



Regency and City Industrial Sector Efficiency in East Java Province

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ABSTRACT

The intense global competition requires the industrial sector to produce efficiently. Industrial efficiency is determined not only by internal factors but also by external factors. This study aims to measure industrial efficiency in regencies and cities in East Java Province and to determine the determining variables of industrial efficiency so that it can be used as material for government policy in the development of the industrial sector. The data used is secondary data sourced from the Central Statistics Agency. Meanwhile, the analysis tools used are efficiency analysis and multiple regression analysis with panel data. The results showed that in general the industrial sector in districts and cities in East Java was not efficient. Meanwhile, the external variables that affect the efficiency of the industrial sector are the inflation variable and the district/city minimum wage. Regional governments are expected to be able to control inflation in their regions and be able to determine district/city minimum wages that can benefit both the industrial sector and workers.

Keywords: Efficiency, industrial sector, minimum wages, inflation

JEL Classification Code: E24, E31, L16

INTRODUCTION

Economic liberalization has brought major changes to all countries in the world. The biggest impact on the industrial sector is the increasingly fierce competition, including that faced by the industrial sector in Indonesia. Therefore, in order for the industry in Indonesia to be able to survive in the face of global competition, it must be able to increase its competitiveness through increasing efficiency and innovation. Efficiency is a source of competitive advantage that will increase the competitiveness of a product. Industries that are not able to perform efficiency and innovation will surely find it difficult to win the competition in capturing market share. Whereas globalization has the widest market share in all sectors of life, both for goods, services, information, and other areas of need. Indonesia's efficiency in the ASEAN Region ranks fifth out of 10 countries. International trade is a form of activity that is useful for obtaining profits due to differences in relative prices and specialization in production.

Economic liberalization through trade as it is today, namely the Asia Pacific Economic Cooperation (APEC), Asia Pacific Economic Cooperation (AFTA), and the World Trade Organization (WTO) is a form of choice for a country in improving its economy through increasing product competitiveness which is driven by the existence of a competitive industry. efficient. In practice, liberalization has given rise to many new businesses so many companies have achieved success by taking advantage of global business opportunities and excelling in terms of efficiency, but also many companies have gone bankrupt because they cannot compete in global competition due to inefficient companies so they have to close. The results of the research on the determinants of industrial efficiency in China conclude that first, the main sources of environmental inefficiency in China's industry are the inefficiency of the gross industrial output value, exces-

sive energy consumption, and pollutant emissions. Second, the highest growth rate of total environmental factor productivity among the three industry categories was manufacturing, followed by mining, and the production and supply of electricity, gas, and water. Third, foreign direct investment, capital-labor ratio, ownership structure, energy consumption structure, and environmental regulations have varying degrees of impact on environmental efficiency and total environmental factor productivity (Feng, 2012).

The industrial concentration factor can also play a role in influencing industrial efficiency. The higher the concentration ratio of the company, the greater the barriers for new companies to enter the industry. (Hasbullah Firmansyah, 2015). The inflation factor also plays a role in influencing efficiency. Inflation can have a positive or negative effect on people's purchasing power. For people with fixed incomes, inflation will reduce purchasing power, and for people with irregular incomes who tend to benefit from inflation, such as entrepreneurs, it will increase purchasing power. Uncertain purchasing power conditions will reduce purchasing power or increase purchasing power will result in industrial uncertainty it will have an impact on inefficiency. Hasibuan (1993: 123) says that efficiency cannot be separated from the link between input and output, meaning that input is used as best as possible to obtain as much output as possible. Some regions in Indonesia have efficient industrial groups and some are not. The results of another study on the efficiency and productivity of large and medium industries in the province of Bali concluded that not all large and medium industrial groups in the province of Bali were fully efficient and technical efficiency from year to year continued to decline. Pratiwi (2014). Research for the West Sumatra region using the data envelopment analysis method concludes that using one input variable, namely labor expenditure, shows

that industrial efficiency in West Sumatra is still very low. However, by using 2 input variables, namely the expenditure of labor and raw materials, the efficiency score is better when compared to using only one input variable. Meanwhile, if the input variable is changed to the expenditure of labor and raw materials, the efficiency score is also better when compared to using the input of labor and raw materials. The expenditure on labor, raw materials, and the cost of electricity and gas will affect the output value which will show the efficiency of the industry. (Nurmulyani: 2014).

Several studies in other countries on industrial efficiency, for example in Pakistan, analyzed the technical efficiency of large-scale manufacturing industries using the Double Bootstrap Data Envelopment Analysis (DEA) technique to determine the source of technical efficiency. The results of the study reveal that the average wage as a measure of worker skills has a positive impact on technical efficiency, while market size has no effect on technical efficiency. The results also reveal that the industry should also reduce its size as there is evidence of scale diseconomies. (Mujaddad: 2016). According to Triantis (2014), the industrial efficiency measurement technique using DEA is appropriate because it is a non-parametric approach related to the input and output transformation process, so there is no need to have the same unit of measurement.

In order to increase the efficiency and productivity of the industrial sector in Indonesia, it is necessary to pay attention to the resources, potential, infrastructure, and existing facilities and infrastructure in the region. Industrial progress on a macro scale is inseparable from government policies at both national and regional levels. In addition, the progress of the industrial world also depends on the quality of human resources who have the ability, innovation, creativity, and are responsive to the development of information technology.

Therefore, it is necessary to have a strong synergy between business actors and policymakers so that the industrial world can advance and be able to compete at the international level.

East Java is one of the provinces that is currently planning to expand its industrial development to the southern and western regions, which already have toll road access because toll road access will increase industrial efficiency. Until the first quarter of 2017, East Java's economic structure according to the business sector was supported by three main sectors, namely the manufacturing industry 29.30%, wholesale retail trading 17.94%, and agriculture 13.44%. The three sectors contributed 60.69% of the total GRDP of East Java. The main source of East Java's economic growth was the manufacturing industry at 1.29%, followed by wholesale and retail trade and repair of cars, motorcycles, and motorcycles at 1.07%, and mining and quarrying at 0.64%. (kominfo.jatimprov.go.id)

The East Java Provincial government's efforts in developing the industrial sector are by establishing an industrial area (KI) Java Integrated Industrial Port Estate (JIPE), Gresik Industrial Estate (KIG), Surabaya Industrial Estate Rungkut (SIER), Sidoarjo Industrial Estate Brebek, Ngoro Industrial Park (NIP). There are also Pasuruan Industrial Estate Rembang (PIER), and Safe N Lock Eco-Industrial Park. In Tuban, there is also the expansion of the developer PT Gresik Industrial Estate, and in Lamongan there is the Maritime Industrial Area, as well as the Wongsorejo Industrial Estate (KIW) in Banyuwangi. low so that it is expected to have competitiveness. The industrial estates are located in Gresik, namely the North Gresik Agro-industrial Area and KI Salt Laka, while in Jombang there is the Peloso Industrial Estate, and the Mojokerto Industrial Estate. In the 2015-2035 national industrial development master plan, Tuban, Lamongan,

Gresik, Surabaya, Sidoarjo, Mojokerto, and Bangkalan have been designated as industrial growth centers in the East Java Province. (www.kemenperin.go.id)

The existence of a master plan for industrial development shows that there has been a careful calculation of the feasibility, both socially and economically. However, in the course of what has been planned sometimes does not go well due to the influence of both internal and external influences which causes the industry in a region to be inefficient and unable to compete with the industries of other regions or other countries. Based on these problems, it is necessary to study the efficiency of the industrial sector in regencies and cities as well as a study several variables that affect the efficiency of the industrial sector. This is useful for local governments in deciding on industrial development policies in their regions. For this reason, the objectives of this study are (1) to map the efficiency of the industrial sector in the districts and cities in East Java Province. (2) Identify the variables determining the efficiency of the industrial sector in the districts and cities in East Java Province.

METHODOLOGY

The research objects are districts and cities in East Java Province, totaling 29 districts and 9 cities. The choice of East Java is because East Java Province has the highest contribution from the industrial sector nationally. The data in the study are secondary data, which are time series, sourced from the Central Bureau of Statistics of East Java, obtained by means of documentation.

The data analysis technique uses efficiency analysis, namely the comparison between the output of the industrial sector and the input of the industrial sector, which in this case is the input of labor. Multiple regression analysis with panel data is used to determine the variables that determine the efficiency of the industrial sector. The

regression model is as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

Y is the efficiency of the industrial sector, X1 is inflation, X2 is the district/city minimum wage, and ε = error term. The model is then converted into a logarithmic model as follows:

$$\text{Log } Y = \beta_0 + \beta_1 X_1 + \beta_2 \text{Log} X_2 + \varepsilon$$

The data used is panel data, so the regression method used is to choose one of the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) methods. To determine which model is the best and which is selected from the three models, testing is carried out through the Chow test, Hausman test, and Lagrange Multiplier (LM) test. The Chow test is used to determine whether CEM or FEM is the best, the criteria used are if Probability > then the selected model is CEM, and if probability < then the selected model is FEM. Hausman test is used to determine whether REM or FEM is the best, with the criteria if probability > then the selected model is FEM. Lagrange Multiplier test if the Chow test shows the chosen model is CEM, while the Hausman test shows the selected model is REM, so an LM test is needed to determine whether CEM or REM is the most appropriate, with the criteria if probability < (0.05) then the best model is CEM.

RESULT AND DISCUSSION

Industrial efficiency is very much needed in increasing the competitiveness of production results. If the industry is efficient, it will increase economic growth and improve export performance. The results of the research on the average efficiency level of the district and city industries in East Java which is calculated based on the comparison between industrial sector output and labor input from 2015 to 2018.

Table 1.
Average Efficiency Level of Regency and City Industrial Sector in East Java (2015-2018)

County/City	Efficiency	Information	County/City	Efficiency	Information
Kota. Kediri	3,061	High	Kota. Batu	0,226	Low
Kab. Tuban	0,640	High	Kab. Jember	0,222	Low
Kota Surabaya	0,604	High	Kota. Madiun	0,21	Low
Kab. Trenggalek	0,533	High	Kab. Lumajang	0,197	Low
Kab. Gresik	0,521	High	Kab. Situbondo	0,189	Low
Kab. Sidoarjo	0,499	High	Kab. Banyuwangi	0,187	Low
Kab. Mojokerto	0,480	High	Kab. Bojonegoro	0,180	Low
Kab. Blitar	0,45	High	Kab. Bangkalan	0,164	Low
Kota. Malang	0,304	Low	Kab. Bondowoso	0,159	Low
Kab. Malang	0,303	Low	Kab. Pacitan	0,141	Low
Kab. Tulungagung	0,285	Low	Kota. Blitar	0,128	Low
Kab. Kediri	0,279	Low	Kab. Jombang	0,118	Low
Kab. Nganjuk	0,277	Low	Kota. Mojokerto	0,059	Low
Kab. Ponorogo	0,274	Low	Kota. Probolinggo	0,054	Low

Table 2.
Chow Test

Effects Test	Statistic	d.f.	Prob.
Cross-section F	8.952380	(27,82)	0.0000
Cross-section Chi-square	153.791905	27	0.0000

The efficiency level of the industrial sector is classified as high or low based on the comparison of the average efficiency value of all regencies/cities in East Java. If the value is above the average, it is classified as high and if it is lower than the average efficiency, it is classified as low. The average efficiency value for 4 years of research, from 2015 to 2018 is 0.38. Of the 38 districts and cities in East Java, 30 districts and cities are classified as low efficiency and only 8 districts and cities have high-efficiency values. Based on the table above, only the city of Kediri has the highest efficiency value, followed by Tuban, Surabaya, Trenggalek, Gresik, Sidoarjo, Mojokerto and Blitar. The Gross Regional Domestic Product (GDP) of Kediri City is dominated by the tobacco industry, especially with the presence of PT. Gudang Garam. The GRDP per capita of the City of

Kediri in 2018 reached Rp. 291.48 million and ranks third at the National level. Surabaya as the provincial capital has a GRDP per capita of RP 132.48 million, this figure is far below the GRDP per capita of the city of Kediri. The sector with the highest contribution to GRDP in the city of Surabaya in 2019 was the wholesale and retail trade sector, car and motorcycle repair (28.31%). (BPS city of Surabaya: 2019). Meanwhile, in Tuban Regency, the Processing Industry sector contributed the highest to GRDP, which was 32.25% in 2018. (BPS Kab. Tuban: 2019). Meanwhile, the selection of the best regression model is carried out with the Chow test stage to determine whether the Common Effect Model (CEM) or Fixed Effect Model (FEM). The results of the Chow test can be seen in the following table 2.

**Table 3.
Hausman Test**

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	85.481249	2	0.0000

**Table 4.
Regression Estimation**

Variable	Coefficient	t-Statistic	Prob.
Constant	33.65552	7.675155	0.0000
Inflation (X1)	-1.859344	-6.330308	0.0000
Minimum Wage (X2)	-5.383595	-7.602103	0.0000

According to the table above, the results of the Chow Redundant Fixed Effect test obtained a Cross Section F value of 0.0000, this value is smaller than alpha 0.05, so the selected model is the Fixed Effect Model (FEM). For this reason, the next step is the Hausman test to determine the best model, whether the Fixed Effect Model (FEM) or the Random Effect Model (REM). Hausman test results can be seen in the following table 3.

Based on Table 3. the results of the Hausman Correlated Random Effect test obtained a Random Cross Section value of 0.0000, this value is smaller than alpha 0.05, so the selected model is the Fixed Effect Model (FEM). Two tests, namely the Chow test and the Hausman test, show that the selected model is the Fixed Effect Model (FEM), so there is no need for the Lagrange Multiplier test. Based on the selected model, namely the Fixed Effect Model (FEM), the regression model estimation results are obtained as following table 4.

The regression results based on the Fixed Effect Model (FEM) as shown in the table above show that inflation and the minimum wage have a significant negative effect on the efficiency of the industrial sec-

tor. The regression coefficient for the inflation variable (X1) is -1.859344, meaning that if inflation increases by 1%, the efficiency of the industrial sector will decrease by 1.859344%, which means that the efficiency of the industrial sector is elastic to changes in inflation. The regression coefficient for the minimum wage variable is -5.383595. This shows that when the minimum wage increases by 1%, the efficiency of the industrial sector will decrease by 5.383595%. This figure is greater than the inflation regression coefficient, meaning that the minimum wage has a much greater influence on the efficiency of the industrial sector than inflation. The probability value of 0.000 indicates that the two variables, namely inflation and the district/city minimum wage, have a significant effect on the efficiency of the industrial sector. The following is the regression equation based on the Fixed Effect Model as shown in table 4 above:

$$LOG EFind = 33,65552 - 1,859344 INF - 5,383595 LOG UMK + 0.314422$$

Rising inflation will result in an increase in production costs in the industrial sector. This increase in production costs

forces the industry to make adjustments, especially if the inflation occurs suddenly it will cause the industry to stutter even though the selling price of production cannot immediately follow the increase but still requires an adjustment time lag and of course it will reduce purchasing power of consumers, so this will result in reduced profits or the inefficient industrial sector. The negative effect of inflation is reinforced by the results of research by Nurkholifah (2010) which concludes that inflation has a negative effect on profit margins. The company's profits will decrease with the higher inflation rate. The objects of this research are companies that go public on the Indonesia Stock Exchange. Other research shows that inflation has an effect on decreasing turnover of micro businesses in Metro City (Anastavia: 2018). The micro-enterprises studied were chip businesses which had difficulty in regulating the size of output because micro-enterprises could not immediately increase the selling price, which could be done by reducing the content or reducing the size of the product and this had an effect on reducing consumer demand or the same as decreasing turnover sale.

The minimum wage has a regression coefficient of -5.38, this indicates that an increase in the minimum wage by 1% will reduce the efficiency of the industrial sector by 5.38%. The increase in the minimum wage results in an increase in the cost of industrial production, if the increase in wages is not followed by an increase in labor productivity, in the end the increase in the minimum wage will actually reduce the efficiency of the industrial sector. Conversely, when an increase in the minimum wage is followed by an increase in labor productivity, it will have an impact on the efficiency of the industrial sector. So in some cases the minimum wage can increase efficiency but in some cases it can have a positive effect on industrial efficiency but can also have a negative effect on effi-

ciency. The results of Candra's research (2013) regarding the effect of wages on labor productivity show that wages have a positive effect on employee productivity, this is done for workers with a piece rate system at the jenang company. In another study said that in the short term the minimum wage has an impact on decreasing macroeconomic performance such as declining levels of consumption, exports, sectoral output and rising prices (Maipita: 2013). In line with the results of this study, it means that at a macro level an increase in the minimum wage will cause economic inefficiency.

The results of the Fixed Effect Model (FEM) show an R-Squared value of 0.793341 or 79.33% of the efficiency of the industrial sector explained by inflation variables and the district/city minimum wage, the remaining 20.67% is explained by other variables outside the model. The results of the t-test indicate that the inflation variable has a significant effect on the dependent variable, namely the efficiency of the industrial sector with a probability value of 0.0000 which is smaller than the significant critical value of 0.05. The minimum wage variable has a probability value of 0.0000 which is smaller than the significant critical value of 0.05, so it can be concluded that the minimum wage variable has a significant effect on the Industrial Efficiency Variable.

CONCLUSIONS

Districts and cities in East Java that have relatively high industrial sector outputs are the cities of Kediri, the city of Surabaya, the district of Sidoarjo, the district of Gresik, and the district of Mojokerto. Meanwhile, judging from the efficiency of the industrial sector, it can be concluded that most of them are still relatively low or not yet efficient. Only 8 regions are classified as high efficiency, namely the City of Kediri, Kab. Tuban, Surabaya City, Kab. Trenggalek, Kab. Gresik, kab. Sidoarjo,

Mojokerto district and district. Blitar and 30 other regions have low efficiency. Therefore, district/city governments are expected to be able to take appropriate policies in the development of the industrial sector to be more efficient so that they can compete with regional industries or other countries. Increasing efficiency can be done internally by improving management and industrial productivity, meanwhile increasing efficiency externally can be done by local governments through policies that can encourage the development of the industrial sector such as improving infrastructure, infrastructure and related to licensing administration or through monetary and financial policies. other fiscal.

The rate of inflation and the district/city minimum wage are variables that affect the efficiency of the industrial sector. Therefore, policymakers at the district/city level as well as at the provincial and central levels must be able to control this inflation rate so that it does not fluctuate. Fluctuations in inflation will result in difficulties for the industrial sector to make calculations and adjustments, resulting in the inefficiency of the industrial sector.

The district/city minimum wage has a very large influence on the efficiency of the industrial sector, therefore the policy of determining the district/city minimum wage needs special attention in terms of the calculation method. Involvement of the world of industry, labor, academia, and the government must be carried out in order to produce decisions that can benefit all parties so as to encourage the development of the industrial sector in an area.

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