in a sector. When the output value increases, this indicates a higher demand for goods or services, which will ultimately increase production. This increase in production requires more labour to meet the demand, resulting in higher employment levels. On the other hand, if the production value decreases, this indicates a decrease in economic activity and production which causes reduced demand for labour and has the potential to increase the unemployment rate. Therefore, production value serves as an important indicator of the growth potential of an industry or as a whole, and its fluctuations can significantly affect labour absorption. Meanwhile, simultaneously the variables of the number of industries and the production value of micro and small industries influence the employment of micro and small industries on the island of Java. Therefore, the government needs to help micro and small industries in terms of licensing and capital so that the number of micro and small industrial units increases and can increase production capacity.

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