

Determinants of Local Government Financial Sustainability: The Mediating Role of Reserve Funds

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Abstract

This study examines the influence of regional dependence, capital expenditure productivity, and regional investment intensity on regional financial sustainability, with the establishment of reserve funds as a moderating variable. Using panel data from the provinces of Aceh and Papua from 2016 to 2022, the research applies quantitative methods through multiple regression analysis and Moderated Regression Analysis (MRA). The findings reveal that high regional dependence negatively affects financial sustainability, while productive capital expenditure and strong investment intensity contribute positively. Moreover, the presence of reserve funds significantly moderates these relationships strengthening positive effects and weakening negative impacts. These results highlight the importance of balanced financial autonomy and strategic fiscal management in achieving sustainable regional development. The implications suggest that local governments should prioritize increasing financial independence, optimize capital expenditures, and develop reserve funds to enhance fiscal resilience.

Keywords: Financial Sustainability, Dependence, Expenditure, Investment, Reserve Funds

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1. Introduction

In its role as a manager of public resources, the government has the primary task of providing services to the community with the principles of efficiency, accuracy, and sustainability (Muhtar et al., 2021). According to Wardhani & Payamta (2020), the government's financial condition will always be improved so that the government can enhance services to be better in every region. Meanwhile, local governments also face the challenge of maintaining stable finances to achieve financial sustainability. According to Dadić & Ribarić (2021) the challenge for most nonprofit organizations is to balance the need to maintain financial sustainability and to uphold high-quality and consistent programs.

Based on Law No. 23 of 2014 concerning Regional Government, regional autonomy is implemented in order to improve the welfare of the community through the level of service, empowerment, and role of the community as well as enhancing the competitiveness of the region. In reality, local governments are not fully capable of addressing issues related to community welfare through the improvement of services or facilities provided (Steiner et al., 2018). The low quality and quantity of services from the government can be caused by the inability of local governments to manage finances effectively and efficiently (Ríos et al., 2022). Research by Christia & Ispriyarso (2019) explains that there are various obstacles in the implementation of regional autonomy, some of the financial management issues include improper budget allocation, weak regional revenue generation, and the persistence of regional disparities in Indonesia.

According to Law (UU) Number 59 of 2024 concerning the National Long-Term Development Plan (RPJPN) for the years 2025-2045, the Golden Indonesia 2045 Vision, a Sovereign, Advanced, and Sustainable Archipelagic State, states that this vision demonstrates a balanced and sustainable approach to economic, social, and environmental growth. It is expected that the Indonesian economy will develop into an economy driven by knowledge and technology that produces

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high-value products and services fairly and sustainably. Therefore, in order to consistently carry out activities related to public interest, local governments must be able to maintain financial sustainability (Bolívar et al., 2021).

To achieve financial sustainability, the government must continuously strive to improve financial conditions through increased productivity, one of which is utilizing resources to provide better services to the community in each region (Andrews, 2015). A good financial condition is a sustainable or stable financial condition that does not add a burden to the community in the following period (Galiński, 2023). Intergenerational equity is considered an important factor in evaluating the sustainability of government finances for future financial viability in order to provide public services (Bolívar et al., 2021).

One of the regions that has special privileges or distinctions in managing its regional finances is the Provincial Government of Aceh and Papua. In accordance with the Regional Autonomy Law No. 2 of 2021. In exercising their authority, the Provincial Governments of Aceh and Papua receive budgets sourced from regional revenues and transfers from the central government, as well as special autonomy funds that continue to increase each year (Aulia & Rahmawaty, 2020). However, despite the increase in special autonomy fund transfers, the budgets of these two regions have not continuously increased. This can be seen in the graph below, which shows that over a 5-year period, the budget of the Aceh provincial government has shown a budget deficit as follows:

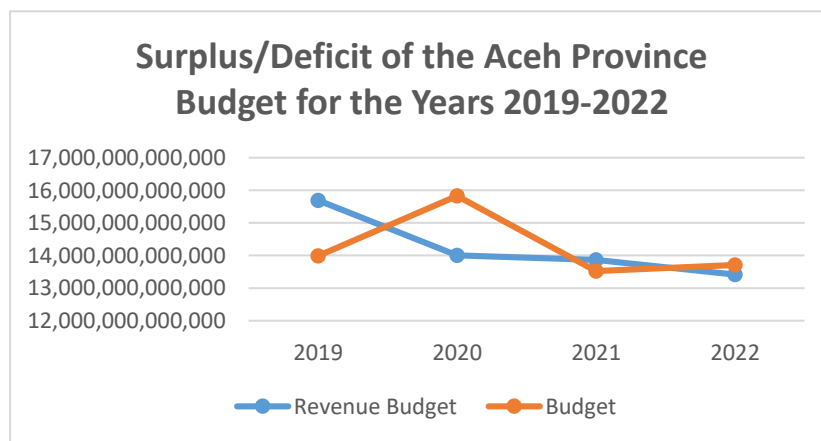


Figure 1. Surplus/Deficit of the Aceh Province Budget for the Years 2019-2022

Based on figure 1, it shows that over a 5-year period in the planning of the Aceh Provincial APBD, there is inconsistency each year, where a stable condition is not depicted with a continuously decreasing surplus, which can disrupt financial sustainability (Wardhani & Payamta, 2020). Like the situation in 2020 when the local government of Aceh Province was faced with the COVID-19 pandemic, resulting in weakened financial conditions in the following years.

2. Literature Review

The Agency Theory, first introduced by (Jensen & Meckling, 1976), is based on psychology and seeks to explain the behavior of managers as agents in serving the best interests of the owners. In the domain of government accounting, the community (principal) assigns tasks to the government (agent) to carry out certain responsibilities. In this framework, the community as the principal demands that the local government manages finances accountably and efficiently to achieve public welfare. However, this relationship is vulnerable to conflicts of interest and information asymmetry because the government, as the agent, has more complete information and control over budget usage. Therefore, a system of oversight and incentives is needed to encourage agents to act in accordance with the principal's interests.

In the context of this research, the level of regional dependence on transfer funds from the central government reflects the weak fiscal capacity and the agency's independence in meeting the needs of the community. Capital expenditure and regional investment reflect the government's efforts to improve public services, but without proper management, this can pose fiscal risks and exacerbate the misalignment between the principal's and agent's objectives. This is where the role of reserve funds as a moderating variable becomes important: as a fiscal instrument that can strengthen financial discipline and enhance the capacity of local governments to maintain fiscal sustainability.

Several previous researchers have studied similar topics. Navarro-Galera et al. (2016) conducted tests on several factors that are suspected to influence financial sustainability in local governments. These factors include the dependency ratio, population size, immigrant population, unemployment rate, education level, budget outcome, tourism activity, business concentration, and Gross Domestic Product (GDP). Bolívar et al. (2021) examined the factors related to socio-demographics on financial sustainability in local governments. These factors include population size, dependency ratio, unemployment rate, and immigrants. Drew & Dollery (2016) used the variables of population size, unemployment rate, and average wages/salaries of residents in relation to financial sustainability.

Meanwhile, this research specifically explores aspects of regional finance, namely the level of dependence on central transfer funds, capital expenditure productivity, and regional investment intensity, which are still rarely studied simultaneously in the context of fiscal sustainability. Moreover, there are not many previous studies that integrate moderating variables into the fiscal sustainability model. Therefore, this research offers a new contribution by introducing the establishment of reserve funds as a moderating variable, in order to test whether this mechanism can strengthen or weaken the relationship between key financial variables and regional financial sustainability. Conceptually, the novelty in this research lies in the use of the Agency Theory framework to assess the relationship between public actors (local governments) as agents and the community as principals, as well as the role of reserve funds as a fiscal control mechanism in reducing the potential for agency conflicts. In addition, by focusing on two provinces with specific characteristics in terms of fiscal revenue, this research is able to provide deeper contextual insights compared to previous studies that were more general in nature. Thus, the proposed empirical model becomes unique and relevant in responding to the need for more adaptive and sustainable fiscal policy formulation, especially in areas with high fiscal complexity.

3. Methods

This research uses a descriptive and quantitative approach. The population of this study includes the Financial Reports of the Aceh and Papua Provincial Governments for the period 2020 to 2023. In this study, the sampling technique used was purposive sampling, with the following criteria:

Table 1. Sample Selection

No.	Criteria	Total
1.	Population of all regencies and cities in Aceh and Papua	64
2.	Local governments whose APBD posture is not yet complete	(4)
3.	Year range	4
4.	Observed data	240

In this study, there are three independent variables, namely Regional Dependence, Capital Expenditure Productivity, and Regional Investment Intensity. Regional Financial Sustainability is the dependent variable with reserve funds as the moderating variable. Table 2 provides a comprehensive overview to understand the definition and measurement tools for each variable.

Table 2. Operational Variables

Variable	Definition	Measurement
FS	The concept of financial sustainability can be defined as the government's ability to provide services now without diminishing its capacity to do so in the future. According to Primadiva et al. (2021), the level of a region's dependence on the central government can be measured through the receipt of the General Allocation Fund (DAU). DAU is a fund taken from the State Revenue and Expenditure Budget (APBN) and distributed by the central government to local governments.	$FS = \frac{\text{Operational Surplus} - \text{Extraordinary Income} + \text{Extraordinary Expenses}}{\text{Total Population}}$
IR	The main objective of this fund allocation is to ensure the equitable distribution of financial capacity among various regions, so that each region has better access to financial resources for carrying out development and public services.	=Ln Dana Alokasi Umum

Variable	Definition	Measurement
BM	Capital expenditure is a local government expenditure designed to provide long-term benefits, more than one fiscal year (Surachman & Handayani, 2020). Based on Government Regulation Number 63 of 2019 on Regional Investment, it is the placement of a certain amount of funds and/or financial assets in the long term for investment in the form of shares, bonds, and/or direct investment to obtain economic, social, and other benefits.	= Ln Realization of Capital Expenditure
INV	Fiscal Reserves, also known as contingency funds, are funds set aside to cover needs that require relatively large amounts of money that cannot be met within the one-year budget period. Then, the reserve funds are recorded in a separate account under the name of the government reserve fund, managed by the Regional General Treasurer (BUD) (PSAP No 01).	= Ln Realization of Investment
FR		FR = Grant Income+Emergency Fund+ Special Autonomy)-Increased Expenditure

The statistical analysis used in this research is PLS SEM with the following research equation model:

$$FS_{it} = \beta_0 + \beta_1 IR_{it} + \beta_2 BM_{it} + \beta_3 INV_{it} + \beta_4 FR_{it} + \beta_5 LIQ_{it} + \beta_6 SOL_{it} + \beta_7 IR_{it} * FR_{it} + \beta_8 BM_{it} * FR_{it} + \beta_9 INV_{it} * FR_{it} + \epsilon_{it}$$

4. Result and Discussions

Statistics are presented first when study findings are presented. For variables having a ratio of scale measurements, Maximum, Minimum, average, and standard deviation values.

Table 3. Descriptive Statistics

	FS	IR	BM	INV	FR
Mean	2827267.52	0.675	25.685	24.385	26.812
Median	2440459.09	0.669	25.648	24.401	26.788
Minimum	745830.20	0.173	18.854	22.071	25.331
Maximum	11682436.93	1.030	28.894	28.136	28.642
Std. Dev.	1410693.64	0.123	0.873	0.954	0.481
Observations	240	240	240	240	240

Based on table 3, the average (mean) regional financial sustainability is 2827267 with a median of 2440459. The highest value was recorded in Maybrat Regency (2020) at 11682436, while the lowest was in Mimika Regency at -745830. The standard deviation of 1410693 indicates a data distribution that is not very varied. Based on Luthfi's classification (2022), the provinces in Aceh and Papua generally fall under the consultative level, which means these regions have the capacity to exercise autonomy with minimal guidance from the central government. The average regional dependency ratio is 0.675 with a median of 0.669. The highest value was recorded in Pegunungan Bintang Regency (2020) at 1.030, while the lowest value was in Jayapura Regency (2022) at 0.173. A standard deviation of 0.123 indicates that the data distribution is relatively homogeneous. This result shows that most regions still rely on central government transfer funds, although there are some regions that are starting to depend on local revenue (PAD). The productivity of capital expenditure has an average of 25.685 with a median of 25.648. The highest value is found in Sarmi Regency (2023) at 28.894 and the lowest in Lanny Jaya Regency (2021) at 18.854. With a standard deviation of 0.873, the data variance is quite low. The average capital expenditure shows a good proportion to support productive projects, although the impact may not yet be fully visible in some areas, especially those affected by the pandemic. The average regional investment value is 24.385 with a median of 24.401. The highest value is found in Aceh Utara Regency (2021) at 28.136, and the lowest in Subulussalam Regency at 22.070. A standard deviation of 0.95 indicates low data dispersion. This figure indicates that the region still tends to prioritize short-term activities over sustainable long-term investments. The average reserve fund formation is 26.812 with a median of 26.788. The highest value is found in Mimika Regency (2022) at 28.642 and the lowest in Aceh Barat Regency (2019) at 25.331. The standard deviation of 0.481 indicates low data variation. This reflects varying levels of fiscal maturity among regions, where some are already quite stable while others are still in the early stages of reserve fund accumulation.

The results of the SEM-PLS analysis provide insights into the relationship between the level of regional dependence, the productivity of capital expenditures, and regional investments on financial sustainability, moderated by the formation of reserve funds. Hypothesis testing in this study was conducted using path coefficient, t-value, and p-value. To assess significance and prediction in hypothesis testing, one can look at the path coefficient and t-value (Hair et al., 2021).

Table 4. Recapitulation of Hypothesis Testing Results

	Path Coeff	Std. Dev	T Statistics	P Values	Confident Interval	
					0.03	97.5%
IR (X1) -> FS (Y)	-0.046	0.066	0.700	0.484	-0.180	0.079
CE (X2) -> FS (Y)	0.281	0.050	5.609	0.000	0.189	0.389
INV (X3) -> FS (Y)	0.121	0.065	1.874	0.061	0.002	0.251
FR (Z) x IR (X1) -> FS (Y)	-0.099	0.043	2.324	0.020	-0.190	-0.021
FR (Z) x CE (X2) -> FS (Y)	-0.121	0.084	1.446	0.148	-0.266	0.065
FR (Z) x INV (X3) -> FS (Y)	-0.011	0.037	0.289	0.773	-0.087	0.065
R Square			0.199300007			
Financial Sustainability (Y)						
Observations	240					

The path coefficient of -0.046 indicates a negative relationship between regional dependency and the financial sustainability of local governments. However, this effect is not significant, with a t-statistic of 0.700 < 1.96 and a p-value of 0.484 > 0.05. Therefore, H1 is rejected, meaning regional dependency does not have a significant effect on financial sustainability. Capital expenditure has a positive and significant effect on financial sustainability, with a path coefficient of 0.281, a t-statistic of 5.609 > 1.96, and a p-value of 0.000 < 0.05. Thus, H2 is accepted. Regional investment has a positive but not significant effect on financial sustainability, with a path coefficient of 0.121, a t-statistic of 1.874 < 1.96, and a p-value of 0.061 > 0.05. Therefore, H3 is rejected. Regional dependency moderated by reserve funds has a negative and significant effect on financial sustainability, with a path coefficient of -0.099, a t-statistic of 2.324 > 1.96, and a p-value of 0.020 < 0.05. Hence, H4 is accepted. Capital expenditure moderated by reserve funds has a negative but not significant effect on financial sustainability, with a path coefficient of -0.121, a t-statistic of 1.446 < 1.96, and a p-value of 0.148 > 0.05. Thus, H5 is rejected. Regional investment moderated by reserve funds also shows a negative and not significant effect on financial sustainability, with a path coefficient of -0.011, a t-statistic of 0.289 < 1.96, and a p-value of 0.773 > 0.05. Therefore, H6 is rejected.

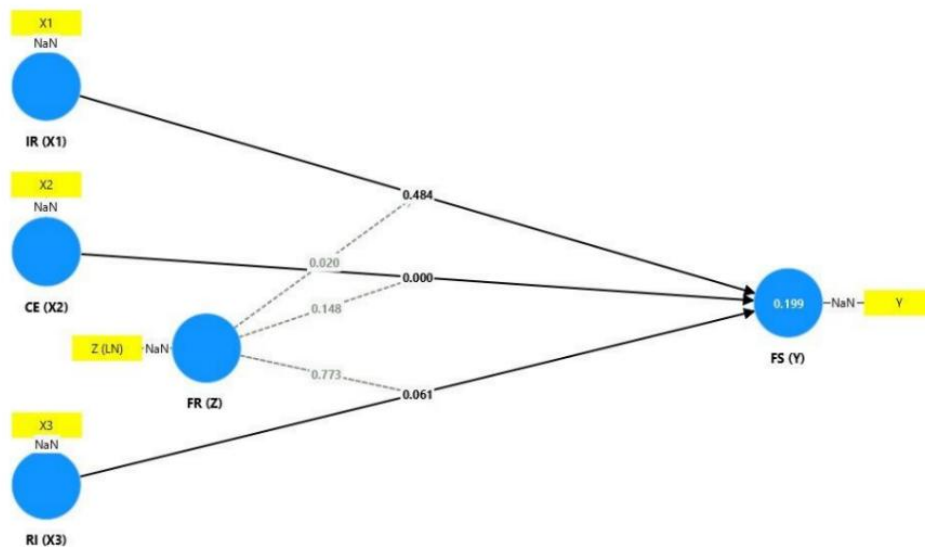


Figure 2. Research Model Path Diagram

The results of the effect size test using Cohen’s F-square explain that the influence of independent variables such as regional dependence, capital expenditure productivity, and regional investment intensity on the financial sustainability of local governments, moderated by the formation of reserve funds, generally tends to be weak or insignificant.

Table 1. Recap of Effect Size Testing Results

	F-Square	Cohen F Square Range	Effect Size
IR (X1) -> FS (Y)	0.002	< 0.02	<i>No. Effect</i>
CE (X2) -> FS (Y)	0.083	0.02 – 0.15	<i>Weak</i>
INV (X3) -> FS (Y)	0.017	< 0.02	<i>No. Effect</i>
FR (Z) x IR (X1) -> FS (Y)	0.025	0.02 – 0.15	<i>Weak</i>
FR (Z) x CE (X2) -> FS (Y)	0.018	< 0.02	<i>No. Effect</i>
FR (Z) x INV (X3) -> FS (Y)	0.000	< 0.02	<i>No. Effect</i>

The results of analysis can shown on table 5, indicate that the level of regional dependence does not have an impact on financial sustainability. Based on data analysis, the coefficient of the regional dependency variable on financial sustainability shows a significant negative value, meaning that an increase in transfer funds from the central government can disrupt the stability and sustainability of regional finances. As supported by various findings from the research of Lhutfi & Sugiharti (2023); Wardhani & Payamta (2020) which state that transfer income from the central government can reduce the level of autonomy, making regions increasingly dependent on central funds, thereby threatening the financial sustainability of local governments if the transfer funds from the central government are stopped. This is also in line with the research conducted by Navarro-Galera et al. (2016), which states that regions with more external revenue sources compared to internal revenue can pose a risk that hinders financial sustainability. According to Trussel & Patrick (2009), dependence on external revenue sources causes fiscal difficulties, whereas rapid revenue growth can avoid fiscal difficulties by developing new infrastructure and improving public services. The central government allocates transfer funds to local governments with the aim of meeting the needs of each region so that the implementation of decentralization runs smoothly. The management of local government finances has become a concern for the central government. Good financial conditions will be achieved if regional resource management is carried out optimally and local governments do not continue to rely on transfer funds from the central government. The regional government has been granted the right to explore the potential in their respective areas with the aim of becoming independent and sustainable regions. In this case, it has not yet been reflected in Aceh and Papua, where they still rely on special autonomy funds as an additional source of income.

Local government capital expenditure is one type of expenditure related to public services for the development of community facilities. This study is in line with the research by Darwanis & Saputra (2014); Suryaningsih & Sisdyani (2016) which states that capital expenditure has a significant value towards financial sustainability, in the direction of a positive coefficient. in line with the research of Zamzami & Rakhman (2023) that capital expenditure in the same year provides benefits for sustainability in the following years, it is concluded that the magnitude of capital expenditure is one of the factors that can serve as a benchmark or reflection of the success of local government financial sustainability. The average allocation of capital expenditure is considered in line with government investment expenditures or direct and indirect productive expenditures at a rate of 75%, which can be interpreted by the United Nations (2009) as the majority of projects being operational.

The impact of capital expenditure on financial sustainability or regional financial sustainability can be caused by various factors, including: First, the realization of programs or activities related to capital expenditure has been achieved in accordance with local needs, resulting in an increase in regional revenue. For example, looking at data from several districts and cities related to traffic management and road transportation programs, the implementation of these programs from planning, execution to evaluation can incur significant costs and generate revenue or fees from these programs. The implementation of budget-related policies needs to be a focus, as the implementation of performance-based budgeting is very necessary to identify programs that have a positive impact, especially on local revenue, and then ensure that the budget is targeted appropriately and the execution runs efficiently and achieves the targets.

The implementation of budget-related policies needs to be a focus, as performance-based budgeting is essential to identify programs that have a positive impact, especially on local revenue, and to ensure that the budget is targeted appropriately, with efficient execution and achievement of targets.

Human resources in promoting the sustainability of regional finances are very important because having good human resources will make the region more independent (Paudel, 2023). Human resources in promoting regional financial sustainability are very important because with good human resources, the region will become more independent (Paudel, 2023). With the addition of special autonomy funds in the provinces of Aceh and Papua, which focus on spending in the field of education, these funds are used, among other things, for the construction of classrooms, procurement of books, student dormitories, development of IT centers, and procurement of mobile laboratories. And in the health sector, it is allocated, among other things, for the construction of hospitals, laboratory equipment, community nutrition improvement, leading to an increase in existing fees. But, the impact is indirect and takes time to become visible. Financial sustainability is more influenced by the ability to increase local revenue (PAD). If this spending capital is not combined with programs that directly support the increase of local revenue (PAD), its impact on financial sustainability will be minimal. Therefore, there needs to be synergy between investment in human resources and local economic development strategies so that the results become significant. Lastly, capital expenditure tends to have a long-term impact. This aligns with the vision of financial sustainability, which looks at the fiscal resilience of a region for the future in financing its needs.

The results of this study indicate that regional investment does not have a significant impact on regional financial sustainability, contrary to the findings of Winarni et al. (2020); Zulvan & Purbasari (2024). Although the coefficients show a significantly positive value, this indicates that an increase in investment can contribute to financial stability if managed well. Chumba et al. (2019) emphasize the importance of a well-planned investment strategy to support regional project funding. Proper investments can increase revenue and maintain fiscal stability, whereas misdirected investments can burden regional finances. Maizunati (2017) also emphasize the importance of independent resource management and the optimization of local potential, while Steiner et al. (2018) highlight the importance of intergenerational equity in fiscal sustainability.

Data shows that regions with stable investment intensity experience an increase in income and financial sustainability ratios. However, in Aceh and Papua, the high Otsus funds and central transfers tend to reduce the urgency of investment optimization. In addition, the dominance of investment in the extractive sector with indirect distribution of results also affects regional finances. Therefore, proper, transparent, and sustainable investment management is crucial so that investments truly have a positive impact on the regional economy and finances. High investment intensity, both domestic and foreign, positively correlates with fiscal sustainability, making optimal investment policies the key to sustainable regional economic growth.

Reserve funds, defined as funds set aside to face emergencies or urgent needs (Kriz, 2015), enable local governments to reduce the negative impact of dependence on transfer funds. Aikins (2023) emphasizes that fiscal reserves help maintain the sustainability of public services and infrastructure projects even during economic shocks, while regions without fiscal reserves will face significant pressure in maintaining operations. Furthermore, Nzau & Kimunguyi (2018) note that local governments with sufficient fiscal reserves are able to avoid drastic measures such as reducing public services or canceling development projects when local revenues decline. In theory, the existence of reserve funds can provide fiscal flexibility and serve as a stabilization instrument in the face of economic uncertainty or future strategic financing needs. However, in practice, the establishment of reserve funds in regions with high fiscal dependency can actually reinforce the negative effects of that dependency on the financial sustainability of the region.

This happens because the establishment of reserve funds is essentially aimed at strengthening the fiscal resilience of the region in facing strategic expenditure needs that cannot be met within a single budget year. However, in regions with a high level of fiscal dependence on the central government, the existence of reserve funds can actually strengthen the negative impact of that dependence on the sustainability of regional finances. This occurs because the primary source of reserve fund formation in regions with high dependency generally comes from central government transfers, not from Local Original Revenue (PAD). Thus, the reserve funds do not reflect the region's fiscal strength independently, but rather reinforce dependence on external parties. Moreover, in practice, reserve funds are often not used strategically for long-term development, but rather become tools for delaying expenditures or even political instruments. As a result, the establishment of these reserve funds risks sacrificing productive spending and weakening fiscal efficiency. At this point, the reserve fund, which should support fiscal sustainability, instead becomes a factor that increases fiscal vulnerability, as it masks the weakness of the regional revenue structure. Therefore, in the context of regions whose fiscal situation is still heavily dependent on the central government, the establishment of reserve funds not accompanied by an increase in fiscal independence has the potential to strengthen the negative impact of the level of dependence on financial sustainability.

Then, fiscal reserves do not strengthen the positive impact of capital expenditure on the financial sustainability of local governments, as indicated by a significance value of 0.148. Although capital expenditure contributes to economic growth and the improvement of public services, its interaction with fiscal reserves does not significantly impact fiscal sustainability. In theory, fiscal reserves serve as a financial buffer to absorb economic shocks and maintain fiscal discipline Cuadrado-Ballesteros & Bisogno (2022); Gao (2024), as well as to enhance transparency and accountability in budget management (Gleißner et al., 2022). These findings indicate that the effectiveness of capital expenditure may not be optimal or may not be matched by sustainable revenue growth, while fiscal reserves tend to function more for stabilization rather than directly promoting financial sustainability. Therefore, additional and more effective strategies are needed to ensure long-term fiscal sustainability amidst high capital expenditure allocations.

Lastly, fiscal reserves do not strengthen the influence of regional investments on the financial sustainability of local governments, with a significance level of 0.776. Although public investment, both domestic and foreign, ideally can enhance connectivity and the economic productivity of society (Ferreira, 1995), this result indicates that regional investment does not have a significant impact on fiscal sustainability. These findings differ from Wang (2023) research, which states that wisely managed fiscal reserves can strengthen the positive impact of investment on financial stability. Bi (2017) also emphasizes the importance of fiscal reserves as a buffer in supporting development financing and economic growth. However, in the context of this research, fiscal reserves do not play a significant role in managing fiscal risks from regional investments or maintaining long-term budget stability, thus the relationship between the two is statistically indicated to be weak.

5. Conclusions

This research concludes that dependence on transfer funds does not significantly affect the sustainability of regional finances, although it poses a risk of reducing fiscal independence if not managed properly. Capital expenditure has been proven to have a positive impact on fiscal sustainability, especially if directed towards strategic sectors, although the effect is indirect. On the contrary, regional investments do not show significant influence, presumably due to suboptimal allocation or indirect impact on regional revenue. Fiscal reserves can mitigate the negative impact of fiscal dependency, but they are often not used strategically, potentially reducing budget efficiency. The interaction between capital expenditure and fiscal reserves also does not show a significant impact on financial sustainability, nor does the interaction between regional investment and fiscal reserves, which is ineffective in managing long-term fiscal risks.

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