

The Growth Pattern and Potential Development of Manufacturing Industry in East Java



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ABSTRACT

The manufacturing industry in East Java has an important role in supporting the economy so that its development must be evenly distributed throughout all districts and cities. This research aims to: 1) measuring the performance of the manufacturing industry, 2) mapping the growth patterns of the manufacturing industry, 3) describing which district/cities in East Java have the potential to be developed and 4) knowing which variables determine the performance of the manufacturing industry. The research objects are 9 cities and 29 districts. The data used is secondary data sourced from the Central Statistics Agency. The data is processed by sharing output contribution analysis, labor absorption contribution, Klassen typology analysis and panel data regression analysis. The results showed that the performance of the industrial sector was very low and uneven between regions, the rate of employment in the industrial sector was also low in all regions. The growth pattern of the industrial sector in 22 districts/cities in the Relatively Underdeveloped classification and 15 districts/cities in the Potential classification and 1 district in the Forward Depressed classification. Inflation variables and the number of business units have a significant effect on industry performance. For this reason, it is recommended that local governments be able to control the inflation rate and be able to provide stimulus or policies to the industrial sector in order to increase productivity and performance.

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1. Introduction

Changes in the economic structure are a mechanism for economic transformation that occurs in a developing country or region from a subsistence nature with an emphasis on the agricultural sector towards a modern economic sector that focuses on the industrial sector (Todaro, 2003). Changes in the economic structure that occur in Indonesia can be seen from the very fast growth of the industrial sector so that it places the industrial sector at number one in terms of its contribution to Gross Domestic Product. Until the second quarter of 2020, the contribution of the industrial sector to Indonesia's Gross Domestic Product was 19.87% (BPS, 2020a). Even though the industrial sector has the largest contribution among other economic sectors, it has not been able to lift Indonesia's position to become a developed country. Currently, it only makes Indonesia a new industrialized country or a country that has very good economic qualifications. Meanwhile, compared to the national level, the contribution of the industrial sector to Gross Regional Domestic Product in East Java Province in the second quarter of 2020 was 30.04%. This means that its contribution is higher than the national figure (BPS, 2020b). The high contribution of the industrial sector at the provincial level does not necessarily indicate the high contribution of the industrial sector in each district and city in East Java. For this reason, it is important to know the performance of the industrial sector in regencies and cities in order to get a clear picture of which districts have advanced and disadvantaged industrial sectors and which allow for their development. In addition, it is necessary to know several factors that can determine the performance of the industrial sector in each district and city. This information is important to know so that in making policies related to the development of the industrial sector it is more targeted. As is known, the existence of the industrial sector in East Java is still uneven, the manufacturing industry in East Java Province is only concentrated in three Development Area Units (SWP), namely SWP 1 Gerbang Kertasusila, SWP 6 Malang - Pasuruan and SWP 7 Kediri and its surroundings. Meanwhile, based on districts/ cities, the manufacturing industry is concentrated in the city of Surabaya, Gresik district, Sidoarjo district, Kediri city, Pasuruan district and Malang city (Landiyanto, 2005).

This unequal industrial sector has an impact on unequal economic growth between districts / cities in East Java. Some of the factors that cause the inequality of the industrial sector in East Java, it is necessary to find out the factors that cause it, whether it is caused by input factors as mentioned in the research results above. External factors such as inflation and local government policies seem to have contributed in determining the growth of the industrial sector. Most of the research carried out only concentrated on internal factors such as raw materials, labor, technology and wages. So, from this it is necessary to conduct research to prove whether external factors such as inflation and local government policies can affect the performance of the industrial sector. The policies to be taken by local governments in the development of the industrial sector must depend on the problems and growth patterns of the industrial sector in each district and city, therefore mapping industrial performance in each region is needed. For that purpose, this research is; 1) to describe the performance of the industrial sector, 2) to map the growth patterns of the industrial sector, 3) to describe which regencies/cities in East Java have the potential to be developed and 4) determine the variables that affect the performance of the industrial sector.

2. Literature Review

Manufacturing Industry

Manufacturing industry is an economic activity which carries out the activity of changing a basic item mechanically, chemically or by hand so that it becomes finished / semi-finished goods, and /or goods which have less value become goods of higher value, and are closer to the end user. Included in this activity are industrial services and assembling work (BPS, 2020a). The classification

of Manufacturing industry based solely on the number of workers and not based on the use of technology or capital used by BPS is as follows:

- a. Large Industry (number of workers 100 people or more)
- b. Medium Industry (number of workers 20-99 people)
- c. Small Industry (number of workers 5-19 people)
- d. Home Industry (number of workers 1-4 people)

Included in the manufacturing industry are food, beverage, tobacco processing, textiles, apparel, leather, wood, bamboo, rattan, paper, printing, chemicals, oil refineries, products from coal, pharmaceuticals, rubber, minerals, base metals, computers, repair services etc. The role of the manufacturing industry sector is very large for an economy because the manufacturing industry sector has very high forward and backward linkages. Forward linkage means that the manufacturing industry sector is a sector that is needed both directly and indirectly by other sectors. The backward linkage means that the manufacturing industry sector is a sector capable of increasing the final demand, either directly or indirectly, to other sectors (Hilman & Ester, 2019).

The growth of the industrial sector depends on several factors, input factors consisting of labor, capital and raw materials are still physical factors that dominate industrial growth, while input productivity has no effect on industrial growth. So that in the long-term industrial growth is difficult to be sustainable and vulnerable to economic shocks (Mohtar, 2015)

Inflation

Inflation is a condition where prices generally increase in a relatively long time. Inflation has a negative effect on economic growth, which means that an increase in inflation will reduce economic growth (Daniel, 2018). Several factors that can cause inflation include an increase in demand. An increase in demand for most goods / services that are not balanced by supply will result in an increase in prices and if it lasts for a long time, it will cause inflation. The increase in production costs is also a factor that can cause inflation. The increase in production costs due to the increase in input prices will have an impact on the price increase of several products. As happened in 1997 during the economic crisis which resulted in an increase in the prices of goods, especially those using imported raw materials, because at that time the value of the rupiah decreased. Another factor that causes inflation is the effect of rising prices for goods, especially those imported from abroad.

Inflation has a negative impact on households, both individual households, companies, industries and countries. Inflation will reduce people's welfare because price increases that are not matched by an increase in income, especially for people with fixed income, will cause a decrease in purchasing power, which results in a decrease in the level of welfare. For business actors such as the industrial sector, inflation will undermine future predictions so that it will disrupt economic stability and raise many speculators. Inflation, both short and long term, can have a significant effect on Gross Domestic Product (Sujianto et al., 2020).

In practice, the growth of an industry does not only depend on internal industry factors but also external factors. Input factors consisting of labor, capital and raw materials are still physical factors that dominate industrial growth, while input productivity does not affect industrial growth. Thus, in the long term industrial growth is difficult to be sustainable and vulnerable to economic shocks (Mohtar, 2015).

The concept of industrial development in an area cannot be separated from the concept of regional development. Basically, regional development must be adjusted to the conditions and development needs of each region. Some of the regional development concepts include:

- a. The concept of regional development based on the character of local resources. This concept emphasizes the choice of superior commodities / sectors as a driving force for development, both at the domestic and international levels.

- b. The concept of regional development based on spatial planning. This concept emphasizes the need to invest in growth center areas that have good infrastructure so as to save on investment spending. Meanwhile, the development of the surrounding area will occur through a trickle-down effect process. Examples of this concept are: Mainstay Areas, Main Development Areas, and Development Area Units.
- c. The concept of integrated area development. This concept emphasizes development efforts that are cross-sectoral and at the same time improve community welfare and poverty reduction in relatively disadvantaged areas. For example: an integrated community development program, etc. (Bappenas, 2007).

Including in the case of industrial development in an area must be integrated with the concept of regional development and pay attention to things such as based on the character of local resources. spatial planning and industrial development based on regional development centers.

3. Research Method

This study took the objects of regencies and cities in East Java, totaling 29 regencies and 9 cities in East Java. East Java was chosen because East Java has the highest contribution to the manufacturing sector nationally. The type of data in this study is panel data, which is a combination of 38 district and city data and 4-year time series data (2016-2018) in the form of Gross Regional Domestic Product in the manufacturing industry sector, labor in the manufacturing industry sector, and inflation in 29 districts and 9 Cities in East Java. These data were obtained from the East Java Central Statistics Agency and the East Java Industry and Trade Service. The analysis technique used is share analysis of output contribution, labor absorption contribution, classic typology analysis and panel data regression analysis with selecting the best model through the Chow test and Hausman test stages. The dependent variable is the performance of the manufacturing industry and the independent variable is inflation and the number of business units in the industrial sector.

4. Results and Discussion

Manufacturing Industry Performance

The performance of the manufacturing industry sector in each regency and city in East Java Province can be seen in two ways, namely by calculating the contribution of the manufacturing sector to Gross Regional Domestic Product (GRDP) and the second is through indicators of employment in the industrial sector. From the results of calculations that have been carried out on the contribution of the industrial sector to GRDP, the following average results are obtained:

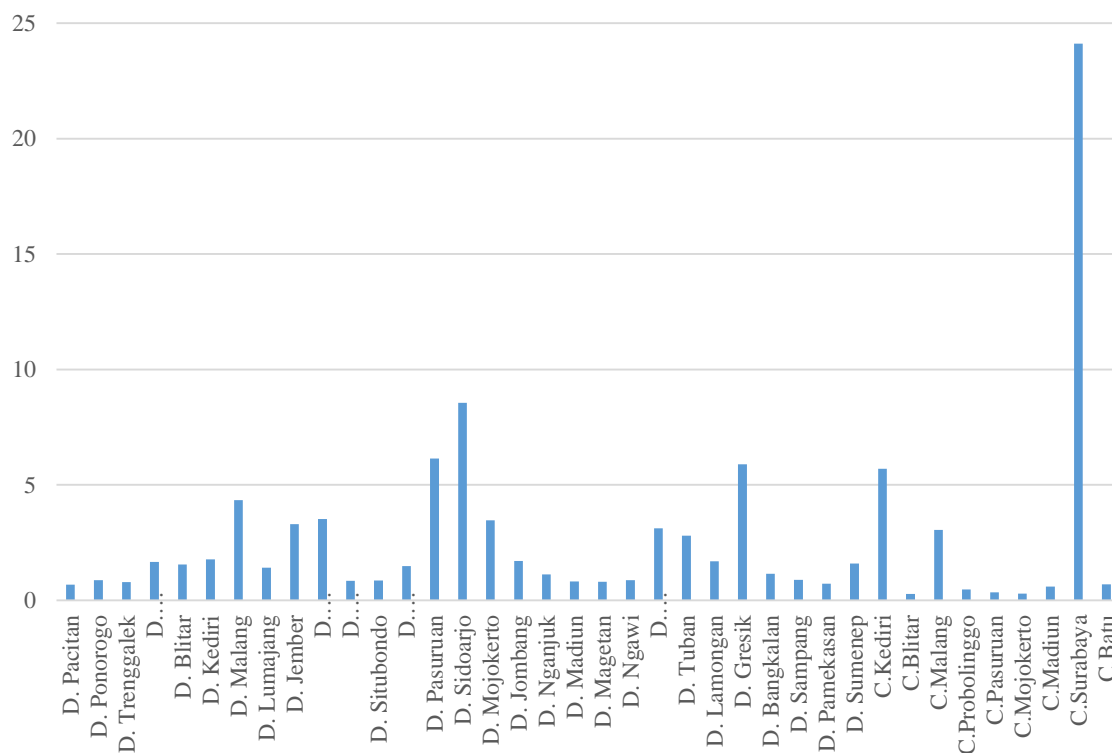


Figure 1. The Average Contribution of Manufacturing Industry in East Java Province (2016-2018)
 Source: Statistics Indonesia – East Java in 2020 (processed data)

Based on Figure 1, it shows that there are five regions whose industries have a fairly high average contribution to GRDP, namely Surabaya City, which reached 24,11 percent, followed by District Sidoarjo with a contribution of 8,55 percent and District Pasuruan with 6,14 percent. Then continued with District Gresik with a value of 4 percent and Kediri City with a contribution of 5,69 percent. Meanwhile, Blitar City has the lowest contribution of all the districts and cities in East Java with only 0,28 percent.

The disparity in the contribution of industry to the GRDP that occurs between districts and cities in East Java Province shows the unequal development of the industrial sector in the East Java region. This needs to be taken into account by the Provincial and Regency / City Governments in their development planning so that the industrial sector is included in development priorities and always pays attention to policies that can support the development of the industrial sector. The development of the industrial sector is very important because this sector is able to absorb employment which is useful for reducing unemployment. The performance of the industrial sector seen from the absorption of labor can be seen in the Figure 2 as follow:

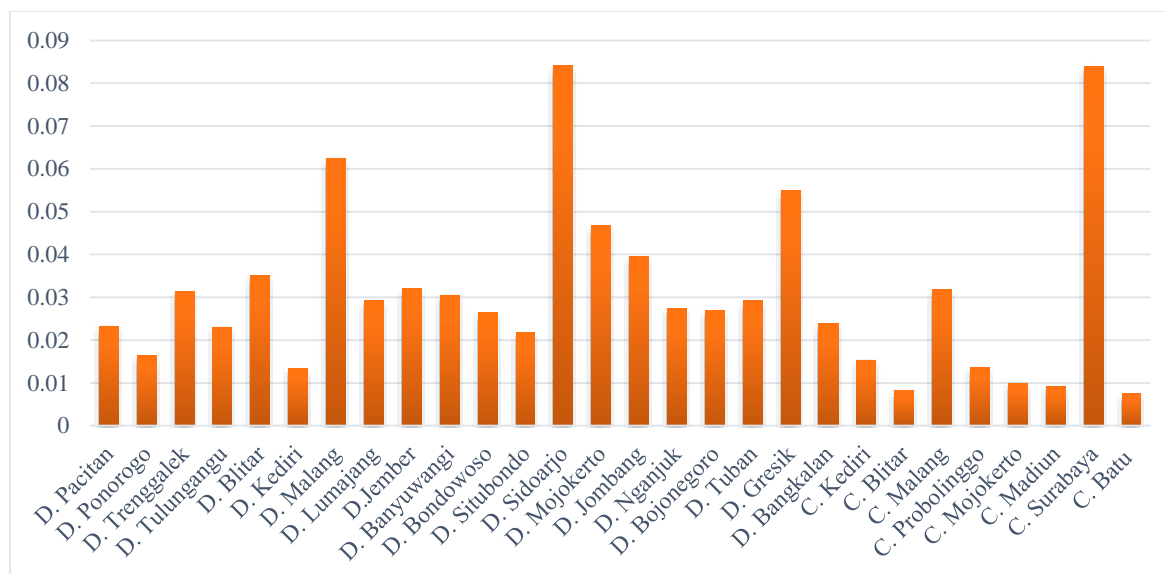


Figure 2. The Average of Labor Absorption in the Manufacturing Industry in East Java (2016-2019)
 Source: Statistics Indonesia – East Java in 2020 (processed data)

Figure 3 shows that the highest average labor absorption in the manufacturing sector in the districts and cities of East Java Province is District Sidoarjo with a value of 0,084 percent, followed by Surabaya City with a value of 0.083 percent and District Malang with a value of 0,062 percent. Meanwhile, the lowest labor absorption in the manufacturing sector is in Batu City and Blitar City with a value of respectively 0,007 percent and 0,008 percent. The absorption of labor in the industrial sector in several regencies and cities in East Java is almost evenly distributed with a relatively low absorption rate. In this case, it is like a region where the GDP contribution of the industrial sector is relatively high and has not been able to absorb high employment opportunities. This needs to be taken into account by the local government so that it always pays attention to the licensing of industrial establishment which can not only increase the regional GDP but also absorb employment opportunities in the area. Development of labour-intensive industries should be prioritized in order to be able to overcome the problem of unemployment in the regions.

Industrial Growth Pattern

The growth pattern of the manufacturing sector in each regency and municipality in the province of East Java needs to be known so that each region knows the position of the industrial sector's growth so that it is not wrong to take industrial sector development policies in the region. Based on the results of the typology class analysis, the growth pattern of the industrial sector in each district / city can be seen in the Table 1.

Table 1. Regional Industrial Growth Patterns in Districts / Cities in East Java Based on Klassen Typology

No.	District/City	Klassen Typology	No.	District/City	Klassen Typology
1	District Pacitan	Relatively Backward	20	Madiun City	Relatively Backward
2	District Ponorogo	Relatively Backward	21	Surabaya City	Relatively Backward
3	District Trenggalek	Relatively Backward	22	Batu City	Relatively Backward
4	District Blitar	Relatively Backward	23	District Tulungagung	Potential
5	District Banyuwangi	Relatively Backward	24	District Kediri	Potential
6	District Situbondo	Relatively Backward	25	District Malang	Potential
7	District Jombang	Relatively Backward	26	District Lumajang	Potential
8	District Nganjuk	Relatively Backward	27	District Jember	Potential
9	District Madiun	Relatively Backward	28	District Bondowoso	Potential
10	District Magetan	Relatively Backward	29	District Probolinggo	Potential
11	District Ngawi	Relatively Backward	30	District Pasuruan	Potential
12	District Bojonegoro	Relatively Backward	31	District Sidoarjo	Potential
13	District Bangkalan	Relatively Backward	32	District Mojokerto	Potential
14	District Sampang	Relatively Backward	33	District Tuban	Potential
15	District Pamekasan	Relatively Backward	34	District Gresik	Potential
16	District Sumenep	Relatively Backward	35	Kota. Kediri	Potential
17	Blitar City	Relatively Backward	36	Malang City	Potential
18	Probolinggo City	Relatively Backward	37	Pasuruan City	Potential
19	Mojokerto City	Relatively Backward	38	District Lamongan	Retarded Region

Source: Statistics Indonesia, 2020 (processed data)

The industrial growth pattern of districts and cities in East Java is mostly (57.8%) in the relatively underdeveloped category or as many as 22 regions, 39.4% or 15 regions in the potential category and 8% or 1 region, namely Lamongan district in the retarded region. The relatively underdeveloped category indicates that the regional industrial growth rate is below the average growth rate of all districts/ cities in the province of East Java, besides that the large contribution of the regional industrial sector GRDP is also below the average contribution of all districts/ cities in East Java. In this case, every regional government whose industrial sector is still in the relatively underdeveloped category must be able to increase the contribution of the industrial sector so that it exceeds the regional average contribution rate, besides that it also increases its growth rate from year to year so that it exceeds the regional average growth rate. Meanwhile, the potential growth category shows that even though the regional industrial sector has a low contribution compared to the average contribution of regencies / cities in East Java Province, it has an industrial sector growth rate above the average industrial sector growth rate of all regencies / cities in Java. East. If this high growth rate is maintained, one day the contribution of this industrial sector will be able to shift the contribution of other economic sectors and in the end it will increase its contribution to GRDP. Expectations for the industrial sector in regions with this potential growth category are still very prospective in the future. Lamongan Regency, which has a depressed advanced industrial growth pattern, means that the industrial sector is able to provide a high contribution to GRDP even above the average contribution of other regions, but the growth rate is low. This needs to be watched out for by Lamongan Regency because if there is no specific policy or action in the development of the industrial sector, in the future the contribution of the industrial sector will continue to decline and eventually become a lagging sector.

The Result of Regression Analysis

The steps to determine the regression model were carried out through the Chow test and the Hausman test. Chow test is used to determine the best model or the selected model between the Common Effect (CE) model and the Fixed Effect (FE) model. Based on the results of the Chow Redundant Fixed Effect test, the Cross Section F value is 0.0000, this value is less than 0.05. Then it was decided to accept H1, meaning that the selected model was Fixed Effect (FE).

Table 2. Chow Test

Effects Test	Statistic	d.f.	Prob.
Cross-section F	285.956707	(37,74)	0.0000
Cross-section Chi-square	566.541578	37	0.0000

Source: Data processed (2021)

The Hausman test is a method used to determine the best model or the selected model between the Random Effect (RE) model and the Fixed Effect (FE) model. Based on the results of the Hausman Correlated Random Effect test, the probability value of random Cross Section is 0.0000, this value is less than 0.05. Then it was decided to accept H₁ with the selected model, namely Fixed Effect (FE).

Table 3. Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	62.711532	2	0.0000

Source: : Data processed (2021)

The results of the regression estimation of the common effect model and the random effect model can be seen in the following table:

Table 4. Common Effect Model and Random Effect Model

Common Effect Model				
Variable	Coefficient	t-Statistic	Probability	
Constant	3.587119	16.25912	0.0000	
Inflation	-0.135028	-1.438841	0.1530	
Number of Industry	0.424259	2.282048	0.0244	
Random Effect Model				
Variable	Coefficient	t-Statistic	Probability	
Constant	3.807007	53.13255	0.0000	
Inflation	-0.024441	-2.257252	0.0259	
Number of Industry	-0.037145	-1.786766	0.0767	

Source: : Data processed (2021)

The best model and the one chosen based on the Chow test and the Hausman test is the Fixed Effect (FE) model. The fixed effect regression model estimates are as follows:

Table 5. Fixed Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.808771	0.023663	160.9557	0.0000
INFLASI (X1)	-0.023116	0.010841	-2.132305	0.0363
UNIT USAHA (X2)	-0.041927	0.020808	-2.014956	0.0475
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.993366	Mean dependent var	3.693010	
Adjusted R-squared	0.989869	S.D. dependent var	0.672883	
S.E. of regression	0.067726	Akaike info criterion	-2.277072	
Sum squared resid	0.339424	Schwarz criterion	-1.317003	
Log likelihood	169.7931	Hannan-Quinn criter.	-1.887434	
F-statistic	284.1134	Durbin-Watson stat	4.339926	
Prob(F-statistic)	0.000000			

Source: : Data processed (2021)

From the regression estimation table for the fixed effects model, it can be written in the regression equation as follows:

$$Y = 3,808771 - 0,023116X1 - 0,041927X2$$

The industrial sector performance is 99.33% influenced by the inflation rate and the number of industrial units and 0.67% is influenced by other variables outside the analyzed model, this is evidenced by the probability value of F statistic which is 0.000 which means it is below the critical value of 0.05. Inflation has a significant negative effect on the performance of the industrial sector with a coefficient value of 0.023116, this is indicated by the probability value which is below the alpha value of 0.05%, namely 0.03%. The higher the inflation in a region, the lower the performance of the industrial sector. Inflation will push up production costs, resulting in lower output in the industrial sector. So the external factors of the industry are very influential on industrial performance in the regions. This is in line with the results research of Satria (2012) that there is a long-term non-linear relationship between inflation and economic growth from 1981 to 2010. Economic growth in this case means growth in output. Meanwhile, the number of industrial business units has a significant negative effect on industry performance with a coefficient value of 0.041927 and a probability value of 0.04, which means that it is below the alpha value of 0.05%. An increase in the number of business units will reduce industrial performance. This shows that the marginal productivity level of the industrial sector is negative. Industries in areas with a large number of business units have low productivity, so there needs to be an increase in quality or productivity. In terms of quality, the results of this study are reinforced by research by Utama (2011) which examines variables affecting the output of the manufacturing industry in Central Java. The results showed that of the 5 variables studied, namely capital, labor, energy, raw materials and technological progress, only labor and raw materials had a significant effect. The highest productivity is only labor, other variables have very little productivity. From this research clearly shows that the problem in the industrial sector in most regions is a problem of productivity. For industrial development in the regions, it cannot be done by increasing the quantity of industry but by increasing the quality, namely by increasing productivity, both labor productivity, capital, and other inputs.

5. Conclusion

From the discussion above, it can be concluded that the performance of the manufacturing industry which is calculated based on the output in most districts and cities in East Java Province is still low and uneven between regencies and cities. Moreover, the performance of the industrial sector, seen from the absorption of labor, is still low and almost evenly distributed in all districts and cities. In addition, the growth pattern of the industrial sector in most districts / cities is in the relatively underdeveloped category and there are only a few potential areas. However, inflation and the number of business units have a significant effect on the performance of the industrial sector.

References

- Bappenas. (2007). *Evaluasi Kebijakan Perencanaan Program Pembangunan dan Pengembangan Wilayah Tertinggal Khusus Terisolir dan Terpencil*.
- BPS, B. P. S. J. (2020a). *Industri besar dan sedang*. <https://www.bps.go.id/subject/9/industri-besar-dan-sedang.html>
- BPS, B. P. S. J. (2020b). *Produk Domestik Regional Bruto*. <https://jatim.bps.go.id/subject/52/produk-domestik-regional-bruto.html>
- Daniel, P. A. (2018). Analisis Pengaruh Inflasi Terhadap Laju Pertumbuhan Ekonomi Di Kota Jambi Prima Audia Daniel STIE Muhammaadiyah Jambi. *EKONOMIS: Jurnal of Economics and Business*, 2(1), 131–136.
- Hilman, A. M., & Ester, A. M. (2019). Peranan Sektor Industri Pengolahan Dalam Perekonomian Indonesia: Model Input-Output. *Media Ekonomi*, 26(1), 63.

<https://doi.org/10.25105/me.v26i1.5210>

- Landiyanto, E. A. (2005). Spesialisasi dan Konsentrasi Spasial Pada Sektor Industri Manufaktur di Jawa Timur. *Paralel Session VIB : Industry and Trade, November*, 1–70.
- Mohtar, R. (2015). Determinan Pertumbuhan Sektor Industri Unggulan di Propinsi Jawa Timur. *JEJAK (Journal of Economics and Policy)*, 8(2), 208–233.
- Satria, D. (2012). Dampak Inflasi Terhadap Pertumbuhan Ekonomi Di Indonesia Doni Satria Fakultas Ekonomi Universitas Negeri Padang. *ECOsains: Jurnal Ilmiah Ekonomi Dan Pembangunan*, 1(2), 212–220.
- Sujianto, A., Azmi, E., & Ulil, M. F. (2020). Associative Studi on Government Spending, Inflation, Trade Balance and Gross Domestic Product. *Ekulibrium: Jurnal Ilmiah Bidang Ilmu Ekonomi*, 15(1), 27–37.
- Todaro, M. P. (2003). *Economic Development*. Harlow: Addison-Wesley.
- Utama, Y. P. (2011). *Analisis Produktivitas Industri Pengolahan Di Jawa Tengah (Pendekatan Total Factor Productivity)*. 1–26.