THE EFFECT OF MANUFACTURING GROSS REGIONAL DOMESTIC PRODUCT, MANUFACTURING FIRMS, AND MANUFACTURING INVESTMENT ON EMPLOYMENT ABSORPTION IN GRESIK REGENCY

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Abstract

This study analyzes the effect of the manufacturing industry sector on employment absorption in Gresik Regency during the period 2015–2024. The manufacturing industry has become one of the major drivers of the regional economy; however, increases in industrial output are not always followed by a proportional increase in employment absorption. Existing studies present divergent findings regarding the relationship between industrial growth, investment, and employment, indicating the need for further empirical analysis at the regional level. This research seeks to investigate the impact of manufacturing sector GRDP, the number of manufacturing enterprises, and industrial investment on employment absorption. The study adopts a quantitative approach using secondary time series data from 2015 to 2024, obtained from the Central Bureau of Statistics (BPS) and relevant agencies. The data are analyzed using multiple linear regression with the assistance of EViews 12. The analysis reveals that manufacturing GRDP has a positive and significant effect on employment absorption, the number of manufacturing firms exhibits a negative but statistically insignificant effect, whereas manufacturing investment demonstrates a negative and statistically significant influence. The results of the joint test show that all independent variables significantly affect employment absorption. These findings indicate a tendency toward a structural shift in the manufacturing industry from labor-intensive to capital-intensive in Gresik Regency.

Keywords: Manufacturing Industry, Investment, GRDP, Employment Absorption, Gresik

INTRODUCTION

The manufacturing industry has become one of the main sectors supporting economic development in Indonesia, both nationally and regionally. Its development contributes not only to increasing regional output but also to creating employment opportunities through the expansion of production activities. From the perspective of Keynesian theory, higher demand for goods and services encourages firms to increase production, which in turn raises the need for labor. Therefore, the manufacturing sector continues to play an essential role in supporting economic growth and labor absorption.

As one of the largest industrial centers in East Java Province, Gresik Regency has experienced continuous growth in manufacturing activities. The availability of industrial estates, adequate infrastructure, and strategic geographical location has encouraged the establishment of new manufacturing firms and attracted substantial investment. During the 2015–2024 period, manufacturing output, investment, and the number of manufacturing enterprises generally showed positive growth. These developments illustrate the important contribution of the manufacturing sector to regional economic performance.

Nevertheless, the expansion of manufacturing activities has not always been followed by a comparable increase in employment absorption. Many firms have gradually shifted their production systems toward automation and modern technology to improve productivity and operational efficiency. As a consequence, industrial growth increasingly reflects capital-intensive production rather than labor-intensive production. Under these circumstances, higher industrial output does not necessarily create additional employment opportunities.

Empirical evidence concerning the relationship between manufacturing development and employment absorption remains inconclusive. Haedzar et al. (2022) reported that manufacturing expansion positively affects employment because growing production activities require additional workers. In contrast, Handoyo and Rudatin (2023) found that technological improvements tend to reduce labor demand, even when industrial activities continue to expand. Likewise, Rini and Septriani (2025) explained that manufacturing investment is frequently directed toward machinery and production technology instead of labor expansion. These findings suggest that the employment effect of manufacturing development depends on the characteristics of industrial growth.

Although previous studies have examined manufacturing development from various perspectives, most of them focus on individual determinants of employment absorption. Limited attention has been given to analyzing manufacturing Gross Regional Domestic Product (GRDP), the number of manufacturing firms, and manufacturing investment simultaneously within a single empirical framework, particularly in industrial regions such as Gresik Regency. This limitation provides an opportunity to conduct further research using a more comprehensive analytical approach.

Accordingly, this study investigates the influence of manufacturing GRDP, the number of manufacturing firms, and manufacturing investment on employment absorption in Gresik Regency during 2015–2024. A quantitative approach based on time-series data is employed, while multiple linear regression analysis is applied to examine both the individual and combined effects of the independent variables on employment absorption.

The contribution of this study lies in integrating three important indicators of manufacturing sector development into one analytical model using recent regional data. By

focusing on Gresik Regency, which represents one of Indonesia's major industrial areas, this research is expected to provide updated empirical evidence regarding the relationship between industrial development and employment absorption. The results are also expected to support policymakers in designing employment policies that are better aligned with sustainable industrial development.

REVIEW OF LITERATURE

Employment Absorption

Employment absorption refers to the number of workers employed in a particular economic sector within a certain period. The level of employment absorption reflects the ability of economic activities to create job opportunities for the labor force. In the manufacturing sector, labor demand is closely related to production activities because firms require workers to support the production process. Therefore, an increase in industrial production is generally followed by an increase in employment opportunities, although the magnitude of this effect depends on the characteristics of each industry (Iksan et al., 2020).

Manufacturing Industry

The manufacturing industry is one of the strategic sectors that contributes significantly to regional economic growth through value-added production activities. This sector transforms raw materials into intermediate and finished products, thereby increasing productivity and regional income. The development of manufacturing industries is expected to stimulate production expansion and create employment opportunities. Previous studies indicate that manufacturing sector development continues to play an important role in increasing employment absorption, particularly in regions where industrial activities are dominant (Haedzar et al., 2022).

Manufacturing Gross Regional Domestic Product (GRDP)

Manufacturing Gross Regional Domestic Product (GRDP) represents the value added generated by manufacturing activities within a region during a certain period. Higher manufacturing GRDP indicates increasing industrial output and stronger economic performance. As industrial production expands, firms generally require additional labor to maintain production capacity and meet market demand. Empirical evidence suggests that manufacturing GRDP has a positive contribution to employment absorption because economic growth encourages firms to increase labor utilization (Iksan et al., 2020).

Number of Manufacturing Firms

The number of manufacturing firms reflects the level of industrial development in a region. An increase in the number of firms generally indicates expanding business activities and greater economic potential. However, the establishment of new firms does not always create additional employment because production scale, business size, and technology adoption differ across companies. Consequently, several studies found that the number of manufacturing firms does not necessarily have a significant effect on employment absorption (Handoyo & Rudatin, 2023).

Manufacturing Investment

Manufacturing investment represents capital allocation intended to increase production capacity, improve production facilities, and adopt new technologies. Investment is expected to strengthen industrial competitiveness and support regional economic

development. Nevertheless, investment does not always generate additional employment because firms may allocate more capital to machinery and automation than to labor expansion. This condition explains why investment in manufacturing industries may have a limited or even negative impact on employment absorption, particularly in capital-intensive industries (Rini & Septriani, 2025).

RESEARCH METHOD

The research methodology in this study is described in a structured and systematic manner to help readers gain a clear understanding of the procedures undertaken. This study applies a quantitative method using an explanatory research design to analyze the effect of the manufacturing industry sector on employment absorption in Gresik Regency. The explanatory approach is utilized to identify and explain the relationships among variables based on empirical evidence. The analysis utilizes secondary time-series data for the 2015–2024 period obtained from the Central Bureau of Statistics (BPS) and the Investment and One-Stop Integrated Service Office (DPMPTSP) of East Java Province. The variables analyzed include manufacturing sector GRDP, the number of industrial companies, and investment as independent variables, while employment absorption serves as the dependent variable.

Data were collected through documentation techniques by compiling and reviewing relevant statistical records. Multiple linear regression analysis was employed to assess the influence of the independent variables on employment absorption, both partially and simultaneously, with the support of EViews 12 software.

The regression model utilized in this study is presented in the following equation:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

In addition, several classical assumption tests, including the t-test, F-test, and coefficient of determination (R^2) were employed to verify the reliability of the regression model and evaluate the significance of the relationships between the research variables.

RESULTS AND DISCUSSION

The findings of the multiple linear regression analysis on the relationship between manufacturing GRDP, the number of manufacturing firms, manufacturing investment, and employment absorption in Gresik Regency are presented in Table 1.

Table 1.
Multiple Linear Regression Results

	Variable	Coefficient	Std. Error	t-Statistic	Probability
1	(Constant)	10936.23	39689.73	0.275543	0.7921
	X1	8.094253	1.204645	6.204182	0.0008
	X2	-143.0653	88.59110	-1.614895	0.1575
	X3	-2.301683	0.537728	-4.280389	0.0052

Source: Data processed (2026)

Table 2.
Coefficient of Determination Results

	Description	Value
1	R-squared	0.904918
	Adjusted R-squared	0.857377

Source: Data processed (20256)

Table 3.
F-Test Results

	Description	Value
1	F-statistic	19.03451
	Prob (F-Statistic)	0.001812

Source: Data processed (2026)

Table 4.
t-Test Results

	Variable	Coefficient	Std. Error	t-Statistic	Prob.
1	Manufacturing GRDP (X1)	8.094253	1.304645	6.204182	0.0008
	Number of Manufacturing Firms (X2)	-143.0653	88.59110	-1.614895	0.1575
	Manufacturing Investment (X3)	-2.301683	0.537728	-4.280389	0.0052

Source: Data processed (2026)

Multiple Linear Regression Results

The multiple linear regression results are presented as follows:

$$Y = 10936.23 + 8.094253X_1 - 143.0653X_2 - 2.301683X_3$$

The interpretation of the model is as follows:

The constant value of 10936.23 indicates that employment absorption remains positive when all independent variables are assumed constant. Manufacturing GRDP (X1) has a positive coefficient of 8.094253, indicating that higher industrial output tends to increase employment absorption. The number of manufacturing firms (X2) has a negative coefficient (-143.0653), suggesting that an increase in the number of firms does not necessarily lead to greater employment opportunities. Manufacturing investment (X3) also has a negative coefficient (-2.301683), implying that additional investment tends to reduce employment absorption, reflecting the increasing use of capital-intensive production technology.

Coefficient of Determination (R^2)

The coefficient of determination is applied to evaluate the extent to which the independent variables are able to explain the dependent variable within a regression framework. The findings reveal an R-squared value of 0.904918, which implies that 90.49% of the variation in employment absorption is accounted for by manufacturing GRDP, the number of manufacturing firms, and manufacturing investment. The remaining 9.51% is attributed to factors outside the model. In addition, the Adjusted R-squared value of 0.857377 indicates that even after adjusting for the number of predictors included, the model still maintains strong explanatory capability. Overall, this points to a high goodness of fit, showing that the model is effective in explaining employment absorption in Gresik Regency during the 2015–2024 period.

F Test

The F-test results indicate an F-statistic value of 19.03451 with a probability (p-value) of 0.001812, which is below the 0.05 significance threshold. This suggests that the independent variables, when considered together, have a statistically significant effect on employment absorption. In other words, the results confirm that manufacturing GRDP, the number of firms, and investment jointly exert a meaningful influence on employment absorption in Gresik Regency.

t-Test

The partial test results reveal that manufacturing GRDP positively and significantly affects employment absorption. In contrast, the number of manufacturing firms has a negative but insignificant effect. Meanwhile, manufacturing investment has a negative and statistically significant effect on employment absorption. These findings indicate that investment is increasingly directed toward technology adoption and production efficiency rather than labor expansion, suggesting a gradual shift toward capital-intensive manufacturing industries in Gresik Regency.

Effect of Manufacturing GRDP on Employment Absorption

The results indicate that the manufacturing sector GRDP positively and significantly influences employment absorption in Gresik Regency. The regression results show a coefficient of 8.094253 with a significance value of 0.0008, which is lower than 0.05. This means that every one-billion-rupiah increase in GRDP increases employment absorption by approximately 8 workers, assuming other variables remain constant. This finding indicates that industrial economic activity still plays an important role in creating employment opportunities. An increase in GRDP reflects higher industrial output and production activities. This condition encourages firms to hire additional workers to meet increasing production demands. Higher levels of industrial output generally lead to an increased need for labor during production activities. This demonstrates a strong link between industrial growth and employment absorption in Gresik Regency. This finding is consistent with Todaro (2003) and Keynesian theory, which explain that economic growth can increase employment opportunities through expanded production activities. Thus, the manufacturing sector remains one of the key drivers of employment absorption in the study area. This finding is consistent with Haedzar et al. (2022), who reported that manufacturing sector growth contributes positively to employment absorption through increased production activities. It also supports the theory of economic growth proposed by Todaro and Smith

(2015), which argues that higher output expansion encourages firms to increase labor demand.

Effect of Number of Manufacturing Firms on Employment Absorption

The number of manufacturing firms does not have a statistically significant impact on employment absorption in Gresik Regency. The analysis results show a coefficient of -143.0653 with a significance value of 0.1575, which is greater than 0.05. This means that an increase in the number of firms is not followed by a significant increase in employment. This condition indicates that this variable does not adequately explain changes in employment absorption. It occurs because not all newly established firms operate at a large scale that requires substantial labor. Some firms tend to adopt modern production technologies that are more efficient than manual labor. In addition, the expansion in the number of firms is not always accompanied by a proportional increase in production capacity. As a result, its impact on employment absorption is limited. These findings suggest that the increase in the number of firms is more administrative or related to business scale expansion rather than labor expansion. This also reflects a structural shift toward a more capital-intensive industrial system in Gresik Regency. Therefore, the growth in the number of firms does not necessarily lead to higher employment absorption. This result supports the findings of Handoyo and Rudatin (2023), who argued that an increase in the number of manufacturing firms does not necessarily create more employment because many firms prioritize production efficiency through technology adoption.

Effect of Investment on Employment Absorption

An increase in manufacturing investment is associated with a significant decline in employment absorption in Gresik Regency. This is indicated by a coefficient of -2.301683 with a significance value of 0.0052, which is lower than 0.05. This means that every one-billion-rupiah increase in investment reduces employment by approximately 2 workers. This finding indicates an inverse relationship between investment and employment. The negative effect suggests that investment is primarily allocated to machinery and production technology. The use of such technology improves efficiency, thereby reducing labor requirements. In addition, the manufacturing sector in Gresik Regency tends to develop toward a capital-intensive structure. This makes increases in investment not necessarily lead to higher employment absorption. This finding is consistent with Sornarajah (2010), who states that investment in capital-intensive industries does not always contribute to employment growth. Therefore, investment in the manufacturing sector is more oriented toward productivity improvement rather than labor expansion. This finding is in line with Rini and Septriani (2025), who found that manufacturing investment tends to increase production efficiency rather than labor demand. This condition reflects the transformation of manufacturing industries toward capital-intensive production systems.

CONCLUSION

This study found that the manufacturing sector still contributes considerably to labor absorption in Gresik Regency, particularly through its contribution to Gross Regional Domestic Product (GRDP). An increase in production activities in this sector tends to be followed by a higher demand for labor in the field. The results demonstrate that the manufacturing industry continues to play an important role in generating employment

opportunities within the study area. Therefore, industrial sector development remains relevant to employment conditions.

Meanwhile, industrial investment and the number of firms do not show a directional effect on employment absorption. This condition indicates that current industrial development is increasingly oriented toward efficiency improvements through the use of technology and production machinery. As a result, increases in investment and the number of firms do not always correspond to higher employment levels. This reflects a structural shift toward a more capital-intensive industrial pattern.

Overall, the variables of GRDP, number of firms, and industrial investment jointly have a significant effect on employment absorption. The research model is also able to explain variations in employment absorption with a relatively strong explanatory power. These findings indicate that the industrial sector remains an important factor in the dynamics of employment in Gresik Regency. Therefore, industrial development policies should consider not only economic growth aspects but also their impact on job creation.

The limitations of this study lie in the relatively limited number of variables examined and the time span covered by the data. In addition, other factors such as wages, labor quality, and technological development have not been included in the analysis. These limitations open opportunities for future research to expand the scope of variables in order to obtain more comprehensive results. In this way, understanding of the factors affecting employment absorption can become more in-depth.

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