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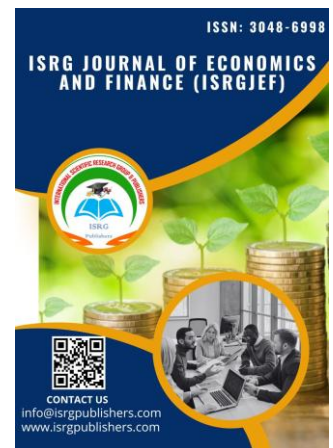
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Analysis of Factors Causing Inter-regional Income Inequality in West Nusa Tenggara Province, Indonesia

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Abstract

Inter-regional income inequality remains a structural issue in regional economic development facing West Nusa Tenggara (NTB) Province. This inequality is influenced by various factors related to infrastructure conditions, investment, labor markets, and the quality of human resources. This study aims to analyze the impact of road length, Domestic Direct Investment (PMDN), Foreign Direct Investment (PMA), the Open Unemployment Rate (TPT), and the Human Development Index (IPM) on inter-regional income inequality in NTB Province. The study covers all regencies and cities in NTB Province, utilizing relevant data from the study period. Analysis was conducted using multiple linear regression with the aid of EViews 12 software, employing the inter-regional Theil Index as the indicator for inter-regional income inequality. The research model incorporates road length and investment (PMDN and PMA) in logarithmic form, while TPT and IPM serve as additional explanatory variables.

Estimation results indicate that, individually, road length, domestic investment (PMDN), foreign investment (PMA), the open unemployment rate (TPT), and the Human Development Index (IPM) do not have a significant effect on inter-regional income inequality at the 5 percent significance level. Nevertheless, the signs of the coefficients suggest that road length, PMA, TPT, and IPM tend to be associated with a reduction in inequality, whereas PMDN tends to be associated with an increase in inequality. Simultaneously, the five variables also do not significantly affect inequality, with an F-statistic of 0.777233 and a probability of 0.589999. The R-squared value of 0.301577 indicates that approximately 30.16 percent of the variation in inequality can be explained by the variables in the model, while the remainder is influenced by factors outside the model. These findings suggest that inter-regional economic inequality in NTB is a multidimensional and structural phenomenon that cannot be explained solely by road infrastructure, investment, unemployment, and human development. Therefore, policies aimed at promoting equity should focus on strengthening inter-regional connectivity, ensuring the equitable distribution of investment, enhancing workforce quality and productivity, developing human resources, diversifying the economy, and strengthening economic linkages between regencies and cities.

Keywords: inter-regional income inequality, road length, PMDN, PMA, TPT, IPM, Theil Index, NTB.

INTRODUCTION

Background

Global income inequality has experienced a significant rise over the past two centuries. This phenomenon is evidenced by the surge in the global Theil Index from 0.522 in 1820 to 0.855 in 1992 (Bourguignon & Morrisson, 2002). Structurally, the contribution of between-country inequality rose sharply from 10% in 1820 to 30% in 2020 (Bourguignon & Morrisson, 2002; Chancel & Piketty, 2021). Reports from the Asian Development Bank indicate that this escalation of inequality has been particularly severe in developing nations experiencing rapid economic growth—including the ASEAN region, which is considered to have failed to prevent the widening economic gap in Asia-Pacific (Syadullah et al., 2019).

Inequality dynamics in Indonesia mirror the trends observed across Southeast Asia. According to a World Bank report, Indonesia has experienced a rapid rise in income inequality. A primary driver of this phenomenon is inequality of opportunity, which accounts for 33% of total national inequality (World Bank, 2016). Both theoretically and empirically, widening income inequality adversely affects macroeconomic and social stability. High levels of disparity fuel extreme polarization, dividing nations into two poles: high-income and low-income groups (Hassan et al., 2020). Furthermore, there is a strong positive correlation between income inequality and crime rates; the wider the economic gap, the higher the incidence of crime (Bourguignon & Morrisson, 2002; Hipp, 2006; Kang, 2016; Sugiharti et al., 2023). Consequently, the formulation of equitable policies and targeted intervention priorities is essential (Stiglitz, 2015).

At the regional level, West Nusa Tenggara (NTB) Province faces complex inequalities across both spatial (inter-regional) and rural-urban dimensions. During the 2011–2021 period, the Gini ratio in NTB's urban areas rose from 0.380 to 0.413, whereas in rural areas, it declined slightly from 0.336 to 0.332. Furthermore, Theil Entropy Index analysis confirms that while within-region inequality on the islands of Lombok and Sumbawa decreased, between-region inequality actually tended to rise between 2010 and 2021 (Sahri et al., 2023). Given that the determinants of inequality are multidimensional and vary across regions (Conrad, 2017; Hassan et al., 2020; Syadullah et al., 2019), region-specific studies are crucial for identifying the impact of road length, Domestic Direct Investment (PMDN), Foreign Direct Investment (PMA), the Open Unemployment Rate (TPT), and the Human Development Index (IPM) on inter-regional income inequality in NTB Province.

LITERATURE REVIEW

Income inequality—whether among individuals, households, or sectors, or across regions—constitutes a structural problem that is both persistent and dynamic over time. Academic interest in examining this phenomenon has deep historical roots in the evolution of economics, having been a fundamental focus for classical figures ranging from Adam Smith, David Ricardo, and Karl Marx to John Maynard Keynes. Research emphasis on inequality intensified following the global financial crisis, which highlighted systemic failures in the global distribution of wealth (Goda, 2013). The global significance of addressing this issue is also reflected in the Sustainable Development Goals (SDGs) declared by the United Nations in 2015; specifically, Goal 10 mandates the reduction of inequality within and among countries

as a development priority for the 2015–2030 period (Hidayat et al., 2020).

From a regional economics perspective, there is a clear analytical distinction between studies of inequality among population groups and studies of regional inequality. Research on inequality among population groups focuses on welfare disparities between wealthy and poor social strata, utilizing household income data. Conversely, studies on regional inequality quantify the gap in economic performance between developed and underdeveloped regions, using per capita Gross Regional Domestic Product (GRDP) as the primary observational metric (Sjafrizal, 2018).

Methodologically, several analytical tools are commonly used to measure the degree of inter-regional income disparity, including the Williamson Index, Theil Index, J. Bonet Index, and Sigma Convergence (Kuncoro, 2013). However, the instruments possessing high scientific rigor and most frequently applied in empirical regional studies are the Williamson Index and the Theil Entropy Index (Sjafrizal, 2018).

Inter-regional income disparity is not a simple, linear phenomenon but rather the result of complex interactions among various multidimensional exogenous and endogenous factors that can either exacerbate or mitigate inequality within an economic system (Hassan et al., 2020). Based on a synthesis of regional economic theory, several macroeconomic variables consistently identified as determinants of inter-regional income inequality include the acceleration of national economic growth, population migration patterns, investment mobility and agglomeration, infrastructure availability and quality, human capital accumulation, the spatial concentration of economic activities, and the dynamics of regional autonomy policies and fiscal decentralization (Sjafrizal, 2018).

Research across eight developing countries reveals a phenomenon wherein rising national per capita income is accompanied by a parallel widening of inter-regional income inequality (Doğan & Aslan, 2023). In Pakistan, long-term analysis found that unemployment rates, inflation rates, exchange rate volatility, remittance growth, and manufacturing sector investment growth are positively correlated with the widening of income inequality (Hassan et al., 2020). Meanwhile, studies in the ASEAN region confirm that population dependency ratios, unemployment rates, and macroeconomic growth rates play crucial roles in inter-regional income inequality (Syadullah et al., 2019). Similarly, research conducted in Indonesia has identified several factors that contribute to inter-regional income inequality.

Research by Sri Hartati (2019) demonstrates that road infrastructure and Foreign Direct Investment (FDI) individually have a positive and significant impact on widening inter-provincial disparities, whereas the Human Development Index (HDI) contributes significantly to reducing inequality. Consistent with this, an inter-island comparative study confirms a strong structural relationship between spatial inequality and the expansion of employment opportunities, poverty alleviation, HDI improvement, and investment intensity (Panggarti et al., 2022).

At the regional level, research in West Java concludes that disparities in natural resource wealth, demographic conditions, barriers to the mobility of goods and services, economic agglomeration, and unequal development fund allocation are the primary determinants of disparity (Silviana & Tallo, 2020). In East Java, labor-related variables were found to correlate more strongly with inequality than investment did (Krinantya, 2014), while the

Regional Minimum Wage (UMR), labor force absorption, HDI, and government expenditure allocation were found to significantly influence the dynamics of inter-regional inequality (Noto & Suman, 2016).

Research Methodology

The research was conducted across all regencies and cities in West Nusa Tenggara (NTB) Province. This location was selected purposively based on the fact that, over the last decade, NTB Province has ranked fifth-lowest in terms of economic growth—following West Papua, Aceh, and Riau provinces—with East Kalimantan Province recording the lowest rate.

- The data collection methods employed in this study included questionnaires, documentation, and observation, gathering the specific data required to meet the research objectives.
- Data analysis regarding the factors causing inter-regional income inequality in NTB Province was performed using Multiple Linear Regression analysis via the EViews 12 application. The formula used is as follows:

$$Y = \alpha_0 + \beta_1 \text{Log}(X_1) + \beta_2 \text{Log}(X_2) + \beta_3 \text{Log}(X_3) + \beta_4 (X_4) + \beta_5 (X_5) + e$$

Where:

Y : Inter-regional Theil Index

α_0 : Constant

$\beta_1 - \beta_5$: Regression coefficients for each independent variable

X1 : Road length

X2 : Domestic Direct Investment (PMDN)

X3 : Foreign Direct Investment (PMA)

X4 : Open unemployment rate (TPT)

X5 : Human Development Index (IPM)

Research Results

Factors Causing Inter-regional Income Inequality

Based on a literature review and previous research, the factors identified as causes of inter-regional income inequality in West Nusa Tenggara (NTB) Province are road length, domestic investment (PMDN), foreign investment (PMA), the open unemployment rate (TPT), and the Human Development Index (IPM). The following section presents an analysis describing each of these factors contributing to inter-regional income inequality in NTB Province.

Road Length Factor

Road infrastructure is a crucial component of regional economic development, as it enhances accessibility, inter-regional connectivity, the mobility of factors of production, and the connection between communities and centers of economic activity. Theoretically, improved connectivity can reduce transportation costs and expand market access, thereby stimulating production, investment, and traactivities. However, the impact of roads on income inequality is not always negative; road development concentrated primarily in already developed areas can reinforce

economic agglomeration and widen inter-regional disparities (Azim, Sutjipto, & Ginanjar, 2022). Data on road length by regency/city in NTB Province from 2019 to 2023 reveals significant variations in road length across regencies and cities. In 2023, the greatest road length was recorded in Sumbawa (1,540.60 km), followed by Bima (1,321.34 km) and East Lombok (1,256.62 km). Conversely, the shortest road lengths were found in Bima City (295.36 km) and Sumbawa.. West [Sumbawa] at 484.90 km, and Mataram City at 473.58 km. Overall, West Nusa Tenggara (NTB) had approximately 8,504 km of roads in 2023, with about 72 percent classified as regency or city roads.

These differences in road length demonstrate that the total length of roads alone cannot serve as a direct indicator of superior economic access for a region. This is because road effectiveness is heavily influenced by quality, condition, population density, land area, and connectivity to production centers and markets. For instance, while Sumbawa possesses the longest road network, a significant portion of it spans a vast and dispersed geographical area. In 2023, out of 951.51 km of regency roads in Sumbawa, approximately 367.71 km were in a state of severe disrepair. Conversely, although Mataram City has a shorter total road length, the characteristics of its urban environment result in a network with a much higher intensity of economic utilization.

From the perspective of regional inequality, this situation gives rise to two possible scenarios. First, if road development is directed toward relatively underdeveloped areas and successfully links production centers with markets, improvements in road length and quality can expand economic opportunities and reduce inequality. Research on inter-regency road infrastructure in Indonesia indicates that limited connectivity drives up transportation costs and restricts public access to markets, employment, and investment. Second, if road development primarily enhances access for regions that already possess a strong economic base, the economic benefits may be realized more quickly by these developed areas, potentially exacerbating inequality instead of alleviating it.

Empirical evidence in Indonesia indicates that road infrastructure can influence inter-regional inequality, particularly when infrastructure development is uneven. Consequently, in the context of West Nusa Tenggara (NTB) Province, road length is expected to have a complex relationship with inter-regional income inequality. Increasing road length has the potential to reduce inequality if development focuses on improving connectivity for underdeveloped areas; conversely, it may exacerbate inequality if the benefits of improved accessibility are concentrated in regencies or cities that are already hubs of economic activity. Therefore, in regression analysis, the coefficient for the road length variable must be interpreted in conjunction with other variables—such as Domestic Direct Investment (PMDN), Foreign Direct Investment (PMA), the Open Unemployment Rate (TPT), and the Human Development Index (IPM)—rather than based solely on the total length of roads in kilometers. Indeed, studies on inequality in Indonesia have found that the impact of road infrastructure on inequality can vary depending on regional characteristics.

Domestic Direct Investment (PMDN) Factor

Domestic Direct Investment (PMDN) is a crucial instrument for building production capacity and driving regional economic growth. Investment can boost capital formation, productivity, employment opportunities, and demand for local inputs, while also

broadening the regional economic base. However, increased investment does not automatically lead to more equitable outcomes because Domestic Direct Investment (PMDN) is a crucial instrument for building production capacity and fostering regional economic growth. Investment can boost capital formation, productivity, employment opportunities, and demand for local inputs, while also expanding the regional economic base. However, increased investment does not automatically lead to equitable development, as its impact is heavily influenced by factors such as the investment's location and sector, local labor absorption, linkages to the regional economy, and the capacity to generate spillover effects in other areas. From the perspective of Williamson (1965), the concentration of economic activity and investment in regions possessing initial advantages can exacerbate regional disparities at certain stages of development. Between 2019 and 2023, Domestic Direct Investment in West Nusa Tenggara (NTB) province saw a dramatic rise—surging from IDR 5.70 trillion in 2019 to IDR 31.85 trillion in 2023, an increase of approximately 459 percent. Yet, this growth was not distributed proportionally across the province's regencies and cities; instead, investment became increasingly concentrated in specific areas. In 2023, West Sumbawa Regency accounted for approximately 75.45 percent of NTB's total domestic investment, while the top three recipients—West Sumbawa, Central Lombok, and Sumbawa—captured about 89.59 percent of the provincial total. This situation highlights the existence of spatial inequality in domestic capital accumulation

The concentration of Domestic Direct Investment (PMDN) has the potential to influence income inequality through the mechanisms of "growth poles" and "cumulative causation." Large-scale investments in specific areas can boost production capacity, employment opportunities, trade, services, and income, thereby enhancing the region's attractiveness for further investment. This cumulative reinforcement process can cause regions with high investment levels to grow more rapidly than those with low investment. In the context of West Nusa Tenggara (NTB), West Sumbawa's position as a hub for PMDN concentration could serve as a growth engine while simultaneously widening disparities if the investment benefits fail to spread to other regencies. However, the relationship between PMDN and inequality is ambivalent; a concentration of investment does not automatically prove that PMDN causes inequality. PMDN can foster more equitable outcomes if it generates backward and forward linkages—such as the use of local raw materials, transport services, regional suppliers, local labor absorption, technology transfer, and inter-regency trade. Strong linkages allow investment benefits to diffuse to other areas, promoting regional convergence. Conversely, if spillover effects are weak and economic activity remains confined to the investment-receiving area, inter-regional disparities may widen further—a trend exacerbated by the "investment gap" phenomenon.

Regencies with relatively low levels of Domestic Direct Investment (PMDN)—such as Dompu and Bima—risk experiencing slower productivity growth, limited formal job creation, lower economic diversification, and reduced capital accumulation. In the long run, these disparities in capital accumulation can exacerbate gaps in per capita Gross Regional Domestic Product (GRDP) and income across regions. Thus, PMDN is structurally linked to the dynamics of inter-regional income inequality in NTB, though the direction of this influence depends on the spatial distribution of investment and the strength of economic spillovers. An aggregate increase in PMDN does not

necessarily equate to a reduction in inequality. The policy implication is that investment development in NTB must shift from a focus solely on increasing PMDN value toward inclusive and spatially dispersed investment growth. This can be achieved by diversifying investment locations, strengthening MSMEs as suppliers to large industries, enhancing human resource quality, improving supporting infrastructure, and reinforcing inter-regional economic linkages.

Foreign Direct Investment (FDI) Factors

Foreign Direct Investment (FDI) is a source of capital formation with the potential to enhance production capacity, productivity, employment opportunities, and technology transfer, as well as to link a region to broader markets. From a regional economic perspective, FDI can accelerate economic growth by boosting production, creating jobs, stimulating demand for local goods and services, and fostering inter-sectoral linkages. However, the benefits of FDI are not automatically distributed evenly, as investments tend to concentrate in regions that possess initial advantages. This situation aligns with Williamson's (1965) perspective, which posits that regional inequality may rise during certain stages of development when economic activity and investment become concentrated in specific areas.

Between 2019 and 2023, total FDI in West Nusa Tenggara (NTB) Province rose from approximately IDR 4.325 trillion to IDR 8.047 trillion—an increase of about 86 percent. However, this growth was accompanied by a very high level of spatial concentration. The three regencies receiving the most FDI accounted for approximately 59.54 percent of the province's total FDI in 2019; this share rose to 85.96 percent in 2020, 82.81 percent in 2021, 89.75 percent in 2022, and 86.56 percent in 2023. Consequently, the FDI structure in NTB Province during this period can be categorized as highly concentrated.

West Sumbawa Regency serves as a prime example of such investment concentration. Foreign Direct Investment (FDI) in the area rose from approximately IDR 1.246 trillion in 2019 to IDR 4.552 trillion in 2023, accounting for about 56.56 percent of West Nusa Tenggara's total FDI in 2023. A concentration of large-scale investment has the potential to create a "growth pole" by boosting production, employment opportunities, trade and service activities, and government revenue, as well as driving demand for local inputs. However, if these benefits remain concentrated primarily within the host area, that region's economic growth may outpace that of other areas, ultimately widening regional disparities.

Theoretically, the relationship between FDI and regional inequality operates through two mechanisms. First is the divergence effect, occurring when investment concentrates in regions that already possess economic advantages, thereby increasing their production capacity and income more rapidly than in other regions. Second is the convergence effect, which arises if FDI generates spillovers through the use of local raw materials, transportation services, and labor, as well as through supplier development, technology transfer, and inter-regional trade. Thus, a concentration of FDI does not automatically imply rising inequality; the determining factor is whether economic linkages and spillover effects can successfully distribute the benefits of the investment to other regions.

In the context of West Nusa Tenggara (NTB), disparities in Foreign Direct Investment (FDI) across regions reveal an investment gap that threatens to widen the divide in production

capacity and productivity. For instance, in 2023, FDI in West Sumbawa reached approximately IDR 4.552 trillion, whereas Bima Regency attracted only about IDR 14.45 billion and East Lombok around IDR 56.46 billion. These disparities indicate unbalanced capital accumulation across regions, potentially triggering a mechanism of "cumulative causation," wherein areas already possessing superior infrastructure, markets, labor forces, and supplier networks become increasingly attractive for subsequent investments.

Consequently, FDI is structurally linked to potential income inequality across NTB's regions, driven largely by the spatial concentration of capital formation. Therefore, investment policies must aim not only to increase the total value of FDI but also to promote a more equitable distribution of investment locations, strengthen MSMEs as suppliers, enhance human resource quality, provide supporting infrastructure, and reinforce inter-regional economic linkages, ensuring that investment spillovers foster regional convergence.

Open Unemployment Rate (TPT) Factor

The Open Unemployment Rate (TPT) is a key indicator for describing labor market conditions, whereas inter-regional income inequality in regional analysis is more accurately represented by disparities in Gross Regional Domestic Product (GRDP) per capita or the Williamson Index. Therefore, the link between TPT and inequality in this study is understood as the relationship between labor market conditions and inter-regional economic disparities, rather than a direct causal relationship with household income distribution.

During the 2019–2023 period, labor market conditions in NTB showed signs of recovery following the COVID-19 pandemic. The province's TPT rose from 3.28 percent in 2019 to 4.22 percent in 2020, then consistently declined to 3.01 percent in 2021, 2.89 percent in 2022, and 2.80 percent in 2023. However, this recovery was uneven across regencies and cities. In 2023, Mataram City recorded the highest TPT at 4.78 percent, while North Lombok recorded the lowest at 1.40 percent. This variation highlights the heterogeneity of the regional labor market in NTB. At the same time, inter-regional economic disparities remained substantial. GRDP per capita in 2023 ranged from IDR 17.66 million in East Lombok to IDR 193.80 million in West Sumbawa—a nearly eleven-fold difference. This inequality is primarily driven by structural economic characteristics, specifically the dominance of the mining sector in West Sumbawa, which generates immense value-added but does not create a proportional level of employment.

West Sumbawa has the highest GRDP per capita, yet its Open Unemployment Rate (TPT) stands at 3.54 percent—higher than the 2.80 percent rate for West Nusa Tenggara (NTB) as a whole. This situation is linked to the capital-intensive nature of the mining sector. Meanwhile, Mataram City records a GRDP per capita of IDR 51.64 million alongside the highest TPT at 4.78 percent. Mataram's high TPT may reflect a more dynamic urban labor market and a more selective job-matching process. Conversely, East Lombok and North Lombok demonstrate that a low TPT does not necessarily indicate high economic prosperity; both regions have relatively low GRDP per capita figures, yet their respective TPTs are only 2.47 percent and 1.40 percent. Low unemployment in these areas may be attributed to high labor absorption in the

informal sector, family-based work, agriculture, or low-productivity activities.

Thus, the relationship between TPT and regional economic inequality in NTB is structural rather than linear. Differences in production structures, job quality, labor productivity, and the concentration of economic activities are key factors explaining why economic growth is not always accompanied by a decline in unemployment. These findings align with Aginta, Mendez, and Someya (2025), who show that the relationship between economic growth and unemployment at the regency/city level in Indonesia varies according to the specific characteristics of local economic structures and labor markets.

Human Development Index (HDI) Factor

From a regional economic perspective, an increase in the HDI reflects an improvement in the quality of human capital, which in turn can boost productivity, employment opportunities, and the community's capacity to participate in value-added economic activities. However, advancements in human development do not automatically result in income equality or inter-regional economic convergence, as development outcomes are also influenced by economic structure, agglomeration, the quality of public services, and the distribution of economic opportunities.

During the 2019–2023 period, the HDI across all regencies and cities in West Nusa Tenggara (NTB) showed an upward trend. The province's HDI rose from 68.14 in 2019 to 72.37 in 2023. Mataram City consistently recorded the highest HDI, reaching 81.15 in 2023, while North Lombok ranked lowest at 68.02. Nevertheless, the HDI gap between regions has tended to narrow, indicating a trend toward convergence in human development.

In contrast to HDI trends, inter-regional economic disparities remain very high. In 2023, the Gross Regional Domestic Product (GRDP) per capita in West Sumbawa reached approximately IDR 193.80 million, whereas in East Lombok it was only around IDR 17.66 million—a nearly eleven-fold difference. This situation indicates that the gap in economic capacity between regions is far more extreme than the gap in human development. The Williamson Index, calculated based on GRDP per capita and population size, stood at approximately 0.97, with West Sumbawa acting as the primary outlier. Empirically, there is a positive relationship between the Human Development Index (HDI) and GRDP per capita. A Spearman correlation of approximately 0.673 indicates that regencies/cities with relatively higher HDI scores tend to have higher GRDP per capita when ranked. However, the Pearson correlation is only around 0.311, suggesting a relatively weak linear relationship. This discrepancy is primarily driven by the heterogeneity of economic structures—specifically, the status of West Sumbawa as an outlier.

The case of West Sumbawa demonstrates that high economic output does not automatically translate into the highest levels of human development. Its exceptionally high GRDP per capita is linked to the dominance of the capital-intensive mining sector; consequently, the increase in regional value-added has not been fully matched by a proportional expansion of job opportunities or an enhancement of human capabilities. In contrast, Mataram City exhibits a combination of relatively high HDI and GRDP per capita, supported by a concentration of government, education, healthcare, trade, and service sectors, as well as the benefits of agglomeration.

Thus, it can be concluded that the rise in the Human Development Index (HDI) in NTB is positively linked to regional economic capacity but has not yet automatically succeeded in reducing inter-regional economic inequality. Human development convergence is not synonymous with regional income convergence, as disparities are also shaped by production structures and the distribution of economic opportunities. Therefore, NTB's strategy for equitable development must integrate investments in education, health, and skills with economic diversification, productivity enhancements, the strengthening of MSMEs and local supply chains, and the diffusion of agglomeration benefits from growth centers to surrounding areas.

Analysis of Factors Causing Inter-Regional Income Inequality

As previously noted, several factors have been identified as causes of inter-regional inequality in West Nusa Tenggara (NTB) Province. These factors include road length, domestic investment (PMDN), foreign investment (PMA), the open unemployment rate, and the Human Development Index (HDI). Data processing using EViews 12 yielded the results presented in Table 4.1.

Table 4.1 Results of Multiple Linear Regression Analysis on Causes of Inter-Regional

Income Inequality

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.177336	0.352056	0.503716	0.6266
LOG_X1	-0.017052	0.039131	-0.435760	0.6733
LOG_X2	0.000732	0.000548	1.336521	0.2142
LOG_X3	-0.000164	0.001008	-0.162757	0.8743
X4	-0.002102	0.002579	-0.815139	0.4360
X5	-0.000388	0.000763	-0.509013	0.6230
R-squared	0.301577	Mean dependent var	0.005287	
Adjusted R-squared	-0.086436	S.D. dependent var	0.004544	
S.E. of regression	0.004737	Akaike info criterion	-7.577737	
Sum squared resid	0.000202	Schwarz criterion	-7.294517	
Log likelihood	62.83303	Hannan-Quinn criter.	-7.580754	
F-statistic	0.777233	Durbin-Watson stat	1.634946	
Prob(F-statistic)	0.589999			

Source: Data processed using EViews 12.

Based on the data in Table 4.1, the multiple linear regression equation can be formulated as follows:

$$Y = 0.177336 - 0.017052\ln(X_1) + 0.000732\ln(X_2) - 0.000164\ln(X_3) - 0.002102X_4 - 0.000388X_5 + \varepsilon$$

where Y represents the indicator of inter-regional income inequality. The estimation results indicate that none of the independent variables have a statistically significant effect on inter-regional income inequality at the 5 percent level, whether analyzed individually or simultaneously. This finding is significant because it demonstrates that inter-regional inequality in NTB cannot be simply explained by road length, domestic or foreign investment, unemployment, and human development alone. From a regional economics perspective, inequality results from the interaction of various structural and spatial factors, productivity, agglomeration, and the characteristics of economic sectors. Williamson (1965) emphasized that the development process can unfold unevenly across space because economic activity and investment tend to concentrate in specific regions.

First, road length (X_1) has a coefficient of -0.017052 with a probability of 0.6733. The negative sign suggests a tendency for increased road length to be associated with reduced inequality,

although this relationship is not statistically significant. From a regional economics standpoint, this negative direction is plausible, as road network development can improve connectivity, lower transportation costs, expand market access, and link lagging regions with growth centers. Fundamentally, transportation infrastructure can boost productivity by enhancing access to markets and factors of production. Aschauer (1989), for instance, demonstrates the importance of public infrastructure—including roads and transportation networks—in supporting productivity. However, road length alone is not synonymous with the quality of connectivity. The impact on inequality likely depends on road conditions, network density, connectivity to production centers and markets, and whether the infrastructure benefits accrue primarily to lagging regions or serve to reinforce existing growth centers.

Second, Domestic Direct Investment (PMDN) (X_2) has a coefficient of $+0.000732$ and a probability of 0.2142. The positive sign suggests a tendency for increased domestic investment to be associated with rising inequality, though this effect is not statistically significant. Substantively, this result may be explained by the likelihood that domestic investment is concentrated in regencies or cities that already possess advantages in terms of location, infrastructure, markets, resources, or more developed economic sectors. Under such conditions, investment can drive faster growth in recipient areas, thereby widening inter-regional disparities. This aligns with Williamson's perspective regarding the tendency for regional inequality to rise when development processes are concentrated in specific areas. Nevertheless, the lack of statistical significance in the coefficient implies there is insufficient empirical evidence to conclude that domestic investment statistically increases inequality in West Nusa Tenggara (NTB).

Third, Foreign Direct Investment (FDI) (X_3) has a coefficient of -0.000164 with a probability of 0.8743, making it the variable with the weakest statistical evidence in the model. The negative sign suggests a tendency for FDI to be associated with a reduction in inequality, yet the effect is far from significant. Theoretically, FDI can foster greater equity if foreign investment not only boosts the recipient region's output but also generates local employment, facilitates technology transfer, establishes linkages with local suppliers, and creates spillovers to other areas. Conversely, if investment is concentrated in capital-intensive sectors with weak local linkages, an increase in FDI does not necessarily lead to regional equity. Therefore, the small, insignificant coefficient does not imply that FDI is unimportant for NTB's development; rather, it indicates that variations in FDI within this model specification do not convincingly explain the variations in inequality.

Fourth, the Open Unemployment Rate (TPT) (X_4) shows a coefficient of -0.002102 with a probability of 0.4360. The negative direction suggests that an increase in TPT tends to correlate with a decrease in inequality, though the result is not statistically significant. From an economic perspective, this direction requires cautious interpretation. A low TPT does not necessarily reflect high economic well-being, as individuals may be employed in the informal sector, low-productivity roles, or low-paying jobs. Thus, the relationship between unemployment and inter-regional inequality does not necessarily follow a linear pattern. Regional inequality is also influenced by the quality of employment opportunities, the structure of economic sectors, labor productivity, and wage levels, rather than solely by the number of unemployed persons.

Fifth, the Human Development Index (X5) has a coefficient of -0.000388 with a probability of 0.6230 . The negative sign indicates a tendency for improvements in human development to be associated with a reduction in inter-regional inequality, though the effect is not statistically significant. Theoretically, this negative direction aligns with the argument that improvements in education, health, and living standards can enhance productivity and the capacity of the population to access economic opportunities. However, an increase in the HDI does not automatically lead to income convergence if production structures, investments, and economic opportunities remain concentrated in specific regions. In other words, convergence in human development is not necessarily synonymous with regional economic convergence.

Simultaneous Test and Model Explanatory Power

The F-test yielded an F-statistic of 0.777233 with a Prob (F-statistic) of 0.589999 . Since the probability value is well above 0.05 , the variables X_1 , X_2 , X_3 , X_4 , and X_5 do not have a significant simultaneous effect on Y . Consequently, the hypothesis stating that these five variables collectively influence inter-regional income inequality finds no empirical support in this model.

The R-squared value of 0.301577 indicates that approximately 30.16 percent of the variation in inequality can be explained by the five variables, while the remaining 69.84 percent is explained by factors outside the model. Furthermore, the Adjusted R-squared value is -0.086436 , indicating that—after accounting for the number of explanatory variables and degrees of freedom—the current model specification does not yet provide strong explanatory power. Therefore, these results are best understood as an indication that inter-regional inequality in NTB is a multidimensional and structural phenomenon, rather than as evidence that the five variables lack economic relevance entirely.

Conclusions and Recommendations

Conclusions

Based on the analysis of data regarding the factors identified as causes of inter-regional inequality in West Nusa Tenggara (NTB) Province, the following conclusions can be drawn:

Regression results indicate that, whether considered individually or simultaneously, there is currently no strong statistical evidence that road length, Domestic Direct Investment (PMDN), Foreign Direct Investment (PMA), the Open Unemployment Rate (TPT), and the Human Development Index (IPM) determine inter-regional income inequality in NTB within the model specification used. Nevertheless, the coefficient signs provide interesting structural insights: road length and IPM tend to act in a direction that reduces inequality, and PMA also shows a negative relationship; conversely, PMDN tends to increase inequality, while TPT shows a negative relationship.

These findings indicate that inter-regional economic inequality in NTB is a multidimensional and structural phenomenon that cannot be explained solely by road infrastructure, investment, unemployment, and human development.

The lack of statistical significance across all variables suggests that the mechanisms driving regional inequality in NTB are likely determined more by a combination of sectoral structure, investment concentration, productivity, job quality, economic agglomeration, inter-regional linkages, and the specific characteristics of each regency/city.

Recommendations

Government policies aimed at promoting equity need to focus on strengthening inter-regional connectivity, ensuring a more even distribution of investment, enhancing workforce quality and productivity, developing human resources, diversifying the economy, and strengthening economic linkages between regencies and cities.

Policies should also aim to increase the employment intensity of economic growth through economic diversification, the development of the manufacturing sector, improvements in MSME productivity, workforce skills enhancement, and the expansion of inter-regional economic linkages.

Further research is required—particularly regarding the factors influencing inter-regional income inequality—to assist local governments in addressing income disparities across the regencies and cities of West Nusa Tenggara Province.

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