



The Effect of the General Allocation Fund (DAU), Special Allocation Fund (DAK), and Revenue Sharing Fund (DBH) on the Human Development Index (HDI) in Surabaya City

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Abstract: This study aims to analyze the effect of the General Allocation Fund (DAU), the Special Allocation Fund (DAK), and the Revenue Sharing Fund (DBH) on the Human Development Index (HDI) in Surabaya City during the period 2010–2024. A quantitative approach was employed using a multiple linear regression method based on secondary time-series data obtained from official government institutions. The results indicate that DAU, DAK, and DBH simultaneously have a significant effect on the Human Development Index. Partially, the Special Allocation Fund exhibits the strongest and most significant influence, reflecting its targeted allocation toward basic public service sectors, particularly education and health. The General Allocation Fund also has a positive and significant effect by strengthening overall regional fiscal capacity to support public service provision. In contrast, the Revenue Sharing Fund shows a positive but statistically insignificant effect on the Human Development Index. These findings suggest that improving human development outcomes in Surabaya City requires more targeted, effective, and equitable management of intergovernmental transfer funds, with a stronger emphasis on enhancing the quality of basic public services.

Keywords: General Allocation Fund, Special Allocation Fund, Revenue Sharing Fund, Humand Development Index, Surabaya

Introduction

Human development has become a strategic priority in national development policy as it reflects the level of societal welfare through key dimensions of health, education, and living standards, which are comprehensively measured by the Human Development Index (HDI) (UNDP, 2024) (Todaro & Smith, 2015). As one of the largest metropolitan cities in Indonesia, Surabaya exhibits dynamic socio-economic characteristics and has consistently recorded a very high HDI over recent years (Badan Pusat Statistik Kota Surabaya, 2025). Nevertheless, despite this achievement, disparities in the quality and accessibility of public services—particularly in fundamental sectors related to basic human needs—remain a persistent challenge. Within the framework of fiscal decentralization, the capacity of local governments to enhance human development outcomes is closely linked to the effectiveness of managing intergovernmental fiscal transfers, notably the General Allocation Fund

(DAU), the Special Allocation Fund (DAK), and the Revenue Sharing Fund (DBH), which are designed to reduce vertical and horizontal fiscal imbalances (Oates, 1972) (Musgrave & Musgrave, 1959) (Mardiasmo, 2009).

Existing empirical studies generally suggest that DAU, DAK, and DBH have the potential to influence HDI through improved public spending on education, health, and infrastructure) (however, the magnitude and significance of these effects vary across regions. Several studies find that all or some components of intergovernmental transfers significantly contribute to HDI improvement (Harahap, 2011) (Lestari et al., 2019) (Sarkoro & Zulfikar, 2015) (Widia Sofyan, 2023), while others report partial or insignificant effects depending on regional characteristics, fiscal capacity, and spending efficiency (Damayanti, 2014) (Saswatata & Parju, 2022) (Ina & Hudang, 2024). Most of this literature focuses on regions with medium HDI levels, employs cross-regional panel data, and examines periods prior to the COVID-19 pandemic, when fiscal policies and transfer mechanisms differed substantially from current conditions. Consequently, empirical evidence specifically addressing large metropolitan cities with very high HDI levels—such as Surabaya—and incorporating the post-pandemic fiscal context remains limited.

Therefore, this study seeks to address this gap by providing an in-depth analysis of the contribution of DAU, DAK, and DBH to the development of the Human Development Index in Surabaya City using a more recent and sustained observation period. The novelty of this research lies in its focus on a high-HDI metropolitan city and its examination of intergovernmental transfer effectiveness in the post-pandemic fiscal environment, which has been relatively underexplored in prior studies. The objective of this research is to analyze the effects of DAU, DAK, and DBH on the HDI of Surabaya City and to identify which type of fiscal transfer plays the most dominant role in improving the quality of life of its population.

Research Method

Research Design

This study employed a quantitative approach with an explanatory research design to examine the causal relationship between intergovernmental fiscal transfers and human development outcomes in Surabaya City. The explanatory design was selected to assess the extent to which the General Allocation Fund (DAU), Special Allocation Fund (DAK), and Revenue Sharing Fund (DBH) influence the Human Development Index (HDI) using numerical time-series data. This design enables the identification of both the simultaneous and partial effects of the independent variables on the dependent variable through statistical modeling.

Population, Sample, Sampling

The population of this study consisted of all annual data related to the Human Development Index, General Allocation Fund, Special Allocation Fund, and Revenue Sharing Fund of Surabaya City. The research sample was determined using purposive

sampling, focusing on a time-series dataset covering the period from 2010 to 2024. This period was selected based on the availability, consistency, and completeness of official data records. No data points within the selected period were excluded, as all observations met the inclusion criteria of being officially published and consistently reported. Secondary data were collected through documentation techniques from the Central Bureau of Statistics (Badan Pusat Statistik/BPS) of Surabaya City and the Regional Financial Information System (SIKD).

As this study relied exclusively on secondary aggregate data at the city level, it did not involve human subjects or personal data, and therefore did not require ethical clearance or informed consent.

Instrument

The research instrument used in this study was a structured data recording sheet designed to systematically compile secondary data on HDI, DAU, DAK, and DBH. The HDI data represent annual percentage values published by BPS, while DAU, DAK, and DBH variables are measured using annual realized fiscal transfer values obtained from SIKD records. Instrument validity was ensured by verifying data sources against official government publications and cross-checking consistency across reporting periods. Reliability was established through temporal consistency, as the data were generated using standardized measurement frameworks and accounting procedures applied uniformly across years. All variables were measured on a ratio scale, allowing for meaningful statistical analysis.

Data Analysis Method

Data analysis was conducted using multiple linear regression to evaluate the effect of DAU, DAK, and DBH on the Human Development Index of Surabaya City. The regression model was applied to assess both the joint (simultaneous) and individual (partial) influence of the independent variables on HDI. Statistical testing included the F-test to determine the simultaneous significance of all independent variables, t-tests to examine the partial effects of each fiscal transfer component, and the coefficient of determination (R^2) to measure the explanatory power of the model. All analytical procedures were performed in accordance with established quantitative research and econometric standards to ensure the validity and robustness of the findings.

Result and Discussion

Multiple Linear Regression Analysis

Table 1. Multiple Linear Regression

Coefficients ^a		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	.867	.303		2.867	.015
	DAU	.067	.020	.476	3.384	.006
	DAK	.011	.004	.557	2.978	.013
	DBH	.009	.013	.123	.716	.489

a. Dependent Variable: IPM

Based on the estimation results presented in Table 1, the multiple linear regression model is formulated as follows:

$$\text{LOG_HDI} = 0.867 + 0.067\text{LOGDAU} + 0.011\text{LOGDAK} + 0.009\text{LOGDBH}$$

The interpretation of the regression coefficients is as follows:

- The constant value of 0.867 represents the baseline level of the Human Development Index when the General Allocation Fund, Special Allocation Fund, and Revenue Sharing Fund are assumed to remain constant.
- The regression coefficient of the General Allocation Fund (DAU) is 0.067, indicating a positive relationship. This implies that a one-unit increase in DAU leads to an increase in the Human Development Index by 0.067 units.
- The regression coefficient of the Special Allocation Fund (DAK) is 0.011, which also indicates a positive effect. An increase of one unit in DAK is associated with an increase in the Human Development Index by 0.011 units.
- The regression coefficient of the Revenue Sharing Fund (DBH) is 0.009, suggesting that this variable also has a positive influence on the Human Development Index. A one-unit increase in DBH results in an increase in the Human Development Index by 0.009 units.

Simultaneous Significance Test (F-Test)

Table 2. Simultaneous Test (F-Test)

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.002	3	.001	20.746	.000 ^b
	Residual	.000	11	.000		
	Total	.002	14			

a. Dependent Variable: IPM

b. Predictors: (Constant), DBH, DAU, DAK

Based on Table 2, the calculated F-value is 20.746 with a significance level of 0.000, which is less than 0.05. This result indicates that the independent variables—General Allocation Fund, Special Allocation Fund, and Revenue Sharing Fund—simultaneously have a significant effect on the dependent variable, namely the Human Development Index of Surabaya City. Therefore, the alternative hypothesis (H1) is accepted, while the null hypothesis (H0) is rejected.

Partial Significance Test (t-Test)

Table 3. Partial Test (t-Test)

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.867	.303		2.867	.015
	DAU	.067	.020	.476	3.384	.006
	DAK	.011	.004	.557	2.978	.013
	DBH	.009	.013	.123	.716	.489

a. Dependent Variable: IPM

Based on Table 3, the results of the t-test are as follows:

- The hypothesis test for the General Allocation Fund (X1) shows a t-statistic of 3.384 with a significance value of 0.006, which is less than 0.05. This indicates that DAU (X1) has a positive and statistically significant partial effect on the Human Development Index (Y). Therefore, H0 is rejected and H2 is accepted.
- The hypothesis test for the Special Allocation Fund (X2) yields a t-statistic of 2.978 with a significance value of 0.013, which is less than 0.05. This result indicates that DAK (X2) has a positive and statistically significant partial effect on the Human Development Index (Y). Accordingly, H0 is rejected and H3 is accepted.
- The hypothesis test for the Revenue Sharing Fund (X3) produces a t-statistic of 0.716 with a significance value of 0.489, which is greater than 0.05. This indicates that, although DBH (X3) has a positive direction of influence, it does not have a statistically significant partial effect on the Human Development Index (Y). Based on this result, the null hypothesis (H0) is accepted and the alternative hypothesis (H4) is rejected.

Coefficient of Determination Analysis (R²)

Table 4. Coefficient of Determination (R²)

Model Summary				
Model	R	R Square	Adjusted Square	RStd. Error of the Estimate
1	.922 ^a	.850	.809	.00578

a. Predictors: (Constant), DBH, DAU, DAK

Based on Table 4, the R Square value of 0.850 indicates that the independent variables—General Allocation Fund (X1), Special Allocation Fund (X2), and Revenue Sharing Fund (X3)—are able to explain 85.0% of the variation in the dependent variable, namely the Human Development Index (Y). This means that 85.0% of the increase or decrease in the Human Development Index is influenced by these three independent variables, while the remaining 15.0% is explained by other factors not included in the model.

Discussion

The findings of this study indicate that intergovernmental fiscal transfers play a substantial role in influencing human development outcomes in Surabaya City. The simultaneous test results confirm that the General Allocation Fund (DAU), Special Allocation Fund (DAK), and Revenue Sharing Fund (DBH) jointly have a statistically significant effect on the Human Development Index (HDI). This result supports the theoretical framework of fiscal decentralization, which emphasizes that transfers from the central government are essential instruments for enhancing local government capacity to provide public services and improve social welfare (Oates, 1972) (Musgrave & Musgrave, 1959) (Mardiasmo, 2009).

The partial analysis shows that DAU has a positive and statistically significant effect on HDI. This finding suggests that the flexible nature of DAU, which allows local governments discretion in allocating funds according to regional priorities, contributes effectively to improvements in education, health services, and living standards. This result is consistent with previous empirical studies that found a significant positive relationship between DAU and HDI across various regions in Indonesia (Harahap, 2011) (Lestari et al., 2019) (Widia Sofyan, 2023). From a theoretical perspective, DAU enhances fiscal capacity and reduces vertical fiscal imbalances, enabling local governments to sustain essential public expenditures that directly affect human development indicators (Bird & Vaillancourt, 1998) (Jhingan, 2020).

Similarly, the Special Allocation Fund (DAK) is found to have a positive and significant effect on HDI. This result indicates that earmarked transfers targeted at specific sectors—such as education, health, and basic infrastructure—are effective in improving human development outcomes when properly implemented. This finding aligns with studies by Sarkoro and Zulfikar (2015), Saswatata and Parju (2022), and Ina and Hudang (2024), which emphasize the strategic role of DAK in supporting sector-specific development programs. In the context of Surabaya as a metropolitan city with a very high HDI, DAK appears to function as a complementary fiscal instrument that strengthens the quality of public services rather than merely expanding access, particularly in the post-pandemic period when targeted spending became increasingly critical.

In contrast, the Revenue Sharing Fund (DBH) shows a positive but statistically insignificant effect on HDI. This result suggests that although DBH contributes to regional revenues, its impact on human development is relatively limited compared to DAU and DAK. This finding is consistent with several previous studies that reported insignificant or weak effects of DBH on HDI, particularly in regions with diversified economic structures

and high fiscal capacity (Damayanti, 2014) (Sulastri & Efendri, 2021) (Siwabessy, 2024). One possible explanation is that DBH allocation is largely determined by natural resource revenues and tax-sharing formulas, which may not be directly linked to social sector spending. In Surabaya's case, DBH may be allocated to broader fiscal needs or infrastructure projects whose benefits to human development indicators are indirect and realized over the long term.

Overall, the high coefficient of determination ($R^2 = 0.850$) indicates that DAU, DAK, and DBH collectively explain a substantial proportion of the variation in Surabaya's HDI. This finding reinforces the argument that fiscal transfers remain a key driver of human development even in cities with already high HDI levels. However, the differential impacts of each transfer type highlight the importance of allocation mechanisms and spending efficiency. While DAU and DAK demonstrate strong relevance for improving human development outcomes, DBH appears less effective in this regard, suggesting the need for improved alignment between revenue-sharing policies and human development objectives.

These findings extend previous research by providing empirical evidence from a metropolitan city with a very high HDI level and by incorporating a more recent, post-pandemic fiscal context. Unlike many prior studies that focused on regions with medium HDI levels or used cross-sectional approaches, this study confirms that the effectiveness of fiscal transfers is not uniform across regions and depends on local characteristics and governance capacity. Therefore, this research contributes to the literature by highlighting the continued relevance of fiscal decentralization policies while emphasizing the need for differentiated strategies in utilizing intergovernmental transfers to sustain and enhance human development outcomes.

Conclusion

The Revenue Sharing Fund (DBH), the General Allocation Fund (DAU) and Special Allocation Fund (DAK) have a statistically significant effect on Surabaya City's Index of Human Development (HDI) between 2010 and 2024, according to a significance value of 0.000 (< 0.05) and an F-statistic of 20.746. DAU having a relatively positive and substantial impact on HDI, a regression coefficient of 0.067, a t-value of 3.384, and a significance level of 0.006. The t-value is 2.978, the significance level is 0.013, and the regression coefficient is 0.011, DAK also exhibits the largest standardized influence ($\beta = 0.557$) among the independent variables. DBH, on the other hand, has a positive but statistically negligible influence on HDI having a t-value of 0.716 and a significance level of 0.489 and a regression coefficient of 0.009, indicating its very little contribution to human development outcomes in Surabaya City. Furthermore, the model shows DAU, DAK, and DBH account for 85.0% of the variance in HDI, with the remaining 15.0% being impacted by factors not included in the model, according to a coefficient of determination (R^2) of 0.850. In order to better capture institutional and governance factors influencing the efficacy of intergovernmental fiscal transfers on human development, it is advised that future research include additional variables such as regional original revenue, sectoral expenditure, poverty, and

unemployment, apply panel data or dynamic econometric methods, and take into consideration qualitative or mixed-method approaches.

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