

## Analysis of the Impact of Special Economic Zone (SEZ) Gresik on the Economy of Gresik District

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### ABSTRACT

Although Special Economic Zones play a role in encouraging economic growth, high economic growth is not necessarily followed by equitable distribution of benefits for the welfare of all levels of society. This study aims to compare economic conditions before and after the existence of the Gresik Special Economic Zone through a t-test and Granger causality test to determine the cause-and-effect relationship between the independent variables (investment, Local Revenue, processing industry) and the dependent variable (GRDP) during the 2017-2024 period. The results concluded that the Special Economic Zone (SEZ) of Gresik Regency has an impact on the regional economy and the comparison before and after the establishment of the Special Economic Zone (SEZ) shows changes that indicate a shift in the economic structure towards a more productive direction. In addition, the Special Economic Zone (SEZ) of Gresik Regency shows a strong spread effect with an increase in the processing industry sector which contributes directly to GRDP, as well as an influx of investment that increases Local Revenue. However, the backwash effect also occurs when investment activities are focused on the processing industry sector, which relies on Local Revenue as its main growth factor.

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## **INTRODUCTION**

Economic development aims to improve people's welfare through improved living standards and access to basic needs (Todaro & Smith, 2006). One of the main indicators of development success is the Gross Regional Domestic Product (GRDP), which reflects the total value added of all economic activities in a region (Liow et al., 2022). GRDP not only indicates economic growth, but also shows the contribution of key sectors in creating jobs and increasing people's income (Rahmadani, 2020). At the regional level, GRDP is an important tool for measuring economic performance.

In East Java, Gresik Regency occupies a strategic position with a large contribution to the provincial GRDP, especially through the processing industry sector. Gresik's GRDP shows a positive trend post-2020, reflecting the region's economic resilience, especially through the industrial, trade, and construction sectors. The processing industry is the dominant sector with a contribution of 50.39% of the total GRDP of Gresik Regency (BPS Jawa Timur, 2022).

As a step to accelerate development, the government has established Special Economic Zones (SEZ), including the Java Integrated Industrial and Ports Estate (JIPE) in Gresik since 2021. This SEZ integrates industrial, port and residential areas in one area, and is supported by modern facilities and investment incentives (JIPE, 2021). This concept is in line with Perroux's Growth Pole theory (1955), which states that growth centers are able to encourage the development of surrounding areas through the spread effect.

The data shows an increase in investment, especially Foreign Direct Investment (FDI), as well as significant growth in Local Revenue after the operation of SEZ JIPE. However, it needs to be studied more deeply whether the economic growth that occurs is truly felt equally by the local community. Challenges such as the backwash effect and inequality of access to local labor are important issues in the sustainability of SEZ-based regional development.

Several previous studies have shown the positive contribution of SEZs in various regions to GRDP and job creation (Riesfandiari et al., 2023; Rahman & Sopiana, 2019; Makalew et al., 2019). However, most of these studies tend to focus on national-level or interregional impact, and often utilize qualitative approaches. There remains a lack of empirical, region-specific, and quantitative studies that analyze the direct economic impact of SEZs Gresik using measurable indicators such as GRDP, investment, Local Revenue, and manufacturing industry. This research seeks to fill that gap by providing localized empirical evidence using a quantitative approach.

Based on this, this study aims to analyze the impact of Gresik Special Economic Zones (SEZs) on the economy of Gresik Regency. Specifically, it investigates the influence and causality relationships between the SEZ and key regional economic indicators namely GRDP, investment, Local Revenue, and manufacturing industry. The results of this study are expected to contribute to the evaluation and formulation of more effective development policies based on industrial area expansion.

## LITERATURE REVIEW

### *Special Economic Zones (SEZs)*

SEZs are areas with certain boundaries set by the government to develop highly competitive economic activities through special facilities and incentives. The aim is to attract investment, increase exports, create jobs, and accelerate national and regional economic growth. SEZs also serve as development catalysts through economic spillover effects for the surrounding region (World Bank, 2017).

SEZs offer great potential such as increased foreign investment (FDI), exports, and job creation. Studies show the large contribution of SEZs to the economic growth of developing countries (World Bank, 2017). However, challenges include dependence on fiscal incentives, limited infrastructure, and limited spillover effects to the surrounding region. Therefore, the success of SEZs requires careful planning and policies as well as adequate infrastructure support.

### *Growth Pole Theory*

This theory was proposed by François Perroux (1950) and states that economic growth occurs unevenly, but is concentrated in certain areas that become growth centers (Indrapraja, 2022). These regions develop due to the presence of an industrial core that encourages agglomeration and growth of related sectors. Despite creating inequality, growth centers serve as the main drivers of the regional economy (Nusa, 2021)

In the context of growth theory, there are two impacts, the first is the spread effect, which refers to positive impacts such as increased income, technology, and infrastructure in the region around the growth center. Meanwhile, the backwash effect refers to negative impacts such as migration of skilled labor and capital flows to the core region, which can widen the gap between regions (Iskandar et al., 2024).

### *Economic Indicators*

- a. GRDP measures the gross value added of all economic activities in a region. GRDP at current prices reflects economic strength, while constant prices show real growth (BPS Jawa Timur, 2022).
- b. Investment is spending on capital goods that increase production capacity. Consisting of domestic and foreign investment (FDI and FPI), investment drives growth, technology, and employment opportunities (Wahed & Sishadiyati, 2019)
- c. LOCAL REVENUE is revenue obtained by the region from taxes, levies, and management of regional assets, used to fund development without relying on the center (Wahed & Ayu P, 2022).

## METHODOLOGY

This research uses a quantitative approach, conducted in Gresik Regency, with a focus on Gresik SEZ. The data used is quarterly data for 2017-2024 to compare conditions before and after SEZ development. Quantitative secondary data was obtained from BPS Gresik, DPMPTSP, and BPPKAD, including GRDP, investment, Local Revenue, and Manufacturing industry in 2017-2024.

This research uses two main methods:

### **Paired Sample t-Test**

Paired Sample t-Test is a method used to compare two groups of paired data, such as measurements before and after treatment on the same subject (Nurba'id et al., 2022).

Used to test significant differences in variables before and after SEZ development.

The following is the Paired Sample t-test formula (Nuryadi et al., 2017):

$$t_{hitung} = \frac{\bar{d}}{SD/\sqrt{n}}$$

Description:

- a.  $\bar{d}$  : the average difference of the data pairs before and after
- b.  $SD$  : Standard Deviation of the difference of the data pairs
- c.  $n$  : Number of data pairs

Hypothesis:

- o  $H_0$ : There is no significant difference
- o  $H_1$ : There is a significant difference

### **Granger Causality**

Granger causality test is an analytical method used to identify the relationship between two variables, where one dependent variable can be influenced by an independent variable, while the independent variable can also act as a dependent variable. This kind of relationship is often referred to as a causal relationship (O. Wullur et al., 2019)

Used to test whether the independent variables (investment, LOCAL REVENUE, processing industry) causally affect GRDP as well as between independent variables.

The Granger Causality equation model (Gujarati, 2010) can be formulated as follows:

$$Y_t = \sum_{i=1}^m a_i Y_{t-i} + \sum_{i=1}^m \beta_i X_{t-i} + \epsilon_{1t} \dots \dots (3.1)$$

$$X_t = \sum_{i=1}^m \delta_i X_{t-i} + \sum_{i=1}^m \varphi_i Y_{t-i} + \epsilon_{2t} \dots \dots (3.2)$$

Description:

$Y_t$  : Dependent Variable

$X_t$  : Independent Variable

$\alpha$  : Constant.

$\beta, \delta, \varphi$  : Coefficient of each variable

$\epsilon_t, \eta_t$  : Error term

$m$  : Number of lags

Hypothesis:

- a. If the probability value (p-value) < 0.05, then  $H_0$  is rejected. That is, there is a cause-and-effect relationship.
- b. If the p-value  $\geq$  0.05, then  $H_0$  is accepted. This means that there is no significant causal relationship.

## RESEARCH RESULTS AND DISCUSSION

### T-Test

The establishment of Gresik SEZ in 2021 became a new economic growth pole. Gresik's GRDP rose from IDR 118.6 trillion (2017) to IDR 163.9 trillion (2022). Investment jumped from IDR 9.8 trillion (2021) to IDR 52 trillion (2023), and LOCAL REVENUE reached IDR 1.171 trillion (2023).

Table 1 t-Test

Variable	p-value	Conclusion
GRDP (Rp miliar)	0,0000	Significant (p<0,05)
Investment (Rp Miliar)	0,0000	Significant (p<0,05)
Local Revenue (Rp miliar)	0,0006	Significant (p<0,05)
Manufacturing Industry (Rp miliar)	0,0000	Significant (p<0,05)

Source: Data processed by the author, 2025

The results of the t-test show that all the main variables-GDP, investment, Local Revenue, and manufacturing industry-experienced significant increases after the SEZ was inaugurated (p-value <0.05). This increase shows a strong growth effect, mainly triggered by investment and expansion of the manufacturing sector, which accounts for more than 50% of Gresik's GRDP.

This finding is in line with the growth pole theory and supported by literature such Violita (2023) and Riesfandiari et al., (2023), In other words, the T-test shows a significant difference in the economic structure before and after the SEZ, which in theory can be interpreted as Gresik's growth pole effect.

### Granger Causality

Table 2 Granger Causality Test Results

Causality Relationship	Lag(prob)	Description
Investment → GRDP	2 (0.1158)	No causal relationship
GRDP → Investment	2 (0.2959)	No causal relationship
Local Revenue → GRDP	2 (0.1547)	No causal relationship
GRDP → Local Revenue	2 (0.2026)	No causal relationship
Manufacturing Industry → GRDP	1 (0.0045)	Causal relationship exists
GRDP → Manufacturing Industry	1 (0.0039)	No causal relationship
Local Revenue → Investment	2 (0.3309)	No causal relationship
Investment → Local Revenue	2 (0.0465)	Causal relationship exists
Manufacturing Industry → Investment	2 (0.3103)	No causal relationship

Investment → Manufacturing Industry	2 (0.0434)	Causal relationship exists
Manufacturing Industry → Local Revenue	1 (0.2600)	No causal relationship
Local Revenue → Manufacturing Industry	1 (0.0324)	Causal relationship exists

*Source: Data processed by the author, 2025*

### ***Investment and GRDP***

In theory, investment is considered one of the main drivers of economic growth. The Harrod-Domar and Solow-Swan theories explain that investment increases production capacity and enlarges national output. However, the Granger test results show that in Gresik there is no causal relationship between investment and GRDP, either one-way or two-way.

This is surprising, but can be explained contextually. Gresik is an area with a very mature industrial structure, dominated by large national and multinational companies such as PT Freeport Indonesia, PT Smelting, and others. Additional incoming investment tends to be capacity expansion or infrastructure renewal, whose effects on output (GRDP) are not immediately felt in the short term. Similarly, although GRDP increases, these companies do not necessarily add new investment, because investment decisions are long-term and are strongly influenced by global conditions and national macro policies.

### ***Local Revenue and GRDP***

The test results show that there is no causal relationship between Local Revenue and GRDP. This means that an increase in Local Revenue does not trigger an increase in GRDP, and conversely, GRDP growth does not necessarily increase Local Revenue. This can happen because the structure of Local Revenue in Gresik mostly comes from taxes and levies that are inelastic to economic growth, as well as many large industrial taxes directly deposited to the center.

Although in theory Local Revenue reflects fiscal capacity that can be used to encourage economic development, in practice in Gresik, high economic growth has not been in line with a proportional increase in Local Revenue. For example, despite significant increases in GRDP and investment, Local Revenue realization in 2023 only reached around 73.9% of the target and did not show sharp growth.

### ***Processing Industry and GRDP***

Unlike the previous two relationships, the Granger test found that there is a two-way causal relationship between the processing industry and GRDP. This means that the manufacturing sector not only contributes greatly to economic growth, but also grows thanks to general economic development.

This suggests that the industrial sector is the center of gravity of Gresik's economy. When industry develops, GRDP rises. Conversely, when the economy improves, the industry also grows through increased demand, exports, and production expansion. This finding is in line with Gresik's position as one of the largest manufacturing bases in East Java.

### ***Investment and Local Revenue***

The test results show that investment affects Local Revenue, but not the other way around. This means that when investment increases—for example, due to the entry of large projects into SEZs—there will be an increase in Local Revenue, either through retribution, business licenses, or derivative economic activities. However, an increase in Local Revenue does not necessarily encourage additional investment.

This makes sense given the role of investment as an initial trigger. In the context of Gresik SEZ, large investments in the industrial sector have had an impact on Local Revenue, although the contribution has not been maximized because most of the revenue is still managed by the central government. Thus, it is important for the region to improve its fiscal system in order to capture more benefits from these investment flows.

### ***Investment and Manufacturing Industry***

Furthermore, there is a one-way relationship from investment to manufacturing. The influx of investment, particularly in the form of construction of manufacturing facilities, smelters, or expansion of heavy industry, has been shown to boost industrial sector output growth. On the other hand, industrial production growth has not been strong enough to attract new investment directly.

This could be due to the business model of large companies that tend to be unresponsive to short-term fluctuations. Despite rising demand, many companies prefer to optimize their existing capacity before undertaking new expansion.

### ***Local Revenue and Manufacturing Industry***

The latest findings show that Local Revenue has an effect on manufacturing industry, but not the other way around. This means that regional expenditures sourced from Local Revenue, such as road construction, energy supply, or public facilities, are able to create conditions that support industries to grow. However, the growth of the manufacturing industry has not had a large direct impact on increasing Local Revenue.

This is because most large industries in Gresik do not contribute directly to local Local Revenue. They operate with central licenses and pay taxes to the central government. As a result, although the industry is growing rapidly, the fiscal benefits received by the region are still limited. To overcome this, the local government needs to expand the local tax base that reaches industrial support sectors such as logistics, trade, and worker housing.

The results of the research through the Granger Causality test show that there is a combination of the spreading effect and the sucking effect in Gresik Regency after the development of SEZs. In terms of the spreading effect, there is a two-way causal relationship between the manufacturing sector and GRDP. This indicates that the growth of the industrial sector makes a real contribution to GRDP and vice versa, thus showing a healthy synergy between the industrial sector and regional economic growth. In addition, there is a one-way relationship from investment to PAD, which means that investment flows are able to increase

regional fiscal capacity. These two findings suggest that Gresik SEZ has a positive role in driving the region's overall economy.

However, this study also identifies signs of a sucking effect. One of them is the one-way relationship from investment to the manufacturing sector. This means that investment into Gresik SEZ tends to focus on certain industrial sectors only and has not spread to other sectors such as agriculture, services, or the local economy. This indicates a narrow concentration of development. In addition, the one-way relationship from PAD to manufacturing shows that industrial growth still depends on regional fiscal support. Meanwhile, the industrial sector has not made a balanced direct contribution to PAD, as most industrial taxes are remitted to the central government.

Overall, these findings confirm that the Gresik SEZ has succeeded in creating a new economic growth center that has a positive impact on GRDP, the manufacturing sector, and PAD. However, the benefits are still unevenly distributed across all sectors. Therefore, more inclusive policies are needed so that the SEZ's spreading effects can reach other economic sectors. Strategies such as involving local MSMEs in the industrial supply chain, diversifying investment into the energy, water, waste management sectors, and increasing regional fiscal capacity are essential to ensure that Gresik SEZ provides long-term benefits to all levels of society and economic sectors in Gresik Regency.

## CONCLUSIONS AND RECOMMENDATIONS

### *Conclusions*

The determination of Gresik Regency as a special economic zone (SEZ) area for industrial development, investment, employment, local economy and economic growth and equitable development. The phenomenon above requires immediate evaluation and impact to ensure the successful implementation of development policies according to the plans set at the beginning by the government, so that from the stages of this research several conclusions are obtained, namely:

- a. The Special Economic Zones (SEZs) of Gresik Regency has an impact on the regional economy through an increase in Gross Regional Domestic Product, investment, Regional Original Revenue, and processing industry output. Comparison before and after the establishment of Special Economic Zones (SEZs) shows a change, which indicates a shift in economic structure towards a more productive direction.
- b. The Special Economic Zones (SEZs) of Gresik Regency shows a strong Spread Effect impact with an increase in the processing industry sector that contributes directly to GRDP in the long term, as well as an influx of investment that increases Local Revenue. However, the Backwash Effect also occurs, where investment is focused on the processing industry sector, which relies on Local Revenue as its main growth factor. This concentration risks creating sectoral imbalances and limiting equitable distribution of economic benefits in the short term.
- c. This study is subject to several limitations. First, it relies solely on secondary data, which may not capture qualitative dimensions such as community perceptions, labor dynamics, or environmental impact.

Second, the analysis focuses on a single SEZ (Gresik) without comparing it with other similar zones, which limits the generalizability of the findings. Third, the research emphasizes economic indicators, while excluding social or ecological aspects that may be important for comprehensive SEZ evaluation.

- d. For future research, it is recommended to incorporate primary data collection, such as surveys or interviews, to gain deeper insights into the social and labor impacts of SEZ development. Comparative studies across multiple SEZs in different regions would also strengthen the analysis. In addition, integrating environmental and social equity indicators could provide a more holistic understanding of SEZ impacts and support more sustainable policy design.

### **Recommendations**

Referring to the analysis, discussion and results that have been described, the following suggestions are proposed that can be applied based on the results of the evaluation of the impact of the Gresik Regency Special Economic Zone policy, namely:

- a. The Gresik Regency Government needs to formulate further policies that strengthen the connection between activities in the SEZ and the local economy, such as by encouraging the participation of MSMEs, providing supporting infrastructure, and incentives that support local supply chains. This effort is important so that the SEZ does not become a separate economic enclave, but truly becomes a motor of inclusive growth in the Gresik region.
- b. The elaboration of the roles of the central and local governments in the context of SEZ management determines the success while creating an investment ecosystem that is more conducive to regional economic development.

### **ADVANCED RESEARCH**

Future research could explore a multi-dimensional impact assessment of SEZ Gresik by incorporating social and environmental indicators alongside economic variables. This would allow for a more holistic understanding of how SEZ development affects community welfare, labor absorption, land use patterns, and ecological sustainability. Moreover, applying spatial econometric models and GIS-based analysis could help identify the geographical spread and sectoral reach of the SEZ's economic influence. Comparative longitudinal studies between multiple SEZs in Indonesia such as Sei Mangkei or Mandalika would also strengthen policy recommendations by uncovering patterns of success and structural challenges across different regional contexts.

### **REFERENCES**

- BPS Jawa Timur. (2022). Produk Domestik Regional Bruto Kabupaten/Kota Jawa Timur. *Bps.Go.Id*, 2022(December), 1–6.
- Gujarati, D. N. (2003). *Basic Econometrics*. McGraw Hill. <https://books.google.de/books?id=byu7AAAAIAAJ>

- Indrapraja, De. (2022). *Analisis Dampak Jembatan Nasional Suramadu Terhadap Aglomerasi Industri Di Wilayah Surabaya Dan Madura*. Universitas Airlangga.
- Iskandar, A. R. A., Subandi, M. D., & Pasaribu, R. R. B. (2024). Penurunan Industri Manufaktur Terhadap Turunnya Ekspor Impor. *Investama: Jurnal Ekonomi Dan Bisnis*, 10(01), 55–70. <https://doi.org/10.56997/investamajurnalekonomidanbisnis.v10i01.1320>
- JIIPE. (2021). *Kawasan Ekonomi Khusus Indonesia Gresik Java Integrated Industrial and Ports Estate-JIIPE*. Jiipe.Com. [https://www.jiipe.com/id/home/kawasanekonomi/page/pp\\_71](https://www.jiipe.com/id/home/kawasanekonomi/page/pp_71)
- Liow, maria omega, Naukoko, A., & Wensy, R. (2022). Pengaruh Jumlah Penduduk dan Investment Terhadap Produk Domestik Regional Bruto (GRDP) di Provinsi Sulawesi Utara. *Jurnal Berkala Ilmiah Efisiensi*, 22(2), 140.
- Nurba'id1, A. R. C., Nafilah, Z., Magdalena, M., Nisyak, H. K., Lailatul, S., Mutmainah, R., Ghurri, A., Andriana, L. M., & Ningsih, A. W. (2022). ARTIKEL REVIEW: Penerapan Paired T-Test Local Revenuea Penelitian Farmasi REVIEW ARTICLE: Application of Paired T-Test in Pharmaceutical Research. 2(2), 146–153.
- Nuryadi, Astuti, T. D., Utami, E. S., & Budiantara, M. (2017). Buku Ajar Dasar-dasar Statistik Penelitian. In *Sibuku Media*.
- Nusa, E. A. A. (2021). *Dampak Pembangunan Jembatan Suramadu dan Spillover Effect Kegiatan Ekonomi Kota Surabaya terhadap Wilayah Madura* [Universitas Brawijaya]. <http://repository.ub.ac.id/185237/>
- O. Wullur, R., A.M Koleangan, R., & O.Niode, A. (2019). Analisis Kausalitas Pendapatan Asli Daerah Dan Pertumbuhan Ekonomi Di Provinsi Sulawesi Utara Tahun 2001-2017. *Jurnal Berkala Ilmiah Efisiensi*, 19(03), 45–55.
- Rahmadani, D. R. (2020). *Growth Pole dalam Pembangunan Ekonomi Indonesia*. Feb.Ub.Ac.Id. <https://feb.ub.ac.id/growth-pole-dalam-pembangunan-ekonomi-indonesia/>
- Riesfandiari, I., Setyawan, B., & Wahyudi, I. T. (2023). Dampak Kawasan Ekonomi Khusus (Kek) Sei Mangkei Terhadap Perekonomian Di Kabupaten Simalungun. *Jurnal Perspektif Bea Dan Cukai*, 7(1), 147–170. <https://doi.org/10.31092/jpbc.v7i1.2131>
- Violita, R. (2023). *Peran Kawasan Ekonomi Khusus (KEK) terhadap Pertumbuhan Ekonomi Wilayah: Analisis Spasial Eksternalitas = Spatial Externalities of Special Economic Zone on economic growth: Case of Indonesia*. Universitas Indonesia.
- Wahed, M., & Ayu P, I. S. (2022). Analisis Efektifitas Pajak Daerah Kabupaten Bojonegoro. *Jurnal Dinamika Ekonomi Pembangunan*, 5(1), 86–94. <https://doi.org/10.33005/jdep.v5i1.320>
- Wahed, M., & Sishadiyati, S. (2019). Perencanaan Kebijakan Investment Dalam Percepatan Pertumbuhan Ekonomi Kabupaten Pacitan. *Dinamika Governance: Jurnal Ilmu Administrasi Negara*, 9(2). <https://doi.org/10.33005/jdg.v9i2.1677>
- World Bank. (2017). Special economic zones: an operational review of their impacts. *The World Bank Group*, 1–174. <http://documents.worldbank.org/curated/en/316931512640011812/Special-economic-zones-an-operational-review-of-their-impacts>