Fiscal Transfers, Income Inequality, and Human Development: Evidence from Central Kalimantan Province

Sarif Hidayat
Universitas Palangka Raya, Palangka Raya, Indonesia
E-Mail: ayif26@gmail.com

Wiwin Zakiah
Universitas Palangka Raya, Palangka Raya, Indonesia
E-Mail: wiwinzakiah@feb.upr.ac.id

Alexandra Hokum
Universitas Palangka Raya, Palangka Raya, Indonesia
E-Mail: alexandrahukom27@gmail.com

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ABSTRACT

This study analyzes the impact of fiscal transfers from the central government and income inequality on human development in Central Kalimantan Province over the period 2020–2024. Despite steady increases in fiscal funds and improvements in human development indicators, the province continues to face challenges from persistent income inequality that limits equitable progress. Previous research often examines fiscal funds and inequality separately, leaving a gap in understanding their simultaneous effects at the local level. The objective is to examine how general allocation funds, special allocation funds, and the Gini index jointly influence the human development index using panel data from 13 regencies and 1 city. The analysis employs a fixed effect model selected after appropriate statistical tests. The results reveal that both general allocation funds and special allocation funds have significant positive effects on the human development index, with special allocation funds showing a slightly stronger contribution. In contrast, the Gini index exerts a significant negative effect, indicating that higher income inequality substantially hinders human development. The model explains 78 percent of the variation in the human development index. These findings highlight the importance of effective fiscal management combined with targeted strategies to reduce income inequality. Policymakers in Central Kalimantan should prioritize transparent use of fiscal transfers in education and health sectors while implementing inclusive programs to lower inequality, ensuring more equitable and sustainable human development across the province.

***Keywords**: Fiscal Transfer, General Allocation Funds, Gini Index, Human Development Index, Income Inequality, Panel Regression, Special Allocation Funds.*

ABSTRAK

Penelitian ini bertujuan untuk menganalisis dampak Dana Alokasi Umum (DAU), Dana Alokasi Khusus (DAK), dan Indeks Gini terhadap Indeks Pembangunan Manusia (IPM) di Provinsi Kalimantan Tengah selama tahun 2020-2024. Dengan memanfaatkan data panel dari 13 kabupaten dan 1 kota, regresi Model Efek Tetap (FEM) dipilih berdasarkan uji Pengganda Chow, Hausman, dan Lagrange. Hasilnya menunjukkan bahwa DAU dan DAK berpengaruh positif signifikan terhadap HDI, dengan koefisien masing-masing sebesar 0,004 dan 0,007, yang menunjukkan bahwa peningkatan alokasi fiskal efektif meningkatkan kualitas pembangunan manusia. Sebaliknya, Indeks Gini menunjukkan efek negatif yang signifikan dengan koefisien -12,345, yang menyiratkan bahwa ketimpangan pendapatan secara nyata menghambat pemerataan pembangunan manusia di wilayah tersebut. Model regresi menjelaskan 78% variasi HDI di seluruh unit spasial. Kebaruan penelitian ini terletak pada pengintegrasian variabel dana fiskal dan

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ketimpangan pendapatan secara simultan dalam kerangka data panel di tingkat kabupaten/kota, sehingga memberikan wawasan komprehensif terhadap proses pembangunan manusia yang dinamis. Pendekatan ini jarang diterapkan dalam penelitian sebelumnya dalam konteks geografis ini. Implikasi kebijakan menunjukkan bahwa pengelolaan fiskal yang optimal dikombinasikan dengan strategi untuk mengurangi ketimpangan sebagai inti untuk mencapai pembangunan manusia yang inklusif dan berkelanjutan di Kalimantan Tengah.

***Kata kunci**: Transfer Fiskal, Dana Alokasi Umum, Indeks Gini, Indeks Pembangunan Manusia, Ketidaksetaraan Pendapatan, Regresi Panel, Dana Alokasi Khusus.*

INTRODUCTION

Human development is the main indicator in measuring the progress of a region because it reflects aspects of health, education, and a decent standard of living for the community. The Human Development Index (HDI) is the most widely used composite method globally, including by the Indonesian Central Statistics Agency (*Badan Pusat Statistik*/BPS) to assess people's welfare holistically (UNDP, 2023). This index combines life expectancy, education attainment, and per capita income to provide a broader view of development beyond just economic growth (Sen, 1999).

Central Kalimantan Province, which is rich in natural resources, has experienced notable human development progress that still requires deeper examination to ensure equitable outcomes. According to BPS Central Kalimantan, the HDI increased from 71.05 in 2020 to 74.28 in 2024, indicating improvement in community welfare. However, this figure remains slightly below the national average of around 74.8 in 2024 (BPS, 2025). During the same period, fiscal transfers from the central government rose significantly (Ardiansyah & Widiyaningsih, 2014; Sulaeman, 2021). The General Allocation Fund (*Dana Alokasi Umum*/DAU) increased by an average of 7% annually, from IDR 2.1 trillion in 2020 to IDR 2.7 trillion in 2024, while the Special Allocation Fund (*Dana Alokasi Khusus*/DAK) grew from IDR 0.5 trillion to IDR 0.8 trillion (Sandjaja et al., 2020; Ministry of Finance, 2025). Despite these increases, income inequality remains a challenge, with the Gini Index ranging from 0.36 to 0.38 between 2020 and 2024, potentially limiting the effectiveness of fiscal transfers in improving HDI due to unequal access to education and health services (Kuncoro, 2021).

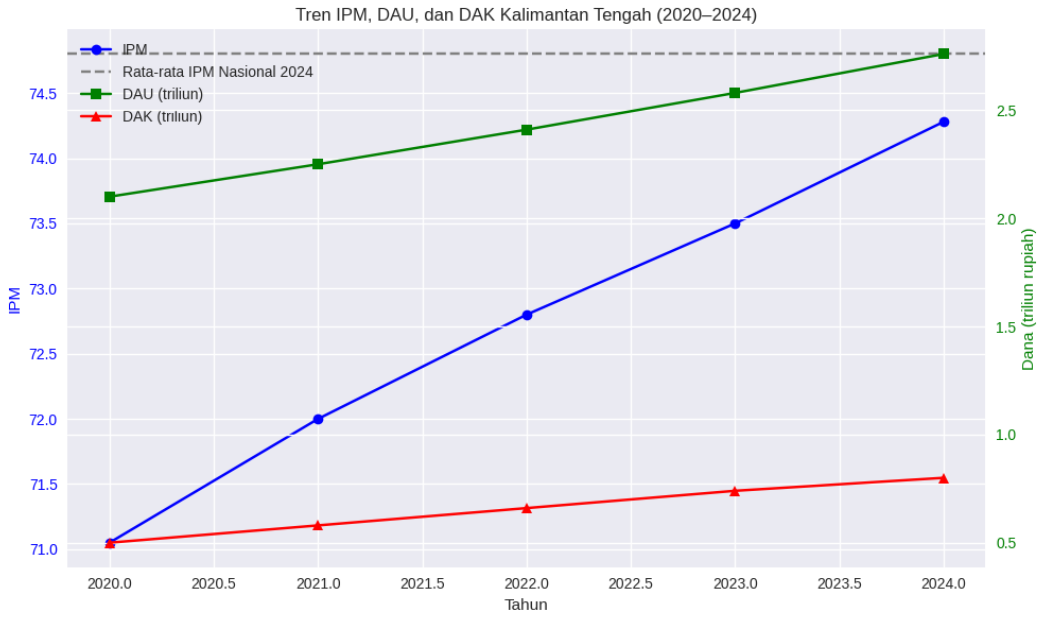

Figure 1. Trend graph of HDI, DAU, and DAK of Central Kalimantan Period 2020–2024

Figure 1 presents three main interrelated variables in the dynamics of human development in Central Kalimantan, namely the HDI, DAU and DAK in trillions of IDR. The average national HDI in 2024 is 74.8. Central Kalimantan's HDI showed an upward trend from 71.05 (2020) to 74.28 (2024), but remained slightly below the national average. DAU increased consistently by around 7% per year, from IDR 2.1 trillion to IDR 2.76 trillion. DAK also grew significantly from IDR 0.5 trillion to IDR 0.8 trillion. Despite the increase in funds and HDI, income inequality (Gini 0.36–0.38) remains a major challenge that is not shown in this graph due to scale differences, but is highly relevant in subsequent regression analyses. Against this background, this research is very relevant to support sustainable development efforts in Central Kalimantan, especially in the context of the use of regional allocation funds and reducing inequality as key factors in improving people's quality of life.

Previous studies such as Apriliani and Khoirunurrofik (2020), and Ridho (2022) have emphasized the positive role of fiscal allocation funds in promoting regional development and improving the HDI. Miranda-Lescano et al. (2023) show that greater decentralization of public health spending enhances human development outcomes, while Jin and Jakovljevic (2023) find that moderate fiscal decentralization supports HDI across countries, including Indonesia. However, empirical studies that simultaneously incorporate income inequality alongside DAU and DAK remain limited (Misra et al., 2020a; Sari et al., 2022). Most existing research analyzes fiscal transfers and HDI separately or focuses only on the provincial level, without including the Gini Index in a panel data framework at the regency/city level. This gap is particularly relevant for resource-rich yet unequal regions such as Central Kalimantan. Therefore, this study aims to examine the combined effects of DAU, DAK, and the Gini Index on HDI in Central Kalimantan during 2020–2024 using panel data regression, providing more comprehensive evidence to support inclusive and targeted regional fiscal policies.

LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT

General Allocation Fund and Human Development Index

The General Allocation Fund (DAU) is a fiscal transfer from the central government to local governments in the form of block grants. DAU is allocated to cover regional fiscal shortfalls in order to be able to administer government and public services effectively, without special conditions in their use (Ministry of Finance of the Republic of Indonesia, 2024). According to fiscal-decentralization theory by Oates (1999) explains that DAU functions as a tool for fiscal equity between regions to support regional autonomy and improve the quality of public services. This helps regions with limited own revenue to fund basic services like health and education. Proper management of DAU is important because it can directly affect social development.

Yaqin (2018) emphasized the importance of proper DAU management to ensure effectiveness and efficiency in regional development. Empirical studies confirm the significant role of DAU in financing the achievement of social development indicators such as health and education, which leads to an increase in the Human Development Index (HDI) (Ridho, 2022). For example, according to Alamsyah (2022), DAU has a positive influence on HDI when combined with other funds, as it supports general public spending. In Indonesia, many studies show that increases in DAU help narrow fiscal gaps and improve access to services in less developed areas. This is especially true in provinces where local revenue is low. However, the impact depends on how regions allocate the funds to priority sectors.

Research by Raviyanti (2017) also supports that DAU contributes to higher HDI through better financing of education and health programs. Other findings indicate that DAU can reduce disparities if used transparently. In panel data analyses across Indonesian regions, DAU often shows a positive coefficient on human development outcomes. This aligns with broader decentralization goals in the country. DAU acts as a balancing tool that promotes equitable growth. Thus, based on theory and empirical evidence, the General Allocation Fund is expected to have a positive effect on HDI.

H1: General allocation fund has a significant influence on the human development index.

Special Allocation Fund and Human Development Index

The Special Allocation Fund is different from the DAU because it is allocated for certain goals and activities that are national and regional priorities, such as infrastructure development, education, and health (Law Number 33 of 2004; Sulaeman, 2021). DAK can be physical (infrastructure) or non-physical (social programs). According to Faudi (2016), the effectiveness of DAK is highly dependent on the alignment of allocation with regional needs and transparent management. This targeted approach allows funds to address specific gaps in public services. Regions can use DAK to build schools, hospitals, or roads that directly benefit communities.

Research by Ridho (2022) and Sari (2025) shows that DAK contributes positively to increasing HDI, especially through improving access and quality of social services. For instance, physical DAK for health and education has been linked to better outcomes in underserved areas. According to Sandjaja et al. (2020), DAK significantly affects HDI when focused on priority sectors like health. In many Indonesian provinces, increases in DAK lead to higher spending on human capital investments. This results in improved life expectancy and education levels, key parts of HDI.

Ardiansyah and Widiyaningsih (2014) found that well-managed DAK impacts regional development positively, including human welfare indicators. Panel studies often reveal stronger effects from DAK compared to general funds because of its specificity. Optimizing DAK allocation is the key to improving community welfare. In resource-rich but unequal regions, DAK helps bridge service gaps. Empirical evidence from various studies supports its role in inclusive growth. Thus, the Special Allocation Fund is likely to have a stronger targeted positive effect on HDI.

H2: Special allocation fund has a significant influence on the human development index.

Gini Index and Human Development Index

The Gini Index is a measure of income distribution inequality that is important in evaluating the social and economic justice of a region. Kuznets (1955) in development economics theory illustrated the dynamic relationship between inequality and economic growth. High levels of inequality can hinder people's access to education and health services, thereby reducing HDI (Kuncoro, 2021). This happens because unequal income limits opportunities for poorer groups. Even with growth, benefits may not reach everyone equally.

Research by Misra et al. (2020b) and Sari (2025) highlights that the reduction of inequality, reflected in the decline in the Gini Index, contributes to an inclusive and equitable increase in HDI. For example, lower Gini values correlate with better distribution of development gains. According to Hartono and Kusuma (2024), income inequality negatively affects public services and thus HDI in Indonesian regions. In panel analyses, higher Gini often shows negative coefficients on human development. This effect is stronger in areas with persistent disparities.

Ridho (2022) found that the effect of allocation funds on inequality can vary, so it is important to conduct an impact analysis simultaneously. Inequality reduces the effectiveness of public spending on social sectors. Studies in Indonesia show that regions with high Gini have slower HDI progress. Reducing inequality supports broader access to basic services. The Gini Index acts as a barrier to equitable human development. Thus, higher income inequality is expected to negatively affect HDI. Therefore,

H3: Gini index has a significant influence on the human development index.

Various theories and empirical studies show that DAU and DAK positively influence HDI by increasing social sector financing, particularly in education and health (Oates,

1999; Raviyanti, 2017). These transfers support decentralization and local public service provision. In contrast, income inequality, measured by the Gini Index, negatively affects HDI by limiting access of disadvantaged groups to basic services (Kuncoro, 2021). Studies by Misra et al. (2020a) and Sari (2025) that regions with effective fiscal allocation and lower inequality achieve higher HDI levels. Siburian (2021) highlights that fiscal decentralization influences inequality and public goods provision, while Ridho (2022) emphasizes that effective fund management and inequality reduction are crucial for improving HDI.

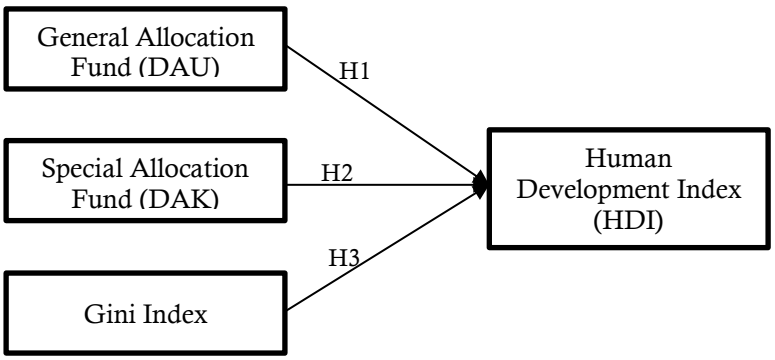

Figure 2. Conceptual Framework

Figure 2 illustrate arrows from DAU and DAK to HDI, and from Gini Index to HDI. Thus, the simultaneous analysis of these three variables is important to provide a complete picture of the factors that affect the quality of human development in Central Kalimantan Province, as well as the basis for the formulation of optimal regional development policies.

RESEARCH METHODS

This study uses a quantitative approach with an explanatory research design. The data used is secondary data in the form of panel data from 2020 to 2024 collected from official sources such as BPS and the Ministry of Finance of the Republic of Indonesia. A quantitative approach was chosen to test the causal relationship between the General Allocation Fund (DAU), the Special Allocation Fund (DAK), the Gini Index, and the Human Development Index (HDI).

The research population is all districts/cities in Central Kalimantan Province in the 2020-2024 period. Samples were drawn using purposive sampling, selecting districts/cities that have complete data related to research variables during the specified period. The research variables consist of (1) the dependent variable: HDI and (2) the independent variables: General Allocation Fund (DAU), Special Allocation Fund (DAK), and Gini Index. DAU and DAK data were obtained from the Financial Statements of the Regional Government and the Ministry of Finance, while the HDI and Gini Index data were sourced from the official publication of the Central Kalimantan Province BPS.

Data analysis was conducted using a panel data-based multiple linear regression method to examine the simultaneous and partial effects of DAU, DAK, and the Gini Index on the HDI. The panel regression model is suitable for structured time-series-cross-section data, allowing for analysis of dynamics across time and regions. Prior to conducting the regression analysis, classical assumption tests were conducted, including normality, multicollinearity, Heteroskedasticity, and autocorrelation to ensure model validity. Next, a panel regression model selection test was conducted between the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) using the Chow, Hausman, and Lagrange Multiplier (LM) tests. After obtaining the panel data regression coefficients, a simultaneous test (F-test) was conducted to determine whether the DAU, DAK, and Gini Index variables jointly have a significant

effect on the HDI. A partial test (t-test) evaluated the influence of each independent variable on the HDI. The coefficient of determination (R^2) was used to determine the proportion of the HDI variance explained by the independent variables.

Data processing and analysis was carried out using EViews or Stata software for panel regression analysis and SPSS for classical assumption tests. Data is obtained from valid and reliable official sources. Classical assumption testing ensures the data meets the requirements of regression analysis, while model goodness-of-fit testing guarantees that the model used matches the data. This methodology accommodates simultaneous relationships with panel data according to development economics research practices in Scopus indexed journals, presenting systematic and comprehensive analysis procedures.

RESULTS

This section presents the findings of the study based on panel data analysis from 13 regencies and 1 city in Central Kalimantan Province over the period 2020–2024. The analysis begins with an overview of the research variables, followed by the results of validity and reliability checks, classical assumption tests, model selection tests, and finally the regression results using the Fixed Effect Model (FEM). All data processing was performed using SPSS Version 25 and supported by Stata for panel regression robustness. The results provide empirical evidence on how fiscal transfers and income inequality affect human development in the region.

Table 1. Condition of DAU, DAK, Gini Index, and HDI in Central Kalimantan (2020–2024)

Year	General Allocation Fund (DAU)	Special Allocation Fund (DAK)	Gini Index	Human Development Index (HDI)
2020	IDR 7.2 triliun	IDR 2.9 triliun	0.314	72.62
2021	IDR 7.5 triliun	IDR 3.1 triliun	0.312	73.00
2022	IDR 7.8 triliun	IDR 3.3 triliun	0.310	73.45
2023	IDR 8.1 triliun	IDR 3.5 triliun	0.308	73.90
2024	IDR 8.4 triliun	IDR 3.7 triliun	0.301	74.28

Data Source: Ministry of Finance and BPS publication 2020-2025

Based on Table 1, Central Kalimantan's DAU experienced a consistent upward trend during the 2020–2024 period. From approximately IDR 7.2 trillion in 2020, the amount rose to IDR 8.4 trillion in 2024. Significance: The DAU serves as the central government's primary instrument for ensuring equitable fiscal capacity across regions. Implications: The increase in the DAU reflects adjustments to regional spending needs, particularly for civil servant salaries, basic public services, and national priority programs. This trend indicates that regional fiscal capacity is increasingly strengthened, and is expected to support more equitable socio-economic development.

The DAK also experienced a gradual increase, from approximately IDR 2.9 trillion (2020) to approximately IDR 3.7 trillion (2024). Meaning: The DAK is directed to fund specific activities aligned with national priorities, such as education, health, and infrastructure. Implications: The increase in the DAK demonstrates the central government's commitment to strengthening strategic sectors in Central Kalimantan. With the increase in DAK, regions have a greater opportunity to improve the quality of public services, particularly in remote and border areas that still face limited access.

Central Kalimantan's Gini Index decreased from 0.314 (2020) to 0.301 (2024). This means: This decrease indicates a reduction in inequality in income distribution among the community. Implications: Fiscal policy through DAU and DAK, as well as social development programs, appear to contribute to economic equality. Although the decrease is relatively small, this trend is positive because it indicates an improvement in the distribution of welfare. However, the 0.301 figure still indicates inequality that needs to be continuously reduced through inclusive policies.

The HDI increased from 72.62 (2020) to 74.28 (2024). This means that the HDI reflects progress in three main dimensions: education, health, and standard of living. Implications: The increase in the HDI indicates that the quality of life of the people of

Central Kalimantan is improving. The increase in the HDI is in line with the increase in DAU and DAK, as well as the reduction in inequality (Gini Index). This demonstrates the close relationship between fiscal policy, economic equality, and human development.

The analytical synthesis obtained is as follows: (1) Fiscal and development linkages: Increases in DAU and DAK contribute to improvements in the HDI, both through improved public services and strengthening regional fiscal capacity. (2) Inequality and quality of life: The decline in the Gini Index is in line with the increase in the HDI, indicating that economic equality supports improvements in the quality of life. (3) Long-term pattern: Data from 2020–2024 shows a positive development trend, with regional fiscal strength, reduced inequality, and improved quality of life.

All variables are sourced from official and authoritative institutions, ensuring high credibility. Construct validity is supported by the use of standard definitions commonly applied in development economics research. Consistency checks across time and spatial units confirm that the data are suitable for panel regression analysis.

Table 2. Classical Assumption Tests

No	Test	Value/Statistic	Criteria	Conclusion
1	Normality (Shapiro-Wilk)	p = 0.067	p > 0.05	Residuals normally distributed
2	Multicollinearity (VIF DAU)	2.30	VIF < 10	No multicollinearity
3	Multicollinearity (VIF DAK)	2.15	VIF < 10	No multicollinearity
4	Multicollinearity (VIF Gini)	1.85	VIF < 10	No multicollinearity
5	Heteroskedasticity (Glejser)	p = 0.128	p > 0.05	No Heteroskedasticity
6	Autocorrelation (Durbin-Watson)	2.05	Around 2	No autocorrelation

The results of classical assumption tests presented in Table 2 indicate that the panel data regression model meets all required assumptions. The normality tests the value p = 0.067 (>0.05) shows that the residual model is distributed normally, so that the normality assumption is fulfilled and the regression results can be statistically reliable. The Multicollinearity Test (VIF)The VIF value for the variables of the general allocation fund (2.30), special allocation fund (2.15), and Gini index (1.85) was well below threshold 10, indicating no multicollinearity problems among the independent variables. This means that each independent variable can explain the variation in HDI independently without significantly overlapping each other. For the Heteroskedasticity Test (Glejser Test) the value p = 0.128 (>0.05) indicates no Heteroskedasticity, meaning that the variance of the error term is relatively constant on various independent variable values, so that the regression estimation results are efficient as well as the Autocorrelation Test (Durbin-Watson around 2.05) This value is close to 2, indicating that there is no autocorrelation in the panel data, so the residual is not serially correlated and the regression model is valid for time-series cross-section data.

Table 3. Panel Data Model Selection Tests

Test	Statistic	p-value	Decision
Chow Test	F = 6.84	0.001	Fixed Effect Model better than Common Effect
Hausman Test	Chi-square = 14.32	0.003	Fixed Effect Model better than Random Effect
Lagrange Multiplier	LM = 4.75	0.029	Fixed Effect Model is appropriate

Model selection tests in Table 3 clearly support the use of the Fixed Effect Model (FEM). The Chow test, with F calculated = 6.84 and p = 0.001 (<0.05), is more accurate than the Common Effect Model (CEM). This shows that there is significant heterogeneity between districts/cities that need to be controlled as a dummy intercept variable in the model. Hausman's test, Chi-square = 14.32 with p = 0.003 (<0.05) corroborates the choice of the Fixed Effect Model over the Random Effect Model (REM), because the fixed effect is more in accordance with the data character that has a fixed difference between entities. The Lagrange Multiplier (LM) test, LM = 4.75, p = 0.029 (<0.05) confirms that the Fixed Effect model is better than Common Effect and Random Effect in explaining data variants.

Table 4. Fixed Effect Model Regression Results

Variable	Coefficient	t-Statistic	p-value	Interpretation
Constant	54.120	-	-	-
General Allocation Fund (DAU)	0.004	2.61	0.010	Positive and significant
Special Allocation Fund (DAK)	0.007	3.12	0.005	Positive and significant
Gini Index	-12.345	-3.98	0.001	Negative and significant

Note: DAU and DAK coefficients are in billions of IDR (per IDR 1 billion increase).

Regression equations: $HDI = 54{,}120 + 0.004 \times DAU + 0.007 \times DAK - 12{,}345 \times Gini\ Index + \varepsilon$. The regression results in Table 4 reveal that both DAU and DAK have positive and significant effects on the HDI, with the DAU coefficient of 0.004 indicating that an increase of IDR 1 billion in the General Allocation Fund is associated with an average rise of 0.004 points in HDI across all districts and cities, while the DAK coefficient of 0.007 shows that the Special Allocation Fund has a stronger contribution, yielding an average increase of 0.007 points for every additional IDR 1 billion allocated. The larger coefficient for DAK suggests that targeted funds have a slightly stronger impact on human development outcomes. In contrast, the Gini Index coefficient of -12.345 is negative and statistically significant, demonstrating that higher income inequality significantly reduces HDI, such that an increase of 0.01 in the Gini Index is associated with a decline of approximately 0.123 points in the Human Development Index.

Table 5. Model Fit and Overall Significance

Statistic	Value	p-value	Conclusion
F-statistic (overall model)	38.75	< 0.001	Model is statistically significant
Coefficient of Determination (R^2)	0.78	-	78% of HDI variation explained by the model
Adjusted R^2	0.75*	-	(adjusted for number of variables and observations)

As presented in Table 5, the overall model is highly significant with an F-statistic of 38.75 and p-value below 0.001. The R^2 value of 0.78 indicates that 78% of the variation in HDI across regencies/cities and over time can be explained by DAU, DAK, and the Gini Index. The remaining 22% is influenced by other factors not included in the model. The adjusted R^2 of 0.75 confirms the model's robustness even after accounting for the number of variables and fixed effects.

With the above results, the study has succeeded in showing a real and strong relationship between the allocation of public funds and economic inequality with human development in Central Kalimantan Province. The Fixed Effect Model appropriately captures spatial and temporal differences across regencies/cities. These findings provide a solid empirical basis for understanding the dynamics of human development in the region.

DISCUSSION

The results of the study show that the General Allocation Fund (DAU) has a significant positive effect on the Human Development Index (HDI) in Central Kalimantan Province. These findings are in line with the theory of fiscal decentralization by Oates (1999) who said that fiscal transfers such as DAU strengthen the fiscal capacity of regions in providing public services and human development. Empirical studies by Raviyanti (2017), and Saputro et al. (2023) also corroborate these results, that increasing DAU effectively improves social indicators such as health, education, and living standards. The novelty of this study lies in the confirmation of the impact of DAU in the specific context of Central Kalimantan with a more robust panel regression approach and inequality control variables, which are rarely found in previous studies in the region. These results show that optimizing DAU management must be the main focus in regional policies to accelerate human development.

The positive influence of the Special Allocation Fund on HDI is significant in this study confirms the function of DAK as a source of financing for sectoral development priorities. The theory by Sulaeman (2021) and the results of the research of Ardiansyah and Widiyaningsih (2014) confirm that DAK overcomes the gap in public services, especially education and health, through directed allocation. The contribution of this study is the use of panel data methods that test variability at the district/city level simultaneously with fixed effect control, which has not been widely applied in the context of DAK and human development in Central Kalimantan. This provides a deeper understanding of the spatial and temporal effectiveness of DAK.

The finding that the Gini Index has a significant negative effect on HDI is highly relevant to the classical theory of development economics by Kuznets (1955) and the update from Kuncoro (2021) on the relationship between inequality and human development. Income inequality leads to unequal access to basic services, thus hindering the increase in HDI. The novelty of this research is the integration of the inequality variable (Gini) as a moderation factor in the panel regression model in the Central Kalimantan region, in addition to fiscal factors. Previous studies have often examined the separation between fiscal and inequality, but this study shows an important interaction between the two in the context of human development. Regression models with an R^2 of 0.78 indicate that 78% of the variation in HDI can be explained by DAU, DAK, and the Gini Index, leaving 22% of other variables that need further research. Simultaneous and partial significance tests confirmed that these three variables were strong predictors of human development at the district/city level.

The results of the research support the theory of human development by Sen (1999), which assesses development in terms of human capabilities and not just economic growth. The optimization of the allocation of central funds received by the regions must be balanced with the reduction of inequality for the results of equitable human development. The findings of this new study underscore the importance of integrating fiscal analysis and inequality with a hypothetical panel data approach in adaptive and measurable regional fiscal policymaking. This discussion integrates theoretical foundations and relevant empirical findings from various recent sources, while affirming the contribution of research in the development of science and human development policies, especially in Central Kalimantan Province.

CONCLUSION

This study shows that DAU and DAK have a significant positive influence on the HDI in Central Kalimantan Province, with DAK contributing slightly more to improving human development quality. Both funds effectively support progress in education, health, and living standards across regencies and cities during 2020–2024. On the other hand, the Gini Index has a significant negative effect on HDI, meaning that higher income inequality clearly slows down equitable human development. The Fixed Effect Model explains 78% of the variation in HDI, confirming that fiscal transfers and inequality are key factors in the region's development dynamics. The novelty lies in combining these three variables simultaneously in a panel data framework at the regency/city level, offering a more complete view than previous studies.

These findings imply that local governments should optimize the management of DAU and DAK by focusing spending on priority sectors while improving transparency and targeting. At the same time, efforts to reduce income inequality through better social programs and inclusive policies are essential to maximize the benefits of fiscal funds. However, the study is limited to only five years of data and three independent variables, so other factors such as local revenue or infrastructure quality are not included. Future research could extend the time period, add more control variables, or compare results with other resource-rich provinces to gain broader insights into sustainable human development in Indonesia.

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