

FINANCIAL RESILIENCE AS A MODERATOR OF BUDGETARY PARTICIPATION AND ACCOUNTING INFORMATION SYSTEMS IN PRIVATE SCHOOL OPERATIONAL SUSTAINABILITY

Risti Nurul Hasanah¹, Widia Astuty², Irfan³

¹Master of Accounting Program, Postgraduate Program, Universitas Muhammadiyah Sumatera Utara, Medan, Indonesia

^{1,2} Postgraduate Program, Universitas Muhammadiyah Sumatera Utara, Medan, Indonesia
Email: ristismkbinakarya@gmail.com, widiaastuty@umsu.ac.id, dr.irfan@umsu.ac.id

Received: 04/08/2026 | Revised: 15/08/2026 | Accepted: 02/09/2026 | Published: 23/09/2026

Abstract

Private schools in Tapanuli Tengah Regency face significant challenges in maintaining operational sustainability, particularly after the flash floods and landslides of November 2025, which reduced tuition revenue, disrupted teaching and learning activities, and weakened public trust in schools. This study aims to examine the effect of budgetary participation and accounting information systems on school operational sustainability, and to examine the moderating role of financial resilience on both relationships. The study employs a quantitative, associative research design. The population consists of all private senior and vocational high schools in Tapanuli Tengah Regency, using census sampling that involved the principal, treasurer, and one teacher representative from each school as respondents. Data were collected through a Likert-scale questionnaire and analyzed using Structural Equation Modeling based on Partial Least Squares (SEM-PLS) with SmartPLS software. The results show that budgetary participation and accounting information systems have a positive and significant effect on school operational sustainability. Financial resilience was found to moderate and strengthen the effects of both variables, with a stronger moderating role in the relationship between accounting information systems and sustainability than in the relationship involving budgetary participation. These findings indicate that a school's financial resilience determines the extent to which these factors can support operational continuity, particularly in disaster-prone areas. This study contributes theoretically to management accounting and educational-sector accounting studies, and practically to schools and local government in formulating financial policies that support school operational sustainability after natural disasters.

Keywords: Accounting Information System; Budgetary Participation; Financial Resilience; School Operational Sustainability

INTRODUCTION

Education plays a strategic role in developing high-quality and competitive human resources. Schools are required to maintain their operational functions continuously so that learning services can remain effective. Private schools, however, often face limitations in funding and resource management, which can threaten operational continuity. In this context, school operational sustainability refers not only to the continuation of routine activities but also to the ability to maintain learning, financial stability, operational obligations, and meaningful educational services over time.

The issue becomes more complex in areas that are exposed to natural disasters. Tapanuli Tengah Regency is geographically vulnerable to floods, landslides, and earthquakes. The flash floods and landslides that occurred on 25 November 2025 affected education infrastructure and disrupted learning activities. The thesis data report that 613 educational units were affected, consisting of 322 elementary schools, 81 junior/senior/vocational secondary schools, and 210 kindergartens, with 139 units classified as severely damaged. These conditions illustrate how external shocks can weaken the financial and operational foundations of education institutions.

The disruption was not limited to physical damage to facilities. Learning activities were interrupted, access and supporting infrastructure were disturbed, and schools needed time to resume normal operations. The thesis also records that learning disruptions extended from 25 November to 12 December 2025 in 52 regencies/cities across

Aceh, North Sumatra, and West Sumatra, while schools in Tapanuli Tengah were still conducting learning activities gradually by 8 December 2025. Schools in Tapanuli Tengah reopened only on 5 January 2026 using learning and trauma-healing approaches. Such conditions place pressure on private schools because operational spending must continue while tuition receipts and community purchasing power may be unstable.

Operational sustainability is therefore a strategic issue rather than merely an administrative concern. The theoretical perspective used in the thesis is Stakeholder Theory, which emphasizes that organizational continuity depends on managing relationships with parties that have interests in the organization (Freeman, 1984). In schools, these stakeholders include foundations, principals, teachers, students, parents, communities, and local government. Participation in budgeting can involve internal stakeholders in financial planning, while accounting information systems can provide transparent and timely financial information. Financial resilience can further determine whether these organizational mechanisms can be translated into effective action during periods of pressure (Barbera et al., 2017; Ducheck, 2020).

Budgetary participation represents the involvement of relevant individuals in preparing the school budget. Milani (1975) and Brownell (1982) associate participation with better communication, coordination, commitment, and organizational performance. In schools, participation allows the people who are closest to operational needs to provide information about priorities and constraints. The thesis argues that greater participation should make resource allocation more realistic and responsive to changing needs, including post-disaster recovery. Previous studies cited in the thesis also report positive relationships between budget participation and organizational performance or accountability (Ahmad et al., 2022; Nasution et al., 2024; Ramadhani et al., 2024).

Accounting information systems constitute another important mechanism. They collect, process, and present financial information to support planning, control, reporting, and decision-making. Romney and Steinbart (2021), Hall (2018), and Gelinis et al. (2021) emphasize the importance of information quality, reliability, integration, and accountability. In school management, an effective system can support the management of education funds, financial reporting, monitoring, and decisions related to operational continuity. The thesis also identifies practical challenges in Tapanuli Tengah, particularly limitations in system integration, electricity and internet disruptions, and damage to technological equipment after disasters.

Financial resilience is positioned as a moderating variable because organizational resources do not operate independently of financial capacity. Barbera et al. (2017) define financial resilience as the capacity to anticipate, absorb, and respond to financial shocks, while Ducheck (2020) views resilience as a capability that enables organizations to withstand and adapt to disruption. For private schools, resilience includes liquidity, income diversification, efficient spending, crisis-management capacity, and financial adaptation. A school may have participatory budgeting or useful accounting information, but the practical effect of these mechanisms can be constrained when financial resources are too limited to implement decisions.

The research gap identified in the thesis can be summarized in three areas. First, earlier studies have more often examined budget participation and accounting information systems as determinants of performance, accountability, or financial management rather than operational sustainability over the medium and long term. Second, the use of financial resilience as a moderator remains limited, especially in educational institutions. Third, studies focusing specifically on private senior and vocational high schools operating under post-disaster conditions are still limited. This study therefore integrates budgetary participation, accounting information systems, operational sustainability, and financial resilience in the context of private secondary schools in Tapanuli Tengah Regency after a natural disaster.

Based on this background, this study examines four relationships: the effect of budgetary participation on school operational sustainability; the effect of accounting information systems on school operational sustainability; the moderating role of financial resilience in the relationship between budgetary participation and operational sustainability; and the moderating role of financial resilience in the relationship between accounting information systems and operational sustainability. The empirical setting comprises 19 private senior and vocational high schools distributed across the districts identified in the thesis. The school coverage used for the census is presented in Table 1, while the scale of disaster-related educational damage and operational disruption is presented in Tables 2 and 3.

Table 1. Private Senior and Vocational High Schools in Tapanuli Tengah Regency

No.	District	School	Level
1	Pandan	SMKS Maduma	SMK
2	Pandan	SMKS TI Muhammadiyah 11 Sibuluan	SMK
3	Pandan	SMKS TI Putra Harapan	SMK
4	Pandan	SMKS Yapim Taruna Pandan	SMK

No.	District	School	Level
5	Manduamas	SMK Swasta Binakarya Manduamas	SMK
6	Andam Dewi	SMKS YP. Rico Tunas Harapan	SMK
7	Sirandorung	SMK Swasta Polibima	SMK
8	Sorkam Barat	SMKS TIK Tri Mulia Bhakti	SMK
9	Tapian Nauli	SMKS BM Clemen Tapian Nauli	SMK
10	Pandan	SMA Swasta Al Muslimin	SMA
11	Pandan	SMA SW St. Fransiskus	SMA
12	Pandan	SMAS Yapim Taruna Pandan	SMA
13	Badiri	SMA Islam Insan Cendekia Badiri	SMA
14	Manduamas	SMAS SW Budi Mulia	SMA
15	Manduamas	SMAS SW Keluarga	SMA
16	Sirandorung	SMA Swasta Tunas Harapan Bangsa	SMA
17	Sorkam Barat	SMA Swasta Maarif	SMA
18	Barus	SMA SW Tiga Bukit	SMA
19	Sarudik	SMA SW Eka Satria	SMA

Source: Data Pokok Pendidikan (Dapodik), Directorate General of Early Childhood, Basic and Secondary Education, Ministry of Basic and Secondary Education.

Table 2. Damage to Educational Facilities in Tapanuli Tengah after the November 2025 Disaster

Education level	Minor damage	Moderate damage	Severe damage	Total affected
Elementary school (SD)	40	201	81	322
Secondary school (SMP, SMA and SMK)	30	30	21	81
Kindergarten (TK)	87	86	37	210
Total	157	317	139	613

Source: Government of Tapanuli Tengah Regency (2026). Presentation by the Deputy Regent at the post-disaster recovery coordination meeting, 9 January 2026.

Table 3. Post-Disaster Learning Operational Disruptions in Tapanuli Tengah

No.	Operational disruption indicator	Data and facts
1	Duration of learning disruption	25 November–12 December 2025 (≥ 17 days) in 52 regencies/cities in Aceh, North Sumatra, and West Sumatra
2	Gradual learning as of 8 December 2025	Tapanuli Tengah, Tapanuli Selatan, Tapanuli Utara, Langkat, and Sibolga were still conducting gradual learning
3	Schools unable to operate	At least one PAUD/TK unit in Barus could not operate because the operational building (village hall) was severely damaged; learning was moved to a teacher's terrace
4	Reopening of schools in Tapanuli Tengah	Schools reopened on 5 January 2026 using enjoyable learning and trauma-healing methods
5	Emergency classroom needs in North Sumatra	381 emergency classrooms were required; many students learned in shifts in emergency tents

Source: Ministry of Basic and Secondary Education of the Republic of Indonesia, Press Release No. 896/sipers/A6/XII/2025.

LITERATURE REVIEW

Stakeholder Theory

Stakeholder Theory explains the importance of considering the interests of internal and external parties that affect or are affected by organizational activities. Freeman (1984) argues that organizational continuity depends on the ability to manage relationships with stakeholders. Donaldson and Preston (1995) and Mitchell et al. (1997) further

emphasize stakeholder interests, legitimacy, and influence. In education, stakeholders include school foundations, principals, teachers, students, parents, communities, and government.

The theory is relevant to this study because operational sustainability in private schools requires sustained support and trust from stakeholders. Budgetary participation reflects internal stakeholder involvement in planning and decision-making. Accounting information systems support transparency and accountability toward stakeholders. Financial resilience helps a school meet obligations and implement decisions during adverse conditions. Thus, the three constructs can be integrated within the stakeholder perspective used in the thesis.

School Operational Sustainability

Operational sustainability describes an organization's ability to maintain its core activities consistently over the long term while adapting to changes and uncertainty. Silva et al. (2025) relate sustainability to the integration of operational strategies with long-term objectives. Kays and Sadri (2022) view sustainability and resilience as complementary concepts for maintaining organizational performance. Fernández-Miguel et al. (2024) also emphasize adaptation and innovation as elements that support organizational sustainability.

In the school context, operational sustainability includes financial stability, continuity of learning activities, efficient resource use, adaptation to environmental change, and stakeholder trust. The thesis operationalizes the construct using ten statements that cover these dimensions. The descriptive results later show that the overall mean is 4.04, categorized as good, although financial stability, resource efficiency, and speed of emergency adjustment receive relatively lower scores than other indicators.

Budgetary Participation

Budgetary participation is the degree to which individuals are involved in setting and preparing organizational budgets. Milani (1975) explains that participation can improve attitudes and performance by creating opportunities for contribution, while Brownell (1982) highlights its role in communication, coordination, and control. Anthony and Govindarajan (2019) describe participative budgeting as an approach that brings managers and organizational members into target setting and financial planning.

In schools, participation can improve the fit between budget allocations and actual operational needs because principals, treasurers, teachers, and other relevant personnel possess different information about learning and administrative requirements. The thesis measures budgetary participation through involvement in budget preparation, influence over budget decisions, frequency of participation, communication, and contribution of ideas.

Accounting Information Systems

Accounting information systems are designed to collect, record, process, and present financial information for planning, control, evaluation, and decision-making. Romney and Steinbart (2021), Hall (2018), and Gelinias et al. (2021) emphasize information quality, system reliability, integration, and accountability. Technology-supported systems can improve operational efficiency and the quality of information available to decision-makers (Susanto, 2022).

For schools, accounting information systems support the management of education funds, reporting, internal control, and transparency. The thesis measures the system through information quality, ease of use, reliability, integration, and data security. These characteristics are expected to support operational sustainability because accurate and timely information enables schools to identify financial problems and take corrective action.

Financial Resilience

Financial resilience is the capacity to anticipate, absorb, and respond to financial shocks (Barbera et al., 2017). It is related to organizational resilience because financial flexibility can determine whether an organization is able to maintain its core operations when revenue, costs, or external conditions change. Duchek (2020) describes resilience as a capability that supports anticipation, coping, and adaptation, while Koirala and Pradhan (2021) and OECD (2022) emphasize liquidity, flexibility, risk management, and adaptive strategies.

The thesis operationalizes financial resilience through liquidity, income diversification, efficiency in financial management, the ability to face financial crises, and financial adaptation. The moderating argument is that high resilience should provide greater room to implement the information and decisions generated by budget participation and accounting information systems, while weak resilience can limit the practical effect of those mechanisms.

Hypotheses Development

Budgetary participation is expected to improve operational sustainability because broader involvement can produce more realistic resource allocation, stronger commitment, and better coordination. Prior studies cited in the thesis report positive associations between budget participation and organizational performance or accountability (Ahmad et al., 2022; Nasution et al., 2024; Ramadhani et al., 2024). Therefore:

- H1: Budgetary participation has a positive effect on school operational sustainability.

Accounting information systems are expected to support operational sustainability through accurate, relevant, timely, and integrated information. The thesis cites evidence that accounting information systems support financial sustainability and organizational performance (Nguyen et al., 2021; Sari et al., 2023; Wahyuni, 2023). Therefore:

- H2: Accounting information systems have a positive effect on school operational sustainability.

Financial resilience is expected to strengthen the effect of budgetary participation because participative plans require sufficient financial flexibility for implementation. Lee et al. (2021) link financial resilience with organizational sustainability, while Rahim and Karim (2020) show the relevance of moderating mechanisms in budget participation relationships. Therefore:

- H3: Financial resilience moderates and strengthens the effect of budgetary participation on school operational sustainability.

Financial resilience is also expected to strengthen the effect of accounting information systems because information becomes more useful when schools have the financial capacity to execute decisions, maintain systems, and respond to disruption. The thesis links this argument with resilience and accounting information literature (Duchek, 2020; Kays & Sadri, 2022; Pratama et al., 2024). Therefore:

- H4: Financial resilience moderates and strengthens the effect of accounting information systems on school operational sustainability.

The research framework presented in the thesis integrates budgetary participation and accounting information systems as explanatory variables, school operational sustainability as the outcome, and financial resilience as the moderating construct. The original structural model is reproduced in Figure 1.

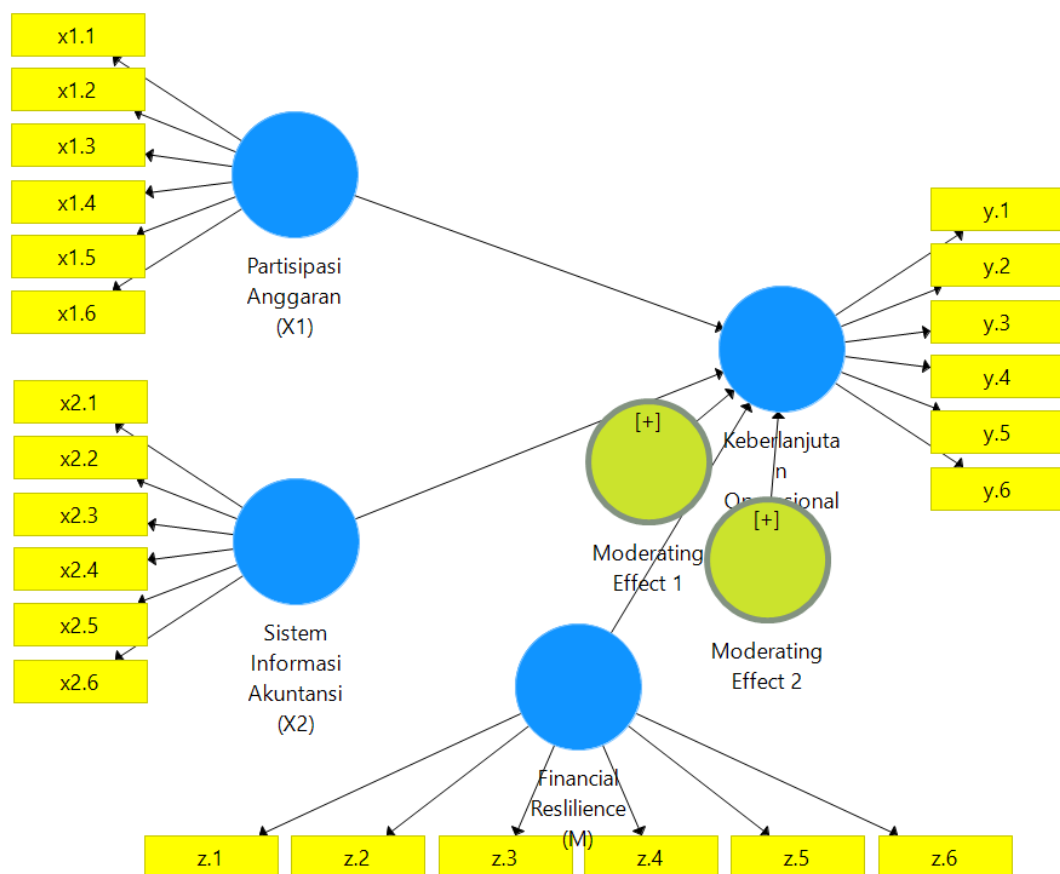


Figure 1. PLS Structural Model Used in the Study

METHOD

This study employs a quantitative associative research design. The research was conducted at private senior and vocational high schools in Tapanuli Tengah Regency. The population consisted of 19 private SMA and SMK institutions. Census sampling (saturated sampling) was used, so all 19 schools were included in the study.

Three respondents were selected from each school because they were directly involved in budgeting and financial management: the principal, the treasurer, and a teacher representative. The planned and obtained sample therefore consisted of 19 schools $\times$ 3 respondents, or 57 respondents. All 57 questionnaires were returned and usable, resulting in a 100% response rate.

Data were collected using a closed questionnaire with a five-point Likert scale. The four variables were budgetary participation (X1), accounting information systems (X2), school operational sustainability (Y), and financial resilience (Z). Each variable was measured with ten statements based on the indicators specified in the thesis. Before the main survey, a pilot test involving 30 different respondents was conducted to assess instrument validity and reliability. The thesis reports that all 40 items were valid because their item-total correlation values exceeded the critical value of 0.361, while Cronbach's Alpha values were above the stated reliability threshold.

The data were analyzed using descriptive statistics and Structural Equation Modeling based on Partial Least Squares (SEM-PLS) with SmartPLS software. The measurement model was evaluated through outer loadings, discriminant validity, Average Variance Extracted (AVE), Composite Reliability (CR), and Cronbach's Alpha. The structural model was evaluated through path coefficients, R-squared (R^2), and effect size (f^2). The hypotheses were tested at the 5% significance level using bootstrapping; the thesis uses a t-statistic criterion of 1.96 and a p-value criterion of 0.05.

Table 4. Operational Variables and Measurement

Variable	Definition used in thesis	Indicators	Scale
Budgetary Participation (X1)	Involvement in organizational budget preparation to improve planning and decision-making.	Budget preparation involvement; influence on budget decisions; participation frequency; communication; contribution of ideas.	Ordinal (Likert 1–5)
Accounting Information System (X2)	A system that collects, processes, and presents financial information for decision-making.	Information quality; ease of use; system reliability; integration; data security.	Ordinal (Likert 1–5)
School Operational Sustainability (Y)	The ability of a school to maintain operational activities consistently over the long term despite pressure.	Financial stability; continuity of learning; efficient resource use; adaptation; stakeholder trust.	Ordinal (Likert 1–5)
Financial Resilience (Z)	The ability of an organization to face, adapt to, and recover from financial pressure.	Liquidity; income diversification; financial efficiency; crisis capacity; financial adaptation.	Ordinal (Likert 1–5)

Source: Processed data (2026)

Table 5. Respondent Characteristics (n = 57)

Characteristic	Category	Frequency	Percentage
Gender	Male	25	43.8%
Gender	Female	32	56.2%
Education	Senior high school/vocational	2	3%
Education	Bachelor (S1)	49	86%
Education	Master (S2)	6	11%
Years of work	< 1 year	7	12.2%
Years of work	1–5 years	32	56.1%
Years of work	> 5 years	18	30.7%

Source: Processed data (2026)

RESULTS AND DISCUSSION

Descriptive Results

The descriptive analysis shows that respondents generally rated the four study variables positively. School operational sustainability obtained an overall mean score of 4.04 (Good). Budgetary participation obtained a mean score of 4.21 (Very Good), accounting information systems obtained a mean score of 4.11 (Good), and financial resilience obtained a mean score of 4.16 (Good). The pattern suggests that participation in budgeting was perceived as a relative strength, while financial stability and some aspects of information-system reliability remained areas requiring attention.

For operational sustainability, the highest-rated aspects were priority-based spending and stakeholder trust, both with a mean score of 4.51, followed by the continuation of learning after disaster with 4.35. The lower-rated aspects were financial stability, efficient resource use, and speed of emergency adjustment, each with a mean of 3.37. These results indicate that schools were able to continue core educational services and maintain stakeholder support, but short-term financial capacity and rapid emergency response remained relatively weaker components of sustainability.

Budgetary participation recorded the highest overall mean of 4.21. The thesis reports strong scores for direct involvement in budget preparation (4.44), consideration of respondents' opinions (4.39), budget communication (4.33), openness of budget information (4.51), ability to submit proposals (4.35), and consideration of submitted ideas (4.23). The lowest indicator was frequency of participation in meetings or budget discussions, with a mean of 3.37. This pattern indicates that respondents generally perceived the budgeting process as open and participative, although the intensity of participation was not uniformly strong.

Accounting information systems produced an overall mean of 4.11 (Good). The thesis indicates positive assessments of timely information, system integration, data access, protection against unauthorized access, and safe data storage. At the same time, the accuracy of information and the frequency of system interruptions received relatively lower ratings, with a mean of 3.37 for the weakest items. These results are consistent with the thesis discussion that electricity, internet, and technology disruptions can affect accounting information systems after a disaster.

Financial resilience obtained an overall mean of 4.16 (Good). Stronger aspects included income diversification (4.51), efficient budget use (4.51), financial adaptation to changing conditions (4.46), and the ability to remain operational when income declines (4.33). The weakest aspects were the availability of sufficient short-term funds and the existence of formal strategies for financial crises, both with a mean of 3.37. Thus, schools were perceived as adaptable, but liquidity buffers and formal crisis planning still needed strengthening.

Table 6. Average Variance Extracted (AVE)

Construct	AVE
Financial Resilience (Z)	0.824
School Operational Sustainability (Y)	0.796
Budgetary Participation (X1)	0.754
Accounting Information System (X2)	0.823

Source: Processed data (2026)

Table 7. Composite Reliability

Construct	Composite Reliability
Financial Resilience (Z)	0.979
School Operational Sustainability (Y)	0.975
Budgetary Participation (X1)	0.968
Accounting Information System (X2)	0.979

Source: Processed data (2026)

Table 8. Cronbach's Alpha

Construct	Cronbach's Alpha
Financial Resilience (Z)	0.976
School Operational Sustainability (Y)	0.971
Budgetary Participation (X1)	0.963
Accounting Information System (X2)	0.980

Source: Processed data (2026)

Measurement Model Evaluation

The measurement model is supported by strong reliability and validity evidence. The thesis reports outer loadings for the indicators ranging from approximately 0.736 to 0.969 across the constructs, with the displayed structural model showing that the indicators used in the final model meet the intended loading criteria. All four constructs have AVE values above 0.50, ranging from 0.754 to 0.824. Composite Reliability ranges from 0.968 to 0.979 and Cronbach's Alpha ranges from 0.963 to 0.980. These values indicate high internal consistency of the measurement model according to the criteria applied in the thesis.

The discriminant-validity assessment in the thesis also shows that the indicator-to-construct relationships are stronger within the intended constructs than with competing constructs. These measurement results therefore provide a basis for interpreting the structural relationships among budgetary participation, accounting information systems, financial resilience, and operational sustainability.

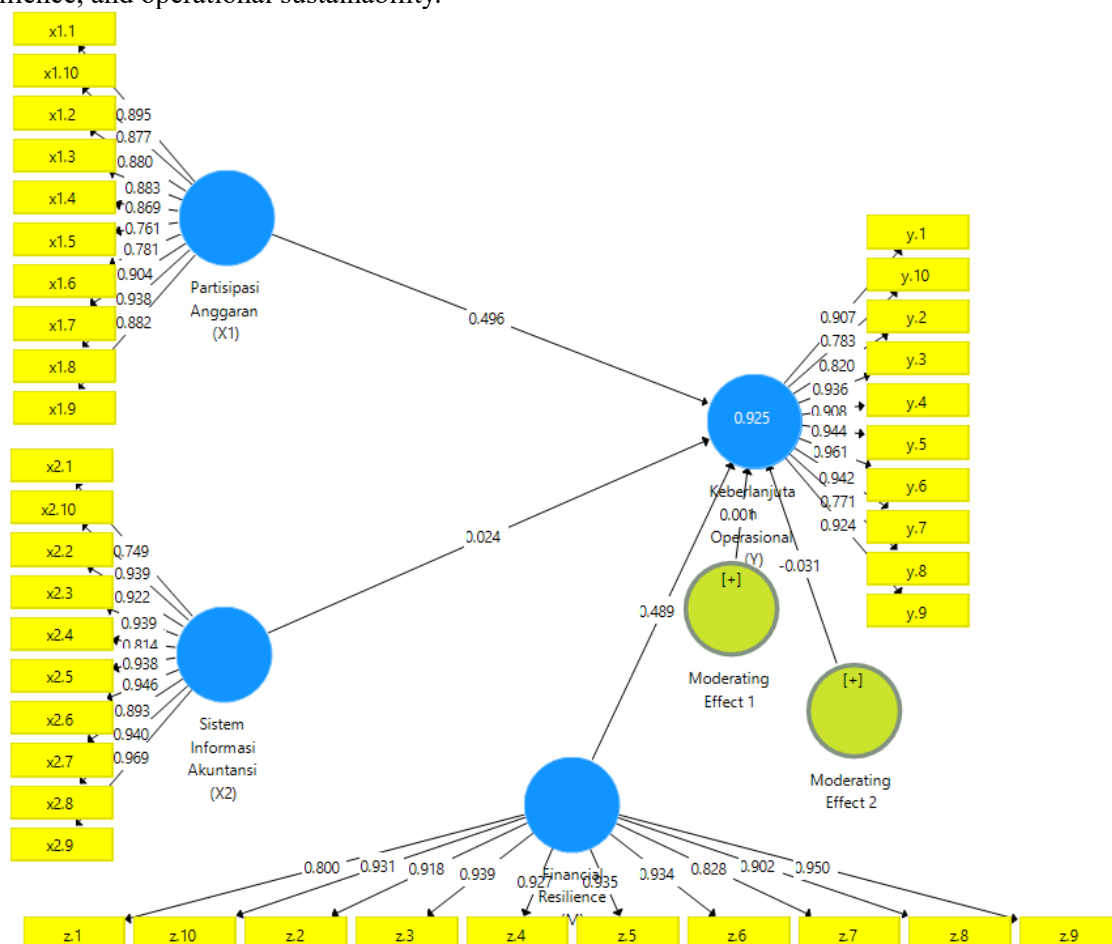


Figure 2. Final PLS Structural Model and Estimated Coefficients

Structural Model Results

Table 9. Coefficient of Determination (R^2)

Construct	R Square	R Square Adjusted
School Operational Sustainability (Y)	0.924	0.920

Source: Processed data (2026)

Table 10. Effect Size (f^2)

Predictor	f^2 on Operational Sustainability
Financial Resilience (Z)	0.352
Budgetary Participation (X1)	0.283
Accounting Information System (X2)	0.265

Source: Processed data (2026)

The structural model produces an R^2 value of 0.924 and an adjusted R^2 of 0.920 for school operational sustainability. Thus, the model explains a very large proportion of the variance in the dependent construct within the sample analyzed. The f^2 values reported in the thesis are 0.352 for financial resilience, 0.283 for budgetary participation, and 0.265 for accounting information systems, indicating meaningful contributions of the explanatory constructs to the structural model.

Table 11. Direct-Effect Hypothesis Testing

Relationship	Original Sample (O)	Sample Mean (M)	STDEV	t-statistic	p-value
Budgetary Participation (X1) → Operational Sustainability (Y)	0.496	0.519	0.179	2.778	0.006
Accounting Information System (X2) → Operational Sustainability (Y)	0.240	0.350	0.055	3.438	0.001

Source: Processed data (2026)

Table 12. Moderating-Effect Hypothesis Testing

Moderating relationship	Original Sample (O)	Sample Mean (M)	STDEV	t-statistic	p-value
Moderating Effect 1 → Operational Sustainability (Y)	0.134	0.067	0.046	3.294	0.001
Moderating Effect 2 → Operational Sustainability (Y)	0.308	0.154	0.084	3.368	0.001

Source: Processed data (2026)

Effect of Budgetary Participation on Operational Sustainability

The first hypothesis is supported by the results. Budgetary participation has a positive and significant effect on school operational sustainability, with an original sample coefficient of 0.496, a t-statistic of 2.778, and a p-value of 0.006. Because the t-statistic exceeds 1.96 and the p-value is below 0.05, the relationship is statistically significant according to the criteria specified in the thesis. The finding indicates that greater involvement in budgeting is associated with stronger operational continuity. The mechanism described in the thesis is that participation improves the realism and accountability of budgets by bringing together information from people involved in day-to-day school activities. When principals, treasurers, teachers, and other relevant parties contribute to budgeting, priorities can better reflect actual needs. In post-disaster conditions, this is particularly relevant because schools face changing priorities and unexpected expenditures.

This result is consistent with the literature cited in the thesis. Milani (1975) links participation with performance and attitudes, while Brownell (1982) emphasizes communication and coordination. More recent studies cited by the thesis also identify positive relationships between budget participation and organizational performance or accountability (Ahmad et al., 2022; Nasution et al., 2024; Ramadhani et al., 2024). From the Stakeholder Theory perspective, participative budgeting provides an internal mechanism for incorporating stakeholder knowledge into organizational decisions.

Effect of Accounting Information Systems on Operational Sustainability

The second hypothesis is also supported by the results. Accounting information systems have a positive and significant effect on school operational sustainability, with an original sample coefficient of 0.240, a t-statistic of 3.438, and a p-value of 0.001. The significance test therefore supports the proposed positive relationship between the two variables. The thesis explains that an effective accounting information system contributes to operational continuity through accurate, relevant, and timely financial information. Such information enables school managers to monitor liquidity, identify financial problems, control spending, and prepare recovery actions. Integration and data security also matter because disruption or loss of financial data can interfere with reporting, accountability, and decision-making.

This finding is consistent with the studies cited in the thesis. Nguyen et al. (2021) associate accounting information systems with financial sustainability, while Sari et al. (2023) and Wahyuni (2023) report positive roles of accounting information systems in organizational or school financial management. In the post-disaster context, the result emphasizes that reliable information is an operational resource: it helps schools transform financial data into decisions that support continuity of learning and other essential services.

Moderating Role of Financial Resilience in the Budgetary Participation Relationship

The third hypothesis is supported by the results. The moderating effect of financial resilience on the relationship between budgetary participation and operational sustainability has a coefficient of 0.134, a t-statistic of 3.294, and a p-value of 0.001. Financial resilience therefore strengthens the positive relationship between participation in budgeting and operational sustainability under the thesis testing criteria.

The theoretical explanation is that participative budgeting is more actionable when schools possess sufficient financial flexibility. A participative plan can identify priorities and establish realistic allocations, but implementation still requires liquidity, alternative revenue, efficient spending, and capacity to respond to shocks. The thesis therefore positions financial resilience as a catalyst that enables the benefits of participation to materialize more strongly under uncertainty. This interpretation is consistent with the resilience literature used in the thesis. Barbera et al. (2017) describe financial resilience in terms of anticipating, absorbing, and responding to shocks, while Duchek (2020) emphasizes resilience as an organizational capability that enables adaptation. The empirical finding extends this logic to private schools by showing that the effect of budgeting participation is contingent on financial capacity.

Moderating Role of Financial Resilience in the Accounting Information System Relationship

The fourth hypothesis is supported by the results. The moderating effect of financial resilience on the relationship between accounting information systems and operational sustainability has a coefficient of 0.308, a t-statistic of 3.368, and a p-value of 0.001. The moderating coefficient is larger than the 0.134 coefficient obtained for the budgetary participation relationship. The thesis interprets this difference in terms of the resource requirements of accounting information systems. Implementing and sustaining such systems can require financial resources for hardware, software, connectivity, training, maintenance, and data recovery. Schools with stronger financial resilience have greater capacity to preserve these resources and to implement decisions generated from financial information. Thus, financial resilience conditions the extent to which accounting information system capabilities contribute to operational continuity. The result is consistent with the thesis discussion of Duchek (2020), Kays and Sadri (2022), and Pratama et al. (2024), which emphasizes that organizational benefits from information and systems can depend on contextual capabilities. From the stakeholder perspective, reliable financial information supports transparency and trust, while financial stability provides the capacity to act on that information. The combined mechanism is therefore relevant to the sustainability of private schools operating under post-disaster uncertainty.

Overall Discussion and Practical Implications

Taken together, the four findings reveal a consistent theoretical pattern. Budgetary participation and accounting information systems function as organizational mechanisms that improve planning, information, accountability, and resource use. Financial resilience functions as an organizational capacity that strengthens the conversion of those mechanisms into sustainable operations. The combined model is aligned with the thesis's use of Stakeholder Theory, while also integrating ideas from budget participation, accounting information systems, and resilience literature.

The descriptive results add an important operational dimension to the inferential findings. Schools were generally perceived as able to continue learning, prioritize spending, retain stakeholder trust, diversify income, and adjust financial policies. At the same time, short-term liquidity, formal crisis strategies, resource efficiency, emergency-response speed, and some aspects of system reliability received lower assessments. This combination

indicates that post-disaster sustainability involves both positive organizational capabilities and the management of specific vulnerabilities. The thesis proposes practical measures that follow directly from these findings: broader participation of school stakeholders in budgeting; stronger integrated accounting information systems; regular data backup and recovery mechanisms; diversified sources of school income; emergency financial reserves; efficient cost management; long-term financial planning; and disaster-recovery planning. These measures are presented as ways for schools to translate participation, information, and financial capacity into more stable operational continuity.

CONCLUSION

Based on the results, budgetary participation has a positive and significant effect on the operational sustainability of private schools in Tapanuli Tengah Regency after the natural disaster. The finding indicates that greater involvement in budget preparation is associated with a stronger capacity to maintain financial stability, learning continuity, operational obligations, and stakeholder support.

Accounting information systems also have a positive and significant effect on operational sustainability. Accurate, relevant, timely, integrated, and secure financial information supports more effective planning, control, reporting, and decision-making, which are important for maintaining school operations under post-disaster conditions.

Financial resilience moderates and strengthens the effect of both budgetary participation and accounting information systems on operational sustainability. The moderating effect is 0.134 for budgetary participation and 0.308 for accounting information systems. The latter coefficient is larger in the thesis results, indicating that the relationship between accounting information systems and operational sustainability is more strongly conditioned by financial resilience within the analyzed sample.

The study therefore concludes that sustainable operations in private schools after a disaster are supported by the combined presence of participatory budgeting, reliable accounting information, and adequate financial resilience. The findings provide a basis for schools and local government to pay attention not only to financial procedures and information systems individually, but also to the financial capacity required to implement decisions and maintain educational services during recovery.

REFERENCES

- Abd, M., & Shahada, R. (2025). Sustainability in educational institutions: Financial and social perspectives. *Journal of Educational Management Studies*, 12(1), 45–60.
- Ahmad, Z., Rahman, A., & Karim, M. (2022). Budget participation and organizational performance: Empirical evidence from public sector organizations. *International Journal of Accounting Research*, 10(2), 112–125.
- Annarelli, A., & Nonino, F. (2016). Strategic and operational management of organizational resilience: Current state of research and future directions. *Omega*, 62, 1–18.
- Barbera, C., Jones, M., Saliterer, I., & Steccolini, I. (2017). Governmental financial resilience under austerity in Europe. *Journal of Public Administration Research and Theory*, 27(3), 405–419.
- Brownell, P. (1982). Participation in budgeting process: When it works and when it doesn't. *Journal of Accounting Literature*, 1, 124–153.
- Carvalho, T., Ferreira, A., & Silva, R. (2023). Operational efficiency and sustainability in public organizations. *Public Administration Review*, 83(2), 289–301.
- Duchek, N. (2020). Organizational resilience: A capability-based conceptualization. *Business Research*, 13(1), 215–246.
- Fernández-Miguel, A., Cabello-Medina, C., & Carmona-Lavado, A. (2024). Innovation and sustainability in organizational performance. *Journal of Business Research*, 170, 114–126.
- Ferraro, F. (2023). Corporate sustainability and stakeholder trust. *Academy of Management Perspectives*, 37(1), 89–104.
- Gelinas, U. J., Dull, R. B., & Wheeler, P. R. (2021). *Accounting information systems* (11th ed.). Cengage Learning.
- Hall, J. A. (2018). *Accounting information systems* (9th ed.). Cengage Learning.
- Ionescu, L., Dumitrescu, D., & Toma, S. (2024). Financial performance and sustainability indicators in public sector organizations. *Sustainability*, 16(2), 1150–1165.
- Kays, M., & Sadri, G. (2022). Resilience, sustainability, and organizational performance. *International Journal of Organizational Analysis*, 30(3), 654–670.

- Kemendikdasmen. (2025). Siaran Pers Nomor 896/sipers/A6/XII/2025: Perkembangan penanganan dampak bencana pada layanan pendidikan di Aceh, Sumatera Utara, dan Sumatera Barat. Kementerian Pendidikan Dasar dan Menengah Republik Indonesia.
- Koirala, S., & Pradhan, S. (2021). Financial resilience in uncertain economic conditions. *Journal of Financial Management*, 14(2), 98–110.
- Lee, J., Kim, S., & Park, H. (2021). Financial resilience and organizational sustainability: Evidence from public institutions. *Sustainability*, 13(9), 1–15.
- Milani, K. (1975). The relationship of participation in budget-setting to industrial supervisor performance and attitudes. *The Accounting Review*, 50(2), 274–284.
- Nasution, A., Siregar, R., & Lubis, M. (2024). The effect of budget participation and reporting systems on responsibility accounting with organizational commitment as a moderating variable. *Minartis Journal*, 5(2), 101–115.
- Nguyen, T., Pham, H., & Tran, Q. (2021). Accounting information systems and financial sustainability. *Asian Journal of Accounting Research*, 6(3), 245–260.
- OECD. (2022). Building financial resilience in organizations. OECD Publishing.
- Pratama, R., Hidayat, T., & Kurniawan, A. (2024). Budgeting systems, accounting information systems and performance: The moderating role of contextual variables. *Journal of Accounting and Management Studies*, 11(1), 77–92.
- Putro, A., & Najib, M. (2023). Implementation of accounting information systems in school operational fund management. *E-Journal Universitas Majalengka*, 4(1), 55–68.
- Rahim, A., & Karim, M. (2020). Budget participation and organizational commitment: A moderating effect analysis. *International Journal of Accounting Studies*, 8(1), 77–90.
- Ramadhani, D., Putra, A., & Sari, N. (2024). The influence of budget participation and accounting systems on government performance. *Open Journal Unimal*, 6(2), 88–102.
- Sari, R., Nugroho, A., & Putra, D. (2023). The role of accounting information systems in improving financial performance. *Journal of Public Sector Accounting*, 8(2), 145–158.
- Silva, R., Gomes, P., & Costa, L. (2025). Organizational sustainability and long-term operational performance. *Sustainability Journal*, 17(1), 1–15.
- Susanto, A. (2022). Sistem informasi akuntansi: Konsep dan pengembangan berbasis teknologi. Lingga Jaya.
- Tengah, P. K. T. (2026). Paparan Wakil Bupati Tapanuli Tengah dalam Rapat Koordinasi Pengecekan Indikator Pemulihan Pemerintahan dan Kemasyarakatan Pascabencana bersama Menteri Dalam Negeri. Pemerintah Kabupaten Tapanuli Tengah.
- Wahyuni, S. (2023). The impact of accounting information systems on school financial management effectiveness. *Journal of Education Finance*, 11(2), 88–102.
- Zanaria, Y. (2022). The influence of accounting information systems and budget participation on employee performance. *Journal of Applied Accounting Research*, 6(1), 33–47.