

Determinants Of Sectoral Economic Growth In An Industrial Buffer Zone: A Case Study Of Sidoarjo Regency (2010–2024)

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Abstract

Economic growth in Sidoarjo Regency plays a critical role in supporting the economic stability of East Java, given its strategic function as an industrial buffer zone and a primary satellite region. Despite the manufacturing and trade sectors' dominant contributions to the Gross Regional Domestic Product (GRDP), these industries remain vulnerable to global economic shifts, fluctuating investment realization, and challenges in labor absorption efficiency. This research aims to provide a comprehensive empirical evaluation of the factors determining economic growth within these sectors from 2010 to 2024. The study adopts a quantitative approach, utilizing time-series data obtained from the Central Bureau of Statistics (BPS) of Sidoarjo Regency. A Multiple Linear Regression model is applied to assess the influence of production value, investment, and labor on sectoral performance, supported by rigorous classical assumption testing to ensure statistical validity. The findings demonstrate that production value, investment, and labor collectively exert a positive and significant influence on the economic growth of both the manufacturing and trade sectors. The results indicate that production value serves as the primary driver of sectoral output, while investment provides the necessary capital for infrastructural and technological expansion. Although labor absorption remains a vital factor, its impact varies depending on the capital intensity of the respective sector. Ultimately, this research underscores the necessity of a synergized policy framework that aligns industrial capacity with market trade demands to ensure sustainable regional economic resilience.

Keywords: Economic Growth, Manufacturing Industry, Trade Sector, Production Factors, Sidoarjo Regency



INTRODUCTION

The regency's economic structure is characterized by a high degree of specialization in secondary and tertiary sectors, specifically the manufacturing industry and the wholesale and retail trade sectors. These two sectors are the main engines of Sidoarjo's Gross Regional Domestic Product (GRDP), providing significant added value and creating vast employment opportunities. According to the theory of regional competitive advantage, a region's ability to optimize its base sectors is key to achieving sustainable economic acceleration (Porter, 1990).

The urgency of this research stems from the dynamic shifts in the global and national economic landscape, which have direct implications for regional industrial productivity. Despite Sidoarjo's reputation as an industrial center, fluctuations in investment realization and the efficiency of labor utilization often create disparities in sectoral performance. Furthermore, the rapid transformation of the trade sector requires a deeper empirical understanding of how production factors contribute to sustained growth. While Neoclassical Growth Theory emphasizes that capital accumulation and labor are the primary drivers of output, their practical application in a satellite region like Sidoarjo needs to be re-examined through contemporary data (Arsyad, 2010).

This study aims to fill the analytical gap by examining the causal relationship between production value, investment, and labor toward economic growth in Sidoarjo's manufacturing and trade sectors from 2010 to 2024. By utilizing a robust quantitative approach, this research seeks to determine whether these production factors act as significant catalysts for economic expansion. The findings are expected to provide strategic insights for the Sidoarjo Regency government in formulating targeted policies to attract higher investment and optimize labor productivity, ensuring long-term economic resilience in an increasingly competitive regional environment (Todaro & Smith, 2015).

RESEARCH OBJECTIVES

The primary objective of this research is to provide an empirical and comprehensive analysis of the factors driving economic growth in the leading sectors of Sidoarjo Regency. By focusing on the manufacturing industry and the wholesale/retail trade sectors, this study seeks to achieve the following specific objectives:

- 1) To analyze the influence of production value on sectoral economic growth: This

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objective aims to determine the extent to which the total output value generated by the manufacturing and trade sectors contributes to the regional Gross Regional Domestic Product (GRDP). It examines whether an increase in production capacity directly translates into accelerated economic expansion within these specific sectors.

- 2) To evaluate the impact of investment realization on economic performance: This study intends to investigate the role of capital injection both domestic and foreign in fostering sectoral growth. The objective is to identify if investment acts as a primary catalyst for technological upgrades and infrastructural development that support Sidoarjo's industrial and commercial activities.
- 3) To assess the significance of labor absorption in driving sectoral output: This objective focuses on the human capital dimension, analyzing how the number of workers employed in the manufacturing and trade sectors influences economic productivity. It seeks to understand the efficiency of the workforce in transforming production inputs into economic value-added.

limited research populations, provide a significant opportunity to conduct a more focused and comprehensive analysis on the utilization of Shopee PayLater services. To evaluate the impact exerted by consumptive tendencies and installment- based payment options on Indonesian users' commitment to Shopee PayLater, this research was conducted. Its unique value is derived from a cohesive analytical framework, combining the functional aspects of fintech with the psychological dimensions of consumer behavior, specifically within a regional context that has high credit engagement. It is anticipated that this study will contribute meaningfully to the field of consumer behavior by providing empirical evidence on how external convenience and internal lifestyle factors collectively shape financial technology adoption.

REVIEW OF LITERATURE

Neoclassical Economic Growth

This framework provides a rigorous mathematical and conceptual basis for understanding how an economy's total output is generated through the combination of various production inputs. According to the Solow-Swan model, economic growth is a continuous process driven by three primary determinants: capital accumulation (K), labor (L), and exogenous technological progress. In the context of Sidoarjo Regency, the inclusion of investment data directly represents the capital factor, while the workforce statistics represent the labor component. Solow's theory posits that an economy operates

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under a production function with constant returns to scale. This implies that increasing the stock of capital through both domestic and foreign investment allows for higher levels of production and infrastructural development, which are critical for the manufacturing sector.

However, the theory also introduces the concept of diminishing marginal productivity, suggesting that as more capital is added to a fixed amount of labor, the additional output produced will eventually decrease unless there is technological innovation to offset this decline. In this study, the Neoclassical perspective is used to analyze how Sidoarjo, as an industrial buffer zone, has managed to maintain its growth trajectory. By examining the 2010–2024 period, this research evaluates whether the steady increase in capital investment has been effectively matched by labor productivity. The theory serves as a lens to observe the transition of Sidoarjo's economy from a resource-dependent state to a more industrialized and capital-intensive structure. Furthermore, this framework helps explain why investment is not merely a financial flow but a vital necessity for regional economic survival in a competitive provincial landscape.

Regional Competitive Advantage

To bridge the gap between macroeconomic principles and regional specifics, this research incorporates Michael Porter's (1990) Theory of Regional Competitive Advantage. Unlike traditional economic theories that focus on natural resource endowments, Porter argues that a region's prosperity is created, not inherited. It is determined by the productivity and innovation with which a region utilizes its human, capital, and physical resources. For a satellite region like Sidoarjo Regency, competitive advantage is achieved through the strategic concentration and specialization of its "base" sectors—namely, the manufacturing industry and the wholesale and retail trade sectors. Porter's "Diamond Model" suggests that four interrelated factors—factor conditions, demand conditions, related and supporting industries, and firm strategy collectively create the environment in which local industries compete. In Sidoarjo, the "factor conditions" include the availability of a skilled workforce and a robust investment climate, while the "demand conditions" are represented by the region's proximity to the primary market of Surabaya. This geographical advantage creates a powerful economic cluster where industrial production values (X_1) are amplified by efficient distribution networks in the trade sector. This theory is instrumental in explaining why the manufacturing and trade sectors are chosen as the focal points of this analysis. In Porter's view, these sectors do not operate in isolation; rather, they form a symbiotic relationship

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where the output of the processing industry becomes the commodity for the trade sector. By focusing on these sectors, Sidoarjo can achieve a higher level of economic value-added compared to other regions. This research uses Porter's framework to evaluate how effectively Sidoarjo has leveraged its strategic location and sectoral specialization to transform production inputs into a sustainable and competitive regional Gross Regional Domestic Product (GRDP).pangenberg (1994) proposed that job performance comprises three levels: organizational, process, and individual, with the individual employee being the most critical. As such, human resources play a vital role in the operational process of enterprises. Achieving overall organizational performance goals requires the cooperation and coordination of all members within the organization.

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RESEARCH METHOD

Research Design and Data Sources

This study employs a quantitative descriptive approach using a causal-comparative design. The research utilizes secondary time-series data covering a 15-year period from 2010 to 2024. All data were systematically collected from the official publications of the Central Bureau of Statistics (BPS) of Sidoarjo Regency, specifically focusing on the manufacturing and trade sectors. Operational Definition of Variables Four key variables are analyzed in this research:

1. Production Value (X_1): The total monetary output of the leading industrial and commercial sectors.
2. Investment (X_2): The realization of capital injections into the regional economy.
3. Labor (X_3): The total number of individuals employed within the specified sectors.
4. Economic Growth (Y): Represented by the Gross Regional Domestic Product (GRDP)

Analytical Procedures

The primary analytical tool is Multiple Linear Regression Analysis, processed via statistical software. The procedure begins with Classical Assumption Tests including normality, multicollinearity, heteroscedasticity.

Hypothesis Testing

The strength and significance of the relationship between variables are evaluated through three criteria:

- Partial Testing (T-test): To identify the individual impact of each production factor.
- Simultaneous Testing (F-test): To determine the collective influence of all factors on regional growth.
- Coefficient of Determination *R Square* : To measure the overall explanatory power of the independent variables within the model.



The proposed research framework is illustrated in Figure 1 below.

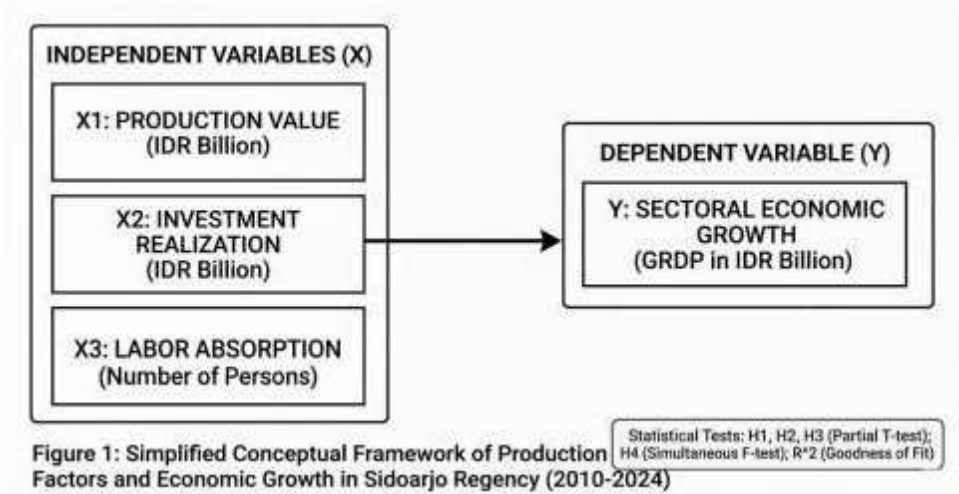


Figure 1. The research framework

Scope and Characteristics of Sample Selection

The scope of this research is focused on the economic dynamics of Sidoarjo Regency, East Java, within a fifteen year timeframe spanning from 2010 to 2024. This period was selected to provide a comprehensive longitudinal analysis of regional growth including industrial expansion and post-pandemic economic recovery phases. The sample selection follows a purposive sampling method, focusing specifically on the manufacturing and the wholesale and retail trade sectors due to their status as "base sectors" that contribute significantly to the regional Gross Regional Domestic Product (GRDP). The final sample consists of 15 annual observations for each variable, including Production Value, Investment Realization, and Labor Absorption. Characteristics of the selected sample include data consistency from the Central Bureau of Statistics (BPS), relevance to regional specialization, and statistical adequacy for conducting multiple linear regression. By limiting the scope to these specific parameters, the study ensures that the analyzed data accurately reflects the primary drivers of economic stability in a strategic industrial buffer zone.

Data Collection Tools

Data collection tool employed in this study is a structured documentation sheet designed to systematically record secondary data from official archives. Since the research relies on external sources, the instrument serves as a data extraction framework to ensure accuracy and consistency in gathering information from the Central Bureau of Statistics (BPS) publications, such as Sidoarjo Regency in Figures and the National Socio-Economic Survey. This documentation tool is organized into categorical tables that capture annual figures for Production Value, Investment Realization, Labor Absorption, and sectoral GRDP from 2010 to 2024. To maintain data integrity, the tool includes a verification checklist to cross-reference data points between different BPS reports, ensuring that the time-series values are standardized in their respective units specifically IDR Billions for financial metrics and the total number of individuals for employment data before being processed through statistical software.

Data Collection Technique

The data collection technique used in this study is documentation. Documentation techniques involve collecting secondary data from statistical reports, official publications, journals, books, and related government documents relevant to the research variables. The collected data were then organized, processed, and analyzed statistically to determine the influence of production value, investment, and labor on regional economic growth.

Operational Definition of Variables

This study consists of dependent and independent variables as follows:

- Economic Growth (Y)

Economic growth is measured using Gross Regional Domestic Product (GRDP) at constant prices in the Processing Industry Sector and the Wholesale and Retail Trade Sector of Sidoarjo Regency during the 2010–2024 period.

- Production Value (X1)

Production value refers to the total value of goods and services produced by the Processing Industry Sector and the Wholesale and Retail Trade Sector measured in billion rupiah.

- Investment (X2)



Investment refers to the realization of capital investment in the Processing Industry Sector and the Wholesale and Retail Trade Sector measured in billion rupiah.

- Labor (X₃)

Labor refers to the total number of workers absorbed in the Processing Industry Sector and the Wholesale and Retail Trade Sector measured in persons.

Data Analysis

This study uses Multiple Linear Regression Analysis to examine the influence of production value, investment, and labor on economic growth. The regression model used in this research is formulated as follows:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + e$$

Description:

- Y = Economic Growth (GRDP)
- X₁ = Production Value
- X₂ = Investment
- X₃ = Labor
- β_0 = Constant
- $\beta_1, \beta_2, \beta_3$ = Regression Coefficients
- e = Error Term

The analysis includes classical assumption tests consisting of normality test, heteroscedasticity test, multicollinearity test, and autocorrelation test. Furthermore, hypothesis testing is conducted using t-test, F-test, and coefficient of determination (R²) analysis to determine the partial and simultaneous influence of independent variables on economic growth.

Result

Multiple Linear Regression Analysis

In a quantitative method study that compares two independent groups, namely the processing industry sector and the large trade and retail sector, regression models are prepared separately for each sector.

Mathematically, the common forms of multiple linear regression are (Gujarati, 2021):

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

Based on this general form, the model in this study is formulated as follows:

Processing Industry Sector Model

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$$YA = \alpha A + \beta_1 AX_1A + \beta_2 AX_2A + \beta_3 AX_3A + \varepsilon A$$

Description:

- Y_A = Economic growth of the processing industry sector
- X_1_A = Production value X_2_A = Investment X_3_A = Labor α_A = Constant
- $\beta_1A, \beta_2A, \beta_3A$ = Coefisien regressions
- ε_A = Error term

Large Trade and Retail Sector Model

$$YB = \alpha B + \beta_1 BX_1B + \beta_2 BX_2B + \beta_3 BX_3B + \varepsilon B$$

Description:

- Y_B = Economic growth of the large trade and retail sector
- X_1_B = Production value
- X_2_B = Investment
- X_3_B = Labor α_B = Constant
- $\beta_1B, \beta_2B, \beta_3B$ = Coefficient regressions
- ε_B = Error term

This study analyzes the influence of production value, investment, and labor on the economic growth of Sidoarjo in the Processing Industry Sector and the Wholesale and Retail Trade Sector during the 2010–2024 period using multiple linear regression analysis. The regression analysis was conducted to determine the partial and simultaneous influence of each independent variable on regional economic growth measured using Gross Regional Domestic Product (GRDP) at constant prices. With the use of these two separate regression models, the study was able to compare the magnitude of the influence of each independent variable on economic growth in both sectors more comprehensively and identify which sectors have a more dominant contribution to regional economic growth (Gujarati, 2021).

RESULTS AND DISCUSSION

Table 4.1 Regression Results of the Processing Industry Sector

Variables	Coefficient	Prob.	Significance Level ($\alpha = 10\%$)
Constants (C)	376	0.6693	Not Significant
Variable (X1)	356.144	0.0599	Significant
Variable (X2)	-956	0.007	Not Significant



Variable (X3)	865.709	0.0375	Significant
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Source: Processed Research Data

The coefficient of determination (R^2) value in the Processing Industry Sector reached 0.9322. This means that 93.22% of the variation in economic growth can be explained by the variables of production value, investment, and labor, while the remaining 6.78% is influenced by other variables outside the research model. This result indicates that the regression model has a very strong explanatory capability and confirms that the Processing Industry Sector is the dominant sector contributing to economic growth in Sidoarjo Regency.

The production value variable (X_1) has a regression coefficient of 0.356144 with a probability value of 0.0599. Since the probability value is smaller than the significance level of 10% (0.10), production value has a positive and significant effect on economic growth. This means that every increase in production value contributes positively to economic growth in the Processing Industry Sector. Therefore, the first hypothesis stating that production value influences economic growth is accepted. This result indicates that the manufacturing industry sector in Sidoarjo Regency has strong productivity and output capacity in generating regional added value. Increased production activities directly increase GRDP formation and strengthen regional economic performance. These findings are consistent with Robert Solow's Neoclassical Economic Growth Theory, which explains that economic growth is influenced by increased output production through the optimization of production factors. Increased industrial productivity creates higher economic output and strengthens regional economic growth. Furthermore, according to Michael Porter's Competitive Advantage Theory, productivity and production efficiency are important determinants of regional competitiveness. The manufacturing industry sector in Sidoarjo Regency demonstrates strong competitiveness because it can continuously generate industrial output and maintain economic productivity. The investment variable (X_2) has a regression coefficient of -0.000956 with a probability value of 0.507. Since the probability value is greater than the significance level of 10% (0.10), investment does not significantly influence economic growth in the Processing Industry Sector. Therefore, the second hypothesis stating that investment affects economic growth in the Processing Industry.



The negative coefficient indicates that increased investment realization does not directly increase economic growth during the research period. This condition may occur because industrial investment tends to be capital-intensive and requires a relatively long adjustment period before generating economic output. Meanwhile, Michael Porter explains that investment only strengthens competitiveness when supported by innovation, operational efficiency, and productive industrial management. Therefore, although investment realization increased, it did not significantly influence economic growth statistically during the observation period. The labor variable (X3) has a regression coefficient of 0.865709 with a probability value of 0.0375. Since the probability value is smaller than the significance level of 10% (0.10), labor has a positive and significant effect on economic growth. This means that increased labor absorption directly contributes to higher economic growth in the Processing Industry Sector. Therefore, the third hypothesis stating that labor affects economic growth is accepted.

The coefficient value of 0.865709 is the largest among all independent variables in the Processing Industry Sector, indicating that labor is the most dominant variable affecting economic growth in this sector. This condition reflects that the manufacturing industry sector in Sidoarjo Regency still depends heavily on workforce productivity and labor absorption. Increased labor absorption contributes directly to production expansion, industrial operational activities, and sectoral productivity growth. According to Robert Solow's theory, labor is an important production factor that directly affects output growth. Increased labor quantity and productivity will encourage higher economic growth. Meanwhile, Michael Porter emphasizes that human resource quality and workforce competitiveness are important determinants of industrial competitiveness. Skilled labor improves production efficiency, innovation capability, and industrial productivity, thereby strengthening regional economic growth. The simultaneous test (F-test) in the Processing Industry Sector produced a probability value smaller than 0.05, indicating that production value, investment, and labor simultaneously have a significant effect on economic growth. These findings confirm that the synergy between industrial production, labor productivity, and capital utilization collectively influences regional economic performance.

Table 4.2 Regression Results of the Wholesale and Retail Trade Sector

Variables	Coefficient	Prob.	Significance Level ($\alpha = 10\%$)
Constants (C)	2.643.587	0.0001	Very Significant
Variable (X1)	-2.742.969	0.0628	Significant



Variable (X2)	7.622.223	0.000	Very Significant
Variable (X3)	3.024.929	0.036	Significant

Source: Processed Research Data

The coefficient of determination (R^2) value in the Wholesale and Retail Trade Sector reached 0.8874. This means that 88.74% of the variation in economic growth can be explained by production value, investment, and labor variables, while the remaining 11.26% is influenced by other external variables outside the research model. Although the explanatory capability remains strong, the R^2 value is lower than the Processing Industry Sector, indicating that the trade sector is more sensitive to market dynamics and external economic conditions. The production value variable (X1) has a coefficient value of -2.742.969 with a probability value of 0.0628. Since the probability value is smaller than 0.10, production value significantly affects economic growth. However, the coefficient value is negative, indicating that increased production value in the trade sector is associated with declining economic growth. Therefore, the first hypothesis is accepted because the variable is statistically significant. This condition may occur because increased trade activities are not always accompanied by increased regional added value. Trade sector performance is strongly influenced by market demand, purchasing power, and distribution efficiency. Fluctuations in trade output may therefore negatively affect regional economic growth when distribution costs and market inefficiencies increase. The investment variable (X2) has a coefficient value of 7.622.223 with a probability value of 0.0000. Since the probability value is much smaller than 0.10, investment has a positive and very significant effect on economic growth. Therefore, the second hypothesis is accepted. Investment is the most dominant variable in the Wholesale and Retail Trade Sector because increased investment realization directly strengthens commercial infrastructure, business expansion, and distribution efficiency. These findings strongly support Michael Porter's Competitive Advantage Theory, which explains that competitiveness is strongly influenced by productivity, infrastructure quality, and investment efficiency. Increased investment improves market accessibility and strengthens commercial activities in the regional economy. The labor variable (X3) has a coefficient value of 3.024.929 with a probability value of 0.0366. Since the probability value is smaller than 0.10, labor significantly influences economic growth. Therefore, the third hypothesis is accepted. This result indicates that labor absorption in the trade sector contributes positively to regional economic circulation and consumption activities. The



trade sector remains labor-intensive and capable of absorbing a large number of workers. According to Robert Solow's theory, labor directly influences output formation and economic growth, while Michael Porter explains that productive human resources strengthen sectoral competitiveness and operational efficiency.

The simultaneous test (F-test) in the Wholesale and Retail Trade Sector also produced a probability value smaller than 0.05, indicating that production value, investment, and labor simultaneously have a significant effect on economic growth. This finding confirms that all independent variables collectively influence economic performance in the trade sector. Overall, the Processing Industry Sector is more dominant in influencing regional economic growth because it has a higher coefficient of determination value ($R^2 = 0.9322$) compared to the Wholesale and Retail Trade Sector ($R^2 = 0.8874$). The Processing Industry Sector demonstrates stronger productivity and labor contribution toward GRDP formation in Sidoarjo Regency, while the Wholesale and Retail Trade Sector is strongly influenced by investment realization and commercial activities. These findings confirm that industrial productivity, workforce quality, and investment efficiency are important factors supporting sustainable economic growth and regional competitiveness in Sidoarjo Regency.

CONCLUSION

Based on the results of the regression analysis, production value, investment, and labor have different influences on the economic growth of Sidoarjo in the Processing Industry Sector and the Wholesale and Retail Trade Sector during the 2010–2024 period. The Processing Industry Sector has a higher coefficient of determination value ($R^2 = 0.9322$) compared to the Wholesale and Retail Trade Sector ($R^2 = 0.8874$), indicating that the industrial sector is more dominant in influencing regional economic growth. The Processing Industry Sector, production value and labor have positive and significant effects on economic growth, while investment does not significantly affect economic growth. Labor becomes the most dominant variable in this sector because it has the largest regression coefficient value. These findings indicate that industrial productivity and workforce absorption play important roles in supporting regional economic performance. Meanwhile, in the Wholesale and Retail Trade Sector, production value, investment, and labor significantly affect economic growth. Investment becomes the most dominant variable because increased investment realization directly improves commercial infrastructure, business expansion, and distribution efficiency. The labor variable also contributes positively through increased labor absorption and market circulation

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activities. Simultaneously, the F-test results in both sectors indicate that production value, investment, and labor jointly have significant effects on economic growth. Therefore, all research variables collectively contribute to regional economic performance in Sidoarjo Regency. The findings of this study support Robert Solow's Neoclassical Growth Theory, which explains that economic growth is influenced by production output, capital accumulation, and labor productivity. In addition, the results also support Michael Porter's Competitive Advantage Theory, which emphasizes that productivity, investment efficiency, and workforce quality are important determinants of regional competitiveness and sustainable economic growth. Overall, the Processing Industry Sector remains the leading sector contributing to economic growth in Sidoarjo Regency, while the Wholesale and Retail Trade Sector plays a strategic role in supporting commercial activities, distribution systems, and regional economic circulation.

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