



The Flypaper is in the Composition, Not the Level: Evidence from South Sulawesi

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ABSTRACT

The flypaper effect literature asks whether intergovernmental transfers stimulate local spending more strongly than own-source revenue. That question is almost always tested on total expenditure. This study moves the test to expenditure composition. The data cover 24 districts and cities in South Sulawesi for fiscal years 2015 to 2025, comprising 264 observations drawn from budget realization reports published by the Directorate General of Fiscal Balance. The model uses district and year fixed effects with standard errors clustered by district. No flypaper effect appears in total expenditure: one additional rupiah of transfers raises spending by 0.866 rupiah against 0.848 rupiah for own-source revenue, a difference of 0.019 with a p value of 0.918. Disaggregation reveals a different picture. Transfers raise capital expenditure by 0.461 rupiah while own-source revenue raises it not at all, with an insignificant coefficient of negative 0.056. The difference of 0.516 carries a p value of 0.010 and survives four alternative specifications. The flypaper effect lies not in the level of spending but in its composition. Transfers fund capital formation while own-source revenue funds recurrent spending.

INTRODUCTION

Public finance theory holds that money is fungible. One rupiah received by a local government should be treated the same regardless of its source. If transfers from the central government expand spending capacity, their effect on spending choices should match that of an equivalent increase in residents' income.

Empirical evidence rejects that prediction. Since Bradford and Oates (1971) formulated the framework of collective fiscal choice, dozens of studies have found that transfers stimulate spending far more strongly than additional own revenue. Hines and Thaler (1995) named the phenomenon the flypaper effect, capturing the idea that money sticks where it lands. Bailey and Connolly (1998) reviewed three decades of work and noted that the phenomenon persists even though its explanation remains contested.

Almost all of that testing has been conducted on total expenditure. The question has always been whether the propensity to spend transfers exceeds the propensity to spend own revenue. Such testing treats local spending as a single box.

Yet local spending is not a single box. Personnel expenditure, goods and services, and capital expenditure carry very different consequences for service capacity. Capital expenditure creates assets that serve residents for years. Personnel expenditure commits the budget permanently. Goods and services sustain ongoing activity. Two local governments with identical total spending can have very different service capacity depending on composition.

This raises a question that has not been answered. If transfers and own-source revenue are both spent, do they flow to the same accounts? This question differs from the conventional flypaper question. The conventional question concerns the size of spending; this one concerns its direction.

The question is pressing in Indonesia for two reasons. First, Law Number 1 of 2022 on Fiscal Relations between the Central Government and Regional Governments places the strengthening of own-source revenue at the center of policy. The motor vehicle tax surcharge in force since 5 January 2025 is its first instrument. That policy rests on the assumption that own revenue is preferable to transfers. If own revenue flows to different accounts than transfers, the assumption needs re-examination. Second, the capital expenditure share of district and city budgets in South Sulawesi has fallen steadily over the observation period while the own-source revenue share has risen. The two trends run together and deserve to be tested.

This study examines that question across 24 districts and cities in South Sulawesi for fiscal years 2015 to 2025, with 264 district-year observations. It makes three contributions. First, it moves flypaper testing from the level of spending to its composition, producing a testable question that the Indonesian literature has not answered. Second, it shows that the two tests can yield opposing conclusions on the same data. Third, its findings speak directly to the own-source revenue policy now under way.

Three questions guide the study. Does the propensity to spend transfers differ from the propensity to spend own-source revenue in total expenditure?

Does any difference appear once spending is disaggregated by component? How robust is that difference to changes in sample and specification?

THEORETICAL FRAMEWORK

The Flypaper Effect and Its Explanations

Bradford and Oates (1971) showed that in a median voter framework an unconditional transfer should be equivalent to an increase in residents' income of the same amount. Both would raise demand for public goods by the income elasticity, which is generally small. The prediction is clear: most of a transfer should be returned to residents through lower local taxes.

Empirical evidence rejects that prediction. Transfers received tend to remain in the government budget and be spent. Hines and Thaler (1995) labelled this anomaly the flypaper effect and placed it among the durable anomalies of economics.

Explanations vary. The first is political: bureaucrats and politicians have incentives to enlarge the budget, and transfers offer that opportunity without the political cost of levying taxes. The second is cognitive: voters do not observe transfers directly and therefore do not demand their return. The third is technical: many transfers are in fact conditional, so their use is already tied. Bailey and Connolly (1998) reviewed all three and concluded that the neoclassical approach was losing explanatory power, so new directions were needed.

One direction they named, but which is rarely pursued, is to examine where the money flows within the budget. This study pursues that direction.

Empirical Evidence on the Flypaper Effect in Indonesia

Flypaper research in Indonesia has grown rapidly and its results are not uniform. Fitrianti, Zaenal, Fattah, and Hidayah (2025) examine provincial governments in Indonesia and find that unconditional grants affect regional expenditure more strongly than own-source revenue, with coefficients of 0.501 against 0.366. They conclude that the flypaper effect holds, with variation across provinces in Sulawesi.

At the district and city level, Ramadhani, Utami, Majiding, and Akib (2025) examine South Sulawesi and find that transfer funds, particularly the General Allocation Fund, significantly affect regional expenditure while own-source revenue plays a minor role. Fiscal capacity does not moderate that dependence.

Research that disaggregates spending by component remains scarce, and its results run in the opposite direction. Sania, Yamin, Paranoan, and Tanra (2024) examine capital expenditure in districts and cities of Central Sulawesi and find that own-source revenue and the Special Allocation Fund drive capital spending while the General Allocation Fund does not. That result implies that unconditional transfers do not flow into capital formation.

The contradiction remains unresolved. Some studies position transfers as the driver of spending; others position own-source revenue as the driver of capital spending. The divergence may stem from differences in region, period, transfer disaggregation, or model specification. This study tests both in a single

framework, in one province over eleven years, with district and year fixed effects, so that the comparison rests on common ground.

Expenditure Composition and Service Capacity

Research on local government financial condition emphasizes that composition matters. Wang, Dennis, and Tu (2007) treat service-level solvency as a distinct dimension, separate from cash and budgetary solvency. A local government can balance its budget while losing its ability to deliver services. Hendrick (2004) shows that dimensions of financial condition do not always move together.

Capital expenditure is the link between the current-year budget and future service capacity. Roads, schools, health centres, and water networks are created through this account. Personnel expenditure, by contrast, commits the budget permanently and narrows room for manoeuvre in subsequent years.

In the Indonesian context, Lewis (2023) assesses the latest fiscal decentralisation law critically and notes that strengthening local revenue does not necessarily improve services. Saptono and Mahmud (2023) find that intergovernmental transfers crowd in local tax collection rather than displacing it. Hummel and Kusumasari (2026) show that local financial performance in Indonesia is shaped more by transfer structure than by own revenue. Hasanah, Masdar, Furqan, and Tenripada (2025) find that own-source revenue strengthens fiscal independence although its contribution still trails transfers.

None of these studies tests whether transfers and own-source revenue flow to different spending accounts. That is the gap this study fills.

Hypothesis Development

If money is fungible as theory holds, the propensity to spend the two revenue sources should be equal in total expenditure. If the flypaper effect holds as the broader literature reports, the propensity to spend transfers will be larger. The first hypothesis is stated in refutable form.

H1: The propensity to spend transfers differs from the propensity to spend own-source revenue in total expenditure.

Capital expenditure is the most flexible account in a local budget because it is not bound by prior-year obligations. A large share of transfers to regions in Indonesia, particularly the physical Special Allocation Fund, is directed at capital formation. Own-source revenue, by contrast, is entirely discretionary and therefore easiest to deploy against pressing current needs. The second hypothesis is stated as follows.

H2: Transfers raise capital expenditure more than own-source revenue does.

If H2 holds while total spending does not differ, own-source revenue must flow elsewhere. The most likely account is goods and services, which holds ongoing activity decided annually. The third hypothesis is stated as follows.

H3: Own-source revenue raises goods and services expenditure more than transfers do.

METHODS

Data and Unit of Analysis

This study uses a quantitative approach with a balanced panel. The unit of analysis is the district or city per fiscal year. The population and sample comprise all 24 districts and cities in South Sulawesi Province for fiscal years 2015 to 2025, yielding 264 observations.

Data come from the portal of the Directorate General of Fiscal Balance, Ministry of Finance, in the form of regional budget realization reports. The items extracted are total regional revenue, own-source revenue, transfer revenue, total regional expenditure, personnel expenditure, goods and services expenditure, capital expenditure, and the prior-year budget surplus carryover. Population data come from Statistics Indonesia projections.

All variables are expressed in rupiah per capita so that comparison across districts is meaningful, given the wide differences in population across districts and cities in South Sulawesi.

Empirical Model

The main model is estimated separately for each spending component.

$$Y_{it} = a_i + b_t + c1 \text{ Transfer}_{it} + c2 \text{ OSR}_{it} + e_{it}$$

Y_{it} is the spending component of district i in year t in rupiah per capita, covering total expenditure, personnel expenditure, goods and services expenditure, capital expenditure, and the budget surplus carryover. Transfer_{it} and OSR_{it} are transfer revenue and own-source revenue in rupiah per capita. The term a_i is a district fixed effect absorbing persistent differences between districts such as area, remoteness, and institutional legacy. The term b_t is a year fixed effect absorbing shocks common to all districts such as the pandemic, changes in central regulation, and inflation.

Coefficients $c1$ and $c2$ are read as the propensity to spend from each revenue source. The focus of this study is not the value of each coefficient but the difference between them, tested through a Wald test of the hypothesis that $c1$ equals $c2$.

Standard errors are clustered by district to address serial correlation within districts.

Robustness Tests

Four robustness tests are applied to the two components that determine the conclusion, namely capital expenditure and goods and services expenditure. The first excludes Makassar City, whose fiscal size far exceeds that of other districts. The second excludes the pandemic years 2020 and 2021, when budget refocusing altered spending composition abruptly. The third restricts the sample to 2024 and earlier, so that the first year of the surcharge is not included. The fourth excludes the three cities, namely Makassar, Parepare, and Palopo, leaving only regencies.

As a complement, the model is re-estimated in logarithmic form to obtain elasticities, so that the conclusion does not depend on rupiah units.

RESULTS

Descriptive Overview

Table 1. Descriptive Statistics, 264 District-Year Observations, 2015-2025

Variable	Mean	SD	Minimum	Median	Maximum
Transfer revenue per capita (million rupiah)	3.007	0.897	0.946	2.971	6.202
Own-source revenue per capita (million rupiah)	0.480	0.270	0.118	0.393	1.872
Total expenditure per capita (million rupiah)	3.852	1.038	1.753	3.730	7.047
Personnel expenditure per capita (million rupiah)	1.556	0.424	0.705	1.511	3.020
Goods and services per capita (million rupiah)	0.989	0.393	0.240	0.899	2.582
Capital expenditure per capita (million rupiah)	0.772	0.345	0.197	0.712	1.958
Budget surplus carryover per capita (million rupiah)	0.214	0.188	0.000	0.159	0.978
Transfer share of revenue (percent)	77.565	8.238	47.509	79.447	90.975
Capital share of expenditure (percent)	19.880	6.268	5.912	19.251	36.505

Note: computed from the portal of the Directorate General of Fiscal Balance.

Transfers dominate local revenue. Their mean share reaches 77.6 percent, with a minimum of 47.5 percent and a maximum of 91.0 percent. Own-source revenue per capita averages only 0.480 million rupiah, one sixth of transfers.

Capital expenditure absorbs 19.9 percent of spending on average, with a wide spread from 5.9 percent to 36.5 percent.

No Flypaper Effect in Total Expenditure

Table 2. Main Model. District and Year Fixed Effects, Rupiah per Capita

Component	Transfer	SE	p	OSR	SE	p	Difference	p diff	R2
Total expenditure	0.866	0.076	0.000	0.848	0.179	0.000	0.019	0.918	0.971
Personnel expenditure	0.203	0.047	0.000	0.312	0.162	0.054	-0.108	0.503	0.951
Goods and services	0.026	0.091	0.777	0.487	0.206	0.018	-0.461	0.057	0.920
Capital expenditure	0.461	0.118	0.000	-0.056	0.202	0.783	0.516	0.010	0.750
Budget surplus carryover	0.142	0.067	0.033	0.068	0.143	0.635	0.074	0.581	0.630

Note: standard errors clustered by district. The p diff column is the p value of a Wald test that the transfer coefficient equals the own-source revenue coefficient. OSR denotes own-source revenue.

One additional rupiah of transfers raises total expenditure by 0.866 rupiah. One additional rupiah of own-source revenue raises total expenditure by 0.848 rupiah. Both are significant at the one percent level. The difference is only 0.019 rupiah with a p value of 0.918.

The first hypothesis is rejected. In total expenditure, transfers and own-source revenue are treated alike. There is no flypaper effect.

This result differs from Fitrianti et al. (2025), who find a flypaper effect among provincial governments, and from Ramadhani et al. (2025), who find a much larger role for transfers among districts and cities in South Sulawesi. The divergence may stem from the district and year fixed effects and the per capita scaling used here. District fixed effects absorb persistent differences between districts that a cross-sectional model without fixed effects would read as a transfer effect.

If testing stopped here, the conclusion would be that the two revenue sources are equivalent. The next section shows that conclusion to be misleading.

The Difference Appears in Composition

Figure 1 displays the coefficients of both revenue sources for every spending component together with 95 percent confidence intervals.

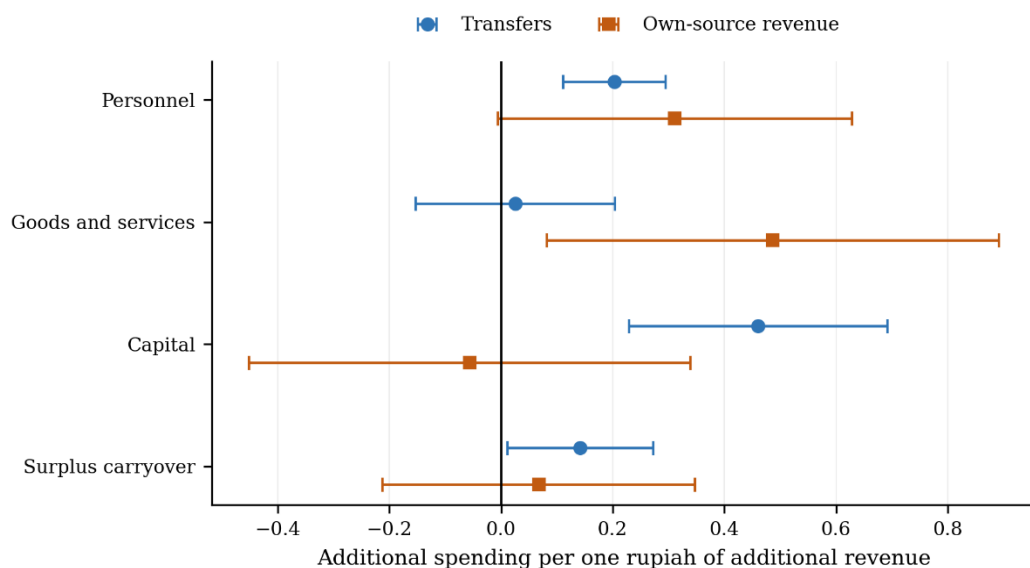


Figure 1. Additional spending per one rupiah of additional transfers and own-source revenue by component, 24 districts and cities in South Sulawesi, 2015-2025

Disaggregation changes the picture fundamentally. Transfers raise capital expenditure by 0.461 rupiah per additional rupiah, with a p value below 0.001. Own-source revenue does not raise capital expenditure at all. Its coefficient is negative 0.056 with a p value of 0.783. The difference between them reaches 0.516 rupiah with a p value of 0.010.

The second hypothesis is supported. Transfers fund capital formation; own-source revenue does not.

The reverse holds for goods and services. Own-source revenue raises this account by 0.487 rupiah with a p value of 0.018, while transfers barely move it,

with a coefficient of 0.026 and a p value of 0.777. The difference is negative 0.461 with a p value of 0.057.

The third hypothesis is supported at the ten percent level but not at the five percent level. Its support is weaker than that of the second hypothesis and must be stated as a tendency rather than an established finding.

For personnel expenditure both revenue sources raise spending, with coefficients of 0.203 for transfers and 0.312 for own-source revenue. The difference is not significant, with a p value of 0.503. This account appears to be funded from both sources without distinction.

For the budget surplus carryover, transfers add 0.142 rupiah with a p value of 0.033 while own-source revenue is insignificant. Part of transfers remains unspent and accumulates as reserve.

Taken together the four components produce a single pattern. Total spending is the same, but its direction differs. Transfers flow to capital formation and reserves; own-source revenue flows to recurrent spending.

Robustness

Table 3 and Figure 3 test whether the pattern survives across samples and periods.

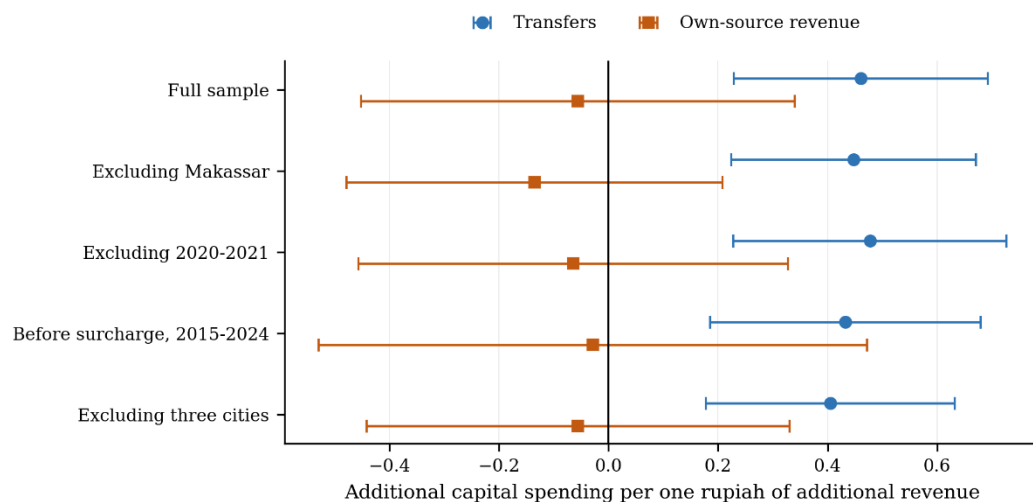


Figure 3. Robustness of the capital expenditure coefficients across five specifications

Table 3. Robustness Tests for Capital Expenditure and Goods and Services

Specification	Outcome	N	Trans fer	p	OSR	p	p diff
Full sample	Capital	264	0.461	0.000	-0.056	0.783	0.010
Excluding Makassar City	Capital	253	0.448	0.000	-0.135	0.441	0.001
Excluding pandemic years 2020-2021	Capital	216	0.477	0.000	-0.064	0.750	0.005

Specification	Outcome	N	Transfer	p	OSR	p	p diff
Before the surcharge, 2015-2024	Capital	240	0.432	0.001	-0.028	0.912	0.047
Excluding the three cities	Capital	231	0.405	0.000	-0.055	0.779	0.012
Full sample	Goods and services	264	0.026	0.777	0.487	0.018	0.057
Excluding Makassar City	Goods and services	253	0.027	0.771	0.487	0.026	0.069
Excluding pandemic years 2020-2021	Goods and services	216	0.025	0.795	0.512	0.014	0.046
Before the surcharge, 2015-2024	Goods and services	240	0.028	0.770	0.459	0.066	0.119
Excluding the three cities	Goods and services	231	0.071	0.486	0.362	0.183	0.358

Note: standard errors clustered by district. The three cities are Makassar, Parepare, and Palopo.

The capital expenditure finding survives every specification. The transfer coefficient ranges from 0.405 to 0.477 and is always significant at the one percent level. The own-source revenue coefficient is always negative, small, and never significant. The difference test is significant at the five percent level in every specification, with p values ranging from 0.001 to 0.047.

The goods and services finding is more fragile. In the specification excluding the three cities, the difference test loses meaning with a p value of 0.358, and the own-source revenue coefficient falls to 0.362 and is no longer significant. In the specification ending before the surcharge, the difference test reaches a p value of 0.119. The tendency for own-source revenue to flow into goods and services is therefore sustained mainly by the three cities and by 2025.

This difference in robustness must be stated openly. The main conclusion of this study rests on capital expenditure, which is firm. The goods and services side is a complement whose strength depends on the sample.

Elasticities

Table 4 reports the logarithmic specification, so that the conclusion does not depend on rupiah units.

Table 4. Logarithmic Specification. Elasticity of Spending with Respect to Revenue Source

Component	N	Transfer elasticity	p	OSR elasticity	p	p diff
Total expenditure	264	0.605	0.000	0.099	0.001	0.000
Personnel expenditure	264	0.374	0.002	0.077	0.241	0.023
Goods and services	264	0.111	0.613	0.147	0.313	0.907
Capital expenditure	264	1.799	0.000	0.174	0.197	0.000
Budget surplus carryover	262	0.529	0.570	0.913	0.002	0.658

Note: two observations with zero carryover are excluded from the last row.

Capital expenditure stands out again. Its elasticity with respect to transfers reaches 1.799, meaning that a one percent increase in transfers raises capital spending by almost two percent. Its elasticity with respect to own-source revenue is only 0.174 and not significant. The difference is significant at the one percent level.

In this specification total expenditure also shows a significant difference, because elasticity is relative to the magnitude of each variable. Transfers are far larger than own-source revenue, so the same percentage represents very different rupiah amounts. The rupiah specification in Table 2 is therefore the appropriate test of the flypaper question, while the logarithmic specification serves to reinforce the composition pattern.

Composition Moves in Opposite Directions

Figure 2 and Table 5 display the movement of revenue and spending shares over the period.

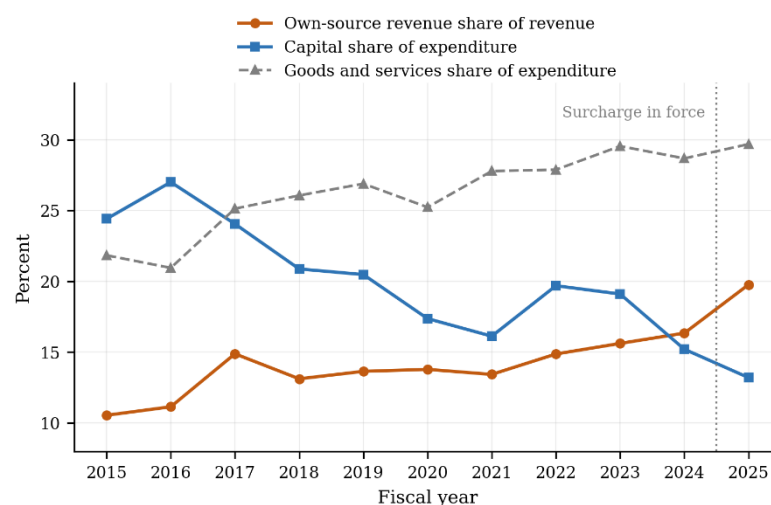


Figure 2. Shares of own-source revenue, capital expenditure, and goods and services expenditure, 24 districts and cities in South Sulawesi, 2015-2025

Table 5. Revenue and Expenditure Composition by Year, 24 Districts and Cities

Year	Transfer share (percent)	OSR share (percent)	Personnel (percent)	Goods and services (percent)	Capital (percent)
2015	68.18	10.54	45.52	21.84	24.41
2016	81.45	11.14	41.94	20.95	27.01
2017	77.41	14.88	38.04	25.14	24.06
2018	77.69	13.12	38.08	26.07	20.88
2019	75.36	13.65	37.87	26.90	20.48
2020	73.31	13.78	39.49	25.24	17.37
2021	76.09	13.43	40.82	27.79	16.13
2022	75.49	14.87	37.99	27.89	19.69
2023	75.08	15.62	36.60	29.55	19.11
2024	77.00	16.35	40.61	28.68	15.21
2025	72.74	19.77	44.52	29.69	13.20

Note: computed from the portal of the Directorate General of Fiscal Balance. OSR denotes own-source revenue.

Two lines move in opposite directions. The own-source revenue share rises from 10.54 percent in 2015 to 19.77 percent in 2025, nearly doubling, with the largest jump in the year the surcharge took effect. Over the same period the capital expenditure share falls from 24.41 percent to 13.20 percent, nearly halving. The goods and services share rises from 21.84 percent to 29.69 percent.

Figure 2 shows the two lines crossing in 2024. From that year the own-source revenue share exceeds the capital expenditure share.

This movement is descriptive and does not establish causation. Its direction is nevertheless consistent with the regression results. As the revenue mix shifts toward a source that does not fund capital expenditure, the capital expenditure share contracts.

DISCUSSION

All three hypotheses produce a single conclusion. The flypaper effect in South Sulawesi lies not in the level of spending but in its composition.

This conclusion reconciles two groups of findings that have stood in tension in the Indonesian literature. Studies testing total expenditure, such as Fitrianti et al. (2025) and Ramadhani et al. (2025), position transfers as the main driver. Studies testing capital expenditure, such as Sania et al. (2024), position own-source revenue as the driver. This study shows that both groups can be correct on different dependent variables, and that the dispute is therefore partly illusory.

The results nevertheless run against Sania et al. (2024) on the direction of the effect on capital expenditure. They find that own-source revenue drives capital spending in Central Sulawesi, whereas this study finds its effect to be zero in South Sulawesi. Three possible explanations deserve mention. First, they disaggregate the General Allocation Fund from the Special Allocation Fund whereas this study uses combined transfers, so the conditional portion directed at capital formation is included here. Second, the provinces differ in fiscal structure. Third, this study uses district and year fixed effects, so what is

measured is change within districts rather than differences between them. All three remain open to testing and form an agenda for further research.

The most plausible mechanism is institutional rather than behavioural. A large share of transfers to regions in Indonesia is conditional or earmarked, particularly the physical Special Allocation Fund, which finances capital formation in full. When transfers rise, most of the increase already carries a designated use. Own-source revenue, by contrast, is entirely discretionary and therefore easiest to deploy against the most pressing current need. Pressing needs in local governments are typically recurrent rather than investment projects that require multi-year planning.

This explanation also accounts for the absence of a flypaper effect in total expenditure. Both sources are spent almost in full. What differs is only their destination.

The finding carries an uncomfortable implication for the current direction of fiscal decentralisation policy. Law Number 1 of 2022 positions the strengthening of own-source revenue as the path to independence, and the motor vehicle tax surcharge is its first instrument. If own-source revenue does not flow into capital formation, strengthening it will raise independence on paper without raising service capacity. Lewis (2023) has warned of this possibility in general terms, and this study supplies quantitative evidence for one province.

The finding also extends the framework of Wang, Dennis, and Tu (2007). Budgetary solvency and service-level solvency are separate dimensions. This study adds that the revenue source helps determine which dimension is strengthened. Transfers support service-level solvency through capital formation. Own-source revenue supports ongoing activity.

CONCLUSIONS AND RECOMMENDATIONS

No flypaper effect appears in total expenditure. One additional rupiah of transfers raises spending by 0.866 rupiah and one additional rupiah of own-source revenue raises spending by 0.848 rupiah, with a difference test *p* value of 0.918.

The difference appears in composition. Transfers raise capital expenditure by 0.461 rupiah while own-source revenue does not raise it at all, with a difference test *p* value of 0.010. The finding survives four alternative specifications and the logarithmic specification, where elasticities are 1.799 against 0.174.

Own-source revenue tends to flow into goods and services, with coefficients of 0.487 against 0.026. This tendency is weaker and depends on the inclusion of the three cities in the sample.

Three recommendations follow. First, policies strengthening own-source revenue should be accompanied by earmarking rules if the objective is to improve services; without such rules, additional own-source revenue will enter recurrent spending. Local governments may set a minimum share of surcharge receipts directed to capital expenditure, as is already common for certain tax receipts. Second, reductions in transfers must be treated with care, because if transfers are the only source funding capital expenditure, reducing them will depress capital formation directly and additional own-source revenue will not

replace it. Third, measures of successful fiscal decentralisation must go beyond the independence ratio: that ratio answers where the money comes from, not where it goes, and this study shows the two questions yield different assessments.

FURTHER STUDY

This study carries four limitations.

First, transfers are treated as a single aggregate. Disaggregating the General Allocation Fund, the Special Allocation Fund, and revenue sharing would clarify how much of the capital expenditure finding stems from the conditional nature of transfers, and that cannot be done at the level of detail available in the data.

Second, own-source revenue is endogenous to local economic conditions. District and year fixed effects absorb most sources of endogeneity but not all. District-specific economic shocks that raise own-source revenue while also changing spending needs may remain.

Third, the study contains no control variables such as gross regional domestic product, the number of poor residents, or area. Most of these move slowly and are absorbed by district fixed effects, but not entirely.

Fourth, coverage is limited to one province over eleven years. The findings do not automatically extend to other provinces, particularly since results in Central Sulawesi run in a different direction.

Further research should disaggregate transfer types, since that disaggregation directly tests the institutional explanation advanced here. Extension to all provinces would show whether this composition pattern is general or specific to South Sulawesi. Using a longer period after the surcharge took effect would permit a direct test of whether additional surcharge receipts do enter recurrent spending as this study suspects. Qualitative research into local budget preparation is also warranted, because the mechanism proposed here remains conjectural and undocumented.

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