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Fiscal Decoupling? How Capital Expenditure Mediates the Impact of Intergovernmental Transfers on Poverty and Unemployment in Emerging Regions

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ABSTRACT

This study aims to analyze the impact of fiscal transfers, including the General Allocation Fund (DAU), the Special Allocation Fund (DAK), and the Revenue Sharing Fund (DBH), on poverty levels and the Open Unemployment Rate (TPT) in 34 Indonesian provinces, by placing Capital Expenditure as a moderating variable. Using an explanatory quantitative approach with the Two-Way Fixed Effects Model (FEM) method on panel data for the 2017–2023 period, the results show that the fiscal transfer component does not directly have a significant effect on poverty. However, after the inclusion of interaction variables, Capital Expenditure is proven to significantly moderate by strengthening the negative impact of DAU in reducing poverty rates, while the interaction of DAK and Capital Expenditure is positively associated as a reflection of the accuracy of policy allocation (policy targeting) to areas with high structural poverty. On the other hand, DAU consistently has a negative and significant effect on reducing unemployment (TPT) in all model specifications, while Capital Expenditure is not proven to moderate the relationship between fiscal transfers and TPT because labor absorption in the physical infrastructure sector tends to be temporary and seasonal.

Keywords: *Fiscal Decentralization, Poverty, Unemployment, Capital Expenditure, Panel Data.*

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INTRODUCTION

Indonesia's fiscal decentralization policy, initiated post-reform, represents one of the largest structural transformations of governance in the world. The spirit of delegating fiscal authority has been continuously reformed through Law Number 23 of 2014 concerning Regional Government, and the most recent regulatory restructuring through Law Number 1 of 2022 concerning Financial Relations between the Central Government and Regional Governments (HKPD). Philosophically, the transfer of financial management authority to regions aims to reduce the inter-regional fiscal gap (horizontal imbalance), encourage regional independence, and ensure inclusive and equitable economic development across the archipelago. The main financial instrument used by the central government to support regional fiscal capacity is the Regional

Transfer Fund (TKD), which includes the General Allocation Fund (DAU), the Special Allocation Fund (DAK), and the Revenue Sharing Fund (DBH).

Theoretically, fiscal transfer flows are designed to trigger a fiscal multiplier effect *at* the regional level. Funding stimulus from the central government is expected to drive the domestic economy, increase people's purchasing power, and intervene independently in the provision of public facilities. In the global landscape, the success of this intergovernmental transfer scheme *is highly* dependent on the quality of governance, transfer system design, and regional macroeconomic stability, as empirically demonstrated by **Oliinyk, Kozlukhova, Urban, Bilan, and Ostrowska (2019)** in their research in *the Journal of International Studies* . The ideal autonomy paradigm demands accountability from local governments to utilize this expanded fiscal space *to* fund strategic sectors that directly impact community welfare, as emphasized by **Kwon (2016)** in *The Annals of Regional Science* . However, fundamental challenges often arise when excessive dependence on central funding supplies actually creates a fiscal non-independence trap that reduces the efficiency of internal governance of regional bureaucracy, a phenomenon sharply highlighted by **Kwon (2023)** in *the Bulletin of Indonesian Economic Studies* .

When faced with the empirical reality in Indonesia throughout the period 2010 to 2023, the accumulated allocation of fiscal transfers from the central government continues to show a very massive upward trend. However, this increase in regional financial liquidity is still unable to fully resolve two acute structural problems in the regional macroeconomy: persistent poverty levels and high Open Unemployment Rates (TPT). The performance of welfare indicators in 34 provinces in Indonesia shows very striking spatial disparities. Provinces in Eastern Indonesia, such as Papua (with an average poverty rate of 27.57%), West Papua (23.36%), and East Nusa Tenggara (21.08%), are still trapped in high poverty rates compared to the national average of around 10.95%. This anomaly confirms that the large disbursement of fiscal transfer funds from the center does not automatically guarantee a linear reduction in poverty and unemployment rates at the regional level.

This budget efficiency gap has sparked a long debate in the public finance literature. On the one hand, intergovernmental transfer flows theoretically have an inherent role in improving the real welfare index of poor households by strengthening the social safety net, as evidenced by (Ajefu & Ogebe, 2023) in their study in *The Journal of Development Studies* . In Indonesia, the implementation of fiscal decentralization policies has also been shown to make a positive contribution to accelerating regional poverty reduction, as explained by (Nursini & Tawakkal, 2019) and (Abror et al., 2026) in *Entrepreneurship and Sustainability Issues* . However, on the other hand, the transmission process from fiscal policy to improving public welfare often experiences bottlenecks *due* to geographical constraints, institutional capacity, and unstable regional macroeconomic volatility, a finding confirmed by **Wadjdi, Sumarto, Umami, Landiyanto, and Devanto (2022)** in *the Journal of Asian Economics* . Therefore, the effectiveness of fiscal transfers is largely determined by the accuracy of the priorities of expenditure allocation by regional governments.

To ensure that fiscal transfer funds (DAU, DAK, and DBH) can work optimally in reducing poverty and creating jobs, regional governments are obliged to allocate this

financial capacity to long-term productive expenditure items, namely **Capital Expenditures** . Capital expenditures focused on the development of public fixed assets such as road networks, bridges, ports, agricultural irrigation, school buildings, and health care facilities are an absolute prerequisite for reducing regional logistics costs, improving inter-regional connectivity, and stimulating the influx of private investment. In the short term, the realization of capital expenditures in labor-intensive infrastructure sectors will absorb a large number of local workers, thereby instantly reducing the open unemployment rate. In the long term, the availability of adequate basic infrastructure will empower underprivileged groups economically and facilitate their escape from the poverty line. This capital expenditure function operates as a vital fiscal redistribution instrument to reduce development inequality, as demonstrated by **Wondemu (2016)** in *the International Journal of Economic Policy Studies* .

Despite the crucial urgency of capital expenditure, regional budgeting practices in Indonesia are often marred by distortions in regional fiscal behavior (*fiscal illusion*) and the *flypaper effect* . Empirical testing by (Abror et al., 2026) in the journal *Public and Municipal Finance* shows a worrying anomaly or *crowding-out effect* : increases in the allocation of certain transfer funds from the central government are sometimes responded to by local governments by reducing their share of public capital expenditure allocations. Conversely, this additional fiscal space tends to be predominantly absorbed to finance the expansion of consumptive operational spending, such as increases in bureaucratic costs, goods purchases, and employee benefits.

When local governments fail to convert transfer stimulus funds into productive physical capital expenditures, their capacity to create new jobs, expand business opportunities, and alleviate poverty will be significantly weakened, a condition that aligns with the analysis of **Aslam, Ahmed, and Hussain (2024)** in *the Journal of International Development* . This distortion or failure of fiscal policy transmission reflects that the main problem of decentralization in Indonesia is not simply a matter of the quantity of budget supply from the center, but rather lies in the low quality of public financial management *and* weak institutional accountability capacity at the local level, as emphasized by **Hassan and Awad (2023)** in *the International Journal of Economics and Financial Issues* .

Based on these theoretical and empirical dynamics, capital expenditure can no longer be positioned as a mere independent variable that influences poverty and unemployment in a linear and separate relationship. Capital expenditure must be positioned more comprehensively as **a moderating variable** (*interaction effect*). By placing capital expenditure as a moderating variable, this study aims to econometrically test the extent to which local governments' commitment to realizing capital expenditure acts as a reinforcing factor (*enabler*) that determines the effectiveness of DAU, DAK, and DBH funds transferred by the central government in accelerating the achievement of poverty reduction targets and open unemployment rates.

The longitudinal analysis in this study utilizes panel data from 34 provinces in Indonesia with a 14-year time span from 2010 to 2023. The use of this long time span is very important because it covers the dynamics of crucial economic cycles, ranging from global commodity price fluctuations that affect DBH, changes in the TKD allocation formula, to the extreme fiscal shocks due to the COVID-19 pandemic that completely

overhauled the regional spending posture. To avoid model specification errors (*specification bias*), this study also integrates structural control variables, namely the Human Development Index (HDI) as a representation of the quality of human capital *and* Population as a representation of the burden and scale of the regional economy. This research is expected to be able to provide new academic contributions to the literature on fiscal autonomy and serve as an empirical reference for the formulation of more pro-welfare budget policies in Indonesia.

RESEARCH METHODS

Research Design and Analysis Approach

This study uses a quantitative approach with an explanatory research design , which aims to explain the causal relationship between fiscal transfers (DAU, DAK, DBH), capital expenditure, and welfare indicators (poverty and unemployment) across all Indonesian provinces. The main analytical method used is panel data regression , an estimation method that combines *cross-sectional dimensions (provincial units) and time series* dimensions (observation years) simultaneously.

The panel data method was chosen based on several advantages relevant to the objectives of this study. First, panel data can control for unobserved heterogeneity *between* provinces that is constant over time, such as geographic, cultural, and local institutional factors, which, if ignored, can lead to estimation bias (Hsiao, 2014). Second, panel data provide more observation points, thereby increasing estimation efficiency and degrees *of freedom* . Third, this approach is better able to identify the dynamics of adjustment between periods than a single *cross-section analysis* . A similar approach has been applied in various studies of fiscal decentralization in Indonesia, including by (Siburian, 2022) who used panel data estimates at the provincial level to analyze the relationship between fiscal decentralization and poverty in Indonesia (Siburian, 2022) , and (Nursini & Tawakkal, 2019) who used panel data from 33 provinces to examine the impact of fiscal decentralization on poverty alleviation . (Febriani et al., 2026) also used panel data of 34 Indonesian provinces for the period 2014–2023 with GMM (*Generalized Method of Moments*) estimation to analyze poverty dynamics, which confirmed the suitability of the panel approach for this type of research context.

Data Sources and Coverage

The data used in this study is secondary data sourced from official Indonesian government institutions. Specifically, the data sources include:

1. Central Statistics Agency (BPS) for data on poverty levels (percentage of poor population), Open Unemployment Rate (TPT), Human Development Index (HDI), and provincial population.
2. The Directorate General of Fiscal Balance (DJPK) of the Ministry of Finance for fiscal transfer data (DAU, DAK, DBH) and provincial government capital expenditure, sourced from the Regional Government Financial Report (LKPD) audited by the Audit Board of Indonesia (BPK).

Data coverage: This study covers 34 provinces in Indonesia from 2010 to 2023 (14 years). However, complete and verified fiscal transfer data (DAU, DAK, DBH) have only

been available since 2017, so the main model estimation, which includes all independent variables, will be based on the 2017–2023 period (7 years × 34 provinces = 238 observations). For the partial model estimation (without fiscal transfer variables), the data used covers the 2014–2023 period with 340 observations.
Table 1 presents a summary of descriptive statistics of all research variables:

Table 1. Descriptive Statistics of Research Variables (34 Provinces, 2014–2023)

Variables	N	Minimum	Maximum	Average	Std. Deviation
Poverty (%)	339	3.47	30.05	10.95	5.73
TPT (%)	339	0.88	10.12	4.85	1.82
DAU (Billion Rp)	231	3.54	99,641	21,916.25	34,456.69
DAK (Billion Rp)	235	1.01	99,641	21,916.25	34,456.69
DBH (Billion Rp)	236	1.01	1,253,300	24,217.70	85,769.85
Capital Expenditure (Billion Rp)	339	1.05	97,858	294.43	5,314.60
HDI	340	56.75	83.55	70.86	4.36
Population (Thousands)	337	1.00	9,942	442.79	1,853.73

Source: BPS and DJPK Ministry of Finance, processed.

Descriptive statistics show significant interregional variation across all variables. Poverty rates range from 3.47% to 30.05%, reflecting the persistent disparity in welfare between developed and underdeveloped provinces. Similarly, the General Allocation Fund (DAU) and Regional Revenue Sharing (DBH) values have very large standard deviations, indicating significant inequality in fiscal capacity across regions.

Operational Definition and Measurement of Variables

1. Dependent Variable (Y)

   This study has two dependent variables that are tested separately in two main models:

   a. Y_1 Poverty Rate (POOR): Measured as the percentage of the number of poor people to the total provincial population (%). Data sourced from BPS. This indicator refers to the BPS poverty line which is updated annually based on per capita expenditure to meet basic needs. The use of the poverty rate as a proxy for welfare is consistent with previous studies in the Indonesian context (Siburian, 2022) , (Nursini & Tawakkal, 2019) .

   b. Y_2 Open Unemployment Rate (TPT): Measured as the percentage of the number of unemployed people to the provincial labor force (%). Data sourced from the National Labor Force Survey (Sakernas) by BPS. TPT is the most commonly used labor market indicator in analyzing the fiscal impact on labor absorption at the regional level (Maryanti et al., 2022).

2. Independent Variable (X)

   a. *block grant*- based general transfer from the central government to regional governments intended to equalize financial capacity across regions. Measured in

billions of rupiah. As reviewed by Sudhipongpracha (2016), a *general grant allocation system* like the DAU is designed to ensure that poor regions remain able to provide minimum public services.

b. X_2 Special Allocation Fund (DAK): A special transfer fund provided by the central government to regions to fund national priority activities in certain areas (infrastructure, health, education, etc.). Measured in billions of rupiah.
c. X_3 Revenue Sharing Fund (DBH): Transfer funds sourced from the sharing of central tax revenues (PPh, PBB) and natural resource revenues (oil, gas, mining, forestry, fisheries). Measured in billions of rupiah. DBH reflects the contribution of producing regions to national revenue.

3. Moderating Variable (Z)

Z Capital Expenditure (BM): Regional government expenditure for the acquisition of fixed assets and other assets that provide benefits for more than one budget year. Includes expenditure on land, buildings and structures, equipment and machinery, roads, irrigation, networks, and other assets. Measured in billions of rupiah. This variable is placed as a moderator that is suspected of strengthening or weakening the relationship between fiscal transfers and poverty and unemployment. The theoretical basis for this placement refers to the findings (Ajefu & Ogebe, 2023) that capital expenditure is one of the critical *transmission channels* (*potential channels*) linking fiscal transfers to increased welfare, as well as (Marinho et al., 2017) which proves that infrastructure spending has a significant impact on poverty reduction.

4. 3.4 Control Variable (C)

To avoid *omitted variable bias* , this study includes two control variables identified from the literature as important determinants of poverty and unemployment:

a. C_1 Human Development Index (HDI): A composite index reflecting human development achievements in health, education, and living standards. Measured on a scale of 0–100. The HDI is controlled because the quality of human resources directly affects productivity and a community's ability to escape poverty (Nursini & Tawakkal, 2019).
b. C_2 Population (POP): Total provincial population in thousands of people. Controlled to account for scale effects *in* public service provision and labor market dynamics.

Econometric Model Specifications

1. Base Model (Without Moderation Interaction)

The basic model of this research is formulated as follows:

Model 1 Impact of Fiscal Transfers on Poverty:

$$MISKIN_{it} = \alpha_i + \beta_1 ln\ DAU_{it} + \beta_2 ln\ DAK_{it} + \beta_3 ln\ DBH_{it} + \beta_4 ln\ BM_{it} + \beta_5 IPM_{it} + \beta_6 ln\ POP_{it} + \lambda_t + \varepsilon_{it}$$

Model 2 Impact of Fiscal Transfers on Unemployment:

$$TPT_{it} = \alpha_i + \gamma_1 ln\ DAU_{it} + \gamma_2 ln\ DAK_{it} + \gamma_3 ln\ DBH_{it} + \gamma_4 ln\ BM_{it} + \gamma_5 IPM_{it} + \gamma_6 ln\ POP_{it} + \lambda_t + \varepsilon_{it}$$

Where:

a. i= province index (i = 1, 2, ..., 34)
b. t= time/year index (t = 2017, 2018, ..., 2023)
c. α_i= individual province *fixed effects* (captures time-invariant unobserved heterogeneity)
d. λ_t= *time fixed effects* (captures shared macroeconomic shocks that affect all provinces in the same year, such as the 2020 COVID-19 pandemic)
e. ε_{it}= idiosyncratic *error term*
f. ln = natural logarithmic transformation for financial variables to correct for right - *skewed distributions* and interpret coefficients as elasticities.

2. Moderation Model (Capital Expenditure Interaction)

To test the role of capital expenditure as a moderating variable, the model is expanded by including *interaction terms* between each fiscal transfer variable and capital expenditure:

Model 3 Moderation on Poverty:

$$MISKIN_{it} = \alpha_i + \beta_1 ln\ DAU_{it} + \beta_2 ln\ DAK_{it} + \beta_3 ln\ DBH_{it} + \beta_4 ln\ BM_{it} + \beta_5 (ln\ DAU_{it} \times ln\ BM_{it}) + \beta_6 (ln\ DAK_{it} \times ln\ BM_{it}) + \beta_7 (ln\ DBH_{it} \times ln\ BM_{it}) + \beta_8 IPM_{it} + \beta_9 ln\ POP_{it} + \lambda_t + \varepsilon_{it}$$

Model 4 Moderation on Unemployment:

$$TPT_{it} = \alpha_i + \gamma_1 ln\ DAU_{it} + \gamma_2 ln\ DAK_{it} + \gamma_3 ln\ DBH_{it} + \gamma_4 ln\ BM_{it} + \gamma_5 (ln\ DAU_{it} \times ln\ BM_{it}) + \gamma_6 (ln\ DAK_{it} \times ln\ BM_{it}) + \gamma_7 (ln\ DBH_{it} \times ln\ BM_{it}) + \gamma_8 IPM_{it} + \gamma_9 ln\ POP_{it} + \lambda_t + \varepsilon_{it}$$

The interaction coefficients β_5–β_7 (and γ_5–γ_7) are key moderating parameters. If β_5 is negative and significant, it indicates that increased capital spending strengthens the negative impact of the General Allocation Fund (DAU) on poverty—meaning that DAU transfers are more effective in reducing poverty when accompanied by a higher proportion of capital spending.

Selection of Panel Data Estimation Model

In panel data regression, there are three main estimation approaches to consider: *Pooled OLS (POLS)* , *Fixed Effects Model (FEM)* , and *Random Effects Model (REM)* . The selection of the appropriate model is done through a series of formal statistical tests:

1. Chow Test Used to choose between Pooled OLS and Fixed Effects Model. The null hypothesis (H_o) states that all intercepts between units are equal (Pooled OLS). If the

F-statistic is significant ($p < 0.05$), then the Fixed Effects Model is more appropriate than Pooled OLS.

2. Breusch-Pagan Lagrange Multiplier Test (LM Test) Used to choose between Pooled OLS and Random Effects Model. H_o states there are no random effects . Rejection of H_o indicates the presence of significant individual effects so REM is more appropriate.
3. The Hausman Test is used to select between the Fixed Effects Model and the Random Effects Model. H_o states that the individual effect is uncorrelated with the explanatory variable (REM assumption is met). If the Hausman statistic is significant ($p < 0.05$), then the FEM is more consistent than the REM. The use of the Hausman test in a similar context has been applied by (Siburian, 2022) in estimating the relationship between fiscal decentralization and poverty in Indonesia, as well as by various other panel studies of Indonesian provinces.

Based on the characteristics of this research data where the observation unit is 34 provinces which are the population (not a random sample) and there are strong reasons to suspect the existence of inter-provincial heterogeneity that is correlated with the explanatory variables (for example, regional fiscal capacity affects the amount of transfers received) then *the Fixed Effects Model* (FEM) with *two-way fixed effects* (province and time) is anticipated to be the most appropriate model.

Classical Assumption Test of Panel Data

To ensure the validity and efficiency of the estimates, a series of diagnostic tests were performed as follows:

1. Multicollinearity Test: Checked using *the Variance Inflation Factor* (VIF). A VIF value >10 indicates serious multicollinearity. The potential for multicollinearity between transfer variables (DAU, DAK, DBH) needs to be considered, considering that all three increase along with national fiscal capacity.
2. Heteroscedasticity Test Tested using *the Modified Wald Test* for *fixed effects models* . The presence of heteroscedasticity, which is very common in cross-provincial panel data given the large differences in economic scale, will be addressed by using *robust standard errors* (Driscoll-Kraay standard errors) which are robust against heteroscedasticity, autocorrelation, and spatial correlation between regions simultaneously.
3. Autocorrelation Test Tested using *the Wooldridge Test for Autocorrelation in Panel Data* . Autocorrelation is often found in fiscal panel data because interregional spending and transfers have strong intertemporal persistence.
4. Endogeneity Test The potential for endogeneity needs to be considered considering the possibility of *reverse causality* : areas with high poverty tend to receive larger transfers (because the DAU formula includes the area and number of poor people). Following the approach (Siburian, 2022) which uses instrumental variables to address endogeneity in the context of Indonesian fiscal decentralization, this study will test for endogeneity using *the Hausman-Wu test* and if proven significant, the estimation will be complemented with *the Instrumental Variable* (IV) or *System GMM approach* using the lagged values *of* the transfer variable as an instrument, as also applied by (Febriani et al., 2026) in the analysis of Indonesian poverty dynamics.

Research Hypothesis

Based on the theoretical and empirical studies that have been described, the research hypothesis is formulated as follows:

H1: Fiscal transfers (DAU, DAK, DBH) have a negative and significant effect on provincial poverty levels in Indonesia. This hypothesis is supported by findings from (Nursini & Tawakkal, 2019) and (Muthama & Gál, 2025).

H2: Fiscal transfers (DAU, DAK, DBH) have a negative and significant effect on the Open Unemployment Rate (TPT) in Indonesian provinces. This hypothesis aligns with the argument that stronger fiscal capacity encourages productive spending that creates jobs (Maryanti et al., 2022).

H3: Capital expenditure moderates (strengthens) the negative effect of fiscal transfers on poverty levels. The higher the proportion of capital expenditure, the greater the impact of fiscal transfers on poverty reduction. This hypothesis is supported by (Ajefu & Ogebe, 2023) and (Marinho et al., 2017) .

H4: Capital expenditure moderates (strengthens) the negative effect of fiscal transfers on TPT. The higher the capital expenditure, the more effective fiscal transfers are in creating jobs and reducing unemployment.

8. Analysis Framework

Overall, the flow of analysis of this research can be described as follows:

[Moderation Variable]
Capital Expenditure (BM)
↕
Independent Variable] [Dependent Variable]
DAU ——————————→ Kemiskinan (MISKIN)
DAK ——————————→
DBH ——————————→ Pengangguran (TPT)
[Control Variables: HDI, Population]
[Data: 34 Provinces × 2010–2023 | Method: FEM/GMM Panel Data]

The interaction between fiscal transfer and capital expenditure variables (DAU×BM, DAK×BM, DBH×BM) was included in the model to test whether capital expenditure strengthens or weakens the effect of fiscal transfer on both dependent variables. All analyses were conducted using Stata 17 and/or EViews 12 statistical software, with significance levels used at α = 1%, 5%, and 10%.

RESULTS AND DISCUSSION

RESULTS

1. Research Data Description

The data for this study are panel data that combines cross-section and time-series dimensions, namely 34 provinces in Indonesia. Based on the results of cleaning and searching the raw data, fiscal transfer variables (General Allocation Fund/DAU, Special Allocation Fund/DAK, and Revenue Sharing Fund/DBH) were only fully available starting in 2017, so the model estimation was carried out in the period

2017–2023 (7 years) with a total of 225 observations (unbalanced panel) after observations with incomplete data (missing values) were removed from the sample.

The dependent variables in this study are the poverty rate (percentage of poor population) and the Open Unemployment Rate/TPT (percentage). The independent variables are three components of fiscal transfers (DAU, DAK, DBH in billions of rupiah), with Capital Expenditure (BM) as a moderating variable. Given the highly variable nominal scale of fiscal variables across provinces and over time and their right-skewed distribution, all DAU, DAK, DBH, and BM variables were transformed into natural logarithms (ln) before estimation, so that the coefficients can be interpreted as elasticities (percentage change in poverty/TPT due to a 1 percent change in fiscal transfers).

Table 1 Descriptive Statistics of Research Variables (2017–2023, N = 225)

Variables	Average	Std. Dev	Minimum	Maximum	Unit
Poverty	10.74	5.52	3.47	27.74	%
TPT (Unemployment)	4.74	1.65	0.88	10.12	%
DAU	11,730.25	9,170.06	22.98	41,709.37	Billion Rp
DAK	2,451.82	9,955.96	1.36	149,232.00	Billion Rp
DBH	5,605.88	20,472.76	70.18	242,972.00	Billion Rp
Capital Expenditure (BM)	5,617.40	4,283.52	1,054.57	21,119.93	Billion Rp

Source: Processed data, 2026.

Table 1 shows the average provincial poverty rate in Indonesia for the 2017–2023 period of 10.74 percent with a standard deviation of 5.52, indicating a fairly high poverty disparity between provinces — ranging from 3.47 percent in the provinces with the lowest poverty to 27.74 percent in the provinces with the highest poverty (generally provinces in eastern Indonesia). The average TPT is 4.74 percent with a range of 0.88–10.12 percent, which also indicates variations in the labor market structure between provinces. On the fiscal transfer side, the General Allocation Fund (DAU) has the largest average value (Rp11.73 trillion) compared to the Special Allocation Fund (DAK) and the Regional Revenue and Expenditure Fund (DBH), confirming that the DAU is indeed designed as the main fiscal equalization instrument (block grant) in the balancing fund scheme in Indonesia. DAK and DBH show variability (standard deviation) that is much greater than the average, reflecting the nature of DBH which is highly dependent on the potential of natural resources/taxes

of producing regions (for example, oil and gas producing provinces and provinces with a large tax base), so that its distribution between provinces is very uneven.

2. Panel Data Estimation Model Selection

Before interpreting the coefficients, a panel data model selection test was conducted to determine whether the Common Effects (Pooled OLS) or Fixed Effects model was more appropriate. The test used was the Chow Test (F-restricted test), which compares the residual sum of squares (RSS) of the pooled model with a two-way fixed effects model (province entity and time).

Table 2 Chow Test Results

Model (Dependent Variable)	F-statistic	df	p-value	Decision
Poverty	651.65	(40, 182)	0.0000	Fixed Effect
TPT (Unemployment)	33.17	(40, 182)	0.0000	Fixed Effect

Source: Processed data, 2026.

The Chow test results in Table 4.2 show a p-value of 0.0000 (<0.05) for both dependent variables, thus rejecting the null hypothesis that the pooled (common effect) model is more appropriate. These results confirm that there is heterogeneity in individual provincial characteristics (e.g., geographic conditions, economic structure, and initial fiscal capacity) as well as time effects (e.g., national policies, the COVID-19 pandemic in 2020–2021) that cannot be ignored. Therefore, a two-way fixed effect model (with province fixed effects and year fixed effects) was chosen as the main estimation model in this study. To address the possibility of heteroscedasticity and residual correlation across time within a single province, standard errors were calculated using the cluster-robust standard error technique grouped at the province level.

3. Panel Data Regression Estimation Results

Estimation is carried out in stages with three model specifications for each dependent variable: (1) Model 1 direct effect of DAU, DAK, and DBH on the dependent variable; (2) Model 2 Model 1 plus Capital Expenditure (BM) variable as an additional independent variable; and (3) Model 3 complete model that includes interactions between each fiscal transfer component and BM (DAU×BM, DAK×BM, DBH×BM) to test the role of BM as a moderating variable, following the Moderated Regression Analysis (MRA) approach. All independent and moderator variables have been centered (mean-centered) before forming interactions to reduce multicollinearity due to interactions.

a. The Effect of Fiscal Transfers on Poverty Levels

Table 3 Fixed Effect Estimation Results — Dependent Variable: Poverty (%)

Variables	Model 1	Model 2	Model 3
ln DAU	0.046 (0.885)	-0.054 (0.855)	0.337 (0.243)
ln DAK	0.052 (0.355)	0.040 (0.478)	0.119* (0.075)
ln DBH	0.047 (0.513)	0.022 (0.741)	0.055 (0.497)
ln BM	-	0.413* (0.066)	0.217 (0.508)

DAU × BM	-	-	-0.819* (0.057)
DAK × BM	-	-	0.579*** (0.001)
DBH × BM	-	-	0.085 (0.292)
R^2 (within)	0.009	0.029	0.078
N	225	225	225

Note: Numbers in parentheses are p-values based on cluster-robust standard error (cluster: province*); p<0.01, p<0.05, p<0.10. Province and year fixed effects are included in all models (not shown).*

Table 4 Panel Regression Estimation Results — Poverty and TPT Models

Variables	Poverty Coefficient	TPT Coefficient	Direction of Poverty	TPT Direction	Information
LN_DAU	+0.0786	+0.0004	Positive	Neutral	Not significant
LN_DAK	-0.0100	+0.0204	Negative	Positive	Weak
LN_DBH	-0.1248	+0.0417	Negative	Positive	Significant
LN_Capital Expenditure	+0.2176	+0.2041	Positive	Positive	Needs to be studied
LN_IPM	-4.0816	+1.7708	Negative	Positive	Very significant
LN_Population	-0.0684	-0.0800	Negative	Negative	Weak
R^2 (Poverty)	0.4280	—	—	—	42.80% of the variation is explained
R^2 (TPT)	—	0.2156	—	—	21.56% of the variation is explained

Source: Processed data (2024). p<0.10; p<0.05; p<0.01

In Model 1, neither DAU, DAK, nor DBH showed a statistically significant effect on poverty levels after controlling for province and year fixed effects. This suggests that directly (without considering how the funds are spent), the amount of fiscal transfers received by a province is not necessarily associated with changes in poverty levels. In Model 2, the addition of the BM variable produces a positive and marginally significant coefficient on BM (β = 0.413; p = 0.066), but this positive direction should be interpreted with caution: in the short run in panel data with fixed effects, increases in realized capital expenditures often coincide with years when provinces face pressure for basic infrastructure development, which is also associated with relatively high poverty. Therefore, this relationship reflects a simultaneous association rather than a unidirectional causal effect.

More informative results were obtained in Model 3, the interaction model. The DAU×BM interaction was significantly negative (β = -0.819; p = 0.057),

indicating that the influence of DAU on poverty reduction is stronger (more negative) in provinces with high capital expenditure realization. In other words, BM moderates (strengthens) the influence of DAU in reducing poverty. A large DAU without being balanced by adequate capital expenditure tends to be less effective in reducing poverty, whereas when accompanied by high capital expenditure, these general funds are actually realized into infrastructure and public services that reach the poor.

In contrast, the DAK×BM interaction was significantly positive (β = 0.579; p = 0.001), indicating that in provinces with high capital expenditures, the influence of DAK is actually associated with higher poverty. This pattern can be explained by the characteristics of DAK which is earmarked (its use has been determined by the central government, for example for specific education, health, and infrastructure sectors) and is generally distributed more to provinces with still high levels of structural poverty (targeting based on needs), so that when capital expenditures in these provinces are also high, it actually reflects large-scale development efforts in areas where poverty has not been fully addressed, rather than indicating that DAK has failed to reduce poverty. The DBH×BM interaction was not significant (p = 0.292), indicating that BM does not moderate the influence of DBH on poverty in line with the characteristics of DBH whose amount is largely determined by the potential resources of the producing region and is not directly designed as an instrument for equality/poverty alleviation.

b. The Effect of Fiscal Transfers on the Open Unemployment Rate (TPT)

Table 5 Fixed Effect Estimation Results — Dependent Variable: TPT (%)

Variables	Model 1	Model 2	Model 3
ln DAU	-0.466 (0.002)	-0.436 (0.008)	-0.714 (0.042)
ln DAK	-0.014 (0.848)	-0.010 (0.891)	-0.046 (0.581)
ln DBH	0.128 (0.319)	0.136 (0.332)	0.093 (0.495)
ln BM	-	-0.124 (0.705)	0.089 (0.811)
DAU × BM	-	-	0.597 (0.283)
DAK × BM	-	-	-0.180 (0.477)
DBH × BM	-	-	-0.089 (0.504)
R^2 (within)	0.038	0.039	0.053
N	225	225	225

Note: Numbers in parentheses are p-values based on cluster-robust standard error (cluster: province); p<0.01, p<0.05, p<0.10. Province and year fixed effects are included in all models (not shown).

In contrast to the poverty model, the estimation results for the TPT show a more consistent pattern. In all three models, ln DAU consistently has a negative and significant effect on the TPT (Model 1: β = -0.466, p = 0.002; Model 2: β = -0.436, p = 0.008; Model 3: β = -0.714, p = 0.042). This means that a 1 percent increase in the DAU received by a province is associated with a decrease in the TPT, which is consistent with the function of the DAU as a fiscal equalization instrument that provides flexibility for local governments to finance expenditures

that can stimulate job creation (e.g., personnel expenditures, public service operations, and local economic empowerment programs).

The DAK and DBH variables do not show a significant effect on the TPT in all model specifications. In Model 3, the three interaction terms (DAU×BM, DAK×BM, DBH×BM) are also statistically insignificant ($p > 0.10$), indicating that BM is not statistically proven to moderate the effect of fiscal transfers on the TPT in this panel data. This finding indicates that the decline in unemployment is driven more directly by the amount of DAU itself, rather than by its interaction with the level of realized capital expenditure. This makes theoretical sense because short-term labor absorption from capital expenditure (infrastructure projects) is temporary and concentrated during the construction period, so its effect on the overall annual TPT of the province tends to be weaker and inconsistent than its effect on medium-term poverty alleviation.

DISCUSSION

In general, the results of this study provide three main findings that answer the problem formulation regarding the impact of fiscal transfers on poverty and unemployment with capital expenditure as a moderating variable.

First, fiscal transfers (DAU, DAK, DBH) do not directly impact poverty levels strongly enough without considering how these funds are realized in the form of capital expenditures. Capital expenditures play a significant role as a moderating variable, strengthening the influence of DAU in reducing poverty. This finding is consistent with arguments in the fiscal decentralization literature that the effectiveness of intergovernmental transfers on public welfare depends heavily on the quality of regional budget management (fiscal capacity and spending efficiency), not solely on the amount of funds received.

Second, the opposite pattern was found in the interaction of DAK with BM on poverty, which was actually positively associated. This aligns with the characteristics of DAK as a targeted/earmarked fund whose distribution is directed to provinces with greater development needs (including provinces with high poverty). Therefore, the coefficients found more reflect the direction of policy distribution (policy targeting) rather than the ineffectiveness of DAK itself. This interpretation needs further confirmation with qualitative studies or endogeneity approaches (e.g., instrument variables) in future research.

Third, in the unemployment model, the General Allocation Fund (DAU) consistently proves to be a factor in lowering the TPT across all model specifications, while the moderating role of the Regional Budget (BM) is not significant. This suggests that the transmission channel of fiscal transfers to unemployment reduction is likely more through regional routine/operational spending (funded by the General Allocation Fund) than through temporary capital expenditure projects.

Overall, the coefficient of determination (R^2 within) values are relatively low (ranging from 0.8%–7.8% for the poverty model and 3.8%–5.3% for the TPT model). This is a common characteristic of fixed effects models, which absorb most of the variation in the data through province and year fixed effects, so that the coefficient of determination within only explains the proportion of variation remaining after interprovincial and intertemporal differences are controlled for; this value should not

be confused with the R^2 in ordinary pooled regression and is not the primary measure of model goodness-of-fit in a panel fixed effects context.

Several limitations need to be addressed. First, consistent data on General Allocation Funds (DAU), Special Allocation Funds (DAK), and Revenue Sharing Funds (DBH) only began to be available in 2017, making the estimation period (2017–2023) shorter than the period stated in the research title (2010–2023). The researcher recommends searching for official data from the Ministry of Finance/DJPK for the period 2010–2016 if further research is desired to extend the timeframe. Second, several DBH and DAK values were found to be nominally very extreme compared to the median (possibly related to provinces producing large natural resources such as Riau and the Riau Islands, or potentially containing data input errors). The logarithmic transformation used in this study helps mitigate the effects of these extremes, but re-verification of the raw data on the highest-value observations is still recommended before these results are finalized as part of a thesis.

CONCLUSION

Based on the results of econometric analysis using panel data regression with the *Two-Way Fixed Effects Model* (FEM) approach in 34 provinces in Indonesia for the period 2017–2023, this study produces several main conclusions as follows:

1. The Impact of Fiscal Transfers on Poverty and the Moderating Role of Capital Expenditure
   a. Direct Impact: Partially and directly, fiscal transfer components, including the General Allocation Fund (DAU), Special Allocation Fund (DAK), and Revenue Sharing Fund (DBH), do not significantly impact poverty levels in Indonesia. This demonstrates that the quantity or volume of funds transferred by the central government does not automatically alleviate poverty unless supported by appropriate allocation of expenditures at the regional level.
   b. The Moderating Role of Capital Expenditure on the General Allocation Fund (DAU): Capital expenditure has been shown to significantly act as a moderating variable (*enabler) that strengthens the negative impact of the General Allocation Fund (DAU) on poverty. These results indicate that the block grant* DAU stimulus will work optimally in reducing poverty rates if local governments convert it into a high portion of Capital Expenditure for the provision of public infrastructure and basic services for underprivileged communities.
   c. Anomaly in the Interaction of DAK and Capital Expenditure: The interaction between DAK and Capital Expenditure shows a significantly positive coefficient. This finding does not indicate program failure, but rather reflects the characteristics of DAK as *earmarked funds* allocated massively based on the principle of policy targeting *to* provinces with high levels of structural poverty and acute infrastructure backlogs.
   d. The DBH:Capital Expenditure interaction has not been shown to moderate the effect of DBH on poverty. This is in line with the highly asymmetric nature of DBH distribution, which relies on the potential tax base or natural resource endowment of the producing region. Therefore, it is not designed to promote social equality.

2. The Impact of Fiscal Transfers on the Open Unemployment Rate (TPT)
   a. The Consistent Role of the General Allocation Fund (DAU): The General Allocation Fund (DAU) has consistently been shown to have a negative and significant effect on the Open Unemployment Rate (TPT) across all model specifications. The flexibility of DAU use allows local governments to mobilize bureaucracy, fund public service operations, and stimulate local economic empowerment programs that directly impact employment.
   b. Limitations of the Role of Special Allocation Funds (DAK), Regional Revenue Sharing Funds (DBH), and Capital Expenditures: The DAK and DBH components did not significantly influence the TPT. Furthermore, Capital Expenditures were not shown to moderate the relationship between fiscal transfers and TPT. This is because labor absorption from physical capital expenditures (such as infrastructure construction projects) is generally temporary and seasonal, making their effects less sensitive to decreases in the open unemployment rate calculated on an annual macro scale.
3. Research Limitations Note

   The limited availability of consistent and verified fiscal transfer data (DAU, DAK, DBH) at the provincial level has narrowed the effective estimation period to 2017–2023. However, the use of the *Two-Way Fixed Effects model* has successfully controlled for heterogeneity in regional characteristics and macro-temporal shocks (such as the COVID-19 pandemic) validly.

SUGGESTION

Based on the conclusions above, the recommendations that can be given to policy makers (*stakeholders*) are as follows:

1. For Regional Government (Provincial Government):
   a. Improving Spending Quality (Spending Better): Regional governments must commit to reducing fiscal behavior distortions such as *the flypaper effect* and *fiscal illusion* . Additional fiscal space from increased central government transfers (particularly the General Allocation Fund) must be prioritized to fund productive and labor-intensive public capital expenditures, rather than being spent on expanding consumptive operational expenditures (such as bureaucratic costs, goods purchases, and employee benefits).
   b. Long-Term Infrastructure Synchronization: Considering that Capital Expenditure has proven to be a key factor in strengthening the General Allocation Fund (DAU) in reducing poverty, regional governments need to focus capital expenditure on the development of fixed assets that improve economic connectivity (roads, bridges, ports) in order to reduce logistics costs and open up isolated areas with pockets of poverty.
2. For the Central Government (Ministry of Finance & Bappenas):
   a. Tightening the Budget Oversight Formula: The central government needs to tighten oversight and provide clear fiscal incentives/disincentives to regions. Regulations derived from Law No. 1 of 2022 concerning Regional Government Funds (HKPD) should encourage regions to allocate a certain percentage of their

general transfer funds (DAU) to capital expenditure items that directly impact welfare.

b. Evaluation of the DAK Allocation Formula: The future DAK allocation formula must continue to prioritize affirmative action for poor areas, but must be accompanied by strict monitoring to ensure that its implementation in the field is in sync with regional capital expenditure planning in order to accelerate the convergence of structural poverty reduction.

3. For Further Research:
   a. Handling of Extreme Data (*Outliers*): Further researchers are advised to conduct more in-depth verification of raw data and apply the *Winsorizing method* or exclude regions with extreme fiscal values (such as oil and gas-rich provinces) in order to obtain more moderate coefficient estimates.
   b. Addressing Endogeneity Issues: It is recommended for subsequent research to apply the *Instrumental Variable* (IV) or *System Generalized Method of Moments* (System-GMM) method to address the potential for reverse causality *,* where regions characterized by high poverty tend to receive larger transfer funds from the central government.

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