Analysis of Factors Affecting the Output of Manufacturing Industry Sector in Central Java

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Abstract. This study aims to analyze the influence of the District Minimum Wage, Labor, and Number of Business Units on the GRDP of the industrial sector in Central Java in 2014–2018. The data used is panel data consisting of time series data for 2014–2018 and cross-sections of 35 districts and cities in Central Java. The analytical tool used is panel data regression, namely the Fixed Effect Model (FEM). The study results show that the number of business units had a negative and significant effect on the GRDP of the industrial sector in the region of Central Java in 2014–2018. Meanwhile, labor force and city minimum wages had a positive and significant effect on the GRDP of the industrial sector in Central Java in 2014–2018. With this research, it is hoped that the regional government will facilitate the process of managing a business license because it will encourage entrepreneurs to establish industrial units. The number of industrial units will increase production volume and ultimately increase the GRDP of the manufacturing industry sector. It will eventually absorb labor in the sector.

Keywords: City Minimum Wage · Labor · Number of Business Units

1 Introduction

The industry has a role as a "leading" sector. The industry is a trigger for the development of other business fields. The presence of the industrial sector provides opportunities for residents to gather and increase the consumption of food and services. Residents who gather in one area increase demand in several business sectors so that along with industrial development, demand increases both in terms of industry and its supporters will increase (Purnomo, 2008).

Industrial growth in Central Java is currently quite reasonable. It can be seen from several new industrial areas that will encourage increased industrial investment. That way, the ruler of Central Java has prepared several strategies to encourage industrial competitiveness in Central Java. First, inclusive industrial regional development. In this case, the provincial government encourages the regions to initiate industrial areas with an orientation towards export-oriented industries and import substitution. Second, empowering small and medium-sized industries through process assistance, promotion and marketing, and even training to become exporters. Third, the procurement of industrial

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needs continues to rely on the small business sector and the utilization of economic resources.

The industrial sector considered strategic is the manufacturing industry. Industry processing is seen as a driver or driver of the economy. In general, developing countries have abundant natural resources. On the other hand, Indonesia has a very high population and workforce. The processing industry sector is a medium to take advantage of natural resources. It will be able to absorb a large workforce. The central role of the industrial sector is to provide employment, the main motor for the creation of added value in the economy, the fulfillment of basic needs of the people, increasing and equalizing people's income, and a source of foreign exchange.

2 Literature Review

Industry Theory

Strategic sectoral development policies are development policies in the industrial sector. This sector is seen as a sector with a high level of productivity, so its superiority will get high added value. Therefore, the goal of creating community economic welfare can be realized more quickly by developing this sector. (Muhammad, 2016).

The role of the industrial sector in economic development in various countries is vital because the industrial sector has several leading sectors in accelerated development. For example, the growth of the industrial sector is very rapid. It stimulates the growth of the agricultural sector to provide raw materials for industry. These industries also allow the development of the service sector.

According to the Central Statistics Agency (CSA), an industry is a unit/production unit located in a particular place that carries out economic activities, aiming to change an item mechanically, chemically, or by hand to become a new object/goods/product with a higher value. Its nature is closer to the end consumer.

From the above understanding, it can be concluded that industry is a skill and perseverance in human activities in specific fields to produce goods or services that aim to create added value. The industrial sector is also used as a benchmark for the progress and prosperity of a country. Industrial growth is one of the factors for the economic growth of a region.

Manufacturing Theory

The processing industry, or manufacturing, is all economic activities that produce goods and services that are not classified as the main product. Explanation of primary products is the processed results of the first raw goods produced from processed or natural. Primary products have a selling value because they are basic daily needs. According to the Ministry of Industry and Trade, industry is an economic activity that processes raw materials, semi-finished goods or finished goods to become goods with a higher selling value. According to the Central Statistics Agency (2003), the industry is profit-oriented. Located in a particular building or location and has its administrative record of production and cost structure. The term industry has two meanings. First, the industry can mean the association of similar companies. In this context, the name of the cosmetics industry, for example, means the diversity of companies producing cosmetic products.

Second, this industry can also refer to the economic sector, where productive activities process raw materials into finished goods or semi-finished goods. Processing activities themselves can be in the form of electricity or manual.

The second term, the industry, is often referred to as the manufacturing industry sector (manufacturing) as one of the production sectors or businesses in calculating national income following the production approach (Dumairy, 1997). The processing industry is all production activities that aim to improve quality and services. The production process can be done mechanically, chemically or using simple tools and machines. Industrial companies, agricultural companies, mining and others can conduct the process. The industrial sector also includes services that show it, such as repairs and maintenance of engines, ships, trains and aircraft (Central Statistics Agency, 1990). In general, the manufacturing industry in Indonesia is grouped into small, household, medium and large industries whose grouping is based on the number of workers following the definition of the Central Statistics Agency (CSA). In addition, grouping is also based on the capital owned. In this study, the industrial group that became the object of research was a small, medium and large processing industry based on the number of workers owned. By CSA, the number of workers is 5–19 in the small industry and 20–99 in the moderate industrial group. The number of workers is more than 100 people entering large industrial groups. Industrial services that are closely related to the manufacturing industry are: (Irsan Azhary Saleh, 1985: 106).

A Technical services that support the construction of production installations. Fabric, or the manufacture of production equipment ready to produce services that can be sold (transportation), namely the construction of industrial projects, design services, factory design services (ship factory design, aircraft, trains, cars) and factories and construction service factories.
B Engineering services that support manufacturing production equipment or machinery, namely the design and engineering of machinery or factory equipment.
C Engineering services that support the manufacture of basic construction materials, for example, industrial research services, material or goods quality testing services, measuring equipment calibration services

The Role of the Manufacturing Industry Sector in the Economy

The manufacturing sector's role cannot be separated from national economic growth. The manufacturing sector has been the backbone of the national economy since 1991. In addition to meeting the needs of the domestic market, the non-oil and gas processing industry also has an excellent foreign market share. The manufacturing sector has experienced positive growth From year to year (Arif Muhammad and Jaunita, 2016).

Policies in the Industrial Sector

In the economic field, the crisis resulted in a decline in business performance in various sectors. It was especially felt in the industrial sector. It is because large industries generally are not oriented toward domestic raw materials and semi-finished materials. The decline in the private sector also impacts increasing Termination of Employment. The Indonesian economy and the natural conditions after the economic crisis will become factors driving the growth of the industrial sector. After the economic crisis, the growth

of the industrial sector was still slightly lower than before the crisis. Efforts to accelerate development, build economic independence, and distribute development and its results throughout the region by providing opportunities for regions to regulate and manage all potential resources they have, have been carried out with the issuance of Law no. 22 of 1999 concerning Regional Government which was later revised into Law no. 32 of 2004 and Law no. 25 of 1999 concerning Financial Balance between the Central Government and Regional Governments which the government and the DPR later revised to become Law no. 33 of 2004. All concerned and interested parties are obligated to actively participate in the regulations/regulations made to achieve optimal results so that these regulations/regulations are not in vain (Miki and Kunto, 2018).

The Development of the Manufacturing Industry in Indonesia

Indonesia's manufacturing industry can contribute 20.27% to the ASEAN economy. Currently, Indonesia has made a transition from the commodity industry model to processing. As a supporter, the government also encourages this change by issuing regulations and relaxing investment in the manufacturing sector. The manufacturing industry is considered more productive and can increase the added value of raw materials, multiplying labor, producing the largest source of foreign income and the most significant tax and customs contributors. The Ministry of Industry also noted several sectors with a percentage of performance above gross domestic product nationally, including the 9.94%base metal industry, the textile and clothing industry at 7.53%, and the transportation equipment industry at 6.33%. An increase in demand influenced this incident, pushing production to increase. Indonesian manufacturing was also developed in countries such as Vietnam and the Philippines. It will encourage national economic growth and increase domestic, regional, and global competitiveness. Another difference possessed by the Indonesian economy is its strength in the domestic market, with a percentage of 80%, and the rest is an export market, another case with Singapore and Vietnam, whose economic system is mainly oriented towards export activities.

The government develops the manufacturing industry by making downstream policies. This policy can increase the income factor and the amount of income from the customs and tax sector. This policy also impacts the stability of raw material supplies and increases the value of goods. The policy requires cooperation from related parties to achieve full implementation. Indonesia's MVA for Asena reached 4.5% and was ranked the highest among ASEAN countries. Meanwhile, Indonesia is ranked 9th in terms of MVA value contribution for the world ranking. The reason for this achievement is Indonesia's participation in the one trillion dollar group, which only belongs to Indonesia among ASEAN countries.

Previous Research Results

On the island of Java during the 2010–2016 period, Desy (2020) found that The provincial UMR has a significant negative impact on the level of employment, with a contribution of 87.4% to employment.

From the theory and one of the previous studies, this research must be conducted to calculate the direction and magnitude of the influence of district minimum wages, the number of business units and labor affects the GRDP of the manufacturing industry sector in Central Java. The findings of this study can be used as a reference for policymakers in

Central Java to develop their manufacturing industry. On the academic side, this research is expected to enrich the treasures of libraries in the development of the processing industry, especially in Central Java.

So that it can draw a temporary conclusion, as follows.

Hypothesis

Thus it can be concluded that the first hypothesis is:

H_1: DMW variable (District Minimum Wage) increases the GRDP of the manufacturing industry sector in Central Java.

H_2: Labor affects the GRDP of the manufacturing sector in Central Java.

H_3: Variable The number of business units lowers the GRDP of the manufacturing sector in Central Java.

3 Methods

The data that will be used in this study is secondary data in the form of panel data in the form of annual data for a period of 5 years, namely from 2014 to 2018, and cross-section data from 35 districts/cities in Central Java Province. Data will be taken from various publications of the Central Java Statistics Agency.

Research Tools and Models

The analytical tool that will be used in this study is panel data regression analysis with the following econometric model:

$GRDPit = \beta_0 + \beta_1 LABORit + \beta_2 DMWit + \beta_3 NBUit + e_{it}$.

where:

GRDP: GRDP of the Processing Industry Sector in Central Java.

β0: Constant.

DMW: District Minimum Wage.

LABOR: Processing Industry Sector Workers in Central Java.

NBU: Number of Business Units.

β1…β4: Regression coefficient of independent variables.

i: Data Cross Section.

t: Time Series data.

e: Errorteam.

Panel Data Estimation Method

According to Gujarati (2003), panel data are cross-sectional (individual/sector) and arranged based on time series. There are three approaches to calculating panel data models: the best modeling test. This test includes two tests, namely the Chow and Hausman tests. These two tests are intended to choose the best method between ordinary PLS, Fixed Effect Model (FEM) and random effect model (REM). The three models are assessed based on the Chow and Hausman tests. The model that passes will be used as an estimator research regression model.

Statistical Test

1. Chow test.

The Chow test is intended to choose the best model between FEM and ordinary PLS.

a. Hypothesis formulation.
   H_0: PLS is the best model.
   H_a: FEM PLS is the best model.
b. hypothesis acceptance criteria.
   $H_0 = p > 0{,}05$.
   $H_a = p < 0{,}05$.

2. Hausman test.

The Hausman test is intended to select the best estimator model between FEM and REM.

a. Hypothesis formulation.
   H_0: REM is the best model.
   H_a: FEM is the best model.
b. hypothesis acceptance criteria.
   $H_0 = p > 0{,}05$
   $H_a = p < 0{,}05$

4 Results and Discussion

The number of business units significantly adversely affects the growth of the manufacturing industry's GRDP. According to the Department of Industry, the Business Unit is the number of operating processing industry companies calculated in business units. In general, the growth of business units of a sector in an area will contribute to the GRDP.

The workforce positively affects GRDP because the increase in labor will reduce unemployment. Hence, it helps a district or city to get even more significant income, thus making an area more advanced because income becomes more excellent.

Regency minimum wages have a positive effect on GRDP because the more excellent wages obtained will reduce the poverty level of the population in an area so that we can meet the daily needs. An area's economy will increase due to the absence of poverty or cases of hunger so the GRDP will increase.

Reporting Research Results
Model selection test.

1. Chow Test (Likelihood Test Ratio)
The Chow test is a test of selecting the best model between FEM and ordinary PLS. If the test results state that Ha is accepted, namely the FEM model, then the next test will be carried out with the Hausman test. This test chooses the best model between FEM and REM. The results of the Chow test are as follows (Table 1):

Prob. Cross-section F obtained a value of 0.0000, so the model chosen was FEM because this value was below the criterion level, namely α 5% ($0.0000 < 0.05$).

2. Hausman Test
The Hausman test is intended to choose the best estimator model between FEM and REM (Table 2).

Table 1. Estimation Chow Test Panel Data

Effects Test	Statistic	d.f.	Prob.
Cross-section F	2180.795049	(34,137)	0.0000
Cross-section Chi-square	1101.742314	34	0.0000

Sumber: Output Eviews 10

Table 2. Results of Hausman Test Panel Data Estimation

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	13.687045	3	0.0034

Sumber: Output Eviews 10

Suppose the p-value or probability of Chi-Square or Cross Section Random is 0.0034 < 0.05. In that case, H0 is unacceptable or means that the Fixed Effect (FEM) method is better than the Random Effect (REM) method in analyzing panel data in this study.

Based on the results of panel data estimation, to choose the best model using the Chow test and Hausman test, the best model was selected, namely the Fixed Effect Model. The estimation results are presented in Table 3.

Based on Table 3 shows the estimation results of the panel data regression equation obtained in this study are:

$PDRB_{it} = 10.28097 + 0.005824logLABOR + 0.456186logDMW_{it} - 0.000168NBU_{it} + e_{it}$.

Selected Model Interpretation

Based on the results of the estimation, it shows that the regression coefficient number of labor variables is 0.005824. This result shows a positive influence ($\alpha = 0.05$) of the labor variable on the absorption of the industrial sector GRDP in Central Java in 2014–2018. Any increase in labor by 1% will tend to increase the GRDP of the industrial sector in Central Java by 0.005%.

Furthermore, the District Minimum Wage variable regression coefficient is 0.456186. This result shows a positive influence ($\alpha = 0.05$) of the District Minimum Wage Variable

Table 3. The Panel Data Regression Estimation Results with FEM Method

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(LABOR)	0.005824	0.008236	0.707107	0.4807
LOG (DMW)	0.456186	0.014192	32.14331	0.0000
NBU	−0.000168	5.32E-05	−3.166974	0.0019
C	10.28097	0.172803	59.49548	0.0000

Sumber: Output Eviews 1

on the Industrial Sector GRDP in Central Java in 2014–2018. Every 1% increase in the District Minimum Wage will tend to be followed by an increase in the industrial sector's GRDP by 0.456%.

While the regression coefficient of variables the number of business units is 0,000168. It shows the number of significant hostile business units ($\alpha = 0.05$) against the absorption of the industrial sector GRDP in Central Java in 2014–2018. Any increase in the number of business units by 1% will tend to reduce the GRDP of the industrial sector in Central Java by 0.016%.

Knowing the factors that are thought to influence the output of the processing industry in Central Java, namely Labor, District Minimum Wage and Business Units, the study results show that the Fixed Effect Model (FEM) is the most appropriate panel data regression model. Based on the effect validity test, the District Minimum Wage and Labor variables positively affect the Processing Industry Sector GRDP. In contrast, the number of Business Units significantly adversely affects the Processing Industry Sector GRDP. From the analysis above, the manufacturing sector has a vital role in the economy in Central Java because manufacturing sector has a leading sector, meaning that the manufacturing sector can drive output growth and the manufacturing sector can attract other sectors in Java. Middle. This condition needs to be maintained and improved where the manufacturing industry sector focuses more on improving Central Java's economy. The processing industry will spur and lift the economy in Central Java. Central Java must pay more attention to and increase sector development efforts in this case-industrial sector.

5 Conclusion

Based on the results of data processing and discussion that has been carried out, it can be concluded that the number of business units has a negative and significant effect on the GRDP of the industrial sector in Central Java in 2014–2018. At the same time, the district labor and district minimum wage had a positive and significant effect on the GRDP of the industrial sector in Central Java in 2014–2018.

With this research, it is hoped that the government will facilitate managing a permit to establish a business. It will thus encourage entrepreneurs to establish industrial units. Many industrial units will increase production volume and ultimately increase the GRDP of the manufacturing industry sector. In addition, with the number of business units, it will absorb labor in the sector so that it can reduce the number of unemployment. The government is expected to increase labor absorption by developing the existing industrial sector, especially in Central Java.

Based on the direct experience of researchers in this research process, there are several limitations experienced by researchers. Hopefully, it will be more attention for researchers in the future because this research itself has deficiencies that need to be improved in further studies. Some limitations of this study including:

1. This research was conducted only to find out the manufacturing industry sector by district or city, not according to the industrial sector or sub-sector.
2. Limited research first causes a lack of references in this research.

3. This research only uses three independent variables: district minimum wages, labor, and number of business units. In comparison, many factors can still affect the GRDP of the manufacturing industry sector, so this research does not cover the fundamental factors that affect the GRDP of the industrial sector.

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