# Labour Absorption in the Manufacturing Industry Sector in Central Java Province Indonesia

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## ABSTRACT

**The purpose** of this research is to measure the effect of Industrial Investment, GRDP of Central Java Regency/City, Production Value, Number of Companies, and Regency/City Minimum Wage on Manpower Absorption in Manufacturing Industry in Central Java Province.

M**ethodology** : The study used the Ordinary Least Square (OLS) Multiple Regression Method. The data used is cross-sectional data for each indicator in all districts and cities in Central Java Province in 2018.

**Results :** The results of the study concluded that Industrial Investment, Production Value and Number of Companies were positively and significantly related to the employment of the manufacturing industry in Central Java Province. District/City GRDP and MSEs show results that are contrary to the theory and are not significant.

## INTRODUCTION

Indonesia's economic activity is supported by various sectors. In the category of Business Fields, the Manufacturing Industry is one of the 17 sectors. The value of this sector is the highest compared to other sectors with a contribution of 20% to Indonesia's GDP. Industry is an economic sector in which there are productive activities that process raw goods into semi-finished goods or finished goods (Arsyad, 2004). Based on the BPS classification, there are 4 types of classification of the processing industry based on the number of people involved. Large and Medium Industries usually become a proxy for the activities of companies with large scale businesses because they employ a minimum of 19 people. It is important to underline that basically the industry concept is the same but with different user needs,

Indonesia's GDP is broken down by activities that occur at the provincial and district/city levels. Economic activity at this level is recorded in the Regional Gross Domestic Product (GRDP). Business Field GRDP is also divided into 17 sectors. On the other hand, the activities of the Processing

Industry are spread mainly on the island of Java. The highest contribution value to the GRDP of the Manufacturing Industry for each region to all national manufacturing industry activities is 23.89% (East Java), 19.45% (West Java), and 12.63% (Central Java).

Economic development that leads to industrialization can be used as a driving force for economic growth and also provide job opportunities for residents to fulfill jobs (Simanjuntak, 2002). The availability of jobs means economic growth creates prosperity for the community. Welfare is measured by how the workforce in an area is absorbed so that the economic turnover by the community can be maximized. Each region has a variation of the workforce that is absorbed by the various existing dynamics. Likewise, industry has different elasticity and level of employment for each sub-sector(Herman, 2021a; dedi Iskamto et al., 2021). The magnitude of the processing industry activity in Central Java should be able to provide economic benefits on the basis of employment. So that the increase in this sector has a multiplier effect on the economic activity of the community.(Alhempi, Sudirman, & Supeno, 2021; Herman, 2021a).

**Relationship of Industrial Investment to Manufacturing Labor**

Investment is an expenditure or investment expenditure of an investment company or company to buy capital goods and production equipment to increase the ability to produce goods and services available in the economy. Investment is divided into Domestic Investment (PMDN) and Foreign Investment (PMA). The recording of investment realization in Indonesia is carried out by the Investment Coordinating Board (BKPM). Investment is needed to maximize profits and company sustainability (SadonoSukirno, 2002).

Increasing investment in the processing industry in Central Java Province is carried out in order to increase the company's business scale. Increasing business scale will directly increase the absorption of new workers. the existence of investment will encourage the creation of new capital goods so that it will absorb new production factors, namely creating new jobs which in turn will reduce unemployment. (Priyo Prasojo, 2009)

Several studies that are in line with the positive relationship between investment and industrial workers occur in Jambi Province (Muhtamil, 2018), Kendari City (Kadir Manat et al, 2016), and Pelalawan Regency (Rudi Sofia et al, 2014). The results of a slightly different study were carried out by Wahyu Hidayah (2016) on the City of Samarinda where the resulting direction was negative.

H1: Industrial investment has a positive effect on manufacturing employment.

**Relation of Regency/City GRDP to Manufacturing Workers**

Regency/City GRDP records economic activity in the scale of the Regency/City administrative area. The large economic activity in the region in Central Java indicates a relatively large industrial activity as well. Industry as the main sector of Central Java creates a multiplier effect to other sectors so that the GRDP in the region grows high. The greater the nominal value of the processing industry produced, it means that the greater the impact of industrial activity on the company and on labor absorption.

Research that states a positive relationship between these two variables occurs in East Java Province through two different studies, namely by Alfizah Annisaul (2020) and Rizal Prasetyo (2019). On the

other hand, the direction of a negative relationship was generated in Central Java Province through research conducted by Dina Listri (2019).

H2: Regency/City GRDP has a positive effect on the absorption of manufacturing workforce.

**Relationship of Industrial Production Value to Manufacturing Labor**

Quoted from the BPS website, the production value is the value of the commodity produced by the production sector, which is usually the result of multiplying the quantity of production with the price per unit of the commodity. The company's output activity is measured by the scale of production values recorded by sector or by region. The company produces output of goods to be consumed or processed into further goods. The higher the output produced by the company, it means that the company has increased its business scale, so that it will increase the workforce that will be recruited by the company. This means that there is a positive relationship between high output and labor absorption.

The results of previous studies that are in line with this theory are by Kholidah Azhar (2011) at the locus of East Java Province, and by Muhtamil (2018) in Jambi Province. Another positive relationship with a more specific industry, namely the Food Industry in East Java Province, was carried out by Areta & Pudjihardjo (2018).

H3: The value of industrial production has a positive effect on the absorption of manufacturing labor.

**Relationship between the number of companies and the manufacturing workforce**

Teori Permintaan dan Penawaran menyatakan bahwa semakin banyak permintaan atas suatu barang/jasa maka akan semakin banyak penawaran akan hal tersebut, tidak terkecuali dalam hal jumlah perusahaan dan tingkat serapan tenaga kerja. Sesuai teori tersebut, maka secara umum, pertumbuhan unit perusahaan pada suatu daerah akan menambah jumlah lapangan pekerjaan. Hal ini berarti permintaan tenaga kerja juga bertambah. Jumlah perusahaan mempunyai pengaruh yang positif terhadap permintaan tenaga kerja, artinya jika unit usaha suatu industri ditambah maka permintaan tenaga kerja juga bertambah. Semakin banyak jumlah perusahaan atau unit usaha yang berdiri maka akan semakin banyak untuk terjadi penambahan tenaga kerja.

Several studies that support this theory include Fauziyah (2019) at the locus in Banten Province and Wulansari (2021) with the research locus in Tuban Regency where the number of companies has a positive and significant effect. Furthermore, the results of research by Saputri et al (2018) explain that the number of companies has an effect on employment, although not significantly.

H4: The number of companies has a positive effect on the absorption of manufacturing workforce.

**Relationship of Wages to Manufacturing Labor**

The reciprocal relationship of services performed by workers in producing goods and services produced by the company is called wages. In the provincial administrative area, the Provincial Minimum Wage (UMP) is set and in the City Regency area, the City District Minimum Wage (UMK) is set. Both of these wage determinations refer to local government policies, namely the Governor's Regulation in consultation with academics, workers and employers(D. Iskamto, 2020). Wages play an

important role as a company's consideration in absorbing how much labor will be employed. According to Todaro (translated by Haris Munandar, 2000), the higher the level of wages offered to workers, the lower the level of employment. The same opinion was expressed by Sumarsono (2003) that high production costs increase product prices which in turn makes the demand for products decrease. This condition forces producers to reduce the number of products produced, which in turn can reduce the demand for labor(Herman, 2021b).

Lina&Wahyuni (2019) had a negative relationship between wages and industrial workers with the Indonesian locus. Specific to Industrial Workers in Java Island, Latri & Henny (2018) also received negative research results. A different direction by producing a positive relationship is in research in Gresik Regency (Atiftur Rahmawati, 2018) and in Central Java Province (Saputri & Rejekiningsih, 2008).

H5: Wages have a negative effect on the absorption of manufacturing labor.

The points that need to be observed from some of the explanations above are that the processing industry is the main basis of the Indonesian economy, while the province of Central Java is one of the 3 largest regions that contribute to the GRDP of the processing industry. It is important to further observe how the escalation of industrial activity affects the employment of the industrial sector in Central Java so that if expansion is carried out it will certainly bring benefits to the community and reduce unemployment. The research will focus on the effect of Industrial Investment, Regency/City GRDP, Production Value, Number of Companies, and Regency/City Minimum Wage on the absorption of Manufacturing Workforce in Central Java.

## RESEARCH METHODS

The study was conducted with the locus of Central Java Province using the Ordinary Least Square (OLS) Multiple Regression Analysis Technique by gradually carrying out the Classical Assumption Test to produce a BLUE model.

The data used is cross section data, namely data for each indicator in all districts / cities in Central Java Province which was observed in the same year, namely 2018. The nature of the data is secondary data and collected from the official website of the Central Statistics Agency (BPS) and the National Statistics Agency. Investment Coordination (BKPM).

This study aims to observe the effect of Large and Medium Industrial Workforce as the dependent variable, on several independent variables, namely (1) Industrial Investment, (2) Regency/City GRDP in Central Java Province (3) Large and Medium Industrial Production Value, (4) Number of Companies and (5) Regency/City Minimum Wage. Some of the detailed details of the data used are:

1.  Manpower: Number of Large and Medium Industrial Workers in 2018 classified by Regency/City, because these 2 types of industries represent large-scale company activities which of course can absorb more workers.
2.  Industrial Investment: Investment for all industrial sectors in all districts/cities in Central Java. Investment is an accumulation of the value of PMDN and PMA whose realization was calculated in 2018. The value of PMA in US$ is converted into rupiah referring to the annual exchange rate calculated by International Financial Statistics (IFS). (Million Rupiah).
3.  GRDP of Regencies/Cities in Central Java Province: GRDP Each constantRegency/City in Central Java in 2018 (Million Rupiah).

4. Production Value: Production Valuet2018 year generated by Large and Medium Industries by Regency/City in Central Java Province (Million Rupiah).
5. Number of Companies: Number of large and medium industrial companies spread across each district/city in Central Java Province.
6. UMK: Regency/City Minimum Wage in Central Java Province in 2018.

The proposed regression equation is:

$$\text{TENAKERi} = \square_0 + \beta_1 \text{ INDUSTRIAL INVESTMENT} + \beta_2 \text{ GDP} + \beta_3 \text{ PRODUCTION} + \beta_4 \text{ NUMBER OF COMPANIES } \beta_5 \text{UMKi} + ei$$

In order to make the model into BLUE, several Classical Assumption Tests were carried out including normality test, heteroscedasticity test, autocorrelation test, and multicollinearity test. Besides that, linearity test and stability test were also carried out. Furthermore, if in the classical assumption test the model is violated, then treatment will be carried out in the form of model improvement depending on the type of test that is violated. If the model has passed all the classical assumption tests, the F test and T test will be carried out to check the relationship and significance of the research results with the hypotheses that have been previously proposed.

## RESULTS AND DISCUSSION

The data is executed using Eviews-10 so that the estimation results are obtained as follows:

### Table 1 Regression Results of Labor Absorption in Central Java Province in 2018

| Variable | Hypothesis | Coefficient | Probability | Conclusion |
|---|---|---|---|---|
| Industrial Investment | (+) | 0.010898 | 0.089* | Hypothesis supported |
| GDP District/City | (+) | -0.000452 | 0.031 | Hypothesis not supported |
| Large and Medium Industrial Production Value | (+) | 0.000905 | 0.000*** | Hypothesis supported |
| Number of Companies | (+) | 175,485 | 0.000*** | Hypothesis supported |
| MSE | (-) | 0.004191 | 0.849 | Hypothesis not supported |
| R-squared | | 0.856144 | | |
| Adj R-squared | | 0.831341 | | |
| F-stat | | 34.51810 | 0.0000 | F test is significant |
| **Classic assumption test** | | | | |
| Normality: Jarque-Berra test | | 0.2871 | 0.8663 | Normality |
| Heteroscedasticity: Breusch-Pagan-Godfrey test | | 6.0942 | 0.2972 | Homoscedasticity |
| Autocorrelation: BreuschGodfrey Serial correlation LM test | | 0.0862 | 0.7689 | No autocorrelation |
| Linearity :Ramsey RESET Test | | 10.9619 | 0.0026 | Not linear |
| Stability : Cusum Test & Cusum of Square Test | | - | - | Stable |
| Multicollinearity - VIF | | | | |
| (1) Investation | | 1.352976 | | |
| (2) District/City GRDP | | 4.167323 | | |
| (3) Production Value | | 4.537672 | | There is no multicollinearity |
| (4) Number of Companies | | 1.679295 | | |
| (5) MSE | | 2.304499 | | |

Description: ***significant at alpha 1%, ** significant at alpha 5%, *significant at alpha 10%,

The regression results show that the model has passed the classical assumption test as evidenced in the normality test, heteroscedasticity test, autocorrelation test, and multicollinearity test. The model that passes the classical assumption test means that the model does not have data normality problems,

the error is constant, there is no relationship between time and between variables. Other tests carried out are linearity tests and stability tests where the model still has linearity problems. F test is significant. While the coefficient of determination (Adj R2) of 83.3% indicates that the model represents the variation of the independent variable in explaining the behavior of the dependent variable, namely Manpower in the Manufacturing Sector in Central Java Province. The following are the test results in the regression equation:

**EMPLOYEE = -5413.967 + 0.010898 INDUSTRIAL INVESTMENT - 0.000452 GDP + 0.000905 PRODUCTIONi + 175.4854 NUMBER OF COMPANIES + 0.004191 MSE**

### The Effect of Industrial Investment on Labor

Mark $\beta_1$ the result is 0,010898with a Prob of 0,089 above0.05. With these results, it is concluded that there is a positive influence of Industrial Investment on Manpower, but the value is not significant. These results are in accordance with the proposed hypothesis. Not all types of investment are directly related to employment, technology investment, for example, will increase the company's efficiency so that it does not have an impact on increasing labor absorption.Iinvestment in sectors and regions Central Java is investment in order to increase business scale which also increases demand for Manpower. Previous research that produced the same positive relationship was by Muhtamil (2018), Kadir Manat et al (2016), and Rudi Sofia et al (2014).

### GRDP Effect Districts/Cities in Central Java Province to Labor

In Table 1, the value of $\beta_2$ the result is -0.0004520 with a Prob value of 0.0314 below 0.05. There is an influencenegative and significant between GRDP District/City in Central Java with absorption tenergy kwork mmanufacturing in Central Java. These results are not in accordance with the hypothesis that has been proposed. The relationship thatnegative this indicates that GRDP Districts/Cities in aggregate that are pushed even have a negative effect on the absorption of manufacturing labor. Underlying logicThis negative influence is that the high-growing GRDP of the Regency/City can be dominated by other sectors that are not the manufacturing sector. So that the increase in aggregate GRDP is not accompanied by an increase in labor absorbed by the manufacturing industry.These results are in accordance with research thatconducted by Dina Listri (2019) which resulted in a negative relationship using a panel methodology analysis in 2011-2015. StudyAlfizah Annisaul (2020) and Rizal Prasetyo (2019)resulted in a positive and significant relationship.

### The Effect of Industrial Production Value on Labor

Mark $\beta_3$ is 0,000905with a Prob value of 0,0000above 0.05 in accordance with Table 1. These results show that the value of industrial production and the manufacturing workforce of Central Java is positively relatedand significant. In principle, the positive direction indicates thattenergy kwork in Central Javain line withdemandtenergy kwork from the company.Total production output on the basis ofhisadjusted to the amount of demand for products that are up and down.Despite fluctuations in the demand for goods, in the aggregate it occursan increase in demand for output which is always accompanied by an increase intenergy kwork.This matterindicates that the profile of companies in Central Java are mostly labor-intensive companies. This positive direction is in accordance with research conducted by Kholidah Azhar (2011), Muhtamil (2018) and Areta & Pudjihardjo (2018).

### The Influence of Number of Companies on Manpower

Mark ▮$_4$ is 175.4854 with a Prob value of 0.0000 below 0.05. The greater the number of large and medium industrial companies in the districts/cities in Central Java, the greater the workforce that will be absorbed by the industry in the area. Research that is in line with these results is Fauziyah (2019) at the locus in Banten Province and Wulansari (2021) with the research locus in Tuban Regency where the number of companies has a positive and significant effect.

**The Effect of the City Minimum Wage (UMK) on Labor**

Shown in Table 1, the value of $\beta_5$ is 0.0004191 This means that there is a positive influence of the MSE on employment. nileai the significance obtained is also not significant (0.849>0.05). MakintThe higher the UMK, the higher the workforce absorbed. This finding contradicts the hypothesis that was previously proposed where the higher the UMK, the lower the employment will be due to the company bearing higher labor costs. The negative relationship is motivated by theories that apply in the scope of macroeconomics. Central Java has quite different characteristics of the relationship between the two variables. This is evidenced by research conducted by Saputri & Rejekiningsih (2008) that both have a negative effect. The supporting phenomenon is that currently companies tend to move to regional locations with low Provincial Minimum Wages (UMP). The pattern of movement occurred from Industry in West Java to Industry in Central Java. This point reflects that by occupyingpa province with a low UMP, the value of the UMK will also be low. The UMK value refers to the UMP, meaning that the increase in the UMK will not be as high as the UMP level. Tthere is an increasennominal UMK, this can still be accommodated bypcompany in order to increase additional workforce. Other supporting information is that the nominal UMP in Central Java compared to other provinces in Java is always in the second lowest position after Yogyakarta.

**CONCLUSIONS AND SUGGESTIONS**

**Conclusion**

Based on the above discussion, it can be concluded that the Manpower Absorption of the Manufacturing Industry in Central Java Province is significantly influenced and positively related by (1) Industrial Investment (2) Production Value produced by Large and Medium Industries, and (2) Number of Large and Medium Companies. The industrial investment variable shows results according to the theory where if there is an increase in PMA and/or PMDN then on average the workforce will be absorbed, but statistically the value is significant within the error limit of (10%). The number of outputs and the number of companies also show results according to the theory where if there is an increase, on average it will increase the absorption of labor in the manufacturing sector in Central Java Province. Meanwhile, the other variables, namely the GRDP of the Regency/City and the UMK produce values that are contrary to the proposed theory. District/City GRDP has a significant negative effect on employment. GRDP growth does not come from the industrial sector where the increase is not in a positive direction with labor absorption. While the UMK produces a negative relationship that is not significant. Increasing the Regency/City Minimum Wage in Central Java Province can still increase the absorption of Manpower in the Manufacturing Industry. This is supported by the fact that Central Java is indeed a labor-intensive industry with an average nominal minimum wage that is still low. Through the F test, it is concluded that at least one of the variables is significant to the workforce. Meanwhile, through the Coefficient of Determination Test, the results showed 83.13%.

**Suggestion**

The analysis of the manufacturing sector workforce in Central Java Province above uses cross section data with the latest publication of the BPS 2021 data. The latest publication contains the latest district/city production and workforce values, namely 2018, meaning that other variables must be measured in the 2018 period. Given that there are the gap with the current year, which is 2021, so that another analysis is needed using other newer data/variables, especially the 2021 data to support the accuracy of the results of this study. Besides that, cross-sectional data analysis is believed to only show long-term behavior, while time series shows short-term behavior, so panel data analysis is needed for the manufacturing industry in Central Java province to verify the results of the research conducted by the author.

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