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Targeted Fiscal Transfers and Regional Income Inequality: Evidence from Sumatra, Indonesia

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Abstrak

Ketimpangan pendapatan tetap menjadi tantangan pembangunan di wilayah kaya sumber daya karena kapasitas ekonomi yang besar tidak selalu menghasilkan pemerataan kesejahteraan. Penelitian ini menganalisis pengaruh desentralisasi fiskal dan kondisi makroekonomi terhadap ketimpangan pendapatan pada sepuluh provinsi di Sumatra selama 2021–2025. Seluruh provinsi di Sumatra digunakan sebagai populasi pengamatan dan dianalisis dengan regresi data panel. Variabel penjelas mencakup Upah Minimum Provinsi, Dana Alokasi Umum, Dana Alokasi Khusus, Dana Bagi Hasil, pengangguran, dan Produk Domestik Regional Bruto. Uji Chow, Hausman, dan Lagrange Multiplier memilih Random Effects Model, sedangkan robust *standard errors* digunakan untuk mengatasi autokorelasi. Hasil menunjukkan Dana Alokasi Khusus berasosiasi negatif dengan ketimpangan; pengangguran juga berasosiasi negatif, tetapi lebih tepat dipahami sebagai kompresi pendapatan daripada peningkatan kesejahteraan. Variabel lainnya tidak menunjukkan hubungan yang meyakinkan. Artikel ini berkontribusi pada perdebatan desentralisasi fiskal dengan menunjukkan bahwa pada tata kelola daerah yang heterogen, desain transfer dan kontrol administratif dapat lebih menentukan daripada besarnya transfer: DAK yang terarah berkaitan dengan penurunan ketimpangan, sementara DAU dan DBH tidak menunjukkan efek redistributif yang terukur.

Kata Kunci: desentralisasi fiskal; ketimpangan pendapatan; Dana Alokasi Khusus; pengangguran; Sumatra

Abstract

Income inequality remains a development challenge in resource-rich regions because strong economic capacity does not automatically produce equitable welfare. This study examines fiscal decentralization and macroeconomic conditions across all ten provinces of Sumatra during 2021–2025 using panel-data regression. The explanatory variables are the Provincial Minimum Wage, General Allocation Fund, Special Allocation Fund, Revenue Sharing Fund, unemployment, and Gross Regional Domestic Product. Chow, Hausman, and Lagrange Multiplier tests select the Random Effects Model, while robust standard errors address serial correlation. The Special Allocation Fund is negatively associated with inequality. Unemployment also has a negative association, but this pattern is interpreted as income compression rather than welfare improvement; the other variables do not show convincing relationships. This article contributes to the fiscal-decentralization debate by showing that under heterogeneous subnational governance, transfer design and administrative control matter more than fiscal magnitude: the targeted Special Allocation Fund is associated with lower inequality, whereas the General Allocation Fund and Revenue Sharing Fund show no measurable redistributive association.

Keywords: fiscal decentralization; income inequality; Special Allocation Fund; unemployment; Sumatra

INTRODUCTION

Income inequality remains a persistent regional-development challenge because aggregate economic expansion does not necessarily translate into an equitable distribution of welfare. This issue is particularly important in Indonesia, where provinces differ substantially in natural-resource endowments, production structures, labor markets, fiscal capacity, and access to public services.

Sumatra is a relevant setting because its economy is supported by oil and gas, mining, palm oil, geothermal energy, agriculture, and manufacturing. Badan Pusat Statistik (2019) reported that Sumatra contributed about 21% of national economic activity, making it the second-largest regional contributor after Java. More recent evidence also shows that regional disparities remain persistent and that the structure of local economic specialization matters for

development priorities (Aginta et al., 2023; Ismail et al., 2026).

The distributional problem is visible in the provincial data. Between March 2021 and March 2025, the Gini ratio fell in eight of the ten Sumatran provinces but increased in Bengkulu and Riau Islands. By March 2025, provincial Gini ratios ranged from 0.222 in Bangka Belitung Islands to 0.382 in Riau Islands, indicating that the same national fiscal framework coexists with markedly different distributional trajectories across provinces (Badan Pusat Statistik, 2026). This heterogeneity provides an empirical basis for examining not only the amount of intergovernmental transfers but also the administrative design through which transfers are allocated and controlled.

Table 1. Provincial Gini Ratios in Sumatra, March 2021 and March 2025

Province	2021	2025	Change
Aceh	0.324	0.282	-0.042
North Sumatra	0.314	0.295	-0.019
West Sumatra	0.306	0.282	-0.024
Riau	0.326	0.307	-0.019
Jambi	0.321	0.301	-0.020
South Sumatra	0.341	0.311	-0.030
Bengkulu	0.326	0.349	+0.023
Lampung	0.323	0.292	-0.031
Bangka Belitung Islands	0.256	0.222	-0.034
Riau Islands	0.343	0.382	+0.039

Source: Badan Pusat Statistik (BPS), *Gini Ratio Menurut Provinsi dan Daerah*, processed by the author (2026).

The coexistence of abundant resources and unequal welfare raises a policy problem: economic capacity can increase without equivalent improvements in the distribution of income, employment opportunities, infrastructure, or basic services. District-level evidence indicates that natural-resource-rich and major urban regions are overrepresented in Indonesia’s higher-income convergence groups (Aginta et al., 2023), while place-based economic expansion can have heterogeneous distributional effects across provinces (Hornok & Raeskyesa, 2024). Public-service disparities also remain an important dimension of regional autonomy, because unequal

access to teachers, health personnel, and other basic services can reproduce socioeconomic gaps across territories (Pratama & Pramono, 2020).

Fiscal decentralization is one of the principal mechanisms through which Indonesia attempts to address such differences. Law No. 1 of 2022 on Financial Relations between the Central Government and Regional Governments reorganizes important elements of the intergovernmental fiscal framework (Pemerintah Indonesia, 2022). Within this system, the General Allocation Fund (DAU), Special Allocation Fund (DAK), and Revenue Sharing Fund (DBH) serve different equalization, targeting, and revenue-sharing purposes. However, the effectiveness of decentralization depends not only on the volume of transfers but also on expenditure quality, implementation capacity, incentives, and accountability (Lewis, 2023; World Bank, 2020).

Existing studies establish a theoretical puzzle that is more important than a simple absence of recent provincial evidence. DAU is designed as a broad equalization transfer and has been shown to reduce disparities in fiscal capacity (Akita et al., 2021), yet greater fiscal capacity does not necessarily translate into lower household inequality when local governments differ in administrative capacity, spending priorities, and accountability. Second-generation fiscal federalism warns that decentralized discretion can generate agency problems and information asymmetry when central government cannot fully observe local spending quality (Oates, 2005). Indonesian evidence on the flypaper effect further shows that transfers can stimulate local expenditure more strongly than own-source revenue and may be absorbed disproportionately by routine spending rather than inequality-reducing programs (Amalia, 2017; Chalil, 2018). By contrast, DAK is more targeted and more closely tied to national priorities, while the post-2022 framework strengthens central steering through earmarks, mandates, and performance instruments (Lewis, 2023). The unresolved anomaly is therefore whether a general-purpose equalization instrument can fail to produce a measurable redistributive association while a more centrally steered targeted transfer does so. This study tests that governance

puzzle by estimating the simultaneous relationships of DAU, DAK, DBH, provincial minimum wages, unemployment, and GRDP across the complete population of Sumatran provinces during 2021–2025.

LITERATURE REVIEW

The theoretical foundation combines public-finance, fiscal-federalism, and development perspectives. Musgrave (1959) identifies allocation, distribution, and stabilization as the major functions of public finance; the distributive function is directly relevant when public spending and transfers improve access to services and productive opportunities. Oates (1972, 1999) argues that decentralized governments may respond more effectively to heterogeneous local preferences and conditions, although the assignment of responsibilities and fiscal instruments determines whether decentralization improves welfare. From a development perspective, Kuznets (1955) and Todaro and Smith (2015) emphasize that growth can coexist with inequality when structural transformation concentrates assets, employment, and opportunities in selected sectors or locations. International evidence similarly indicates that the distributional effects of fiscal decentralization vary with the form of decentralization and the assignment of expenditure and revenue responsibilities (Sacchi & Salotti, 2014).

Empirical research on Indonesia indicates that the distributional effect of decentralization varies across instruments and institutional settings. Siburian (2020) reports an inequality-reducing association of fiscal decentralization, while Siburian (2021) highlights its interaction with local public-good provision. Akita et al. (2021) show that the General Allocation Fund performs an equalizing function in fiscal revenues, whereas geographically concentrated shared revenues can widen fiscal disparities. Lewis and Smoke (2017) demonstrate that intergovernmental transfers can generate complex local incentives, and Lewis (2017) shows that substantial fiscal resources do not automatically produce stronger service delivery. These findings imply that transfer design and subnational implementation should be analyzed together rather

than treating all intergovernmental resources as equivalent.

A public-administration perspective helps explain why transfer instruments with similar fiscal objectives may generate different distributional outcomes. Second-generation fiscal federalism relaxes the assumption of uniformly benevolent and capable local governments and instead emphasizes incentives, agency relationships, and institutional constraints (Oates, 2005). In this setting, information asymmetry arises because the central government can observe the amount transferred more easily than the quality and distributional incidence of local spending. The Indonesian flypaper literature shows that intergovernmental grants can become embedded in local expenditure structures, with lump-sum grants exerting particularly strong effects on routine spending (Amalia, 2017; Chalil, 2018). This creates a governance risk for DAU: broad discretion can equalize fiscal capacity without guaranteeing that additional resources are converted into services that benefit lower-income groups. DAK operates under narrower sectoral purposes and greater vertical steering, which can reduce discretion and make outputs easier to monitor, although stronger central control is not a substitute for local administrative capacity. Recent Indonesian evidence confirms that the effect of fiscal transfers on public-service performance depends materially on governance accountability (Isman et al., 2025). The contrast between DAU and DAK is therefore treated here as a problem of intergovernmental governance—discretion, accountability, bureaucratic capacity, and information—rather than only as a question of fiscal magnitude.

Research in Jurnal Mediasosian further emphasizes the administrative mechanisms through which fiscal resources translate into local outcomes. Studies of village and urban funds show that implementation quality, accountability, community participation, empowerment, and monitoring affect the substantive benefits of public transfers (Haryati et al., 2020; Mashuri et al., 2020; Rama & Setiawan, 2021; Sapitri & Alexandro, 2021). Evidence on targeted cash-transfer implementation similarly indicates that policy design must be supported by

administrative capacity, beneficiary targeting, and coordination to reach intended groups (Abror & Tyasotyaningrum, 2022). These findings are relevant to DAK because a targeted transfer can reduce disparities only when allocation priorities are converted into effective sectoral spending and services.

Labor-market and growth channels are also important. Minimum-wage adjustments can alter the lower part of the wage distribution, although their effects depend on formal-sector coverage, compliance, and employment responses (Chun & Khor, 2010). Unemployment may increase hardship even when measured inequality declines, because income losses can compress the distribution without improving welfare. In Sumatra, unemployment differs substantially across provinces and is related to regional economic structures and employment absorption (Wardiansyah et al., 2017). More broadly, informal workers remain exposed to gaps in social protection and income security (Rahayu et al., 2026), while recent Indonesian evidence confirms that the relationship between local growth and inequality is heterogeneous rather than mechanically redistributive (Hornok & Raeskyesa, 2024). Related Indonesian evidence also associates regional inequality with economic growth, government expenditure, labor conditions, education, and investment, with some relationships differing around the COVID-19 period (Santoso & Mukhlis, 2021; Utomo, 2022).

Based on this literature, the study expects the fiscal and macroeconomic variables to be jointly related to provincial income inequality. The specific hypotheses are that increases in UMP, DAU, and DAK are associated with lower inequality; DBH may have an ambiguous relationship because resource-based revenue sharing can reinforce spatial concentration; unemployment may either widen inequality or compress measured income differences depending on labor-market structure; and higher GRDP does not necessarily reduce inequality when growth is concentrated in capital-intensive or resource-based sectors. The study tests these propositions simultaneously in a province-level panel covering Sumatra.

RESEARCH METHOD

Research Design, Population, and Census Coverage

This study employs a quantitative explanatory research design combined with descriptive analysis to investigate the relationship between fiscal instruments, macroeconomic conditions, and income inequality across provinces on Sumatra Island. The quantitative approach is appropriate because the research estimates the direction, magnitude, and statistical significance of the effects of several explanatory variables on provincial income inequality. The empirical analysis uses panel data, which combine cross-sectional and time-series dimensions and therefore capture both differences among provinces and changes within provinces over time. This approach is particularly suitable for Sumatra because its provinces differ considerably in economic structure, fiscal capacity, natural-resource endowment, labor-market characteristics, and income distribution.

The study covers the ten provinces located on Sumatra Island over the 2021–2025 period. The cross-sectional dimension consists of ten provinces, while the time-series dimension consists of five annual observations for each province, yielding 50 province-year observations. The Gini ratio is obtained from the official Badan Pusat Statistik (BPS) statistical table “Gini Ratio Menurut Provinsi dan Daerah,” while the remaining provincial series are compiled from corresponding BPS statistical tables and publications for 2021–2025 (Badan Pusat Statistik, 2026). The use of official BPS series supports consistency in definitions, measurement procedures, geographical coverage, and annual reporting across the provinces included in the analysis. Data processing and panel-data estimation were conducted using RStudio. The cross-sectional units constitute a census of the complete provincial population of Sumatra rather than a random sample: all ten provinces administratively located on the island are included. Accordingly, the 50 province-year observations arise from complete provincial coverage (10 provinces $\times$ 5 years), not from sampling a larger provincial universe. Statistical inference is therefore interpreted for the defined Sumatra population and 2021–2025 period, while

generalization to provinces outside Sumatra or to longer time horizons remains limited.

Variables and Operationalization

Income inequality is the dependent variable and is represented by the provincial Gini ratio. The Gini ratio measures the extent to which the distribution of income or expenditure differs from perfect equality, with a higher value indicating greater inequality. Six explanatory variables are used to represent fiscal transfers, labor-market conditions, and regional economic performance. The first is the Provincial Minimum Wage (UMP). The fiscal variables are the General Allocation Fund (Dana Alokasi Umum/DAU), Special Allocation Fund (Dana Alokasi Khusus/DAK), and Revenue Sharing Fund (Dana Bagi Hasil/DBH). DAU is a general-purpose transfer intended primarily to reduce differences in fiscal capacity across subnational governments; DAK finances more specifically targeted sectors and priority activities; and DBH redistributes portions of central-government revenues to regions according to relevant tax and natural-resource revenue-sharing arrangements.

The labor-market condition is represented by the unemployment rate, while regional economic performance is represented by Gross Regional Domestic Product (GRDP). In the estimated specification, UMP, DAU, DAK, DBH, and GRDP are transformed into natural logarithmic form, consistent with the variables reported in the empirical regression output. The unemployment variable is retained in level form. The logarithmic transformation reduces large scale differences in monetary variables and permits the coefficients of those variables to be interpreted as semi-elasticities because the dependent Gini ratio remains in level form.

Table 2. Operational Definition of Variables

Variable	Indicator	Form	Source
Gini ratio	Income inequality index	Level	BPS
UMP	Provincial minimum wage	ln(UMP)	BPS

Variable	Indicator	Form	Source
DAU	General Allocation Fund	ln(DAU)	BPS
DAK	Special Allocation Fund	ln(DAK)	BPS
DBH	Revenue Sharing Fund	ln(DBH)	BPS
Unemployment	Open unemployment rate (%)	Level	BPS
GRDP	Gross Regional Domestic Product	ln(GRDP)	BPS

Source: Badan Pusat Statistik (BPS), processed by the author (2026).

Panel Model and Estimation Procedure

Panel-data regression is used to estimate the association between the explanatory variables and income inequality while accounting for both provincial and temporal dimensions. The empirical specification is expressed as follows:

$$Gini_{it} = \beta_0 + \beta_1 \ln UMP_{it} + \beta_2 \ln DAU_{it} + \beta_3 \ln DAK_{it} + \beta_4 \ln DBH_{it} + \beta_5 UNEMP_{it} + \beta_6 \ln GRDP_{it} + \epsilon_{it}$$

In this equation, $Gini_{it}$ denotes the Gini ratio for province i in year t ; β_0 is the intercept; β_1 to β_6 are the estimated regression coefficients; $\ln UMP_{it}$, $\ln DAU_{it}$, $\ln DAK_{it}$, $\ln DBH_{it}$, and $\ln GRDP_{it}$ are the natural logarithms of the Provincial Minimum Wage, General Allocation Fund, Special Allocation Fund, Revenue Sharing Fund, and Gross Regional Domestic Product, respectively; $UNEMP_{it}$ is the provincial unemployment rate; and ϵ_{it} is the stochastic error term.

Three alternative panel estimators are considered: the Common Effect Model, also referred to as pooled regression; the Fixed Effects Model; and the Random Effects Model. The Common Effect Model pools observations without explicitly accounting for province-specific unobserved heterogeneity. The Fixed Effects Model allows the intercept to vary across provinces and controls for time-invariant provincial characteristics. The Random Effects Model treats province-specific heterogeneity as a random component of the composite error structure. Formal model-selection

procedures are used to identify the specification most consistent with the data.

The appropriate panel-data estimator is determined sequentially using the Chow, Hausman, and Lagrange Multiplier tests. The Chow test compares the Common Effect Model with the Fixed Effects Model. The Hausman test then compares the Fixed Effects and Random Effects specifications, while the Breusch-Pagan Lagrange Multiplier test compares the Random Effects Model with the Common Effect Model. Together, these tests provide a systematic basis for choosing the final panel specification rather than relying solely on goodness-of-fit measures.

Diagnostic testing evaluates potential statistical problems in the estimated model. Multicollinearity is assessed using the Variance Inflation Factor, with values below the conventional threshold of 10 interpreted as indicating the absence of serious multicollinearity. Heteroskedasticity is evaluated using the Breusch-Pagan test. Serial correlation is also examined because annual observations for a given province may be related to values in preceding years. The original analysis identifies autocorrelation; consequently, coefficient-level inference is corrected using robust standard errors following the covariance approach associated with Arellano (1987). This adjustment improves the reliability of standard errors, test statistics, and probability values under within-panel dependence.

The empirical evaluation is conducted at a 5% significance level. Partial significance is assessed through the probability values associated with individual regression coefficients, while the sign and magnitude of each coefficient are used to describe the direction and size of the estimated association. Because several explanatory variables are expressed in natural logarithms whereas the Gini ratio remains in level form, their coefficients are interpreted as semi-elasticities. The overall significance of the

model is evaluated through the reported F-statistic, and the coefficient of determination and adjusted coefficient of determination are used to describe explanatory performance. Interpretation emphasizes coefficient direction, statistical significance, robustness of inference, and consistency with the theoretical mechanisms linking fiscal decentralization, labor-market conditions, regional economic performance, and income distribution.

RESULTS AND DISCUSSION

Descriptive Patterns

The empirical analysis covers ten provinces of Sumatra during 2021–2025, combining cross-sectional differences among provinces with annual variation over time. The explanatory variables include the Provincial Minimum Wage, General Allocation Fund, Special Allocation Fund, Revenue Sharing Fund, unemployment, and Gross Regional Domestic Product. The source data show substantial heterogeneity in fiscal allocations and labor-market conditions across provinces, supporting the use of panel-data methods rather than an analysis based solely on aggregate Sumatra-level observations.

The original Special Allocation Fund data show noticeable cross-provincial and temporal variation. North Sumatra generally records a relatively large allocation compared with most other provinces, while allocations fluctuate from 2021 to 2025. Such variation is consistent with the targeted nature of the fund, under which allocations are tied to specific sectors and development priorities rather than distributed uniformly. This variation provides empirical leverage for assessing whether changes in targeted transfers are associated with changes in provincial inequality. Previous Indonesian evidence has likewise emphasized the potential distributive role of intergovernmental transfers, although effects differ across instruments and regional settings (Sidik et al., 2020).

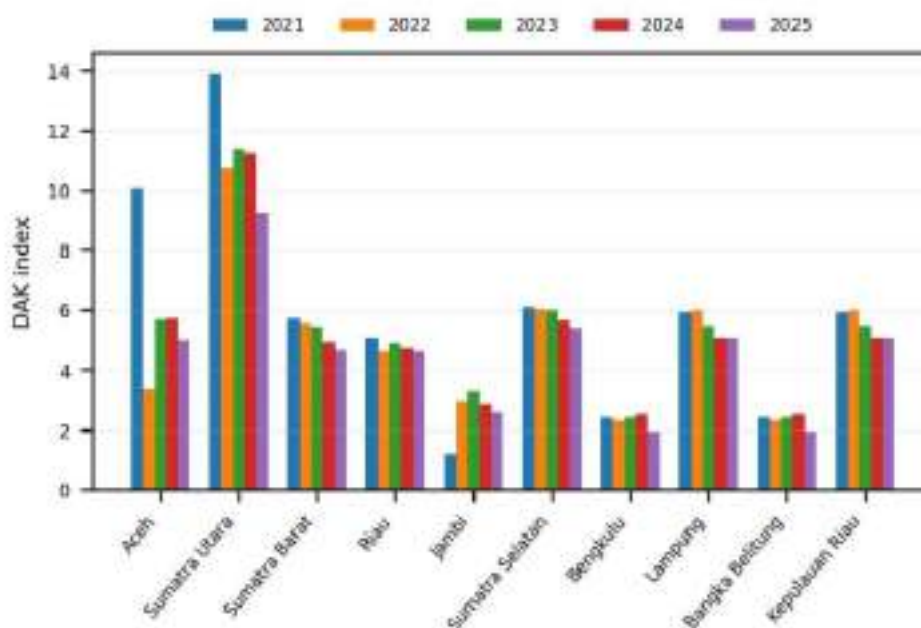


Figure 1. Special Allocation Fund (DAK) across Sumatran Provinces, 2021–2025

Source: Badan Pusat Statistik (BPS), processed by the author (2026).

Unemployment also varies markedly across Sumatra. In the source dataset, the unemployment rate in Riau Islands was 10.12% in 2021 and declined to 6.45% in 2025, while North Sumatra recorded 6.01% in 2021 and 5.32% in 2025. South Sumatra declined from 5.17% to 3.69%, and Bengkulu from 3.72% to 3.41%. These patterns demonstrate

substantial differences in labor-market conditions during the study period. Such variation is consistent with earlier research showing that unemployment across Sumatran provinces is associated with regional economic conditions and employment absorption (Wardiansyah et al., 2017).

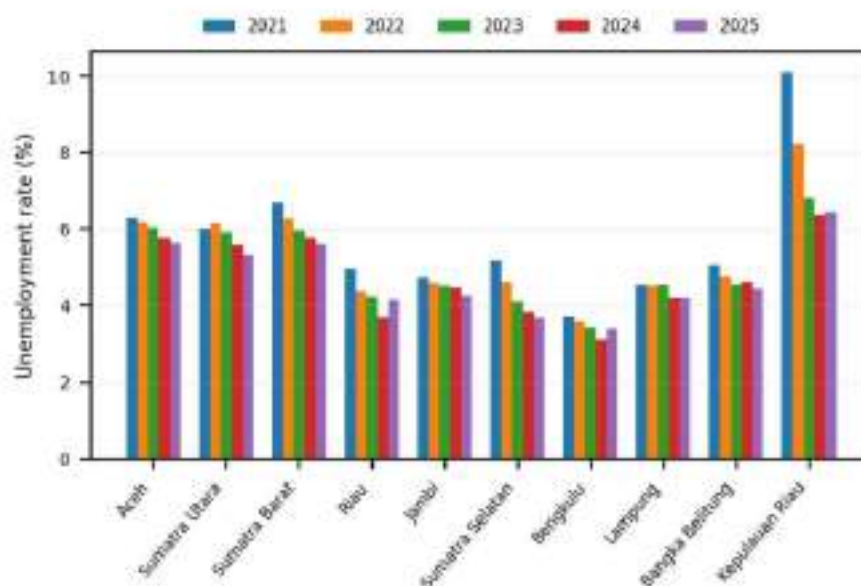


Figure 2. Unemployment Rates across Sumatran Provinces, 2021–2025

Panel Model Selection and Diagnostics

The panel-data specification was determined through the Chow, Hausman, and Lagrange Multiplier tests. The Chow test generated an F-statistic of 15.115 with a probability value of 0.0000. Because the probability value is below 5%, the null hypothesis favoring the Common Effect Model was rejected, indicating that the Fixed Effects Model is preferable pooled estimation. The Hausman test produced a chi-square statistic of 5.1138 with a probability value of 0.5293. Because this value exceeds 0.05, the null hypothesis could not be rejected, supporting the Random Effects Model rather than the Fixed Effects Model. The Breusch-Pagan Lagrange Multiplier test yielded a statistic of 36.533 with a probability value of 0.0000, further indicating that the Random Effects Model is superior to the Common Effect Model. Taken together, the model-selection tests identify the Random Effects Model as the preferred specification.

Table 3. Model Selection and Diagnostic Tests

Test	Statistic	p-value	Decision
Chow	F = 15.115	0.0000	FEM over CEM
Hausman	$\chi^2 = 5.1138$	0.5293	REM over FEM
LM	BP = 36.533	0.0000	REM over CEM
Heterosk.	BP = 23.362	0.07675	Not detected
Autocorr.	F = 7.2731	0.01038	Robust SE used

Source: Author's calculation based on Badan Pusat Statistik (BPS) data (2026).

The sequence of model-selection results is internally consistent. The significant Chow test rejects the assumption that a fully pooled specification is sufficient, while the non-significant Hausman test indicates that the random-effects estimator is not statistically contradicted by the fixed-effects alternative. The significant Lagrange Multiplier test then confirms that modeling province-level random effects is preferable to ignoring unobserved panel heterogeneity altogether. On this basis, the Random Effects Model is retained for coefficient interpretation and subsequent statistical inference.

The original diagnostic analysis reports Variance Inflation Factor values below 10, indicating

no serious multicollinearity. The Breusch-Pagan heteroskedasticity test produced a statistic of 23.362 with a probability value of 0.07675; therefore, heteroskedasticity was not detected at the 5% significance level. In contrast, the autocorrelation test produced an F-statistic of 7.2731 with a probability value of 0.01038, indicating statistically significant serial correlation. Because regional inequality and output may exhibit temporal persistence, this result is plausible. The final inference therefore uses robust standard errors associated with Arellano (1987) to mitigate distortions in standard errors caused by within-panel serial dependence.

Fiscal Transfers and Income Inequality

The Random Effects Model estimates show that the Special Allocation Fund is the only fiscal-transfer variable with a statistically significant relationship with provincial income inequality. Its coefficient is -0.029409 with a probability value of approximately 0.000066, indicating a negative and highly significant association with the Gini ratio. Because the Special Allocation Fund is expressed in natural logarithmic form while the Gini ratio remains in level form, a 1% increase in the fund is associated with an approximate reduction in the Gini ratio of 0.000294, holding other explanatory variables constant. The direction of this relationship is consistent with evidence that targeted fiscal transfers can contribute to lower regional disparities (Sidik et al., 2020).

The General Allocation Fund also has a negative coefficient of -0.033948, but its probability value of 0.133722 exceeds the conventional significance threshold. The Revenue Sharing Fund has a coefficient of 0.000626 and a probability value of 0.951060, indicating no statistically detectable relationship with inequality. The contrast among these three fiscal instruments shows that transfer design matters: in this sample, the strongest empirical association is linked to the targeted Special Allocation Fund rather than to general-purpose or revenue-sharing transfers.

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Table 4. Random Effects Regression Results

Variable	Coefficient	Robust SE	p-value
Intercept	1.640011	0.753668	0.035093*
ln UMP	-0.088573	0.061878	0.159540
ln DAU	-0.033948	0.022211	0.133722
ln DAK	-0.029409	0.006659	0.000066***
ln DBH	0.000626	0.010147	0.951060
Unemployment	-0.005120	0.001819	0.007341**
ln GRDP	0.018355	0.027818	0.512896

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Robust inference follows Arellano (1987).

Source: Author's calculation based on Badan Pusat Statistik (BPS) data (2026).

The result for DAK supports the argument that targeted intergovernmental transfers can have a stronger redistributive role than transfers with broader fiscal purposes. DAK is tied to designated development priorities and can improve access to education, health, infrastructure, agriculture, fisheries, and other services that affect household opportunities. This pattern is consistent with Musgrave's distributive function and with evidence from Jambi that selected equalization transfers are associated with lower regional disparities (Musgrave, 1959; Sidik et al., 2020). It also complements Akita et al. (2021), who distinguish the equalizing role of general transfers from the potentially disparity-enhancing geography of shared revenues.

The weaker relationship for DAU does not imply that general transfers are unimportant. Rather, their distributional consequences depend on expenditure composition and local implementation. Evidence from Indonesian local-government research shows that substantial resources do not automatically translate into service improvements (Lewis, 2017), while Jurnal Mediasosian studies emphasize that accountability, participation, targeting, and implementation quality shape the substantive impact of locally managed funds (Haryati et al., 2020; Mashuri et al., 2020; Rama & Setiawan, 2021; Sapitri & Alexandro, 2021). The same logic helps explain why DBH, which follows the geography of tax and natural-resource revenues,

may not function as a direct equalization instrument.

The administrative contrast between DAK and DAU provides a plausible explanation for the empirical divergence. DAU gives regional governments wider discretion over the spending mix. That flexibility is valuable for local autonomy, but under heterogeneous bureaucratic capacity it also increases the distance between the central government's equalization objective and the actual composition of local expenditure. Flypaper effects and budget rigidities can cause additional general-purpose transfers to be absorbed into established expenditure patterns rather than redirected toward programs with a direct distributional impact (Amalia, 2017; Chalil, 2018). DAK, in contrast, narrows the permitted use of funds and aligns allocations with specified sectoral priorities. The stronger vertical steering emphasized in the post-2022 fiscal framework can reduce discretion, clarify expected outputs, and partially limit information asymmetry between central and regional governments (Lewis, 2023). This does not mean that DAK is administratively superior in every setting; rather, its governance architecture provides a more direct chain from transfer purpose to service output. Evidence that accountability moderates the effectiveness of Indonesian fiscal transfers reinforces this interpretation (Isman et al., 2025). Because the present model does not directly measure bureaucratic capacity, expenditure composition, audit quality, or information asymmetry, these mechanisms should be treated as institutionally grounded explanations rather than separately identified causal channels.

Labor-Market and Growth Effects

Among the non-transfer variables, unemployment is statistically significant. Its estimated coefficient is -0.005120, with a t-statistic of -2.8145 and a probability value of 0.007341. Because unemployment is entered in level form, an increase of one percentage point in the unemployment rate is associated with an approximately 0.00512 decrease in the Gini ratio, conditional on the other variables. This negative coefficient should not be interpreted as evidence that higher unemployment improves welfare. Instead, it may reflect income compression

when deteriorating labor-market conditions reduce earnings across groups or concentrate losses within particular sectors.

The Provincial Minimum Wage has a negative coefficient of -0.088573 but is statistically insignificant at a probability value of 0.159540 . In the semi-log specification, a 1% increase in the Provincial Minimum Wage is associated with an estimated decline of approximately 0.000886 in the Gini ratio, although the evidence is insufficient to establish a systematic relationship. Gross Regional Domestic Product also fails to show a statistically significant association. Its coefficient is 0.018355 with a probability value of 0.512896 , implying an estimated increase of approximately 0.000184 in the Gini ratio for a 1% increase in regional output, but this association is not statistically distinguishable from zero. These results indicate that higher wage standards and aggregate regional output did not independently produce measurable changes in inequality during the study period. The multidimensional nature of regional inequality reported by Rahmadi et al. (2024) is consistent with this finding.

The negative unemployment coefficient should therefore be interpreted as a distributional pattern rather than a welfare gain. A province can display a narrower income distribution when employment losses reduce earnings among groups that previously received higher formal-sector wages. This mechanism is compatible with substantial labor-market heterogeneity across Sumatra (Wardiansyah et al., 2017) and with the continuing vulnerability of informal workers to limited social protection and income security (Rahayu et al., 2026). Policies should consequently distinguish between lower inequality generated by inclusive income growth and lower inequality produced by broad-based income compression.

The weak UMP relationship is also plausible in a labor market with large informal and uncovered segments, because statutory wage floors do not uniformly determine earnings across all workers. The GRDP result likewise reinforces the distinction between economic expansion and distribution: output growth concentrated in extractive, manufacturing, or capital-intensive activities may

increase regional value added without producing proportionate gains for lower-income households. This interpretation is consistent with the Kuznets framework and with recent evidence that localized Indonesian growth initiatives can have heterogeneous distributional effects (Hornok & Raeskyesa, 2024; Kuznets, 1955).

Overall Model, Robustness, and Policy Implications

The overall model is statistically significant. The reported F-statistic is 194.11 with a probability value of 2.2×10^{-16} , indicating that the explanatory variables are jointly associated with provincial income inequality. The model produces an R-squared value of 0.28549 and an adjusted R-squared of 0.18579 . After adjustment for the number of regressors, approximately 18.58% of the observed variation in provincial inequality is accounted for by the included fiscal and macroeconomic variables. The remaining variation may be associated with education, poverty, sectoral employment, urbanization, asset ownership, infrastructure accessibility, demographic composition, institutional quality, and other regional characteristics that are outside the current model.

The difference between the R-squared and adjusted R-squared values also indicates that explanatory performance should be interpreted conservatively. The model is designed to test whether selected fiscal and macroeconomic variables are associated with inequality, not to represent a complete structural model of household income distribution. Consequently, statistically significant coefficients can remain substantively informative even when a substantial proportion of total variation is left unexplained. This is especially relevant for the Gini ratio, which reflects the combined distributional consequences of household characteristics, labor-market segmentation, sectoral structure, public services, and institutional conditions.

The robustness correction is important because serial independence was rejected by the autocorrelation test. Under robust inference following Arellano (1987), the Special Allocation Fund remains strongly significant and negative, while unemployment remains statistically

significant and negative. The Provincial Minimum Wage, General Allocation Fund, Revenue Sharing Fund, and Gross Regional Domestic Product remain insignificant. The central empirical result is therefore that targeted fiscal transfers and labor-market conditions are the two variables with statistically detectable relationships with inequality in Sumatra during 2021–2025. These results provide the basis for the subsequent discussion of why targeted allocations may perform differently from general transfers and why the negative unemployment coefficient must be interpreted cautiously from a welfare perspective.

From a public-administration perspective, the evidence suggests that the effectiveness of fiscal decentralization should be judged by the capacity of transfers to address concrete regional service and opportunity gaps, not only by the amount of money transferred. Targeting, implementation, monitoring, and coordination become especially important for transfers intended to close infrastructure and service deficits. This interpretation is consistent with research on local public-service disparities and decentralized service efficiency (Amalia et al., 2026; Pratama & Pramono, 2020). It also aligns with the policy-oriented regional-development approach advanced by Ismail et al. (2026), in which sectoral structure and local economic characteristics should inform development priorities.

The study nevertheless has limitations. The 2021–2025 observation window is short for identifying long-run structural effects, provincial aggregation conceals within-province disparities, and the adjusted explanatory power indicates that important determinants remain outside the model. Future work should incorporate poverty, education, urbanization, sectoral employment, infrastructure accessibility, institutional quality, natural-resource dependence, and spatial spillovers. Longer panels and district-level or spatial-econometric designs would help distinguish short-term fiscal associations from persistent structural mechanisms. Although the cross-section covers the full population of Sumatran provinces, the small number of provincial units limits the scope for heterogeneous-effect analysis and does not justify

extrapolating the estimated relationships to Indonesia as a whole.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study examines how intergovernmental fiscal transfers and selected macroeconomic conditions relate to income inequality across the complete population of ten Sumatran provinces during 2021–2025. The findings indicate that the targeted Special Allocation Fund is more consistently associated with lower provincial inequality than the General Allocation Fund or Revenue Sharing Fund. The unemployment relationship points to possible income compression rather than improved welfare, while the provincial minimum wage and regional output do not provide evidence of a uniform redistributive effect. The article contributes to the fiscal-decentralization and public-administration debate by showing that the redistributive relevance of transfers is consistent with differences in governance design: discretion, vertical steering, accountability, and bureaucratic capacity may matter as much as fiscal magnitude. The contrast between DAK and DAU therefore should not be read simply as a difference in money transferred, but as a question of how intergovernmental institutions convert fiscal capacity into public-service and distributional outcomes.

Recommendations

The results support several concrete policy options. First, the Ministry of Finance could strengthen the performance-sensitive component of DAU by incorporating a limited set of measurable service-gap and inequality-reduction indicators into periodic allocation or incentive adjustments, while retaining DAU's core equalization function. Second, DAK should preserve its targeted character but place greater emphasis on milestone-based disbursement and ex-post verification of sectoral outputs and outcomes, with technical assistance directed to provinces whose administrative capacity is weaker. Third, DBH oversight in resource-rich provinces should adopt a risk-based asymmetric audit approach: monitoring intensity should increase where dependence on DBH, extractive-

sector concentration, or audit findings indicate greater governance risk, and expenditure financed from DBH should be traceable to defined public-service, infrastructure, or poverty-reduction objectives. Fourth, central and provincial governments should use a shared annual monitoring dashboard linking transfer allocations, expenditure composition, service outputs, Gini ratios, and audit findings so that fiscal equalization can be evaluated in terms of outcomes rather than absorption alone. Because the present estimates are associational, these proposals should be piloted and evaluated before being scaled nationally.

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