COMSERVA:
Jurnal Penelitian dan Pengabdian Masyarakat
Volume 3 No. 11 Maret 2024 (4497-4507)
e-ISSN: 2798-5210
p-ISSN: 2798-5652

Analysis of Development Inequality Between Regions in java and bali, Economic Spatial Approach

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DOI:
10.59141/comserva.v3i11.1240

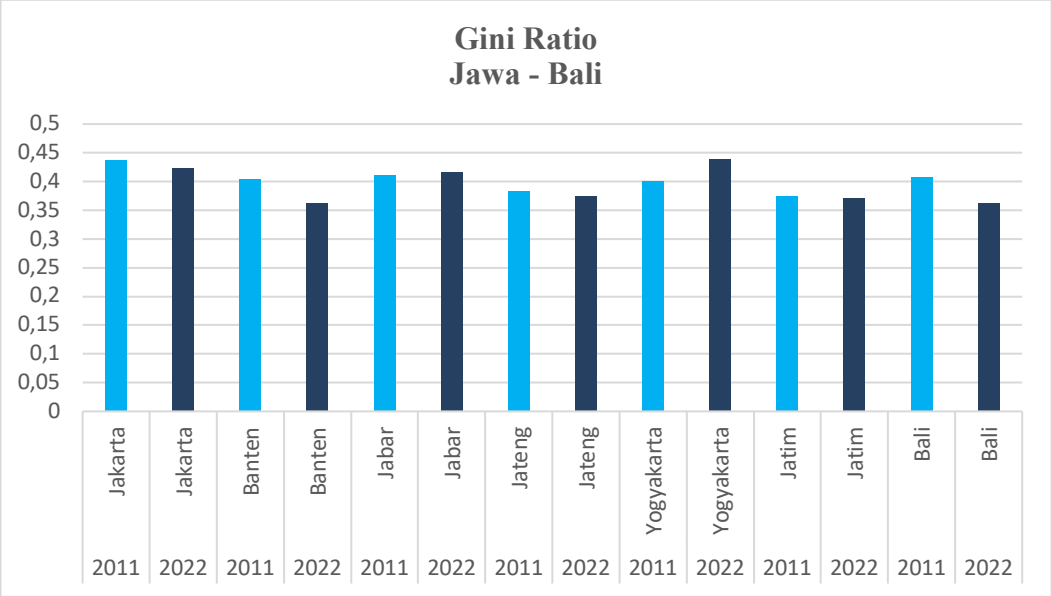
ABSTRACT

Economic activities often experience disparities (inequalities) in regional development, this is due to differences in natural resources and geographical conditions in each área area. This study aims to find out which regions experience development inequality. This research uses reference data on Gross Regional Domestic Product and Number of Population in Java and Bali, with a range of 2011 – 2022. The method of measuring development disparity using the Theil One Stage and Two Stage Index. The results of this study show that inequality in Java and Bali occurs mostly in East Java and Bali. With a tendency to increase trend (convergen). So the theory of Neo-classical Hypothesis is in line with this research. And inequality in the region (Whitin Region) has a high inequality value of 210% - 146% from 2019 - 2022, while from the second stage 47% - 46%. The conclusion of this study shows that Java and Bali experience high development inequality, with economic interactions between regions reinforcing the inequality.

Keywords: *regional development inequality, spatial, economic spatial analysis*

INTRODUCTION

Economic activities often experience disparities in regional development, this is caused by differences in natural resources and geographical conditions in each area (Sjafrizal, 2008). Evidenced in the New Order era, namely the difference between central and regional development, which is still focused on central development. So that regional development tends to slow down development. During the reform period, development was still focused on the central area of government. So in 2001, the central government began equitable distribution of regional development by giving power to local governments to regulate their own regions. So it is hoped that regional autonomy will be the best method to accelerate regional development and reduce regional inequality (Abdiriyanto & Cita Permata, 2022);(Hidayat, 2023). Due to differences between central and regional development, the ability of a region to encourage the development process is different in each region. Development inequality between regions is still a recurring characteristic in Indonesia's economic picture. according to Van Leeuwen &; Foldavari, in the New Order era, the centralized and dominant development pattern in Java Island resulted in development inequality and affected poverty levels (Hidayat, 2023).



Gambar 1 : Gini Ratio Jawa - Bali 2011 - 2022
Sumber: Badan Pusat Statistik 2022

Based on data released by the Central Statistics Agency (BPS), the Java-Bali Gini Ratio data taken for 11 years, namely 2011 – 2022, where in 2011 the area that experienced income inequality was the Jakarta area. Meanwhile, in 2022, the area where income inequality occurs is Yogyakarta. According to the calculation of the gini ratio by the Central Bureau of Statistics where the gini ratio value ranges between 0 (zero) and 1 (one) (Badan Pusat Statistik, 2023). A Gini ratio value that is closer to 1 indicates a higher level of inequality. So this study examines the development of development inequality between regions at the district / municipality, provincial and national levels, namely Indonesia. Our aim is to provide a more modern assessment of Indonesia's development inequality.

According to Sjafira, theoretically, the problem of development inequality between regions was first raised by Douglas C North in his analysis of Neo-Classical Growth Theory (Sjafrizal, 2008). In this theory, a prediction is made about the relationship between the level of national economic development of a country and the inequality of development between regions. This hypothesis came to be commonly known as the Neo-Classical Hypothesis. According to the neo-classical hypothesis. At the beginning of a country's development process, development inequality between regions tends to increase. This process will occur until the inequality reaches a breaking point. After that, if the development process continues, then gradually the development inequality between these regions will decrease.

According to Jhiang, the occurrence of regional inequality is due to the large influence of *the backwash effect* compared to *the spread effect* in underdeveloped countries (Jhingan, 2016). The movement of capital will increase regional inequality, the increase in demand to developed regions will stimulate investment which in turn increases income leading to a second round of investment and so on. A good scope of investment in development centers can create a scarcity of models in underdeveloped regions.

Research on development inequality focuses on averages only at the provincial level such as: (Esmara, 1975);(Akita & Alisjahbana, 2002);(Kataoka, 2010);(Hayashi et al., 2014); However, previous research studies at the district / city level at the national level and research on provinces are:

(Akita, 2003);(Firdaus & Rindayati, 2012);(Hidayat, 2014);(Mukhlis et al., 2017);(Hidayat & Rahayu, 2018);(Soebagyo et al., 2019);(Aginta et al., 2021);(Akita et al., 2021). The results showed that there was a development inequality with a value that was factual during different observation periods.

Current research shows that several different ways are used to calculate inequality values, a method that uses the wiliamson index (Firdaus & Rindayati, 2012);(Hidayat & Rahayu, 2018);(Soebagyo et al., 2019);(Tiara & Rahayu, 2023) and Theil index by (Hidayat, 2014);(Hidayat, Darwin, et al., 2018);(Zasriati, 2022) Using *the One Stage Model* in the meantime (Akita, 2003);(Akita et al., 2021);(Hayashi et al., 2014) menggUse the *two-stage model* method. Both indices have advantages, for example, the Wiliamson index has a realistic final measurement value and can explain the level of development inequality that occurs, while the advantage of the first Theil index, does not depend on the number of regions so that it can be used as a comparison of disparities from different regional systems. Second, it can be combined into between inequality and within inequality within the group or group area simultaneously followed by spatial analysis. Third, have the ability to calculate the contribution (in percentage) of each region to the overall regional development inequality, so as to provide policy recommendations.

The main objective of this study is to identify patterns of development inequality between regions in Java and Bali using an economic spatial approach. Through this approach, the study aims to identify the factors that influence inequality, both spatially and economically. In addition, this study also aims to provide relevant policy recommendations to reduce development inequality between regions. The benefits of this research are crucial, as it can provide a better understanding of regional development dynamics, as well as provide guidance for policymakers in planning more equitable and sustainable development strategies in Java and Bali. Thus, this research is expected to make a significant contribution to economic and social development in Indonesia, especially in Java and Bali. With uneven economic growth between regions, the problem of development inequality is becoming increasingly important to understand and address.

METHOD

This research was conducted quantitatively. Data was obtained from the Central Bureau of Statistics at the District/City and Provincial Levels with a research period of 2010 - 2022. The reference for using this research data is Gross Regional Domestic Product (GRDP) and Number of Population at the Regency / City and Provincial Levels. To obtain the results of the calculation of development inequality using the Theil Index calculation method with the first and second stages *(One-stage and Two stage)*. The initial calculation aims to measure development disparities between regions in Provinces and Districts. The sector area in regencies / cities on the islands of Java and Bali is 128.

Theil Index (Measurement of Inequality)

The function of this method is to analyze trends in geographic concentration over a certain period of time and provide a more structural picture of development inequality between regions by dividing them into inequalities between regions (*between-regions*) and within regions (*within-region*). The method is formulated as follows:

$$I_T = \sum_{i_1}^{n} y_i \log\left(\frac{Y_i}{X_i}\right)$$

Where, IT is the total disparity (Theil Index), yi is the GDP value of Province I or GRDP of a region, xi is the total population of the Province or population of the region, yi log () is the partial disparity. As

for the result of calculating this method, if it is 0, then the area as a whole has been evenly developed $y_i \ / \ x_i$(Hidayat, 2023a) In this study, the Java region is divided into 3 regions, namely region 1: Jakarta Province, and Banten, for region 2: West Java, Yogyakarta, and Central Java Provinces, region 3: East Java, and Bali. Instead, the regional division sector is measured based on the number of district/city sectors that exist.

The decomposition equation from between and within becomes an equation, namely:

$$I_T = I_B + I_W$$

$$I_B = \sum_{g=1}^{n} Y_g \log\left(\frac{Y_g}{X_g}\right) \qquad I_W = \sum_{g=1}^{n} Y_g \ I_g$$

$$Y_g = \sum Y_i \qquad X_g = \sum X_i \qquad I_g \sum_i \frac{Y_i}{Y_g} \log\left(\frac{Y_i/Y_g}{X_i/X_g}\right)$$

Two Stage *Theil Decomposition Method*

According to (Hidayat, 2023), This second stage calculation method is carried out in a hierarchical structure at the regional level – province – district / city. In this method making the district / city level as the main base area for calculation, regional inequality as a whole is written in the following equation:

$$T_T = \sum \left(\frac{y_{ijk}}{Y}\right) \log\left(\frac{y_{ijk}/Y}{x_{ijk}/X}\right)$$

Where yijk is the value of GDP at the district / city level k in Province j in region i. Y is the overall GDP value at the district / city level, is the population at the district / city level k in province j in region i. while X is the total population as a whole at the district / city level $\left(\sum y_{ijk}\right) x_{ijk} \left(\sum x_{ijk}\right)$.

If it is explained that it is an inequality between district / city levels for region I T_{Ti}*(between),* then the equation is written as follows:

$$T_{Ti} = \sum \left(\frac{y_{ijk}}{Y_i}\right) \log\left(\frac{y_{ijk}/Y_i}{x_{ijk}/X_i}\right)$$

The next stage in equation (3) is decomposed intoT_T

$$T_T = \sum \left(\frac{Y_i}{Y}\right) T_{Ti} + \sum_i \left(\frac{Y_i}{Y}\right) \log\left(\frac{Y_i/Y}{X_i/X}\right)$$
$$= \sum_i \left(\frac{Y_i}{Y}\right) \ T_{Ti} + T_{BR}$$

Namely Yi is the sum of GDP of Region i, $X\left(\sum j \ \sum k \ y_{ijk}\right)_i$ is the total population of region i, and $T\left(\sum j \ \sum k \ x_{ijk}\right)_{BR}$ is the inequality between *regions*.

Thus, regional inequality as a whole TT is the sum of the components within region and components *between* regions. Furthermore, Tij is defined as a measure of inequality within the province *(Within)* for province j in region i.

$$T_{ij} = \sum_{k} \left(\frac{y_{ijk}}{y_{ij}}\right) \log \left(\frac{y_{ijk}/Y_{ij}}{X_{ijk}/X_{ij}}\right)$$

Then TTi in equation (3) can be further decomposed into:

$$T_{Ti} = \sum_{j} \left(\frac{Y_{ij}}{Y_i}\right) T_{ij} + \sum_{j} \left(\frac{Y_{ij}}{Y_i}\right) \log \left(\frac{Y_{ij}/Y_i}{X_{ij}/X_i}\right)$$
$$= \sum_{j} \left(\frac{Y_{ij}}{Y_i}\right) T_{ij} + T_{pi}$$

Where Yij is the GDP of Province j in region i (∑k yijk), Xij is the Population of Province j in region i (=∑k xijk), and is a measure of inequality between provinces $T_{pi} = \sum j \left(\frac{y_{ij}}{y_i}\right) \log \left(\frac{y_{ij}/y_i}{x_{ij}/x_i}\right)$*(Between)* in region i.

Substituting TTi in the previous equation becomes:

$$T_T = \sum_{i} \left(\frac{Y_i}{Y}\right) \left[\sum_{j} \left(\frac{Y_{ij}}{Y_i}\right) T_{ij} + T_{pi}\right] + T_{BR}$$
$$= \sum_{i} \sum_{j} \left(\frac{Y_{ij}}{Y}\right) T_{ij} + \sum_{i} \left(\frac{Y_i}{Y}\right) T_{pi} + T_{BR}$$
$$= T_{WP} + T_{BP} + T_{BR}$$

Equation (7) is the decomposition of the second stage *(Two stage) Theil* Index, where regional inequality as a whole is traced into a province *(within) (Twp), an* inter-provincial component *(TBP),* and an inter-region component *(between-region) (TBR).* The *within-province* component is the weighted average of inequality within provinces (Tij), while the *between-province* component is the weighted average of inter-provincial development inequality (TPI). Please note that the inequality rate based on provincial GDP and population data can be compared with the sum of the components of inequality between *provinces and between regions* in the second stage decomposition analysis *of the* Theil Index.

RESULTS AND DISCUSSION

Analysis of development inequality models that occur between regions in Java and Bali using the Theil Index with *one-stage* and *two-stage* decomposition approaches. Furthermore, from the model, calculations were carried out to determine development inequality. Both between regions *(between)* and within regions *(whitin).* The structure of the territory on *the one-stage* is divided into three parts. The

structure of the unit of analysis is the provinces. Meanwhile, for the *two-stage approach,* the regional hierarchy becomes three parts, namely regions-provinces-districts / municipalities.

The results of the Theil Index analysis using GDP data for the 2011-2022 period are presented in the figure below.

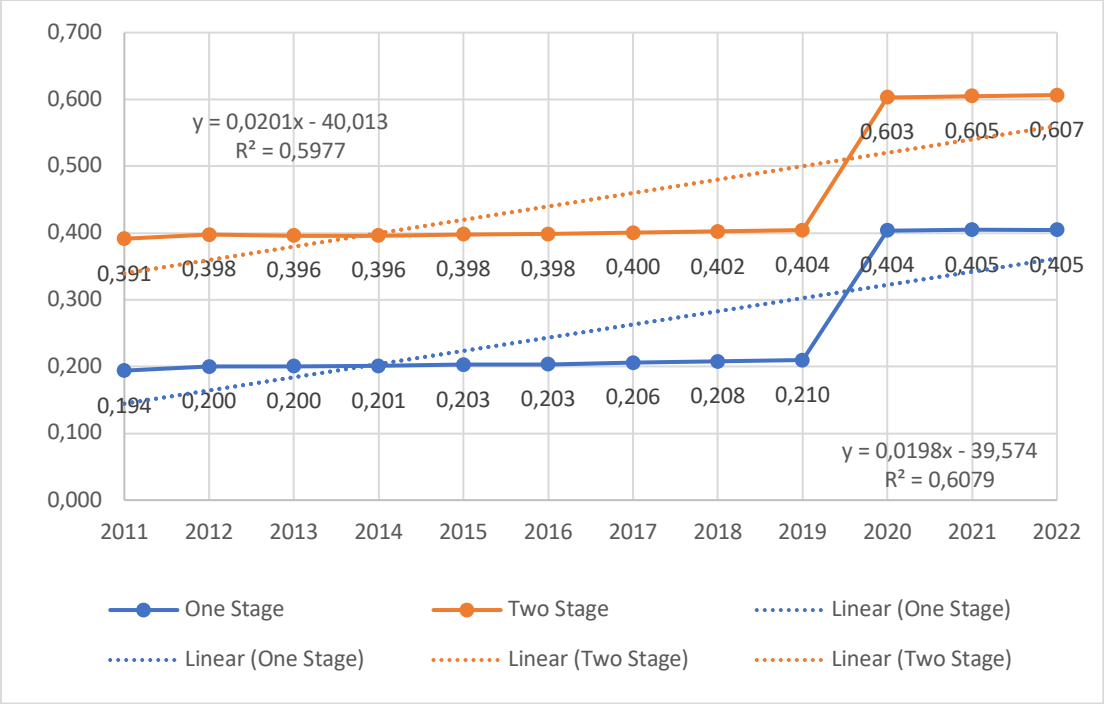


Figure 2. Theil Index Value, 2011-2022
Source: Author's Processed Data

Based on Figure 2, there is an inequality of development between regions, which for *one-stage* calculations is at 0.405 to 0.194 and at *two-stage* is at 0.607 to 0.391 for the 2011-2022 period. Furthermore, the trend of development inequality that occurs between regions has increased for both calculation approaches. The increase in *this trend* has occurred since 2019. From the results of this analysis states that there was a divergence process that occurred on the islands of Java and Bali during the analysis period. The model under study indicates the occurrence of divergence processes in accordance with the theory of Neo-Classical assumptions that initially the development of a developing country tends to increase. Then the process reaches the peak level of inequality, if development continues, development inequality gradually decreases. The conclusion is that in general in developing countries experience high development inequality (Sjafrizal, 2008).

Furthermore, based on the research period, *the calculation of one-stage* decomposition states that the source of development inequality between regions is centered on the third part of the regional group, namely the East Java Region and the Bali Region. Furthermore, referring to the value of Gross Regional Domestic Product, the East Java Region has a high GDP value. Based on research (Septiani & Endang, 2022) said that the East Java region has a high level of inequality. And Mevia (2023) proves that inequality based on regions is broken down into four, namely North, South, North, East, and Southwest. Of the four regions, regional inequality occurs in the North South region (covering Blitar Regency, Malang Regency, Sidoarjo Regency, Mojokerto Regency, Gresik Regency, Pasuruan City,

Surabaya City), with an inequality value of 0.003188 (Mevia, 2023). Meanwhile, according to Raeskyesa et al (2019), most areas of Bali still have gaps between regions (Raeskyesa et al., 2019).

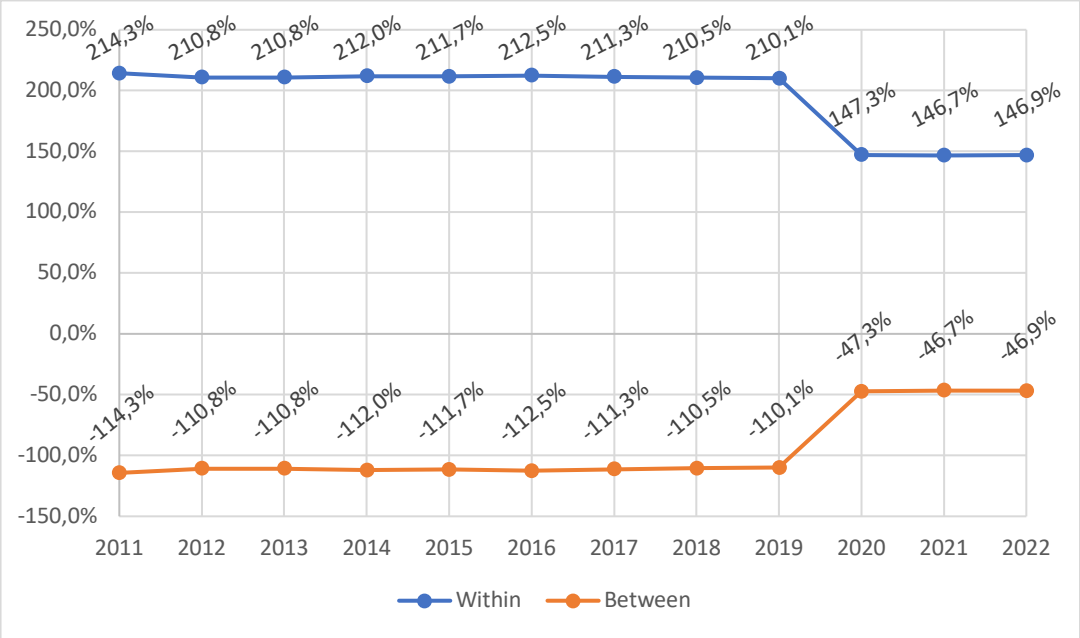


Figure 3. Theil *One-Stage Decomposition*
Source: Author's Processed Data

In a deeper analysis of *Theil's decomposition, the one-stage* in figure 3 contributes to the formation of inequality between regions *(between)* and within regions *(within).* Based on figure 3, those who contributed to the *inner* region decreased by 210.8% to 146.9%. Meanwhile, inter-region between moved up from 110.8% to 46.9%. This is because development inequality is still the highest for the region *within*. According to (Hidayat, 2023) Inequality that occurs within the development area (within region) consists of several adjacent provincial areas both administratively and distance between capitals. So that spatially, neighboring regions have economic influence of other neighboring regions. The inequality of development in East Java is evidenced by (Nasution Marihot, 2020).

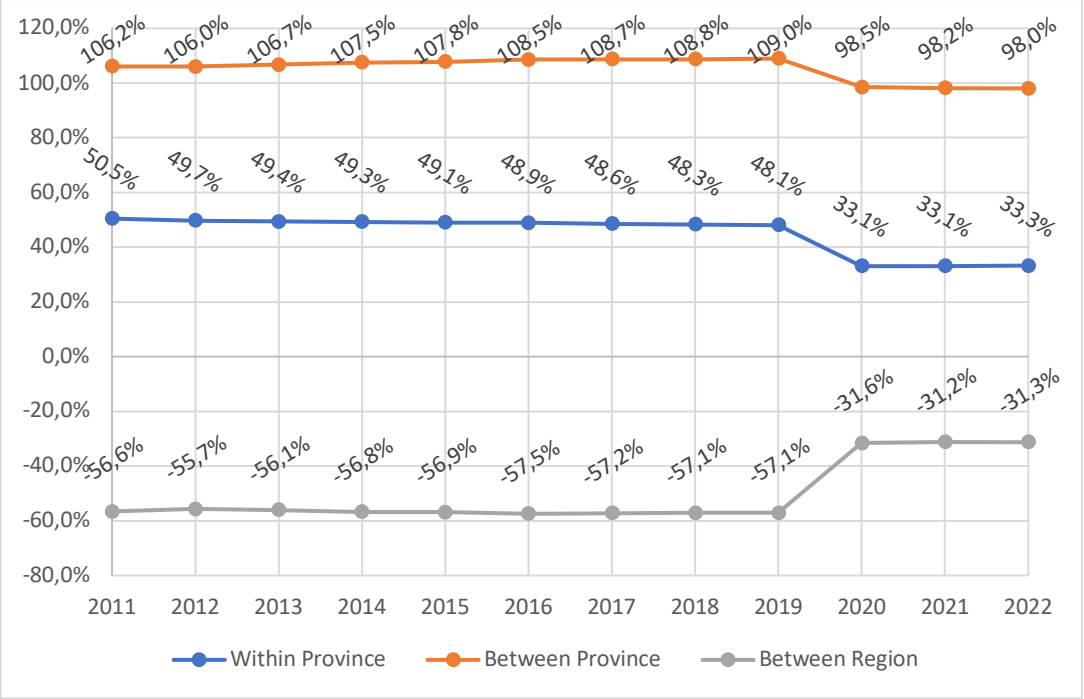


Figure 4. Theil *Two-Stage Decomposition*
Source: Author's Processed Data

Furthermore, in figure 4, Theil *Two Stage* Decomposition is an analysis to assess the contribution of *Theil Two Stage Decomposition*. In this analysis, there is a new value component, namely within provinces, which is the contribution of inequality starting from within the province or between districts / municipalities. Generally, the results of *a two-stage* analysis are divided into three components. The yield between regions increased from 56.6% to 31.3%. The yield between the two provinces decreased from 106.2% to 98%. Meanwhile, the results of the third component indicate that the contribution value within the province has a tendency to decrease from 50.5% to 33.3%.

Based on the results of processing with *theil index* decomposition modeling, that Java and Bali are regions that experience very high development inequality. Spatially, neighboring regions affect development inequality with other regions as evidenced by research from the provincial and district levels, so that the East Java and Bali regions have an attachment to development inequality. (Septiani & Endang, 2022); (Mevia, 2023). And Bali Region by (Raeskyesa et al., 2019).

CONCLUSION

Based on the results of the analysis of development inequality modeling in Java and Bali using the Theil Index with one-stage and two-stage decomposition approaches during the 2011-2022 period, it can be seen that there are significant inequalities between regions. From the one-stage calculation, the inequality rate ranges from 0.405 to 0.194, while in the two-stage it ranges from 0.607 to 0.391. During this period, there was an increase in the trend of development inequality between regions, which began to increase since 2019. This indicates a process of divergence on the islands of Java and Bali during the analysis period, in accordance with the theory of Neo-Classical assumptions. In addition, the results of one-stage decomposition show that the source of development inequality is concentrated in East Java and Bali, with East Java having a high GDP value. This inequality is also reflected in previous studies that showed high levels of inequality in East Java. Furthermore, Theil's decomposition analysis shows that development inequality tends to be high within the region, especially in East Java. This is due to the economic interaction between neighboring regions. Previous research also supports these findings by proving development inequality in East Java. Two-stage decomposition adds to understanding by showing that contributions from within provinces also play a role in development inequality, decreasing from period to period. Overall, the results of the analysis show that Java and Bali experience high development inequality, with economic interactions between regions reinforcing the inequality.

DAFTAR PUSTAKA

Abdiriyanto, D., & Cita Permata, F. (2022). Ketimpangan Pembangunan Ntb Tahun 2017-2021. *Nusantara Journal Of Economics (Nje)*, *04.* Https://Doi.Org/Https://Doi.Org/10.37673/Nje.V4i2.2742

Aginta, H., Gunawan, A. B., & Mendez, C. (2021). Regional Income Disparities And Convergence Clubs In Indonesia: New District-Level Evidence. *Journal Of The Asia Pacific Economy*, *28*(1), 101–132. Https://Doi.Org/10.1080/13547860.2020.1868107

Akita, T. (2003). Decomposing Regional Income Inequality In China And Indonesia Using Two-Stage Nested Theil Decomposition Method. In *Ann Reg Sci* (Vol. 37).

Akita, T., & Alisjahbana, A. S. (2002). Regional Income Inequality In Indonesia And The Initial Impact Of The Economic Crisis. *Bulletin Of Indonesian Economic Studies*, *38*(2), 201–222. Https://Doi.Org/10.1080/00074910232014505 7

Akita, T., Riadi, A. A., & Rizal, A. (2021). Fiscal Disparities In Indonesia In The Decentralization Era: Does General Allocation Fund Equalize Fiscal Revenues? *Regional Science Policy And Practice*, *13*(6), 1842–1865. Https://Doi.Org/10.1111/Rsp3.12326

Badan Pusat Statistik. (2023). *Konsep Ketimpangan Pendapatan (Gini Ratio)*. Badan Pusat Statistik Indonesia.

Esmara, H. (1975). Regional Income Disparities. *Bulletin Of Indonesian Economic Studies*, *11*(1), 41–57. Https://Doi.Org/10.1080/00074917512331332622

Firdaus, M., & Rindayati, W. (2012). The Dynamics Of Regional Disparity In Java Island After Fiscal Decentralization. *Journal Of Economics And Management*, *6*(1), 150–166.

Hayashi, M., Kataoka, M., & Akita, T. (2014). Expenditure Inequality In Indonesia, 2008-2010: A Spatial Decomposition Analysis And The Role Of Education. *Asian Economic Journal*, *28*(4), 389–411. Https://Doi.Org/10.1111/Asej.12042

Hidayat, M. (2014). Inequality Across Districts And Cities In The Riau Article Info. *Inequality Across Districts And Cities In The Riau*. Https://Doi.Org/10.20885/Ejem

Hidayat, M. (2023a). Ketimpangan Pembangunan Antar Wilayah Di Pulau Sumatera, Pendekatan Spasial Ekonomi. *Jurnal Akuntansi Dan Ekonomika*, *13*(1), 11–18. Https://Doi.Org/10.37859/Jae.V13i1.4860

Hidayat, M. (2023). Ketimpangan Pembangunan Antar Wilayah Di Pulau Sumatera, Pendekatan Spasial Ekonomi. *Jurnal Akuntansi Dan Ekonomika*, *13*(1), 11–18. Https://Doi.Org/10.37859/Jae.V13i1.4860

Hidayat, M., Darwin, R., & Hadi, M. F. (2018). International Journal Of Economics And Financial Issues Inequality Of Interregional Development In Riau Indonesia; Panel Data Regression Approach. *International Journal Of Economics And Financial Issues*, *8*(5), 184–189. Http:Www.Econjournals.Com

Hidayat, M., Hadi, M. F., Darwin, R., & Hadi, M. F. (2018). Inequality Of Interregional Development In Riau Indonesia; Panel Data Regression Approach International Journal Of Economics And Financial Issues Inequality Of Interregional Development In Riau Indonesia; Panel Data Regression Approach. *International Journal Of Economics And Financial Issues*, *8*(5), 184–189. Http:Www.Econjournals.Com

Hidayat, M., & Rahayu, S. (2018). Ketimpangan Pembangunan Antar Kabupaten/Kota Di Provinsi Riau : Pendekatan Regresi Kuadratik. *Jurnal Ekonomi Sakti*, *7*(1). Http://Jes.Stie-Sak.Ac.Id

Jhingan, M. L. (2016). *Ekonomi Pembangunan Dan Perencanaan* (D. Guritno, Ed.; 17th Ed.). Rajawali Pers.

Kataoka, M. (2010). Factor Decomposition Of Interregional Income Inequality Before And After Indonesia's Economic Crisis. *Studies In Regional Science*, *40*(4), 1061–1072.

Mevia, T. F. S. (2023). Analisis Pertumbuhan Ekonomi Dan Ketimpangan Regional Empat Koridor Di Jawa Timur Tahun 2016-2021 Titania Fanesa Setia Mevia. *Jurnal Ilmu Ekonomi (Jie)*, *7*(03), 419–437.

Mukhlis, Robiani, B., Marwa, T., & Chodijah, R. (2017). International Journal Of Economics And Financial Issues Agglomeration Of Manufacturing Industrial, Economic Growth, And Interregional Inequality In South Sumatra, Indonesia. *International Journal Of Economics And Financial Issues*, *7*(4), 214–224. Http:Www.Econjournals.Com

Nasution Marihot. (2020). Ketimpangan Antar Wilayah & Hubungannya Dengan Belanja Pemerintah: Studi Di Indonesia. *Jurnal Budget*, *5*(2), 84–102.

Raeskyesa, D. G. S., Suryandaru, R. A., & Kadarusman, Y. B. (2019). Analysis On Growth Pattern And Economic Sector In Bali Province. *Jurnal Ilmu Manajemen & Ekonomika*, *11*(2), 45–46.

Septiani, I. Y., & Endang. (2022). Analysis Of Economic Development Inequality In The Province Of East Jawa In 2016-2020. *Jemes - Jurnal Ekonomi Manajemen Dan Sosial*, *5*(1), 25–31.

Sjafrizal. (2008). *Ekonomi Regional Teori Dan Aplikasi*. Niaga Swadaya.

Sjafrizal. (2008). *Ekonomi Regional (Teori Dan Aplikasi)* (Elfindri, Ed.). Baduose Media.

Soebagyo, D., Fahmy-Abdullah, M., Wei Sieng, L., & Lukis Panjawa, J. (2019). Income Inequality And Convergence In Central Java Under Regional Autonomy. In *International Journal Of Economics And Management Journal Homepage* (Vol. 13, Issue 1). Http://Www.Ijem.Upm.Edu.My

Tiara, P. M., & Rahayu, S. (2023). Analisis Ketimpangan Pembangunan Antar Wilayah Di Pulau Sumatera Tahun 2012-2021. *Agregate*, *6*(1), 1–12.

Zasriati, M. (2022). *Analisis Ketimpangan Pembangunan Di Indonesia Tahun 2010-2020*..