



Regional Fiscal Dynamics and Income Disparity: Cross-Provincial Evidence from Sulawesi

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Abstract. Regional income inequality in Indonesia remains a persistent structural challenge in achieving inclusive and sustainable development. Despite Sulawesi Island's robust economic growth in recent years, substantial disparities in income distribution continue to exist across its provinces. This study investigates the role of regional fiscal dynamics—specifically Intergovernmental Fiscal Transfers (IFT) and Regional Public Investment (RPI)—in reducing the Income Inequality across six provinces in Sulawesi. Utilizing a path analysis approach, the findings reveal that Regional Public Investment exerts a direct, negative, and statistically significant effect on income inequality. In contrast, Intergovernmental Fiscal Transfers do not have a direct impact, but demonstrate a significant indirect effect mediated through regional economic growth. These results underscore the critical need to enhance the effectiveness of regional public investment and strengthen intergovernmental fiscal capacity. Improving fiscal coordination and investment targeting is essential to support sustainable, inclusive, and regionally balanced development strategies across Sulawesi and other economically diverse regions in Indonesia.

Keywords: Intergovernmental Fiscal Transfers, Regional Public Investment, Path Analysis.

1 Introduction

Income inequality remains a critical barrier to inclusive development. While aggregate growth expands opportunities, uneven distribution exacerbates social tensions and undermines sustainability [1]. In Indonesia, this challenge is particularly acute across regions, where fiscal decentralization offers both promise and peril.

Sulawesi Island exemplifies this paradox. In Q2-2023, it recorded Indonesia's highest spatial GRDP growth (7.8%), driven by manufacturing, mining, and agriculture. Yet, three of its provinces rank among the nation's most unequal: Gorontalo (Gini = 0.417), South Sulawesi (0.377), and Southeast Sulawesi (0.371) [2]. Recent data confirms this trend persists, with national Gini rising slightly to 0.381 in September 2024 amid uneven regional recovery—e.g., a decline in West Sulawesi to 0.330—highlighting stalled equity gains [2].

The Kuznets Curve suggests inequality rises during early industrialization before declining with structural transformation. Fiscal decentralization, however, can

accelerate convergence if regional instruments are effectively deployed. Intergovernmental Fiscal Transfers (IFT) and Regional Public Investment (RPI) are pivotal: the former equalizes revenue capacity, while the latter drives productive infrastructure and human capital.

Empirical evidence is mixed. [3] find decentralized spending reduces regional gaps when paired with strong governance. In Indonesia, [4] confirms fiscal transfers lower interprovincial inequality, but effects depend on spending quality. Conversely, [5] warn that misallocated RPI may entrench disparities without redistributive safeguards. Recent analysis reinforces this, showing persistent regional income disparities across 509 districts (2015–2022) despite two decades of decentralization, as measured by Theil and Williamson indices [6].

In Sulawesi, fiscal imbalances persist. South Sulawesi receives 2.5 times more IFT per capita than Gorontalo, yet its Gini remains stubbornly high. This raises a critical question: Do IFT and RPI reduce income inequality directly, or only indirectly through growth?

This study fills the gap by examining both direct and indirect effects of IGFT and RPI on income inequality across Sulawesi's six provinces over 2015–2023, using path analysis on panel data from BPS and the Ministry of Finance. By disentangling mediation through economic growth, it provides actionable insights for designing inclusive fiscal policies in archipelagic, decentralized economies.

2 Literature Review

Income inequality, commonly measured by the Gini coefficient, signals the inclusiveness of economic development. Values below 0.3 indicate low inequality, 0.3–0.5 moderate, and above 0.5 high [7]. In Indonesia, interregional disparities persist despite two decades of fiscal decentralization, making fiscal instruments critical levers for equity.

[8] predicts inequality rises during early industrialization before declining with structural change. Yet, in developing economies, this inverted-U pattern often fails to materialize. [9] show that inequality can remain elevated despite sustained growth when redistribution mechanisms especially fiscal transfers are weak or poorly targeted.

Fiscal Illusion Theory adds nuance: citizens underestimate the true cost or benefit of decentralized policies, leading to inefficient spending [10]. While decentralization improves public goods delivery in theory, it risks widening gaps if lagging regions lack fiscal capacity [11].

Intergovernmental Fiscal Transfers comprising General Allocation Fund, Special Allocation Fund, and Revenue Sharing Fund, under Law No. 33/2004—aim to equalize fiscal capacity. [3] find IFT reduce regional inequality only when paired with strong governance.

Regional Public Investment (RPI), captured in capital expenditure, drives infrastructure and human capital. [12] shows its impact varies: pro-poor infrastructure narrows gaps, while elite-biased projects widen them. [5] stress that RPI effectiveness

hinges on targeting and management quality.[4] reinforces this, finding high-quality public spending accelerates regional convergence.

Economic growth mediates these relationships. While IFT stimulate aggregate demand and output, RPI directly enhance productivity in lagging areas. However, evidence remains fragmented at the subnational level, particularly in archipelagic regions like Sulawesi, where fiscal imbalances and growth-inequality paradoxes coexist.

This study addresses this gap by applying path analysis to disentangle direct and indirect effects of IFT and RPI on income inequality across Sulawesi's six provinces (2015–2023). It contributes to the literature by testing mediation in a high-growth, high-disparity island context and offering policy-relevant insights for inclusive decentralization.

3 Method

This study adopts a quantitative explanatory research design to examine the causal relationship between regional fiscal capacity and income inequality across six provinces in Sulawesi, Indonesia, over the period 2015–2023. Path analysis is employed to evaluate both direct and indirect effects within a structural equation model, with particular emphasis on the mediating role of regional economic growth.

This study employs balanced panel data from six provinces in Sulawesi over the period 2015–2023 ($N = 6$, $T = 9$), sourced from Statistics Indonesia and the Directorate General of Fiscal Balance, Ministry of Finance. The independent variables include Intergovernmental Fiscal Transfers are proxied by Regional Transfer and Village Funds (in IDR billion) and Regional Public Investment (proxied by annual capital expenditure in IDR billion). The mediating variable, regional economic growth, is proxied by the level of Gross Regional Domestic Product at constant 2010 prices (in IDR billion), Income inequality is captured by the Gini Coefficient, obtained from Statistics Indonesia [2].

The model in this study can be formulated as follows:

$$REG_{it} = f(IFT_{it}, PCR_{it}) \quad (1)$$

$$GI_{it} = f(REG_{it}, IFT_{it}, PCR_{it}) \quad (2)$$

Where:

REG = Regional economic growth

GI = Income inequality

IFT = Intergovernmental fiscal transfers

PCR = Regional public investment

The path analysis model is employed to examine both direct and indirect effects of intergovernmental fiscal transfers and regional public investment on income inequality, mediated by regional economic growth. The model consists of two structural equations, specified as follows:

- Mediating Variable (Regional Economic Growth)

$$\ln(\text{REG}_{it}) = \alpha_0 + \alpha_1 \ln(\text{IFT}_{it}) + \alpha_2 \ln(\text{PCR}_{it}) + \mu_{1it} \tag{3}$$

- Dependent Variable (Income Inequality)

$$\text{GI}_{it} = \beta_0 + \beta_1 \ln(\text{REG}_{it}) + \beta_2 \ln(\text{IFT}_{it}) + \beta_3 \ln(\text{PCR}_{it}) + \mu_{2it} \tag{4}$$

where:

i = province ($i = 1, 2, \dots, 6$)

t = year ($t = 2015, \dots, 2023$)

μ_{1it}, μ_{2it} = error terms

All monetary variables are transformed into natural logarithms to interpret coefficients as elasticities and mitigate heteroskedasticity.

The direct effect of $\ln(\text{IFT})$ on income inequality is captured by β_2 , while the indirect effect operates through regional economic growth ($\beta_1 \alpha_1$). The total effect of $\ln(\text{IFT})$ is thus $\beta_1 \alpha_1 + \beta_2$. Similarly, the total effect of $\ln(\text{RPI})$ is $\beta_1 \alpha_2 + \beta_3$.

4 Result

This study examines the impact of intergovernmental fiscal transfers and regional public investment on the income inequality index across six provinces in Sulawesi Island from 2015 to 2023, with regional economic growth serving as a mediating variable. The analysis employs a path analysis approach to identify both the direct and indirect relationships among the variables.

Table 1. Estimated Path Coefficients and Significance

Independent Variable	Dependent Variable	Path Coefficient	Significance
Regional Public Investment	Income Inequality Index	Negative	Significant
Intergovernmental Fiscal Transfers	Income Inequality Index	Not Significant	Not Significant
Intergovernmental Transfers → Economic Growth → Income Inequality	—	Negative	Significant

The estimation results indicate that Regional Public Investment has a direct, negative, and statistically significant effect on the Income Inequality Index. This suggests that increased capital expenditure directed toward productive sectors and basic infrastructure can expand economic access and reduce income disparities among population groups. These findings are consistent with studies by [12] and [5], and are

further supported by [13], who demonstrate that high-quality public spending contributes to economic growth and inequality reduction in Indonesia.

In contrast, Intergovernmental Fiscal Transfers do not exhibit a significant direct effect on the Income Inequality Index, but show a significant indirect effect through economic growth. This implies that fiscal allocations from the central government to local governments only impact inequality when they first succeed in stimulating regional economic growth. These results align with the findings of [3], and are reinforced by [4], who found that fiscal decentralization in Indonesia is associated with reduced regional inequality, particularly when accompanied by sound governance and adequate institutional capacity.

Table 2. Direct, Indirect, and Total Effects

Pathway	Direct Effect	Indirect Effect	Total Effect
Regional Public Investment → Income Inequality	Negative	—	Negative
Intergovernmental Transfers → Income Inequality	Not Significant	Negative via Economic Growth	Negative
Economic Growth → Income Inequality	Negative	—	Negative

Economic growth itself is found to have a negative and significant effect on the Income Inequality Index. This confirms that sustained regional economic growth can serve as a critical pathway for reducing inequality, provided that the growth is inclusive and not concentrated in specific sectors or geographic areas. These findings reinforce the relevance of the Kuznets Curve Hypothesis, while also emphasizing that in developing countries such as Indonesia, structural transformation and fiscal redistribution remain essential prerequisites for equitable growth. The study by [14] similarly highlights that the effectiveness of fiscal decentralization in promoting growth depends heavily on local fiscal capacity and policy design.

Overall, the path model constructed in this study reveals that the effect of Regional Public Investment on inequality is direct, whereas the effect of Intergovernmental Fiscal Transfers is indirect, mediated through economic growth. This has important policy implications: regional economic equalization strategies cannot rely solely on increasing fiscal allocations from the central government, but must also involve strengthening local institutional capacity and improving the effectiveness of public spending.

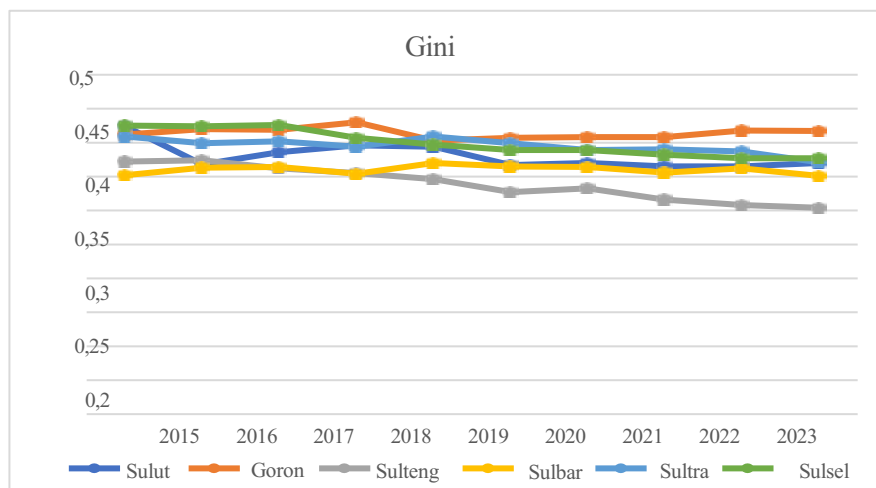


Fig. 1. Trends in the Income Inequality Index in Sulawesi, 2015–2023

These findings are particularly relevant in the context of Sulawesi Island, where fiscal disparities and uneven development persist across provinces. Provinces receiving larger fiscal allocations do not necessarily experience reductions in inequality unless accompanied by high-quality economic growth and well-targeted public investment. Therefore, regional fiscal policy should focus on optimizing public investment that directly benefits communities and enhancing fiscal governance to ensure that fiscal transfers effectively promote inclusive and balanced growth.

Consequently, the distinct transmission channels observed in this study elucidate the complex dynamics of fiscal decentralisation in emerging economies. The direct impact of regional public investment suggests that tangible capital formation possesses an immediate redistributive capacity by fostering labour absorption and improving market access for lower-income groups [15]. Conversely, the reliance of intergovernmental transfers on economic growth as a mediating vehicle indicates that fiscal liquidity alone is insufficient to address structural disparities [16]. This divergence underscores that the efficacy of decentralisation is not determined merely by the volume of funds transferred but fundamentally depends on the allocative efficiency and the strategic capacity of local governments to transform these resources into productive economic activities [17].

From a policy perspective, these findings necessitate a strategic realignment in the management of regional finances across Sulawesi. Local governments must prioritise the quality of public expenditure over mere absorption rates by ensuring that capital investments are targeted towards sectors with high labour demand and connectivity enhancement. Furthermore, the significant mediating role of economic growth implies that fiscal transfers must be rigorously directed towards growth-enhancing initiatives rather than general consumption, requiring robust institutional quality to ensure

effective implementation [18]. Ultimately, achieving a sustainable reduction in income inequality requires a synergistic approach where robust public investment complements a growth-oriented fiscal transfer mechanism to foster a resilient and inclusive regional economy.

5 Discussion

This study set out to address a central question raised in the literature on fiscal decentralisation and inequality, namely whether intergovernmental fiscal transfers and regional public investment mitigate income inequality through direct redistribution, or whether their influence operates primarily through regional economic growth. The empirical evidence from Sulawesi suggests that the two fiscal instruments follow distinct transmission channels, underscoring the argument that fiscal decentralisation can either narrow or widen regional disparities depending on how resources are allocated and translated into productive activity [10], [11].

The results demonstrate that regional public investment exerts a direct and statistically significant negative effect on income inequality. This finding supports the view that capital expenditure can function as an equity enhancing instrument when directed towards infrastructure and human capital that expand opportunities for lower income groups and lagging areas. In the context of developing economies, such investment is most likely to compress inequality when it reduces spatial frictions, improves market access, and raises labour absorption. This mechanism is consistent with evidence that public capital spending may narrow distributional gaps when it is pro poor and productivity enhancing, yet becomes inequality increasing when projects are elite biased or concentrated in already advantaged locations [12]. The direct impact identified here also aligns with the warning that misallocated investment can entrench disparities [5], implying that the inequality reducing effect observed in Sulawesi is contingent on investment being sufficiently inclusive in its incidence. More broadly, the result reinforces the position that the quality and targeting of public expenditure are decisive in shaping convergence, rather than the nominal scale of spending alone [4].

By contrast, intergovernmental fiscal transfers do not exhibit a statistically significant direct association with income inequality. Instead, their influence emerges indirectly, operating through regional economic growth as a mediating pathway. This pattern is consistent with the proposition that transfers are not inherently redistributive in outcome terms unless they strengthen local fiscal capacity and are deployed in ways that expand productive activity [3]. In a decentralised setting, equalisation objectives can be diluted when transfers are absorbed by routine administration or when local governments lack the institutional capacity to convert fiscal space into effective service delivery and growth enhancing investment [11]. The evidence therefore lends support to the fiscal capacity argument in the decentralisation literature, which emphasises that transfers reduce disparities only under conditions of sound governance and strategic spending [3], [10]. It also helps explain why interregional inequality may persist despite large transfer flows, as documented in broader Indonesian evidence showing continued spatial income divergence across districts even after prolonged decentralisation [6].

The mediating role of regional economic growth is itself substantively important. Economic growth is found to be negatively associated with income inequality, indicating that, within Sulawesi, expansion in regional economic performance is linked to reductions in distributional disparity. This supports the broader development proposition that growth can contribute to equity when it is sufficiently broad based and accompanied by mechanisms that enable participation by poorer households and peripheral regions [1]. At the same time, the findings should be interpreted in light of the Kuznets hypothesis, which posits that inequality may rise during early structural transformation and fall only later [8]. Recent evidence suggests that this inverted U pattern often does not materialise automatically in emerging economies, particularly where redistribution mechanisms are weak or poorly targeted [9]. The present results indicate that growth can serve as an equalising channel in Sulawesi, but only insofar as fiscal instruments, especially transfers, effectively stimulate growth that is inclusive in its sectoral and spatial incidence.

Taken together, the findings provide a clear response to the mixed evidence reported in prior studies. While fiscal decentralisation can reduce regional gaps, this outcome depends critically on governance quality and the effectiveness of spending [3], [4], [10]. The direct inequality reducing role of regional public investment indicates that tangible capital formation can function as an immediate equalisation device when it expands access to productive resources and public services in lagging areas, consistent with the conditional effects emphasised in the investment inequality literature [12] and with concerns regarding misallocation risks [5]. The indirect nature of fiscal transfer effects further indicates that transfers alone are insufficient to deliver equity gains unless they are linked to growth enhancing utilisation and local administrative capacity [11]. This aligns with the broader observation that fiscal decentralisation may generate paradoxical outcomes when fiscal instruments are not matched by institutional readiness [10], [11].

From a policy perspective, the differentiated pathways identified in this study imply that reducing inequality in Sulawesi requires a dual strategy. First, regional public investment should be strengthened and more explicitly targeted towards projects with high inclusion potential, particularly those that enhance connectivity, basic infrastructure, and human capital in provinces and districts with weaker initial conditions. Second, intergovernmental transfer design and implementation should be oriented towards strengthening growth generating capacity, supported by improved monitoring and governance arrangements that limit inefficient absorption and reinforce developmental use of funds. Such a strategy would address the core concern raised in the literature that decentralisation outcomes are determined less by the volume of funds transferred than by the institutional capacity to allocate them efficiently and equitably [10], [11], and would contribute to the broader objective of inclusive and sustainable development in regionally diverse archipelagic economies [6].

6 Conclusion

This study demonstrates that regional fiscal dynamics play a critical role in reducing income inequality across provinces in Sulawesi Island. Empirical findings reveal that Regional Public Investment has a direct and statistically significant negative effect on the Income Inequality Index, indicating that well-targeted and efficient capital expenditure can promote equitable development outcomes. In contrast, Intergovernmental Fiscal Transfers do not exert a direct influence on inequality, but show a significant indirect effect through economic growth. This suggests that fiscal allocations from the central government contribute to equalization only when they successfully stimulate regional economic growth.

These findings reinforce the relevance of the Kuznets Curve in the context of developing countries, while also highlighting that the effectiveness of fiscal policy is highly dependent on institutional capacity and the strategic direction of public spending. In Sulawesi, fiscal disparities among provinces indicate that large fiscal allocations alone are insufficient to reduce inequality unless accompanied by inclusive economic growth and locally responsive public investment.

Therefore, regional economic equalization strategies should prioritize the optimization of public investment that directly benefits communities, alongside strengthening intergovernmental fiscal governance to ensure that fiscal transfers effectively promote balanced and sustainable growth. This study contributes empirical evidence to the literature on fiscal decentralization and inequality, and offers a data-driven foundation for designing more inclusive regional fiscal policies.

The policy implications of these findings underscore that the effectiveness of regional equalization does not solely depend on the magnitude of central fiscal allocations, but also on the capacity of local governments to strategically direct public investment and foster inclusive economic growth.

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