



What Drives Inequality in Sumatra? Evidence from Provincial Panel Data, 2015–2024

Khalifany Ash Shidiqi✉, Alif Farreihan Adyun

Department of Economics, Faculty of Economics and Business, Universitas Muhammadiyah Yogyakarta

Permalink/DOI: <https://doi.org/10.15294/efficient.v9i2.35654>

Submitted: December 2025; Revised: March 2026; Accepted: June 2026

Abstract

This research analyzes the relationship between income inequality, measured by the Gini ratio, and key socioeconomic variables such as regional minimum wages, poverty levels, human development, and unemployment across ten provinces in Sumatra from 2015 to 2024. Utilizing annual panel data sourced from BPS and applying a panel regression approach, the Random Effects model was selected as the most appropriate based on specification tests. The findings reveal that higher minimum wages and improved human development outcomes are associated with reduced income inequality, while greater poverty levels are linked to a widening income gap. In contrast, unemployment does not exhibit a statistically significant effect on the Gini ratio. A 1 percent increase in the minimum wage is associated with a 0.00052 reduction in the Gini ratio (≈ 0.052 Gini points) on the 0–1 scale, and a 10 percent increase with ≈ 0.005 (≈ 0.5 Gini points). A one-point improvement in the Human Development Index (HDI) is associated with a 0.002 reduction in the Gini ratio (≈ 0.2 Gini points). These insights support policy measures that enforce fair wage standards, strengthen human capital, and reduce poverty to foster more inclusive growth across Sumatra.

Keywords: Gini Ratio, Socioeconomic, Panel Data, Random Effects, Sumatra

How to Cite: What Drives Inequality in Sumatra? Evidence from Provincial Panel Data, 2015–2024. (2026). Efficient: Indonesian Journal of Development Economics, 9(2), 172–183. <https://doi.org/10.15294/efficient.v9i2.35654>

© 2026 Semarang State University. All rights reserved

✉ Correspondence Address :

Address: Gedung L2 Lantai 2 FE Unnes
Kampus Sekaran, Gunungpati, Semarang, 50229
E-mail : khalifany.ash@umy.ac.id

INTRODUCTION

Despite notable macroeconomic performance over the past decade, Indonesia continues to face structural challenges in achieving equitable income distribution.

Although average economic growth has remained around five percent annually, the resulting benefits have not been shared evenly across population groups or regions. Recent data from Badan Pusat Statistik (BPS, 2024) indicate a

modest reduction in the national Gini coefficient, from 0.40 in 2015 to 0.37 in 2024. This gradual change suggests that growth alone is insufficient to tackle entrenched inequality and underscores the limitations of current policy efforts aimed at redistribution (Hudiyanto, 2001; World Bank, 2016).

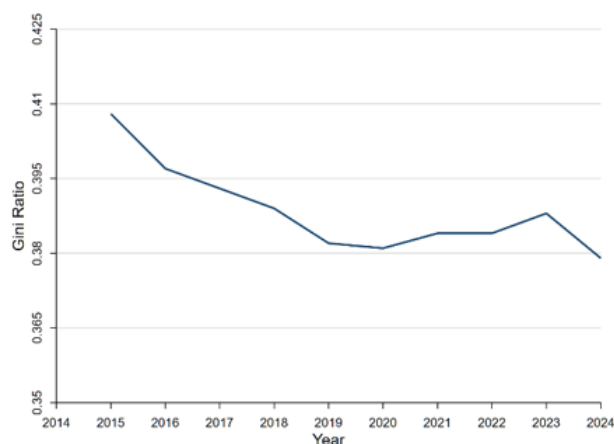


Figure 1. National Gini Ratio in Indonesia 2015 – 2024
Source: BPS, 2025

Figure 1 summarises Indonesia's national inequality trajectory over 2015–2024. The decline in the Gini ratio is gradual rather than sharp, indicating that distributional gains from aggregate growth have been limited and may have accrued unevenly across groups. This motivates an explicitly subnational approach, because national averages can conceal offsetting provincial movements and heterogeneous policy capacity (World Bank, 2016; BPS, 2024).

Building on this national pattern, Figure 2 shows that the decline is not uniform across provinces. Provincial Gini ratios exhibit substantial cross-sectional dispersion and heterogeneous trajectories over 2015–2024: some provinces display a relatively steady downward trend, while others fluctuate around a fairly stable level, suggesting that changes in

inequality are driven by region-specific dynamics rather than a single nationwide process.

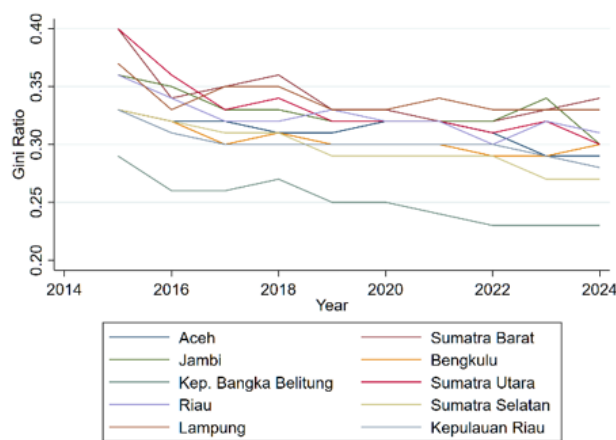


Figure 2. Province-level Gini Ratio Trends 2015–2024

Source: BPS, 2025

The persistence of gaps between higher-inequality and lower-inequality provinces implies that aggregate improvements can mask stagnation or reversals in particular areas, consistent with the view that Indonesia's inequality is shaped by spatially uneven structural change, labour market opportunities, and local policy capacity (World Bank, 2016; BPS, 2024).

Overall, Figure 2 highlights heterogeneity in both levels and dynamics, suggesting that inequality trajectories are shaped by province-specific economic structures and labour market conditions rather than a single nationwide mechanism; this motivates modelling inequality as a function of time-varying provincial fundamentals within a panel framework.

One clear manifestation of inequality lies in consumption patterns. In 2024, the bottom 40 percent of households accounted for just 18.4 percent of national household expenditure, while the top 20 percent captured a

disproportionately large share (BPS, 2024). Such imbalances highlight the concentration of economic opportunities among wealthier segments.

As Yusuf et al. (2014) argue, the persistence of inequality in Indonesia can be attributed to ineffective fiscal redistribution and fragmented social assistance systems that fail to reach the most vulnerable. Subnational evidence from provinces like Yogyakarta and parts of Sumatra also reflects continued dispersion in welfare outcomes (Dewi & Rachmawatie, 2020).

Beyond economic indicators, inequality has more profound implications. Disparities in access to education, healthcare, infrastructure, and formal employment restrict social mobility and perpetuate cycles of poverty. According to the OECD (2015), sustained inequality reduces long-term growth potential by limiting skill development and labour force participation among low-income populations.

Regional disparities, in turn, contribute to uneven service delivery and distort investment incentives, leading to inefficiencies and social fragmentation. The theoretical work of Ravallion (2001) reinforces this perspective, showing that high initial inequality diminishes the poverty-reduction impact of economic growth.

Beyond economic indicators, inequality has more profound implications. Disparities in access to education, healthcare, infrastructure, and formal employment restrict social mobility and perpetuate cycles of poverty. According to the OECD (2015), sustained inequality reduces long-term growth potential by limiting skill development and labour force participation among low-income populations.

Regional disparities, in turn, contribute to uneven service delivery and distort investment incentives, leading to inefficiencies and social

fragmentation. The theoretical work of Ravallion (2001) reinforces this perspective, showing that high initial inequality diminishes the poverty-reduction impact of economic growth.

Given these dynamics, examining inequality at the regional level is crucial. Sumatra, Indonesia's second-most populous and economically diverse island, offers a compelling case. Provinces such as Riau and South Sumatra are resource-rich and reliant on extractive industries, while others like Aceh and Jambi remain agriculture-based.

Bangka Belitung, in contrast, depends heavily on tin mining. These structural differences shape income distribution and access to development benefits (Salsabila et al., 2024). Moreover, Lampung has experienced persistent intra-provincial inequality linked to sectoral disparities (Rachmawatie et al., 2024).

Conceptually, the key determinants examined in this study can affect inequality through distinct, and sometimes offsetting, channels. Minimum wages may reduce inequality when they are binding and effectively enforced, because they compress the lower tail of the wage distribution and raise earnings among low-paid workers; yet the effect can be muted or even reversed where compliance is weak, informality is high, or firms adjust through reduced employment or hours among low-skilled workers.

Poverty is closely linked to the overall income distribution, so shifts in inequality change how strongly growth translates into poverty reduction and may amplify disparities when gains accrue disproportionately to better-off households. HDI, as a composite measure of education, health, and living standards, captures human-capital accumulation that can narrow inequality when improvements are broad-based,

but may leave inequality unchanged if progress is concentrated among already advantaged groups or regions. Finally, unemployment influences inequality by weakening labour incomes at the bottom of the distribution and reflecting structural differences in local labour market opportunities, which can sustain persistent regional gaps over time.

Empirically, several studies have explored the determinants of income inequality at the regional level. Maghriza & Hasmarini (2024), for instance, examined the Yogyakarta region and found that poverty and the Human Development Index (HDI) significantly influenced inequality, whereas minimum wage and unemployment rates did not have notable effects.

In contrast, Nurdini et al. (2024), using data from North Sumatra, identified both minimum wage levels and unemployment as important predictors of inequality, highlighting the role of labour market structure. Fiyantika et al. (2025) used panel data across five provinces and found that minimum wage and poverty significantly affected inequality, but the strength of these relationships varied based on economic structure and governance.

Similar results were reported by Ardian & Huda (2025), who noted that in East Java, unemployment increased poverty, but HDI did not significantly reduce it. Putri & Iryani (2025) further demonstrated that disparities in education infrastructure and local budget allocations influence HDI outcomes, which in turn affect inequality.

Other scholars have examined the broader effects of external factors such as foreign direct investment (FDI). Erlianti (2025) found that while FDI can stimulate economic growth, it often leads to inequality when concentrated in

capital-intensive sectors. In response, Sahadewa & Purbadharmaja (2025) recommended that regional governments direct investment toward industries with high employment potential. Additionally, alternative redistribution mechanisms such as productive zakat have been shown to reduce income gaps among disadvantaged groups (Darsono et al., 2019).

Despite the growing number of studies, several gaps remain in the literature. First, research has been heavily concentrated in Java and Bali, with relatively little focus on Sumatra. Second, many studies analyse socioeconomic variables in isolation, rather than through an integrated model. Third, most rely on cross-sectional data, which cannot capture temporal dynamics or policy changes over time.

This study addresses these gaps by analysing income inequality across ten provinces in Sumatra from 2015 to 2024. Using panel data techniques, it investigates the effects of four key variables: provincial minimum wage, poverty rate, human development index, and unemployment rate. Focusing on Sumatra's varied regional contexts, this research provides new insights into how different socioeconomic factors shape income distribution and offers evidence to support more targeted, inclusive development policies.

RESEARCH METHODS

This study investigates the relationship between income inequality and selected socioeconomic factors across ten provinces in Sumatra from 2015 to 2024. The provinces included in the analysis are Aceh, North Sumatra, West Sumatra, Riau, Jambi, South Sumatra, Bengkulu, Lampung, Bangka Belitung Islands, and Riau Islands. These regions were selected to capture the diversity of economic

structures and institutional capacities within Sumatra. The data used in this study are annual secondary data sourced from official publications of Badan Pusat Statistik (BPS) and consist of a balanced panel comprising 100 observations from ten provinces over ten years.

The dependent variable in this study is the Gini ratio, which measures income inequality on a scale from 0 to 1, with higher values indicating greater inequality. The independent variables include the regional minimum wage, poverty rate, Human Development Index (HDI), and unemployment rate.

The minimum wage variable is expressed in nominal terms and transformed into its natural logarithmic form to reduce scale differences and address potential heteroskedasticity, following Ariefianto (2012). The poverty rate represents the percentage of the population living below the national poverty line. The HDI is a composite measure that reflects education, health, and income components of human development, while the unemployment rate refers to the proportion of the labour force actively seeking work but unable to find employment.

The expected signs of the coefficients are as follows: UMR and HDI are expected to reduce inequality (negative sign); POV is expected to increase inequality (positive sign); and the effect of TPT is theoretically ambiguous due to opposing wage and labour composition effects (Greene, 2018; Vo et al., 2019). The empirical model is specified as follows:

$$GR_{it} = \beta_0 + \beta_1 \ln(UMR)_{it} + \beta_2 POV_{it} + \beta_3 HDI_{it} + \beta_4 TPT_{it} + \mu_i$$

In this equation, GR_{it} represents the Gini ratio in province i at year t ; $\ln(UMR)_{it}$ is the

natural logarithm of the minimum wage; POV_{it} is the poverty rate; HDI_{it} is the human development index; TPT_{it} denotes the unemployment rate; and μ_i is the error term. The coefficient on the logged minimum wage is interpreted as a semi-elasticity, indicating the approximate change in the gini ratio for a one percent change in the minimum wage (Wooldridge, 2010).

To estimate the model, three panel data estimation techniques are considered: Pooled Ordinary Least Squares (OLS), Fixed Effects (FE), and Random Effects (RE), as outlined in Baltagi (2008). The selection of the most appropriate model is determined using several specification tests.

The Chow test compares the pooled OLS and fixed effects models, while the Breusch-Pagan Lagrange Multiplier (LM) test compares the pooled OLS and random effects models. The Hausman test is then applied to determine whether the fixed effects or random effects model is more appropriate, based on whether the unobserved individual effects are correlated with the regressors (Greene, 2018).

If the Hausman test fails to reject the null hypothesis, the random effects model is preferred and estimated using Feasible Generalized Least Squares (GLS). Otherwise, the fixed effects model is used. All models are estimated using robust standard errors to address heteroskedasticity, and additional robustness checks are conducted by clustering standard errors at the provincial level to control for within-group correlation (Wooldridge, 2010).

RESULTS AND DISCUSSION

Table 1 summarises descriptive statistics for all variables covering ten provinces in Sumatra during 2015–2024. The average Gini

ratio is 0.313, ranging from 0.23 to 0.40 across province-year observations. The regional minimum wage (UMR) averages Rp 2.483 million, with the lowest value recorded in Bengkulu in 2015 (Rp 1.5 million) and the highest

in Kep. Bangka Belitung in 2024 (Rp 3.4 million). The poverty rate averages 9.8 percent, with Kepulauan Bangka Belitung having the lowest (4.5 percent) and Bengkulu having the highest (17.9 percent).

Table 1. Summary Statistics

Variables	Obs	Mean	Std. Dev	Min	Max
Gini Ratio	100	0.313	0.031	0.230	0.400
UMR (in IDR)	100	2,483,872	482,129	1,500,000	3,413,066
Poverty Rate (POV, %)	100	9.801	3.875	4.450	17.880
Human Development Index (HDI)	100	71.720	2.228	66.950	79.080
Unemployment Rate (TPT, %)	100	5.373	1.504	2.600	10.340

Source: Data processed, 2025

The Human Development Index (HDI) has an average of 71.7, ranging from 66.9 in Lampung (2015) to 79.1 in Kepulauan Riau (2024). The unemployment rate (TPT) averages 5.373 percent, ranging from 2.6 percent in Kepulauan Bangka Belitung (2016) to 10.3 percent in Kepulauan Riau (2020).

These statistics confirm that economic and social conditions across provinces are far from homogeneous. Provinces with higher wages and higher human development tend to display lower inequality, but the association is not uniform, consistent with structural heterogeneity across Sumatra's regional economies.

Figure 2 reinforces this point by showing pronounced heterogeneity in inequality trajectories across provinces during 2015–2024. The provincial Gini ratio spans 0.23–0.40, and the annual cross-province spread (max–min) remains sizeable (around 0.08–0.11 Gini points across the decade), implying that island-level narratives can mask persistent provincial inequality gaps. This dispersion is consistent with the fact that provincial Gini ratios are

compiled and reported at the province level by BPS.

A “best–worst” comparison makes the pattern tangible. Kepulauan Bangka Belitung is the lowest-inequality province throughout the period, declining from roughly 0.29 (2015) to 0.23 (2024), and it appears as the minimum-Gini province year after year in the Sumatra sample. In contrast, Bengkulu sits at the high-inequality end, with Gini around 0.40 (2015) and about 0.34 (2024), and it appears as the maximum-Gini province in several years.

A third pattern is visible in provinces that temporarily become the highest-inequality province in particular years (for example, Lampung in 2016 and Sumatra Selatan in 2021–2022), indicating that “worst performers” can shift over time even when the overall spread persists. Together, these descriptive facts motivate interpreting the regression estimates as capturing differences in underlying provincial conditions, not only short-run fluctuations.

This study uses panel data analysis, which allows for three estimation approaches: The Pooled Ordinary Least Squares (OLS) model, the

Fixed Effect (FE) model, and the Random Effects (RE) model. The Chow and Hausman tests were performed to determine the most appropriate specifications for this study. The Chow test compares the Pooled OLS and Fixed Effects models.

If the probability value is less than 0.05, the null hypothesis of the common effect model is rejected, indicating that the Fixed Effects model is preferred. As shown in Table 2, the Chow test produced a probability value 0.000, which is smaller than 0.05.

Table 2. Chow Test Results

Effect Test	Prob
F(9.86)	30.71
Prob>F	0.0000

Source: Data processed, 2025

Therefore, the common effect model was rejected, and the Fixed Effects model was considered more suitable, as it can capture the heterogeneity across provinces in Sumatra that may not be directly observable, such as differences in industrial structure, institutional quality, and labour regulations.

Table 3. Hausman Test Results

Effect Test	Prob
$\chi^2(4)$	0.21
Prob> χ^2	0.9947

Source: Data processed, 2025

The Hausman test was conducted to verify whether the Fixed Effects or Random Effects model provides the best fit. The results, presented in Table 3, show a Chi-square probability of 0.9947, which is greater than 0.05. This indicates that the null hypothesis cannot be rejected, implying that the Random Effects

model is the most appropriate specification for the dataset. Consequently, all subsequent interpretations and discussions are based on the estimation of random effects.

Table 4 presents the results of the Random Effects estimation for income inequality (measured by the Gini ratio) across ten provinces in Sumatra between 2015 and 2024. The explanatory variables include the logarithm of the regional minimum wage ($\ln(\text{UMR})$), poverty rate (POV), Human Development Index (HDI), and unemployment rate (TPT). The results show that minimum wages are statistically significant at 1 percent, poverty and human development are marginally significant at 10 percent, and unemployment is not significant.

To interpret these coefficients in the specific Sumatra context, it is useful to contrast provinces at the low- and high-inequality ends of Figure 2. Kepulauan Bangka Belitung is persistently the lowest-inequality province in the panel and also records the lowest observed poverty rate (4.5 percent) and the highest observed minimum wage level (Rp 3.4 million in 2024), a profile consistent with wage compression and relatively stronger lower-tail welfare.

Bengkulu, in contrast, appears repeatedly at the high-inequality end and records the lowest minimum wage value in the panel (Rp 1.5 million in 2015) and the highest observed poverty rate (17.9 percent), consistent with the poverty–inequality reinforcement mechanism captured by the positive POV coefficient.

Kepulauan Riau provides an additional contrast: it records the highest unemployment rate in the sample (10.3 percent in 2020) but does not mechanically become the worst-inequality province in every year, suggesting that

open unemployment alone is an incomplete proxy for distributional stress when adjustment occurs through informal work, hours, or sectoral reallocation.

Table 4. Random Effects Model Results

Variable	Coefficient	Robust Std. Err.	Prob.
Constant	1.210	0.152	0.000***
ln(UMR)	-0.052	0.013	0.000***
Poverty Rate	0.003	0.002	0.058*
Human Development Index (HDI)	-0.002	0.001	0.098*
Unemployment Rate (TPT)	0.001	0.001	0.417
Observations	100		
Groups (provinces)	10		
R ² (Within)	0.651		
R ² (Overall)	0.518		
Wald χ^2 (4)	171.50		
Prob > χ^2	0.000		

Notes: Robust standard errors reported. ***, *, * denote significance at the 1%, 5%, 10% levels.

Source: Data processed, 2025

Against this descriptive backdrop, the estimates quantify the partial associations between inequality and the four explanatory variables. Specifically, the poverty rate has a positive coefficient of 0.003 and is marginally significant at the 10% level (prob. = 0.058), meaning that a one-percentage-point increase in the poverty rate is associated with a 0.003 rise in the Gini ratio (≈ 0.30 Gini points).

This pattern is consistent with a self-reinforcing link between poverty and inequality, where limited access to education, capital, and formal employment constrains upward mobility

at the lower tail of the distribution (Hindun et al., 2019; Yusuf et al., 2014). It also accords with the classic argument that higher initial inequality weakens the poverty-reducing impact of growth (Ravallion, 2001).

For Indonesia, national and provincial evidence show that inequality has remained sensitive to capability gaps and uneven access to services, so poverty and inequality move together through human-capital and spatial channels (World Bank, 2016; Yusuf et al., 2014). The magnitude is comparable to recent provincial panels that report a positive poverty–Gini association conditional on HDI and service access (Panggabean, 2025; Rizky et al., 2024).

Furthermore, the coefficient for HDI is -0.002 and marginally significant at 10 percent (prob. = 0.098), suggesting that a one-point improvement in human development is associated with a 0.002 reduction in the Gini ratio (≈ 0.2 Gini points). In this case, better education and health expand foundational capabilities and access to higher-productivity jobs, which compress lower-tail inequality.

This interpretation is consistent with province-level studies linking human-capital accumulation to more inclusive outcomes (Asman et al., 2024; Dinarjito & Dharmazi, 2020) and with cross-country regional work showing that human capital reduces inequality at least in the short run, with possible non-linearities as development rises (Vo et al., 2019). Beyond direct income effects, higher HDI also enhances intergenerational mobility and resilience to shocks, reducing the persistence of inequality as well as welfare improvements over time (Fadillah & Setiartiti, 2021).

Complementing the HDI channel, the coefficient for ln(UMR) is -0.052 and statistically significant at 1 percent (prob. < 0.001), indicating

that a 1-percent rise in the provincial minimum wage reduces the Gini ratio by roughly 0.00052 (≈ 0.052 Gini points) and that a 10-percent increase is associated with about 0.005 lower inequality (≈ 0.5 Gini points).

This confirms that wage regulation functions as a redistributive policy instrument. Minimum-wage adjustments compress overall income dispersion and can stimulate local consumption demand by lifting earnings at the bottom of the wage distribution, which may generate secondary employment effects.

The size and direction are coherent with recent Indonesian evidence that minimum-wage increases lift earnings around the lower part of the distribution with limited net employment losses among wage workers, translating into modest welfare gains (Merdikawati & Izzati, 2025).

The local nature of Indonesia's wage setting also matters, since district-level estimates show that wage-floor effects operate primarily within the province or district that raises it, which fits our identification from within-province variation (Siregar, 2022).

On the transmission to household outcomes, higher minimum wages are linked to better food-security indicators for formal-worker households, suggesting a plausible channel from wage compression to small declines in consumption-based inequality (Hasanah et al., 2024). There are also dynamic margins, where higher minimum wages shift educational choices toward vocational tracks, which may strengthen lower-tail earnings capacity over time and support inclusive growth (Pritadrajati et al., 2024).

Consistent with these mechanisms, provincial studies find that higher minimum wages narrow income gaps (Firdaus & Indira

Hasmarini, 2023; Mudana & Purbadharmaja, 2024), although effectiveness varies with formality and enforcement capacity.

Regions with extensive informal employment may experience smaller pass-through effects, and evidence from West Java highlights persistent poverty sensitivity despite wage policy (Fiskal & Wardani, 2020). By contrast, the unemployment rate (TPT) coefficient is positive (0.001) but statistically insignificant (prob. = 0.417).

This indicates that short-term variations in unemployment do not meaningfully explain provincial inequality in Sumatra. One plausible reason is that many job-seekers move into informal or own-account work, which masks the relationship between unemployment and measured inequality. In Indonesia's large informal sector, measured unemployment rate often understates labour market slack, weakening year-to-year links with consumption inequality (World Bank, 2016).

The descriptive contrast in Figure 2 is consistent with this mechanism, whereas Kepulauan Riau's unemployment spike does not mechanically coincide with the highest-inequality trajectory throughout the period, suggesting that unemployment alone is an incomplete proxy for distributional stress when labour market adjustment occurs through informality and underemployment (Hariani, 2019; Istikharoh et al., 2020). Overall, these results highlight the structural character of inequality in Sumatra. It is shaped less by cyclical labour market fluctuations and more by persistent differences in wages, human capital, and poverty incidence.

Model fit is solid for a provincial panel: within $R^2 = 0.651$, overall $R^2 = 0.518$, and Wald $\chi^2(4) = 171.50$ (prob. < 0.001). At the same time, the

remainder likely reflects institutional and spatial disparities such as fiscal decentralization, infrastructure gaps, or sectoral concentration.

The findings are consistent with broader evidence from Indonesia and other emerging economies (Vo et al., 2019; World Bank, 2016), which emphasizes that reducing inequality requires an integrated policy framework, combining effective wage enforcement, targeted poverty reduction, and sustained human-capital investment, to ensure that economic growth translates into equitable welfare gains across regions.

CONCLUSION

This study provides empirical evidence that income inequality in Sumatra is primarily determined by structural conditions that can be shaped through policy. The Random Effects estimation shows that provincial differences in inequality are strongly associated with variations in regional minimum wages, poverty incidence, and human development.

Higher minimum wages and improvements in education, health, and living standards reduce inequality, while higher poverty intensifies it. By contrast, unemployment has no significant effect, reflecting the limited role of formal joblessness in economies dominated by informal labour markets. These results remain robust under standard specification and diagnostic tests, confirming the reliability of the estimates and the appropriateness of the Random Effects model.

The findings emphasize that wage policy, human-capital formation, and poverty reduction are mutually reinforcing components of an inclusive development strategy. Credible enforcement of regional minimum wages helps

protect low-income workers and raise their purchasing power.

At the same time, sustained investment in education and health strengthens productivity and mobility among disadvantaged groups, narrowing income disparities over the long run. Poverty alleviation efforts should move beyond short-term transfers toward structural interventions that expand access to quality schooling, healthcare, and formal employment.

Such an integrated approach would allow economic growth to translate more effectively into welfare gains for low-income households, supporting the government's broader agenda for reducing inequality across provinces.

Future research can build on this study in several ways. First, extending the analysis with a longer time series or a broader provincial coverage would help capture the dynamic effects of decentralization, industrial diversification, and demographic shifts on inequality.

Second, incorporating spatial-econometric techniques could uncover inter-provincial spillovers and clustering effects that are not captured in conventional panel models. Third, future work should examine the role of fiscal transfers, digital transformation, and gender disparities as complementary mechanisms influencing regional inequality.

By integrating these dimensions, forthcoming studies could provide a more comprehensive understanding of how structural and policy factors interact to shape equitable development in Indonesia's provinces.

REFERENCES

- Ardian, E. D., & Huda, S. (2025). The Effect of Open Unemployment Rate, Human Development Index, and Minimum Wage on the Poverty Rate in East Java Province. *International Journal of Business and*

- Applied Economics, 4(5), 2697–2708. <https://doi.org/10.55927/ijbae.v4i5.384>
- Ariefianto, Moch. D. (2012). *Ekonometrika: Esensi dan aplikasi dengan menggunakan EViews*. Erlangga.
- Asman, J. R., Arham, M. A., & Akib, F. H. Y. (2024). Analisis Pengaruh Struktur Ekonomi dan Indeks Pembangunan Manusia Terhadap Ketimpangan Pendapatan Di Sulawesi. *Jurnal Studi Ekonomi Dan Pembangunan*, 1(3), 1–9. <https://doi.org/10.37905/jsep.v1i3.23491>
- Darsono, S. N. A. C., Raihana, M., Jati, H. F., & Pachmi, A. (2019). The Impact of Productive Zakat on the Income Inequality of Mustahiq in Yogyakarta. *Journal of Economics Research and Social Sciences*, 3(1). <https://doi.org/10.18196/jerss.030107>
- Dewi, Y. A., & Rachmawatie, D. (2020). Poverty Analysis and Inequality Distribution in Yogyakarta Special Region. *Journal of Economics Research and Social Sciences*, 4(1). <https://doi.org/10.18196/jerss.040119>
- Dinarjito, A., & Dharmazi, A. (2020). PENGARUH DESENTRALISASI FISKAL, INVESTASI, DAN INDEKS PEMBANGUNAN MANUSIA TERHADAP PERTUMBUHAN EKONOMI REGIONAL DI PROVINSI KALIMANTAN TIMUR. *Jurnal Pajak Dan Keuangan Negara (PKN)*, 1(2), 57–72. <https://doi.org/10.31092/jpkn.v1i2.789>
- Erlianti, Z. (2025). Determinan ketimpangan distribusi pendapatan di negara ASEAN-5 tahun 2007-2023 [Skripsi Si, Universitas Sultan Ageng Tirtayasa]. <https://eprints.untirta.ac.id/view/divisions/IEP/2025.default.html>
- Fadillah, N., & Setiartiti, L. (2021). Analysis of Factors Affecting Human Development Index in Special Regional of Yogyakarta. *Journal of Economics Research and Social Sciences*, 5(1), 88–104. <https://doi.org/10.18196/jerss.v5i1.11036>
- Firdaus, A., & Indira Hasmarini, M. (2023). Analisis Pengaruh Jumlah Penduduk, Upah Minimum Kabupaten, Pengangguran, dan Indeks Pembangunan Manusia Terhadap Ketimpangan Pendapatan Kab/Kota di Provinsi Bali Pada Tahun 2015-2022. *Primanomics : Jurnal Ekonomi & Bisnis*, 21(3), 116–123. <https://doi.org/10.31253/pe.v21i3.2128>
- Fiskal, M. Y., & Wardani, D. T. K. (2020). Determinants of Poverty in West Java Province After the Regional Expansion of Pangandaran District. *Journal of Economics Research and Social Sciences*, 4(1). <https://doi.org/10.18196/jerss.040120>
- Fiyantika, F. T. P., Asmara, K., & Nisa, F. L. (2025). Determinants of Interprovincial Income Inequality in Indonesia: A Case Study of DIY Yogyakarta, DKI Jakarta, West Java, Gorontalo, and West Papua. *Asian Journal of Applied Business and Management*, 4(3), 883–896. <https://doi.org/10.55927/ajabm.v4i3.370>
- Greene, W. H. (2018). *Econometric Analysis* (8th ed.). Pearson (Pearson Education, Inc.). <https://www.pearson.com/en-us/subject-catalog/p/econometric-analysis/P200000005909/9780134811932>
- Hariani, E. (2019). Analisis Faktor-Faktor yang Mempengaruhi Ketimpangan Pendapatan di 38 Kabupaten/Kota Jawa Timur Tahun 2012-2015. *The International Journal of Applied Business (TIJAB)*, 3(1). <https://erepository.uwks.ac.id/5356/>
- Hasanah, H., Nachrowi, N. D., Wisana, I. D. G. K., & Siregar, H. (2024). Could the minimum wage policy reduce food insecurity among households of formal workers in Indonesia? *Agriculture & Food Security*, 13(1), 7. <https://doi.org/10.1186/s40066-023-00451-3>
- Hindun, H., Soejoto, A., & Hariyati, H. (2019). Pengaruh Pendidikan, Pengangguran, dan Kemiskinan terhadap Ketimpangan Pendapatan di Indonesia. *Jurnal Ekonomi Bisnis Dan Kewirausahaan*, 8(3), 250. <https://doi.org/10.26418/jebik.v8i3.34721>
- Hudiyanto. (2001). Kesenjangan dan Ketimpangan. *Jurnal Ekonomi Dan Studi Pembangunan*, 2(2). <https://journal.umy.ac.id/index.php/esp/article/view/1457>
- Istikharoh, Prijanto, J. W., & Destiningsih, R. (2020). Education Level Impact Analysis, Minimum Wage and Unemployment Rate on Income Inequality in Special Territory of Jogjakarta, 2008-2018. *DINAMIC: Directory Journal of Economic*, 2(1), 109–125. <https://jom.untidar.ac.id/index.php/dinamic/article/view/1399/0>
- Maghriza, M. R., & Hasmarini, M. I. (2024). The Influence of the Number of Poor People, Minimum Wage, Human Development Index, and Open Unemployment Rate on Income Inequality in Yogyakarta (2010-2023). *Economos : Jurnal Ekonomi Dan Bisnis*, 7(3), 304–311. <https://doi.org/10.31850/economos.v7i3.3451>
- Merdikawati, N., & Izzati, R. Al. (2025). Minimum Wage Policy and Poverty in Indonesia. *The World Bank*

- Economic Review, 39(1), 191–210.
<https://doi.org/10.1093/wber/lhae022>
- Mudana, I. W. E., & Purbadharmaja, I. B. P. (2024). Minimum Dan Kesejahteraan Masyarakat Kabupaten / Kota Di Provinsi Bali. *Jurnal Review Pendidikan Dan Pengajaran (JRPP)*, 7(2), 9601–9612.
- Nurdini, Yusrizal, & Daulay, A. N. (2024). The Influence of Open Unemployment Rates, Inflation and Minimum Wages on Income Inequality in The North Sumatra Region. *Jurnal Manajemen Bisnis*, 11(2), 1279–1290.
<https://doi.org/10.33096/jmb.v11i2.898>
- OECD. (2015). *In It Together: Why Less Inequality Benefits All*. OECD Publishing.
<https://doi.org/10.1787/9789264235120-en>
- Panggabean, M. (2025). Income inequality in Indonesia and its influencing factors. *International Journal of Innovative Research and Scientific Studies*, 8(3), 4069–4082. <https://doi.org/10.53894/ijirss.v8i3.7444>
- Pritadrajati, D., Merdikawati, N., Saxena, S. C. ., & Tjahjadi, A. M. (2024). Minimum Wage and Educational Pathways in Indonesia: General or Vocational Tracks? *Asian Development Review*, 41(02), 107–135.
<https://doi.org/10.1142/S0116110524400110>
- Putri, A. F., & Iryani, N. (2025). Analisis Pengaruh Faktor Internal Terhadap Perbedaan Indeks Pembangunan Manusia Antar Wilayah Di Indonesia Tahun 2010–2024. *Ekonomipedia: Jurnal Ekonomi Manajemen Dan Bisnis*, 3(2), 383–394.
<https://journals.gesociety.org/index.php/ekonomipedia/article/view/351>
- Rachmawatie, D., Prasajo, P., & Mubarrok, W. (2024). Analysis of Inequality in Lampung Province (2014–2021): Sectoral and Regional Approaches. *Journal of Economics Research and Social Sciences*, 8(1), 115–132. <https://doi.org/10.18196/jerss.v8i1.21495>
- Ravallion, M. (2001). Growth, inequality and poverty: Looking beyond averages. *World Development*, 29(11), 1803–1815. [https://doi.org/10.1016/S0305-750X\(01\)00072-9](https://doi.org/10.1016/S0305-750X(01)00072-9)
- Rizky, M. D., Lubis, S. N., & Kesuma, S. I. (2024). Economic Growth, Poverty, Unemployment, and the Human Development Index (HDI) in Mitigating Socio-economic Disparities in North Sumatra (2019–2023): An Econometric Case Study. *South Asian Journal of Social Studies and Economics*, 21(12), 302–311.
<https://doi.org/10.9734/sajsse/2024/v21i12938>
- Sahadewa, I. D. G. N., & Purbadharmaja, I. B. P. (2025). Determinants of Foreign Direct Investment and Economic Growth in Regencies/Cities in Bali Province. *Business and Investment Review*, 3(6), 1–10. <https://doi.org/10.61292/birev.207>
- Salsabila, A., Azaria, N. S., Ramdhani, N., Amanda, A., & Christina, A. (2024). Pengaruh Pengangguran, Kemiskinan, serta Indeks Pembangunan Manusia (IPM) terhadap Kesenjangan Pendapatan di Kabupaten atau Kota Provinsi Banten Periode Tahun 2019–2023. *LITERATUS*, 6(1), 155–166.
<https://doi.org/10.37010/lit.v6i1.1571>
- Siregar, T. H. (2022). Investigating the Effects of Minimum Wages on Employment, Unemployment and Labour Participation in Java: A Dynamic Spatial Panel Approach. *Bulletin of Indonesian Economic Studies*, 58(2), 195–227.
<https://doi.org/10.1080/00074918.2021.1914817>
- Vo, D. H., Nguyen, T. C., Tran, N. P., & Vo, A. T. (2019). What Factors Affect Income Inequality and Economic Growth in Middle-Income Countries? *Journal of Risk and Financial Management*, 12(1), 40.
<https://doi.org/10.3390/jrfm12010040>
- Wooldridge, J. M. (2010). *Econometric Analysis of Cross Section and Panel Data* (2nd ed.). The MIT Press.
https://mitpress.mit.edu/9780262232586/econometric-analysis-of-cross-section-and-panel-data/?utm_source=chatgpt.com
- World Bank. (2016). *Indonesia's Rising Divide*. <http://documents.worldbank.org/curated/en/267671467991932516>
- Yusuf, A. A., Sumner, A., & Rum, I. A. (2014). Twenty Years of Expenditure Inequality in Indonesia, 1993–2013. *Bulletin of Indonesian Economic Studies*, 50(2), 243–254.
<https://doi.org/10.1080/00074918.2014.939937>