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Heterogeneity of Social Returns to Education Across Employees Education Levels in Indonesia

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ABSTRACT: This study examines the effects of the flypaper effect, fiscal stress, and tax effort on the financial capacity of South Sulawesi Province from 2002 to 2024 using the VECM method. In the short term, none significantly influence fiscal capacity. However, in the long term, the flypaper effect and fiscal stress negatively affect financial capacity, while tax effort has a positive impact. The flypaper effect reflects dependence on central transfers, reducing fiscal efficiency. Fiscal stress results from imbalances that weaken capacity, whereas tax effort boosts fiscal autonomy by optimizing local revenue. These findings highlight the importance of reducing fiscal dependence, improving spending efficiency, and promoting good governance to enhance financial sustainability. Institutional and governance quality also play a key role in determining the success of fiscal policy at the regional level.

Keywords: Financial capacity, flypaper effect, fiscal stress, tax effort

ABSTRAK: Penelitian ini mengkaji pengaruh efek flypaper, tekanan fiskal, dan kinerja pajak terhadap kapasitas keuangan Provinsi Sulawesi Selatan dari tahun 2002 hingga 2024 menggunakan metode VECM. Dalam jangka pendek, tidak ada faktor yang berpengaruh signifikan terhadap kapasitas fiskal. Namun, dalam jangka panjang, efek flypaper dan tekanan fiskal berpengaruh negatif terhadap kapasitas keuangan, sementara kinerja pajak memberikan dampak positif. Efek flypaper mencerminkan ketergantungan pada transfer pusat yang mengurangi efisiensi fiskal. Tekanan fiskal merupakan hasil dari ketidakseimbangan yang melemahkan kapasitas, sedangkan kinerja pajak meningkatkan otonomi fiskal dengan mengoptimalkan pendapatan daerah. Temuan ini menyoroti pentingnya mengurangi ketergantungan fiskal, meningkatkan efisiensi pengeluaran, dan mendorong tata kelola yang baik untuk memperkuat keberlanjutan keuangan. Kualitas institusi dan tata kelola juga memegang peranan kunci dalam menentukan keberhasilan kebijakan fiskal di tingkat daerah.

Kata Kunci: Kapasitas fiskal, flypaper effect, tekanan fiskal, kinerja pajak

INTRODUCTION

Claimed as a solution to enhance the efficiency and effectiveness of public service delivery at the regional level, fiscal decentralization implemented for over two decades in Indonesia has ironically revealed a new dilemma. Instead of increasing regional fiscal independence, it has actually increased local governments' reliance on intergovernmental transfers from the central government. The flypaper effect serves as compelling evidence: General Allocation Funds and Special Allocation Funds play a greater role in shaping local spending patterns than the region's local own-source revenue. Rather than becoming a driver of development, many regions remain trapped in a state of artificial fiscal comfort, lacking independence, capacity, and the ability to build their tax bases.

Beyond this phenomenon lies an even more complex issue: local governments are also facing mounting fiscal pressure, commonly referred to as fiscal stress. This condition reflects a persistent imbalance between fiscal capacity and expenditure needs, which, if left unaddressed, can jeopardize long-term fiscal sustainability (Kimhi et al., 2022). The problem thus extends beyond mere dependency on central transfers; many regions now find themselves on the brink of a fiscal governance crisis. Rising fiscal stress indicates that fiscal autonomy has not been accompanied by improvements in budget planning and management. On one hand, public expenditures are growing uncontrollably; on the other, fiscal capacity remains stagnant, creating a dangerous combination for regional fiscal sustainability. As mandatory spending increases and local revenues fail to keep pace, local governments often resort to further reliance on central transfers. Ironically, despite the continuous flow of intergovernmental fiscal transfers, many regions still fail to exhibit significant improvements in financial capacity.

This issue is not exclusive to Indonesian local governments. In several European countries, for example, local governments remain heavily dependent on central funding despite ongoing fiscal decentralization efforts (Martinez-Vazquez et al., 2017). Similarly, in many Asian and OECD countries, local governments with lower fiscal stress tend to show better short-term financial improvements than those under higher fiscal pressure (Sutherland et al., 2005). However, an alternative perspective suggests that fiscal stress experienced by local governments is influenced not only by financial indicators but also by structural variables such as ageing infrastructure, unemployment rates, and the direction of local government policies (Kim et al., 2020).

The emergence of various dynamics related to fiscal stress and dependency on central government transfers across countries indicates that the fundamental issue of fiscal decentralization lies not only in policy design but also in the internal capacity of local governments to manage fiscal resources sustainably. One critical aspect that has not received sufficient attention is the capacity of regional governments to mobilize local revenue potential, particularly through the optimization of local taxation. This highlights the importance of examining how tax effort, defined as the attempts of local governments to maximize their tax potential, can strengthen local fiscal resilience. A lack of focus on this issue not only deepens fiscal dependency but also worsens long-term fiscal pressure, which may threaten the sustainability of local financial governance.

Weak tax efforts and inadequate mobilization of local tax resources further exacerbate the fiscal crisis experienced by many regional governments. Rather than initiating innovation and structural reforms to increase Local Own-Source Revenue (LOS_R), many regions remain passive and reluctant to reform their taxation systems (Bird & Zolt, 2008). As a result, fiscal decentralization, which should act as a driver of fiscal competitiveness and revenue innovation, instead becomes an instrument of dependency that obstructs autonomy. If this situation persists without intelligent and well-targeted fiscal policy intervention, fiscal decentralization may evolve into a long-term structural burden for national development.

Financial capacity refers to the extent to which the financial objectives of local government activities are achieved, measured through various financial indicators and evaluated based on accountability in the implementation of regional budgets (Sijabat, 2014). One method used to assess financial capacity is the regional financial independence ratio, which indicates the contribution of local own-source revenue to total regional expenditure (Angin et al., 2023). Recent studies have explored the complexity of local government financial capacity in different countries. In Ireland, for example,

local government financial capacity has improved since the early 2010s, primarily due to post-crisis fiscal reforms, including the introduction of a local property tax in 2013 and enhanced central-local fiscal coordination mechanisms that strengthened revenue predictability and budgetary discipline (Turley et al., 2020). In Australia, a negative correlation has been found between citizen satisfaction and financial capacity, particularly in rural areas with budget surpluses (Tran & Dollery, 2021). In Indonesia, financial capacity is influenced by government size, the quality of financial reporting, and the follow-up on audit recommendations (Zamzami & Rakhman, 2023). These findings emphasize that regional fiscal performance is shaped by a complex interplay of structural, economic, and governance-related factors.

In the context of local government in Indonesia, the challenges related to financial capacity cannot be separated from the broader fiscal dynamics occurring globally. Across Indonesia, regional financial capacity remains uneven, with many provinces exhibiting low fiscal independence ratios and high reliance on central transfers. Against this backdrop, South Sulawesi Province is selected as the research locus due to its strategic economic role, persistent decline in fiscal independence, and limited existing studies focusing specifically on its fiscal dynamics. Drawing from international experiences, it is essential to assess how South Sulawesi Province is coping with the pressure of achieving fiscal independence amidst more than two decades of decentralization. The measurement of the Regional Financial Independence (RFI) of South Sulawesi Province from 2002 to 2021, based on five-year intervals, indicates weak performance (see figure 1). The highest ratio of financial independence occurred during the 2012–2016 period at 167.9 per cent, which significantly declined to 74.9 per cent in the 2017–2021 period. This figure is even lower than the 118.0 per cent recorded during 2002–2006.

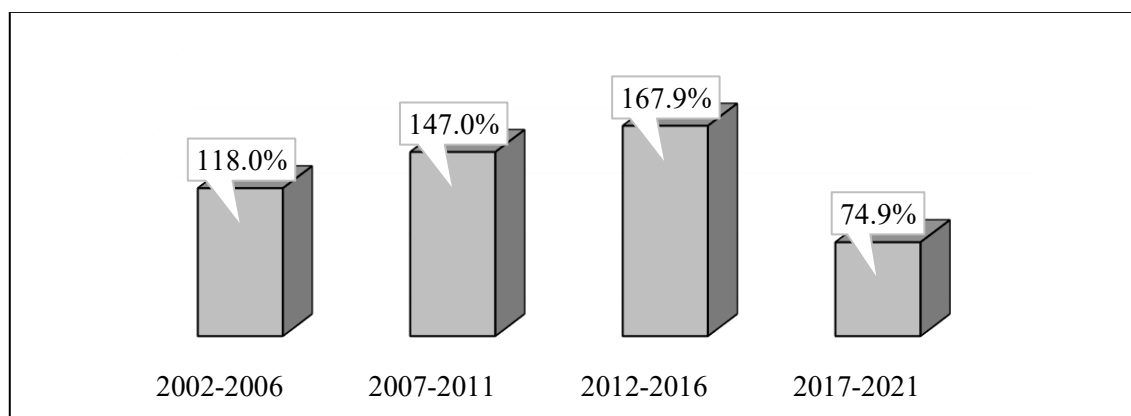


Figure 1. Average Regional Financial Independence Ratio of South Sulawesi Province

When compared to the national average of fiscal independence, South Sulawesi Province has consistently performed below the national level in recent periods (see figure 2). According to data from the Directorate General of Fiscal Balance, Ministry of Finance, the national average financial independence ratio during the 2017–2021 period was approximately 99%, while South Sulawesi Province reached only 74.9%.

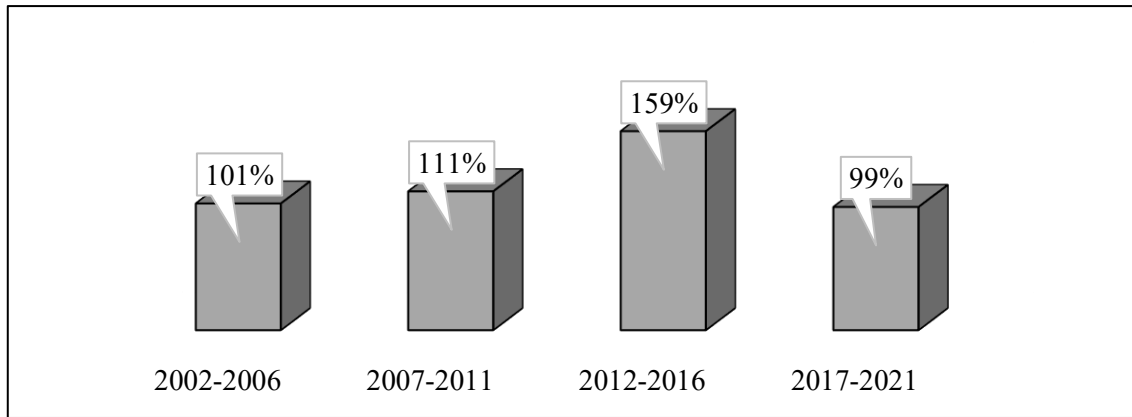


Figure 2. Average Regional Financial Independence Ratio Across Provinces in Indonesia

The data presented above reflect a structural issue that needs more comprehensive examination of the factors influencing regional financial capacity, particularly in South Sulawesi Province, a region that plays a strategic role in Indonesia's eastern economic corridor yet exhibits a persistent and puzzling decline in fiscal independence despite its resource endowment and administrative capacity. Therefore this study aims to further analyze the long-term relationship between the flypaper effect of fiscal stress and tax effort on financial capacity exploring the potential for cointegration while allowing for short-term dynamic changes. Unlike previous studies that commonly employed panel data regression linear regression or path analysis this research employs the Vector Error Correction Model VECM approach. Furthermore, to the best of the authors' knowledge, no existing study has simultaneously examined the interplay of flypaper effect, fiscal stress, and tax effort in shaping financial capacity within the specific context of South Sulawesi. This gap is significant given that the province's fiscal trajectory, marked by a sharp post-2016 deterioration in RFI, diverges from national trends and warrants targeted empirical investigation to inform regional fiscal policy.

METHODS

This study employs a quantitative approach to analyze the financial capacity of local governments in South Sulawesi Province Indonesia. The data used are secondary data obtained from the Directorate General of Fiscal Balance Ministry of Finance covering the period from 2002 to 2024. The analytical method applied is the Vector Error Correction Model VECM, which is appropriate for examining both short-run dynamics and long-run equilibrium relationships among non-stationary but cointegrated variables. The VECM specification used in this study is as follows:

$$\Delta Y_t = \alpha + \beta_1 ECT_{t-1} + \sum_{i=1}^k L_i \Delta Z_{t-i} + \varepsilon_t \dots \dots \dots (1)$$

Where:

Y_t = (RFC_t, FE_t, FS_t, TE_t) is a vector of endogenous variables at time t

RFC = Regional Financial Capacity

FE = Flypaper Effect

FS = Fiscal Stress

TE = Tax Effort

ECT_{t-1} = error correction term derived from the long-run cointegrating relationship

Δ = denotes the first difference operator

L_i = are matrices of short-run coefficients

ε_t = is a vector of white-noise error terms.

Although Table 1 shows that some variables share common components (e.g., local own-source revenue appears in the calculation of RFC, FE, and FS), this study mitigates the risk of spurious regression through rigorous preprocessing: (1) all variables are confirmed to be integrated of order

one; I (1) via Augmented Dickey-Fuller (ADF) tests; (2) cointegration among variables is formally tested using the Johansen procedure; and (3) the presence of a statistically significant error correction term (ECT) in the VECM confirms a genuine long-run relationship, not an artefact of shared numerators. The variables used in this study include one dependent variable Regional Financial Capacity (RFC) and three independent variables Flypaper Effect (FE) Fiscal Stress (FS) and Tax Effort (TE) each defined operationally as follows.

Table 1. Operational Definitions

Variable	Definition	Indicator	Scale
Regional Financial Capacity	Achievement in regional financial management is evaluated through the fiscal independence ratio calculated by comparing the realization of local own-source revenue to the transfers received from the central government	LOSR realization Transfer realization	%
Flypaper Effect	The tendency of local governments to be more extravagant in spending intergovernmental transfers than their source revenue measured through the financial dependency ratio realized transfers to total revenue	LOSR realization Total revenue realization	%
Fiscal Stress	A condition in which budget deficits occur when government expenditures exceed revenues	LOSR minus Total Regional Expenditures	IDR
Tax Effort	The relative intensity of a region's tax collection compared to its economic size, proxied by the ratio of local tax revenue to Gross Regional Domestic Product (GRDP). This measure serves as a proxy for tax effort in the absence of direct data on tax potential.	Local tax realization GRDP	%

The data analysis technique involves several stages such as stationarity testing to determine whether the data being analyzed is stationary using the Augmented Dickey Fuller ADF test. Subsequently, the optimal lag test is conducted which presents a challenge in determining the appropriate lag to evaluate the extent to which a variable is influenced by its past values as well as other endogenous variables Gio 2022

The dynamics of the VECM model are observed through the response of the dependent variable to shocks both from itself and from other variables. The methods used to analyze this dynamic behaviour are the Impulse Response Function IRF and Variance Decomposition VD (Usman et al., 2020). The IRF measures the impact of a shock on endogenous variables both at the time of occurrence and in future periods. Its main purpose is to isolate specific shocks so that it can be identified whether a variable is affected by a particular shock (Russel et al., 2022). Subsequently, variance decomposition is used to support the previous analysis by measuring the contribution of a variable to the changes in itself and other variables in percentage terms. This helps identify which variable has the most significant influence on a particular variable.

RESULTS AND DISCUSSION

1. Stationarity Test

Table 2. ADF Stationarity Test Results at Level

Variable	ADF Statistic t-statistic	Critical Values 5%	Prob	Remarks
Regional Financial Capacity	-1.823824	-3.004861	0.3598	Non-stationary
Flypaper Effect	-1.677555	-3.004861	0.4282	Non-stationary
Fiscal Stress	-0.989083	-3.004861	0.7385	Non-stationary
Tax Effort	-2.267475	-3.004861	0.1903	Non-stationary

Source: Data processing results, 2025

Based on the table above, the results of the stationarity test using the Augmented Dickey-Fuller (ADF) test at the level with a 5% critical value indicate that all variables are non-stationary at the level. This is evidenced by the t-statistic values being smaller than the critical values for each variable: for regional financial capacity, the t-statistic is $-1.823824 < \text{critical value } -3.004861$; for the flypaper effect, the t-statistic is $-1.677555 < \text{critical value } -3.004861$; for fiscal stress, the t-statistic is $-0.989083 < \text{critical value } -3.004861$; and for tax effort, the t-statistic is $-2.267475 < \text{critical value } -3.004861$. Therefore, it is necessary to conduct a test at the 1st difference level to determine whether the other variables are stationary.

Table 3. ADF Stationarity Test Results at the 1st Difference Level

Variable	ADF Statistic t-statistic	Critical Values 5%	Prob	Remarks
Regional Financial Capacity	-3.773759	-3.012363	0.0103	Stationary
Flypaper Effect	-3.484469	-3.012363	0.0191	Stationary
Fiscal Stress	-3.532984	-3.012363	0.0172	Stationary
Tax Effort	-4.592707	-3.012363	0.0017	Stationary

Source: Data processing results, 2025

Based on the table above, the results of the stationarity test using the ADF test at the 1st difference level with a 5% critical value show that all ADF t-statistic values are greater than the critical values. Given the previous assumption, it can be concluded that the RFC, FE, FS, and TE variables are stationary at the 1st difference level. Since both VAR and VECM approaches are highly sensitive to the selection of lag length, the determination of the optimal lag is aimed at identifying the extent to which a variable is influenced by its past values and other endogenous variables. In this study, the optimal lag length was determined based on the Akaike Information Criterion (AIC) and Hanna-Quinn Information Criterion (HQ).

2. Optimal Lag Test

Table 4. Result of the Optimal Lag Test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	315.2116	NA	8.58e+08	31.92116	32.12031	31.96003
1	-264.8024	75.61380*	28689239*	28.48024	29.47597*	28.67462
2	-247.2032	19.35910	30904549	28.32032*	30.11264	28.67020*
3	-238.2913	6.238302	1.30e+08	29.02913	31.61804	29.53452

Source: Data processing results, 2025

Based on the Akaike Information Criterion and Hanna-Quinn Information Criterion, the recommended lag is 2. Therefore, the optimal lag used in this study is lag 2. The stability of the model is tested by analyzing the unit-roots of the polynomial function. A VAR model is considered stable if all polynomial roots lie within the unit circle, which is indicated by the absolute value of each root being less than 1.

3. Var Stability Test

Table 5. Results of the VAR Stability Test

Root	Modulus
0.861549	0.861549
0.724456 - 0.343594i	0.801806
0.724456 + 0.343594i	0.801806
-0.138844 - 0.726900i	0.740041
-0.138844 + 0.726900i	0.740041
-0.527180	0.527180

Root	Modulus
0.172640 – 0.337505i	0.379096
0.172640 – 0.337505i	0.379096

Source: Data processing results, 2025

All modulus values have absolute values less than 1, indicating that the model is stable. Since the VAR model is stable, the analysis of the Impulse Response Function (IRF) and Variance Decomposition (VD) produced can be considered valid.

4. Johansen Cointegration Test

This study applies the Johansen cointegration test by examining the trace statistic. If the trace statistic exceeds the critical value at the 5% significance level, this indicates cointegration among the variables, implying a long-term relationship. In this case, the Vector Error Correction Model (VECM) is used for further analysis. Conversely, if the trace statistic is below the critical value at 5%, it indicates no cointegration—meaning there is no long-term relationship between the variables. In such cases, the analysis continues using the VAR model in a different form.

Table 6. Johansen Cointegration Test Results

Hypothesized No. of CE (s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.733931	57.39991	47.85613	0.0049
At most 1 *	0.581199	30.91992	29.79707	0.0370
At most 2	0.377267	13.51274	15.49471	0.0973
At most 3 *	0.182905	4.039986	3.841465	0.0444

Source: Data processing results, 2025

Based on the Johansen cointegration test results in the table above, the trace statistic values for None and at most 1 are greater than the critical values, and the probability values are less than 0.05. This suggests that all the variables under study exhibit long-term equilibrium relationships. Therefore, the analysis will proceed using the VECM estimation model.

5. Vector Error Correction Model (VECM)

VECM is an extension of the Vector Autoregressive (VAR) model, used to analyze both long-term and short-term relationships between cointegrated variables. In VECM, there is an error correction term (ECT) component that represents the speed of adjustment towards long-term equilibrium.

Table 7. VECM Estimation

Variable	Coefficient	t-statistic	Remarks
Short Term			
CointEq1	-0.086581	1.37916	Not Significant
Flypaper Effect	3.965213	0.39853	Not Significant
Fiscal Stress	0.026073	1.26375	Not Significant
Tax Effort	-50.56235	1.06039	Not Significant
Long Term			
Flypaper Effect	-21.30150	5.46730**	Significant
Fiscal Stress	-0.154302	5.23936**	Significant
Tax Effort	138.3935	2.60907**	Significant

Source: Data processing results, 2025

Note: * and ** indicate statistical significance at the 10% and 5% levels, respectively.

In the long term, the flypaper effect has a negative and significant impact on regional financial capacity. This means that a 1% increase in the flypaper effect results in a decrease in regional financial capacity by -21.30150%. Fiscal stress also has a negative and significant impact on regional financial capacity. Specifically, every 1 billion increase in fiscal stress leads to a decrease in regional financial capacity by -0.154302%. On the other hand, tax effort has a positive and significant effect on regional financial capacity. A 1% increase in tax effort results in an improvement in regional financial capacity by 138.3935%. Therefore, the variables of the flypaper effect, fiscal stress, and tax effort have a long-term impact on regional financial capacity.

In the short-term analysis, none of the independent variables (flypaper effect, fiscal stress, or tax effort) exhibit statistically significant effects on regional financial capacity. As recommended by standard econometric practice, coefficients for variables that are not statistically significant at conventional levels (e.g., 5% or 10%) are not interpreted substantively, to avoid misleading inferences based on spurious relationships or random noise. Therefore, while the estimated coefficients suggest directional trends (positive for flypaper effect and fiscal stress, negative for tax effort), these magnitudes, such as a 3.965213% improvement from a 1% increase in flypaper effect, or a 50.56235% decrease from a 1% increase in tax effort, are not reported or discussed further, as they lack statistical reliability. Consequently, it is concluded that, in the short term, the variables of flypaper effect, fiscal stress, and tax effort do not significantly influence regional financial capacity.

6. Impulse Response Function (IRF)

IRF is specifically capable of mapping the dynamics of a variable's response to shocks in another variable within the system, following the development of the impact over time until equilibrium is restored. This approach allows for a more comprehensive understanding of the interactions between variables in the economic system.

Table 8. Impulse Response Test Results for Regional Financial Capacity (RFC)

Period	Response of RFC:			
	RFC	FE	FS	TE
1	27.57355	0.000000	0.000000	0.000000
2	29.63404	-11.94316	10.69450	-9.034037
3	28.46970	-15.88296	10.60928	-2.651240
4	25.05078	-11.76541	9.026321	8.389000
5	17.31854	-6.214372	13.37005	5.944517
6	12.03904	-9.411161	16.71397	2.619613
7	13.31451	-11.62812	13.96887	5.284253
8	13.28812	-7.886705	11.67253	8.739129
9	10.92648	-6.847459	13.90152	6.258823
10	10.66633	-9.124915	14.71384	4.368816

Source: Data processing results, 2025

The regional financial capacity variable responds negatively to shocks induced by the flypaper effect, initially negative and continuing negative until the end, which can be concluded as permanently negative (see table 8). On the other hand, the shock induced by fiscal stress is permanently positive, showing a positive response from the start to the end of the period. Similarly, the tax effort has a permanent positive response towards regional financial capacity.

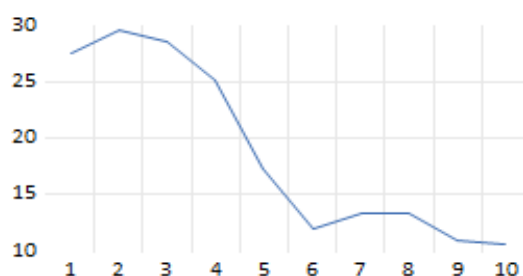


Figure 3: IRF Results for Regional Financial Capacity to Regional Financial Capacity

As shown in Figure 3, the trend of regional financial capacity above the horizontal line (0) indicates a positive impact. This is because regional financial capacity influences itself, thus being able to control the impact it generates.

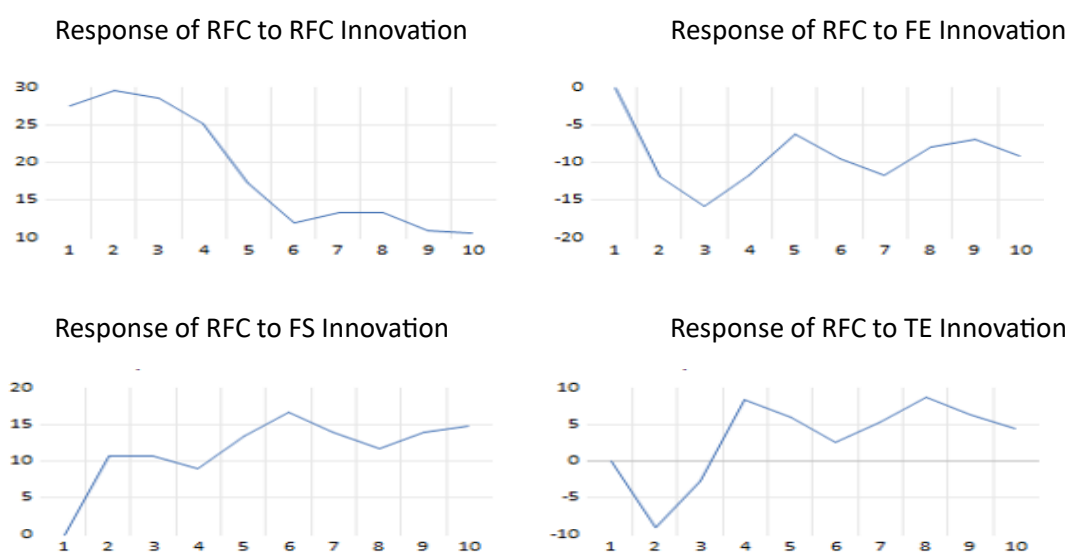


Figure 4. IRF Results for Flypaper Effect, Fiscal Stress, and Tax Effort on Regional Financial Capacity

As shown in Figure 4, which presents the Impulse Response Function (IRF) of Regional Financial Capacity (RFC) to shocks from key fiscal variables, the flypaper effect (FE) induces a permanent negative response in RFC from period 2 through period 10. This pattern is clearly visible in the third column of Figure 4, indicating that greater reliance on intergovernmental transfers consistently undermines fiscal autonomy over time. In contrast, fiscal stress (FS) generates a permanent positive response in RFC starting from period 2, as depicted in the fourth column of Figure 4. This suggests that, although fiscal stress reflects an initial imbalance, it eventually prompts corrective policy actions, such as revenue mobilization or expenditure rationalization, that enhance financial capacity in the medium to long term. Consistent with this, the Variance Decomposition results in Table 9 show that FS is the largest external contributor to RFC variance, with its share rising from 5.78% in period 2 to 21.63% in period 10. Meanwhile, tax effort (TE) exhibits a permanent positive response from period 4 onward, as illustrated in the fifth column of Figure 4, and contributes the smallest but stable share of shock to RFC variance, increasing from 4.12% to 5.22% by period 10 (Table 9). These findings collectively demonstrate that while all three variables exert distinct long-term influences on regional financial capacity in South Sulawesi Province, their directions, timing, and magnitudes of impact are empirically grounded in the dynamic responses visualized in Figure 4 and quantified in Table 9.

7. Variance Decomposition (VD)

VD aims to identify the contribution of each variable to the shocks that affect the main endogenous variable being observed. This analysis helps predict how much variance from each variable affects other variables, both in the current period and in future periods.

Table 9. Variance Decomposition Test Results

Period	Variance Decomposition of RFC:				
	S.E.	RFC	FE	FS	TE
1	27.57355	100.0000	0.000000	0.000000	0.000000
2	44.46462	82.87265	7.214556	5.784846	4.127951
3	56.20926	77.51277	12.49913	7.182484	2.805617
4	63.85371	75.45545	13.08054	7.563925	3.900090
5	68.04368	72.92691	12.35330	10.52199	4.197795
6	71.76120	68.38133	12.82647	14.88481	3.907394
7	75.40035	65.05806	13.99656	16.91490	4.030478
8	78.33650	63.14993	13.98059	17.89093	4.978543
9	80.84125	61.12415	13.84513	19.75651	5.274219
10	83.47410	58.96190	14.18049	21.63693	5.220679

Source: Data processing results, 2025

The results of the VD test in the first period show that regional financial capacity is influenced by its performance. However, as time progresses, other variables begin to influence, although their impact is not as large as the influence of regional financial capacity itself. Fiscal stress provides the second-largest impact after regional financial capacity, with its effect starting at 5.78% and increasing to 21.63% by the end of the period. The smallest impact is provided by tax effort, which influences regional financial capacity by 5.25% at the end of the period. The flypaper effect ranks third in terms of impact, with its contribution to regional financial capacity at 14.21% by the end of the period.

DISCUSSION

The Impact of the Flypaper Effect on Regional Financial Capacity

The estimation result using the Vector Error Correction Model (VECM) indicate that, in the short term, the flypaper effect does not significantly affect the financial capacity of South Sulawesi Province from 2002 to 2024. This suggests that variations in the region's fiscal dependency ratio on transfers from the central government do not significantly influence the improvement or decline in the regional financial capacity, as proxied by the regional financial independence ratio.

Conversely, in the long term, the flypaper effect has a negative and significant impact on regional financial capacity. This mechanism can be explained through the fiscal illusion model, where the public fails to distinguish between the decrease in average and marginal costs in the provision of public goods, thus not realizing the fiscal implications of such transfers. As a result, local governments take advantage of this situation for less efficient budget allocations. These findings align with studies conducted in other countries. In Brazil, fiscal illusion caused by transfers from the central government contributes to inefficient public spending growth, especially in less developed states (Prado & da Silva, 2020). Similarly, in municipalities in Honduras, a strong flypaper effect is observed, where left-wing governments exhibit larger total spending (Bastida et al., 2022). In the United States education sector, a flypaper effect of 12 is estimated, meaning that every US\$1 in state aid results in an additional \$0.15 in educational spending (Nguyen-Hoang & Yinger, 2020). However, the magnitude of this effect can vary depending on political factors. In Spanish municipalities, higher tax collection efficiency and stronger local government political power are associated with a lower flypaper effect (Rios et al., 2022).

Furthermore, the dynamic pattern shows that the flypaper effect has a permanent negative response from the second period until the final period regarding the regional financial capacity of South Sulawesi Province from 2002 to 2024. This effect also contributes as the third-largest shock to the

regional financial capacity of South Sulawesi Province during the study period. The case in South Sulawesi bears similarities to the phenomenon in Brazil, particularly in the funding of basic education. Cruz & Silva (2020) found that redistribution transfers through the Fundo de Manutenção e Desenvolvimento da Educação Básica (FUNDEB) are more prone to triggering the flypaper effect due to their less transparent nature compared to intergovernmental transfers based on agreements through the Fundo Nacional de Desenvolvimento da Educação (FNDE transfers). In the Philippines, fiscal decentralization reliant on unconditional transfers from the central government to the local government has led to excessive dependence on central government support, undermining the principle of fiscal autonomy (Panao, 2021).

The implications of these findings suggest the need for policies that encourage increasing Local Revenue. Additionally, strengthening the fiscal capacity of local governments in managing and allocating budgets more effectively is key to mitigating the negative effects of the flypaper effect. The South Sulawesi regional government must also develop strategies to improve public spending efficiency to stimulate local economic growth and reduce fiscal dependency on the central government.

The Impact of Fiscal Stress on Regional Financial capacity

The results of testing using the Vector Error Correction Model (VECM) indicate that, in the short term, fiscal stress does not significantly affect the financial capacity of South Sulawesi Province from 2002 to 2024. This suggests that fiscal pressure experienced by local governments does not significantly influence regional financial capacity, as proxied by the regional financial independence ratio. However, in the long term, fiscal stress has a negative and significant impact on regional financial capacity. This mechanism can be explained through the theory of Peacock and Wiseman (the displacement effect), which posits that local governments consistently increase expenditures while the public has a certain tolerance level for local taxes. Thus, when the government intends to increase spending without a corresponding increase in local revenue, such as local taxes, it will lead to a decline in regional financial capacity.

The displacement effect theory, which explains the growth of public expenditure in non-continuous stages, has been empirically tested and shown to explain the development of public expenditure in Spain during certain crises (Jaén-García, 2021). A fiscal stress monitoring system can lead to improvements in financial conditions in the short term, particularly in regions with lower fiscal stress levels (Chung & Williams, 2021). However, fiscal stress can exacerbate economic disparities between regions, as low-income regions tend to employ negative tactics such as tightening tax collection and reducing investment, while high-income areas are more capable of implementing positive strategies to attract capital (Ruan & Zhao, 2022).

Furthermore, the dynamic pattern shows that fiscal stress has a permanent positive response from the second period until the final period regarding the financial capacity of South Sulawesi Province from 2002 to 2024. Fiscal stress contributes as the largest shock to the financial capacity of South Sulawesi Province during the study period. Thus, the long-term negative effect occurs due to unresolved fiscal stress (persistent deficit accumulation). However, over time, the local government of South Sulawesi Province responds to fiscal pressure with corrective policies, such as optimizing revenue. This proactive response then generates a permanent positive effect on financial capacity, offsetting the long-term negative impacts.

These findings imply that the local government in South Sulawesi Province needs to implement more effective fiscal management strategies to reduce fiscal stress in the long term. Additionally, fiscal policies should focus on enhancing the region's financial capacity independently, thus reducing reliance on transfers from the central government. In this context, the application of good governance principles in regional financial management becomes crucial to ensuring the effectiveness and efficiency of budget usage.

The Impact of Tax Efforts on Regional Financial capacity

In the short term, the tax effort does not significantly affect the financial capacity of South Sulawesi Province from 2002 to 2024. This indicates that, although efforts to optimize local tax revenues have

been made, their impact on the regional financial independence ratio is not immediately visible in the short run. In the long term, however, the tax effort has a positive and significant impact on the financial capacity of South Sulawesi Province from 2002 to 2024. This finding can be explained through the fiscal federalism theory, particularly in the new perspective that emphasizes the importance of the division of authority between the central and regional governments in the management of fiscal revenues and expenditures. Fiscal federalism theory examines how policy responsibility and fiscal authority are distributed at various levels of government, and how such systems adapt to global challenges like globalization, environmental crises, and inequality (Agrawal et al., 2024). This theory guides the balanced allocation of authority and financing, while considering aspects of fairness and efficiency (Uhoda, 2020).

Nevertheless, the implementation of fiscal federalism often faces challenges, such as the centralization of resources that can lead to institutional problems and undermine democratic principles (Oliveira & Rossignoli, 2019). However, empirical evidence from New York State shows that the principles of fiscal federalism remain relevant. Local governments have been able to surpass tax and spending limitations to meet local needs, especially when facing fiscal pressure and increasing demand for public services (Aldag et al., 2019).

Globally, various studies show that tax effort and fiscal decentralization have a complex relationship with economic performance. In China, tax effort is positively influenced by fiscal decentralization at the provincial level (Xing & Zhang, 2018), while in Indonesia, local tax effort negatively moderates the impact of capital expenditure on regional economic growth (Hanif et al., 2020). Meanwhile, in Spain, tax autonomy is responsibly exercised by local governments, considering budgetary, demographic, and economic conditions (Zárate-Marco & Vallés-Giménez, 2019). In developing federal countries, both revenue and expenditure decentralization have positive effects on economic growth, although these effects are heavily influenced by corruption levels and institutional quality (Hanif et al., 2020). Therefore, the relevance of fiscal federalism and tax effort is highly dependent on the institutional and governance context at both the local and national levels.

The dynamic pattern further shows that the tax effort has a permanent positive response from the fourth period until the final period regarding the financial capacity of South Sulawesi Province from 2002 to 2024. Tax effort contributes the largest shock to the financial capacity of South Sulawesi Province during this period. Botswana has recorded the best tax system in the Southern African Development Community (SADC) region due to financial deepening, stable economic growth, and an open trade policy, although it still faces challenges such as corruption and inflation. Botswana's success stems from a sustainable tax effort strategy through long-term fiscal policies, not just administrative improvements. The combination of macroeconomic policies has made Botswana a successful example for other SADC countries in building a transparent and effective tax system (Chigome & Robinson, 2021). Despite the challenges of corruption and inflation, Botswana's consistency in maintaining a sustainable tax effort can serve as a benchmark for the quality and development of tax efforts in South Sulawesi Province.

The implications of these findings highlight the importance for local governments to continue optimizing strategies to increase tax efforts to strengthen regional financial independence. Although in the short term, tax efforts do not significantly affect regional financial capacity, in the long term, these efforts prove to have a significant positive impact. Local governments must also design fiscal policies that focus on improving the efficiency of local tax management, such as improving the tax collection system, enhancing transparency, and utilizing digital technologies to optimize tax revenues. Additionally, increasing taxpayer compliance should be a key focus. More widespread socialization regarding tax obligations and incentives for compliant taxpayers should be conducted to increase the compliance rate.

CONCLUSIONS

This study reveals that the impacts of the flypaper effect, fiscal stress, and tax effort on the financial capacity of South Sulawesi Province are dynamic and differ between the short term and the long term. In the short term, none of these variables significantly influence regional financial capacity. However,

in the long term, both the flypaper effect and fiscal stress exert a statistically significant negative impact, while tax effort has a significant positive effect. The negative long-term effects suggest that sustained reliance on central transfers undermines fiscal autonomy, and persistent fiscal deficits erode financial resilience over time. Conversely, the positive long-term effect of tax effort indicates that enhanced local revenue mobilization, through improved collection or broader tax base, contributes to strengthening fiscal capacity. These findings highlight the importance of reducing dependency on intergovernmental transfers, managing expenditure discipline to mitigate fiscal stress, and systematically improving local revenue generation as key strategies for achieving sustainable regional finance in South Sulawesi Province.

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