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The Effect of Budget Constraints, Internal Control and Financial Technology on Budget Performance at the Ministry of Finance through Financial Behavior as an Intervening Variable

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Abstract

Effective management of Indonesia's State Revenue and Expenditure Budget (Anggaran Pendapatan dan Belanja Negara, APBN) requires systematic performance measurement and evaluation to ensure that allocated funds are utilized efficiently and achieve their intended objectives. However, budget implementation faces various challenges, including budget constraints, which may influence the financial behavior of government financial managers and ultimately affect budget performance. The Ministry of Finance has consistently received favorable budget performance assessments in recent years, making it a relevant setting for examining the factors influencing budget performance. This study aimed to analyze the effects of budget constraints, internal control, and financial technology on budget performance at the Ministry of Finance, with financial behavior as a mediating variable. A descriptive quantitative approach was employed, using primary data collected from 210 employees involved in financial management. The data were analyzed using partial least squares structural equation modeling (PLS-SEM). The findings indicated that budget constraints, internal control, and financial technology had positive and significant effects on financial behavior. Budget constraints negatively affected budget performance, whereas internal control and financial technology had positive effects. Furthermore, financial behavior positively influenced budget performance and mediated the relationships between budget constraints, internal control, and financial technology and budget performance. These findings highlighted the importance of effective internal controls, financial technology adoption, and sound financial behavior in improving budget performance.

INTRODUCTION

Indonesia's State Revenue and Expenditure Budget (Anggaran Pendapatan dan Belanja Negara, APBN) is an annual government financial plan approved by the House of Representatives, as stipulated in Law Number 14 of 2015. The state budget serves as an authorization instrument for implementing government revenues and expenditures during the applicable fiscal year (Tamburaka et al., 2020). Budget preparation aims to reduce unemployment, minimize resource waste, and improve economic efficiency and effectiveness. The state budget comprises three principal components: revenue, expenditure, and financing. Financing addresses the gap between government revenue and expenditure, while the overall budget provides a framework for implementing government programs and activities throughout the fiscal year (Gruber, 2016; Herdjiono & Damanik, 2016).

A budget is not merely a financial plan for establishing organizational objectives and allocating responsibilities for revenues and expenditures; it also functions as an instrument for

control, coordination, communication, performance evaluation, and motivation (Jannah & Rahayu, 2015). Consequently, the budgeting process plays a crucial role in supporting the achievement of organizational performance targets through both direct and indirect mechanisms (Putri & Subardjo, 2017).

Budget constraints remain a persistent challenge for governments worldwide. Public budgets must accommodate funding requirements across various sectors, programs, and public services. (Hamid, 2013; Waluyo & Saputra, 2017) When government expenditures exceed available revenues, ministries and government agencies must optimize resource allocation to fulfill public needs and service expectations while maintaining fiscal discipline.

To address recurring budget deficits, governments implement financing policies that require prudent risk management and carefully designed budget execution strategies. (Kornai, 1986) introduced the concept of the soft budget constraint (SBC) to explain economic behavior under conditions in which organizations expect external financial support despite budgetary limitations. The concept was subsequently applied to studies of economic transitions from socialism to capitalism. Within government organizations, budget constraints present distinct challenges because public financial management operates under institutional and regulatory conditions that differ from market-oriented organizations. Government financial support may influence budget managers' decisions regarding expenditure priorities, resource efficiency, and financial allocation (Saputra, 2022). Accordingly, budget constraints involve not only resource scarcity but also organizational and individual responses to financial limitations. Organizations operating under comparable budgetary conditions may therefore demonstrate different performance outcomes (Evaranus & Wahidahwati, 2020).

Budget performance measurement and evaluation are essential for determining whether allocated financial resources contribute to established objectives. In Indonesia, the Ministry of Finance, through the Directorate General of Budget, evaluates budget performance across ministries and government agencies receiving APBN allocations. The Ministry of Finance performs two distinct functions: serving as the State General Treasurer (Bendahara Umum Negara, BUN) and operating as a technical ministry responsible for its own institutional programs and activities. Consequently, the Ministry of Finance evaluates its own budget performance as a technical ministry while fulfilling its broader responsibilities for national budget management and oversight (Scheer et al., 2010).

The Ministry of Finance's budget performance evaluation scores, measured through the SMART application, consistently received a "Very Good" rating, ranging from 97.78 in 2021 to 98.40 in 2022. These results indicated strong performance against established budget evaluation indicators, particularly those related to the achievement of planned outputs and outcomes. Nevertheless, high evaluation scores do not necessarily demonstrate that all budget management decisions and implementation processes are optimal. Budget performance must also be examined in terms of resource allocation decisions, expenditure efficiency, internal control effectiveness, and the prevention of unproductive spending. Therefore, a potential distinction exists between budget performance measured through formal evaluation indicators and the quality of financial management behavior underlying budget implementation.

According to Soleh and Rochmansjah, as cited in (Afandi, 2014), performance-based budgeting is a budgeting approach oriented toward achieving predetermined outputs through planned resource allocation. Similarly, Halim and Iqbal, as cited in (Patiroi, 2019), explained

that performance-based budgeting connects financial allocations with expected outputs and outcomes while considering the efficiency of resource utilization. Thus, successful performance-based budgeting should be evaluated not only through budget absorption rates and administrative performance indicators but also through the effectiveness, efficiency, and benefits generated by public expenditures.

To strengthen accountability in managing state financial resources, the Ministry of Finance issued Minister of Finance Decree Number 322 of 2021 concerning the Framework for Implementing the Internal Control System within the Ministry of Finance. This framework provides guidelines for designing, implementing, monitoring, evaluating, and continuously improving the Internal Control System (Sistem Pengendalian Internal, SPI) across organizational units. Effective internal controls are expected to strengthen financial accountability, mitigate operational and financial risks, and support public financial management consistent with good governance principles. Internal control encompasses organizational structures, policies, procedures, and activities designed to safeguard assets, ensure the accuracy and reliability of accounting information, improve operational efficiency, and promote compliance with management policies (Asmawanti & Asiyah, 2017).

Technological developments have also transformed public financial management by improving the efficiency, transparency, and accountability of budgeting processes. However, technology adoption introduces potential risks, including cyberattacks, data breaches, and system downtime, highlighting the importance of reliable and secure information systems. (Arner et al., 2015) described financial technology (fintech) as the application of technological innovations to financial services. In the public sector, financial technology may encompass integrated digital financial management systems that support budget planning, resource allocation, expenditure execution, payment processing, and financial reporting. These systems can facilitate more accurate financial information, streamline administrative procedures, and strengthen monitoring and accountability mechanisms.

Alongside technological optimization, the Ministry of Finance has implemented expenditure control measures to address budget constraints, including controlling administrative expenditures, applying standardized costs, and prioritizing budget allocations. These measures are intended to encourage responsible financial behavior among government budget managers and promote value-for-money principles, encompassing economy, efficiency, and effectiveness. Barberis and Thaler, as cited in (Sisbintari, 2017), explained that financial behavior extends beyond psychological influences on investment decisions to include financing, resource allocation, and other financial management decisions. Within government institutions, employees' financial behavior may influence expenditure decisions, resource utilization, and compliance with budgetary policies, thereby affecting the efficiency and effectiveness of public financial management.

A literature review conducted by (Kuntadi et al., 2022) on factors influencing local government budget performance in Indonesia identified challenges in implementing performance-based budgeting, particularly those associated with limited understanding among budget planners and users and inadequate human resource competencies. In another study, (Kuntadi et al., 2022) concluded that performance measurement systems, organizational support, and individual factors influenced budget implementation performance across government ministries and agencies. These findings suggest that budget performance is shaped

not only by formal budgeting mechanisms but also by organizational conditions and individual behavioral characteristics.

Despite the Ministry of Finance's consistently high budget performance scores, questions remain regarding how budget constraints influence financial management behavior and whether favorable performance evaluations adequately reflect efficiency, effectiveness, and value for money. Furthermore, the extent to which internal control systems and financial technology influence budget performance, either directly or indirectly through financial behavior, requires further investigation. Financial behavior may provide an explanatory mechanism linking budget constraints, internal control, and financial technology to budget performance. However, previous studies have primarily examined these factors separately, leaving limited empirical evidence concerning their integrated relationships within public financial management. In particular, research examining financial behavior as a mediating variable between budget constraints, internal control, financial technology, and budget performance within Indonesia's Ministry of Finance remains limited. This gap highlights the need for a comprehensive analytical framework that incorporates institutional, technological, and behavioral dimensions of government budget management.

Based on these considerations, this study aimed to examine (1) the effects of budget constraints, internal control, and financial technology on employees' financial behavior; (2) the direct effects of budget constraints, internal control, and financial technology on budget performance; (3) the effect of financial behavior on budget performance; and (4) the indirect effects of budget constraints, internal control, and financial technology on budget performance through financial behavior as a mediating variable. The study focused on employees involved in budget management at the Ministry of Finance during the 2025 fiscal year. The findings were expected to contribute to the literature on financial behavior and budget performance in the public sector while providing practical insights for strengthening expenditure controls, improving financial management practices, and enhancing budget performance within the Ministry of Finance.

METHOD

Research Design

This study employed a descriptive quantitative approach to examine the relationships among the research variables (Arikunto, 2010; Sugiyono, 2017). Budget constraints, internal control, and financial technology were examined as independent variables, budget performance as the dependent variable, and financial behavior as a mediating variable.

Population and Sample

Population is a generalized area composed of objects or subjects with certain qualities and characteristics that the researcher determines to be studied and conclusions are drawn (Sugiyono, 2017). The population in this study is employees of the Ministry of Finance who act as state financial managers in 872 work units. The sample was determined through *the purposive sampling* method, which is sampling with consideration of certain criteria, with the criteria of Ministry of Finance employees who serve as budget compilers in work units within the scope of the Ministry of Finance. The number of samples was determined using the Hair formula because the number of respondents could not be determined accurately (Hair et al.,

2022), which was 5 to 10 times the number of indicators used, so that the sample number was obtained of 5 × 42 = 210 respondents.

Measurement and Data Collection Methods

The measurement scale used is the *Likert* scale which measures the attitudes, opinions, and perceptions of a person or a group of people (Sugiyono, 2017). Each instrument item was given a score of 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree. This study uses primary data obtained directly from respondents (Sujarweni, 2022) through the distribution of online questionnaires to a predetermined sample according to criteria.

Data Analysis Techniques

The data analysis technique uses *Partial Least Square* (PLS), which is a *component-based Structural Equation Modelling* (SEM) model that is not based on many assumptions, for example, data is not required to be normally distributed and samples are not required to be large. PLS can be used to explain the existence or absence of relationships between latent variables and is able to analyze constructs with reflective and formative indicators. PLS steps include designing a structural model (*inner model*) based on research hypotheses, designing a measurement model (*outer model*) that connects latent variables with their indicators, and constructing a path chart. The *outer model* equation for reflective indicators is expressed as follows:

$$x = \Lambda^{x\xi} + \varepsilon^{x} \qquad y = \Lambda^{y\eta} + \varepsilon^{y}$$

where x and y are the indicators of exogenous (ξ) and endogenous (η) latent variables, and Λ^x and Λ^y are the *loading* matrix that connects the latent variables with the indicators. The *inner model* equation is expressed as follows:

$$\eta = \beta 0 + \beta\eta + \Gamma\xi + \zeta$$

with η is the vector of the endogenous latent variable, ξ is the vector of the exogenous latent variable, and ζ is the vector of the residual variable. Parameter estimation in PLS is carried out through three stages of iteration, namely *weight estimation* to build a latent variable score, path *estimation* that connects latent variables and estimated *load* to the indicator, as well as estimation of means and parameter location (constant).

The *evaluation of the outer model* was carried out through: (a) *convergent validity*, with *the standardized loading factor* criterion > 0.70; (b) *discriminant validity*, by comparing the square root *of the average variance extracted* (AVE) with the correlation between constructs and the recommended AVE value greater than 0.50 (Tasha Hoover, 2005 in Sofyan Yamin, 2009); (c) *composite reliability*, with a value of > 0.80 declared high reliability and > 0.60 quite reliable; and (d) *Cronbach's alpha* as a reliability test amplifier. The values of AVE and *composite reliability* (ρ^c) are calculated as follows:

$$AVE = \Sigma\lambda i2 \,/\, [\Sigma\lambda i2 + \Sigma^{i}\, var(\varepsilon^{i})] \quad \rho^{c} = (\Sigma\lambda^{i})^{2} \,/\, [(\Sigma\lambda^{i})^{2} + \Sigma^{i}\, var(\varepsilon^{i})]$$

The structural model (*inner model*) was evaluated by paying attention to the *R-square value* for the dependent latent construct, the size of the Stone-Geisser *Q-square* (Q2 > 0 indicates that the model has *predictive relevance*), and the magnitude of the structural path coefficient. Hypothesis testing was carried out using *the bootstrapping resampling* method using t-test statistics, with the statistical hypotheses H^0: $\gamma^i = 0$ and H1: $\gamma^i \neq 0$. The *resampling* method allows data to be distributed *free*, does not require normal distribution assumptions, and does not require large samples.

RESULTS AND DISCUSSION

Overview of Research Objects

This research was conducted on employees of the Ministry of Finance of the Republic of Indonesia who carry out financial management functions in the Ministry of Finance work unit. Primary data was collected through questionnaires distributed online through digital platforms, with a total of 210 respondents spread across various echelon I units.

The majority of respondents were in the productive age group of 26–30 years (38.6%) and 36–40 years (30.5%). Based on the working period, most respondents had a working period of 5–10 years (32.4%), and 72.4% of respondents had worked for more than 5 years, thus understanding the dynamics of government budget management, including budget constraints, internal control mechanisms, and the use of financial technology. In terms of education, the majority of respondents had a bachelor's degree (44.3%), and the proportion of S1 and S2 graduates reached 64.8%, which reflects good academic competence of human resources. Based on position, the majority of respondents were Primary Expert Implementers/JFs (78.1%) who interact directly with the daily budgeting process. The largest respondents came from the DGT (31.9%), followed by BPPK (17.6%) and DGT (15.2%); The diversity of this work unit strengthens the representativeness of the sample to the condition of budget management in all organizational lines of the Ministry of Finance.

Descriptive Statistical Analysis

All variables were measured using *a Likert* scale of 1–5. The average interpretation category was determined by the interval $(5 - 1)/5 = 0.80$, resulting in a category of 1.00–1.79 = Very Low; 1.80–2.59 = Low; 2.60–3.39 = Medium; 3.40–4.19 = High; and 4.20–5.00 = Very High.

The Internal Control variable had the highest total score range (72–140) with an average of 125.47, in line with the greater number of indicators (28 items). The Budget Limitations variable had the lowest average total score (28.30) with a standard deviation of 7.46670 indicating a relatively moderate variation in assessment. No minimum or maximum values were found outside the theoretical score range, so the data was declared worthy of further analysis.

The Budget Constraint variable (12 indicators) is in the Medium category, which indicates that budget constraints are felt in the implementation of tasks, but not at an extreme level. The highest indicator is related to employees' understanding of their work unit's budget ceiling limits and the tendency to prioritize activities based on urgency, while the lowest indicator is related to the impact of budget constraints on employee morale and motivation as well as the drive to find innovative solutions. The Internal Control variable (28 indicators based on the COSO framework) is in the Very High category, with the highest indicators on risk mitigation measures, the availability of written policies and procedures, as well as the financial transaction authorization system, in line with the mandate of Government Regulation Number 60 of 2008 concerning SPIP; the lowest indicator is related to communication between leaders and implementers as well as consistency of monitoring by direct superiors. The Financial Technology variable (16 indicators) is in the Very High category, with the highest indicator being the ability of technology to reduce budget mismanagement and ease of access to real-time budget information, which is consistent with the implementation of SAKTI (Agency-Level Financial Application System) and SPAN (Treasury and State Budget System); the

lowest indicator is related to the need for advanced training and integration between government financial systems.

The Financial Behavior variable (12 indicators) is in the Very High category, with the highest indicators on efforts to avoid unplanned expenditures, collaboration in optimizing limited budgets, and evaluating the effectiveness of budget use, while the lowest indicators are related to updating regulatory knowledge and budget allocation based on benefit-cost analysis. Budget Performance Variables (16 indicators) are also in the Very High category, with the highest indicators on budget realization that achieves targets, budget use efficiency, and output suitability with planning; the lowest indicators are related to minimizing remaining budget surplus financing (SiLPA), level of satisfaction with work unit budget performance, and reporting system support for public accountability. In general, aspects of communication, direct monitoring, technology user training, regulatory competency updates, and management of remaining budgets are areas that still need improvement.

Measurement Model Analysis (Outer Model)

The analysis of the measurement model aims to evaluate the validity and reliability of the construct, which includes convergent validity, discriminant validity, and reliability. The analysis was carried out using SmartPLS 4 software with the PLS-SEM method. *The outer loadings* model is presented in Figure 1.

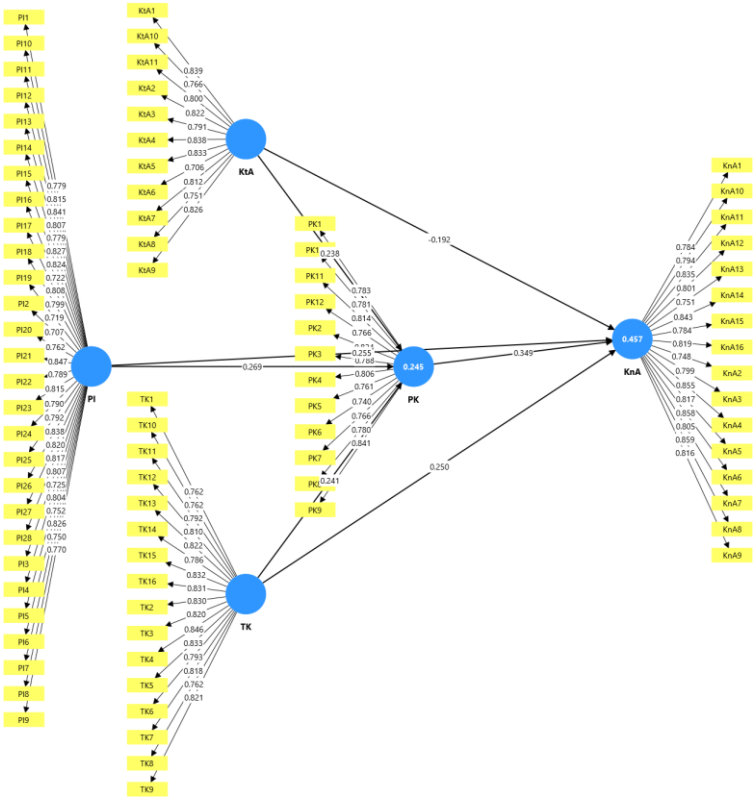


Figure 1. Outer Loadings Model PLS-SEM

Source: SmartPLS Output 4 (2025)

An indicator is declared to be valid convergently if the *outer loading value* is greater than 0.70 and the AVE value is more than 0.50 (Hair et al., 2022). The *outer loading value* of each indicator is presented in Table 6.

Table 1. Construct Variable Outer Loadings

KtA	PI	Kindergarten	PK	KnA
KtA1 = 0.839	PI1 = 0.779	TK1 = 0.762	PK1 = 0.783	KnA1 = 0.784
KtA2 = 0.822	PI2 = 0.707	TK2 = 0.762	PK2 = 0.766	KnA2 = 0.748
KtA3 = 0.791	PI3 = 0.824	TK3 = 0.792	PK3 = 0.814	KnA3 = 0.799
KtA4 = 0.838	PI4 = 0.808	TK4 = 0.810	PK4 = 0.806	KnA4 = 0.855
KtA5 = 0.833	PI5 = 0.815	TK5 = 0.822	PK5 = 0.761	KnA5 = 0.817
KtA6 = 0.706	PI6 = 0.827	TK6 = 0.786	PK6 = 0.740	KnA6 = 0.858
KtA7 = 0.812	PI7 = 0.779	TK7 = 0.832	PK7 = 0.766	KnA7 = 0.805
KtA8 = 0.751	PI8 = 0.719	TK8 = 0.831	PK8 = 0.780	KnA8 = 0.859
KtA9 = 0.826	PI9 = 0.799	TK9 = 0.830	PK9 = 0.889	KnA9 = 0.816
KtA10 = 0.766	PI10 = 0.815	TK10 = 0.820	PK10 = 0.903	KnA10 = 0.794
KtA11 = 0.800	PI11 = 0.841	TK11 = 0.846	PK11 = 0.836	KnA11 = 0.835
KtA12 = 0.842	PI12 = 0.807	TK12 = 0.833	PK12 = 0.916	KnA12 = 0.801
	PI13 = 0.779	TK13 = 0.793		KnA13 = 0.751
	PI14 = 0.827	TK14 = 0.818		KnA14 = 0.843
	PI15 = 0.824	TK15 = 0.762		KnA15 = 0.784
	PI16 = 0.722	TK16 = 0.821		KnA16 = 0.819
	PI17 = 0.808			
	PI18 = 0.799			
	PI19 = 0.719			
	PI20 = 0.762			
	PI21 = 0.847			
	PI22 = 0.789			
	PI23 = 0.815			
	PI24 = 0.790			
	PI25 = 0.792			
	PI26 = 0.838			
	PI27 = 0.820			
	PI28 = 0.750			

Source: SmartPLS 4 output, data processed (2026)

Based on Table 1, all *outer loading* values for all indicators are above 0.70. The highest *outer loading* values in each construct are KtA12 (0.842) for Budget Constraints, PI21 (0.847) for Internal Control, TK11 (0.846) for Financial Technology, PK12 (0.916) for Financial Behavior, and KnA8 (0.859) for Budget Performance. Thus, all indicators are declared valid and able to measure the intended construct properly.

Table 2. Cronbach's Alpha, Composite Reliability, and Average Variance Extracted (AVE)

Variable	Cronbach's Alpha	Composite Reliability (rho_c)	AVE	Remarks
Budget Constraints (KtA)	0,940	0,951	0,640	Valid and Reliable
Internal Control (PI)	0,978	0,979	0,626	Valid and Reliable
Financial Technology (TK)	0,964	0,968	0,653	Valid and Reliable
Financial Behavior (PK)	0,944	0,952	0,621	Valid and Reliable
Budget Performance (KnA)	0,965	0,969	0,658	Valid and Reliable

Source: SmartPLS 4 output, data processed (2026)

Based on Table 2, the entire AVE value is above 0.50, with the highest value in the Budget Performance construct (0.658) and the lowest in the Financial Behavior (0.621). The *composite reliability* value of the entire construct is above 0.95 and *Cronbach's alpha* value is above 0.94, far exceeding the minimum threshold of 0.70. Thus, the entire construct meets the criteria of convergent validity and reliability, so that the questionnaire can be trusted to measure the research variables consistently.

The validity of the discriminant was tested using *the Heterotrait-Monotrait Ratio* (HTMT) with a value criterion of less than 0.90 (Hair et al., 2022) and the Fornell-Larcker criterion which requires that the square root of the AVE of a construct is greater than its correlation with another construct. The test results are presented in Table 8 and Table 9.

Table 3. Heterotrait-Monotrait Ratio (HTMT)

Variable	KnA	KtA	PI	PK	Kindergarten
KnA	–				
KtA	0,136	–			
PI	0,532	0,089	–		
PK	0,513	0,226	0,385	–	
Kindergarten	0,521	0,063	0,506	0,388	–

Source: SmartPLS 4 output, data processed (2026)

Table 4. Fornell-Larcker Criteria (AVE Roots on Diagonals)

Variable	KnA	KtA	PI	PK	Kindergarten
KnA	**0,811**				
KtA	−0.127	**0,800**			
PI	0,521	−0.053	**0,791**		
PK	0,496	0,225	0,376	**0,788**	
Kindergarten	0,507	0,002	0,496	0,375	**0,808**

Source: SmartPLS 4 output, data processed (2026)

Based on Table 4, all HTMT values were below the critical limit of 0.90, with the highest values between PI and KnA (0.532) and the lowest between TK and KtA (0.063). Based on Table 9, the square root of the AVE of each construct, namely KnA (0.811), KtA (0.800), PI (0.791), PK (0.788), and TK (0.808), was greater than the correlation between the constructs

in their rows and columns. These results confirm that each construct measures different dimensions and does not overlap substantially, so that the discriminant validity criteria are met.

Structural Model Analysis (Inner Model)

The structural model analysis aims to test the research hypothesis and evaluate the predictive ability of the model through the determination coefficient (*R-square*), effect size (*f-square*), and predictive relevance (*Q-square*). The results of *the structural model bootstrapping* are presented in Figure 2.

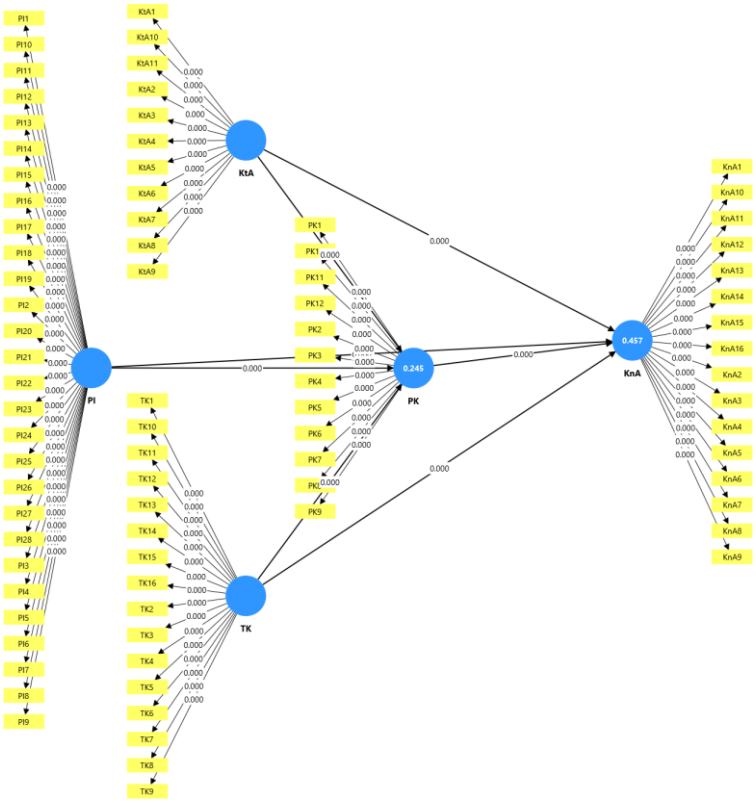


Figure 2. PLS-SEM (Bootstrapping) Model

Source: SmartPLS Output 4 (2025)

An R2 value of 0.75 or more indicates a strong model, 0.50 indicates a moderate model, and 0.25 indicates a weak model (Hair et al., 2022). The R2 value is presented in Table 5.

Table 5. R-Square

Variable	R-Square	R-Square Adjusted
Financial Behavior (PK)	0,245	0,234
Budget Performance (KnA)	0,457	0,447

Source: SmartPLS 4 output, data processed (2026)

Based on Table 5, the R^2 value of Financial Behavior of 0.245 indicates that Budget Constraints, Internal Control, and Financial Technology together explain 24.5% of the variance in Financial Behavior, while the remaining 75.5% is explained by other variables outside the model. This value is in the weak to moderate category, but it is still statistically significant. Based on in-depth and discussion with financial managers within the Ministry of Finance, it is

indicated that there are other variables that can explain financial behavior, including the policies of the agency's top leadership, the social environment of financial managers, and the self-control of financial managers. The R^2 value of Budget Performance of 0.457 shows that all exogenous and mediating variables in the model explain 45.7% of the variance of Budget Performance, which is in the moderate category.

The effect size f^2 was used to assess the relative impact of an exogenous variable on the endogenous variable, with criteria of 0.02 (small effect), 0.15 (moderate effect), and 0.35 (large effect) (Cohen, 1988 in Hair et al., 2022). The results are presented in Table 6.

Table 6. F-Square

Influence Path	f2	Categories
Budget Constraints → Financial Behavior	0,075	Small effects
Internal Control → Financial Behavior	0,072	Small effects
Financial Technology → Financial Behavior	0,058	Small effects
Budget Limitations → Budget Performance	0,063	Small effects
Internal Control → Budget Performance	0,084	Small effects
Financial Technology → Budget Performance	0,082	Small effects
Financial Behavior → Budget Performance	0,170	Between minor and medium effects

Source: SmartPLS 4 output, data processed (2026)

Based on Table 6, all exogenous variables have a small effect on Financial Behavior and Budget Performance, while Financial Behavior on Budget Performance has a value of f^2 = 0.170 which is between small and medium effects. These findings indicate that Financial Behavior has the greatest impact in explaining variance in Budget Performance and confirms its crucial mediating role in the model.

The predictive relevance of the model is measured by the Stone-Geisser value of Q^2, where Q2 > 0 indicates the model has adequate predictive relevance (Shmueli et al., 2019). The results are presented in Table 7.

Table 7. Q-Square (Stone-Geyser Q2)

Variable	SSO	SSE	Q2 (= 1 – SSE/SSO)
Budget Constraints (KtA)	2.520,000	2.520,000	–
Internal Control (PI)	5.880,000	5.880,000	–
Financial Technology (TK)	3.360,000	3.360,000	–
Financial Behavior (PK)	2.520,000	644,280	0,744
Budget Performance (KnA)	3.360,000	981,312	0,708

Source: SmartPLS 4 output, data processed (2026)

Based on Table 7, the value of Q^2 Financial Behavior is 0.744 and Budget Performance is 0.708. Both are greater than zero, so the PLS-SEM model built has good predictive relevance and is able to predict endogenous variables with accuracy that exceeds the *naïve* model (*baseline*).

Hypothesis Testing

Hypothesis testing was carried out using *a bootstrapping* procedure with 5,000 *subsamples* on SmartPLS 4. The hypothesis was accepted if the *T-statistical* value was > 1.96 and *the p-values* were < 0.05 at a significance level of 5% (*two-tailed*). The tests are divided into direct *effects* and indirect effects through Financial Behavior, as presented in Table 8 and Table 9.

Table 8. Direct Effect Hypothesis Test Results

H	Influence Path	Path Coefficients	T Statistics	P Values	Verdict
H1	Budget Constraints → Financial Behavior	0,238	4,442	0,000	Accepted
H2	Internal Control → Financial Behavior	0,269	3,840	0,000	Accepted
H3	Financial Technology → Financial Behavior	0,241	3,489	0,000	Accepted
H4	Budget Limitations → Budget Performance	−0.192	3,533	0,000	Accepted
H5	Internal Control → Budget Performance	0,255	3,855	0,000	Accepted
H6	Financial Technology → Budget Performance	0,250	3,753	0,000	Accepted
H7	Financial Behavior → Budget Performance	0,349	5,172	0,000	Accepted

Source: SmartPLS 4 output, data processed (2026)

Table 9. Results of Indirect Effect Hypothesis Test through Financial Behavior

H	Influence Path	Indirect Effect	T Statistics	P Values	Verdict
H8	Budget Limitations → Financial Behavior → Budget Performance	0,083	3,255	0,001	Accepted
H9	Financial Technology → Financial Behavior → Budget Performance	0,084	2,943	0,003	Accepted
H10	Internal Control → Financial Behavior → Budget Performance	0,094	2,823	0,005	Accepted

Source: SmartPLS 4 output, data processed (2026)

Based on Table 8, all seven direct influence hypotheses are accepted. Budget Constraints have a negative path coefficient (−0.192) on Budget Performance, meaning that the higher the budget constraints, the more budget performance tends to decline directly. However, Budget Constraints have a positive effect on Financial Behavior (0.238), which indicates the effect of behavioral adaptation in dealing with budget constraints. Financial Behavior has the largest path coefficient (0.349) on Budget Performance. Based on Table 9, all three indirect influence hypotheses are also accepted, with the largest *indirect effect* on the Internal Control through Financial Behavior (0.094; T = 2.823; p = 0.005), followed by Financial Technology (0.084; T = 2.943; p = 0.003) and Budget Constraints (0.083; T = 3.255; p = 0.001). These findings confirm that Financial Behavior plays a significant mediating variable.

Discussion

The Effect of Budget Constraints on Financial Behavior. The test results show that Budget Constraints have a positive and significant effect on Financial Behavior, which means that the more budget constraints are felt, the better the financial behavior of employees. These

findings are in line with *behavioral economics* theory , which states that limited resources encourage economic agents to be more disciplined, selective, and careful in making financial decisions (Thaler & Sunstein, 2021). These findings are consistent with Setyaningrum & Sukma Nirwana (2024) who show that in limited budget conditions, government employees tend to adopt more adaptive and efficient financial behavior, and Ummam et al. (2023) who affirm that budgeting constraints encourage apparatus to be more careful in implementing performance-based budgeting. Implicitly, a structured budget restriction mechanism accompanied by a clear priority scale can be a positive catalyst for responsible financial behavior, in line with the *value for money principle*.

The Effect of Internal Control on Financial Behavior. Internal Control has a positive and significant effect on Financial Behavior. When employees realize that their every action is monitored and evaluated regularly, positive financial behaviors such as compliance with procedures, honesty in reporting, and prudence in budget use emerge. These findings support Chawla et al. (2023) who conclude that strong internal control is positively correlated with more responsible financial management behavior, and (Farida et al., 2023) who prove that the effectiveness of an internal control system has a positive effect on employee behavior in carrying out their duties professionally and accountably. Effective internal controls also prevent deviant behavior such as budget abuse and fraud (Hermawan et al., 2024), so SPIP needs to be strengthened not only as an instrument of administrative compliance, but also as a shaper of a culture of financial behavior with integrity.

The Influence of Financial Technology on Financial Behavior. Financial Technology has a positive and significant effect on Financial Behavior because every financial transaction and decision is recorded digitally and can be traced, so that employees are encouraged to behave more structured, transparent, and accountable. These findings are in line with Nabila et al. (2023) who prove that attitudes towards financial technology have a positive effect on financial management behavior, and Cevik (2024) who affirm that *fintech* adoption has a positive impact on financial behavior through increased transparency and efficiency. Financial technology modernization needs to be accompanied by adequate training programs, as reflected in the relatively lower assessment of the advanced training needs indicator.

The Effect of Budget Constraints on Budget Performance. Budget Constraints have a negative and significant effect on Budget Performance. When budget allocation is insufficient to finance all planned activities, the achievement of outputs and *outcomes* will be hampered; work units are forced to revise targets, postpone or cancel programs, or reduce service quality. These findings are supported by Cuadrado-Ballesteros & Bisogno (2022) who show that fiscal constraints have a negative impact on the government's financial and budget performance in the short term, and Setyaningrum & Sukma Nirwana (2024) who confirm that budget constraints are the main challenges in achieving budget efficiency and performance in Indonesian government agencies. The recurring state budget deficit (Table 1) creates real fiscal pressure on the ability of work units to finance their programs. However, these negative impacts can be mitigated through indirect channels, namely the formation of better financial behavior.

The Effect of Internal Control on Budget Performance. Internal Control has a positive and significant effect on Budget Performance. An effective control system ensures that every rupiah of the budget is used according to its designation, supported by adequate evidence, and

produces measurable outputs. These findings support Suhendra et al. (2023) who conclude that the internal control system has a positive effect on the managerial performance of local governments, and Chawla et al. (2023) who affirm that the interaction of internal control and financial management has a real impact on government budget performance.

The Influence of Financial Technology on Budget Performance. Financial Technology has a positive and significant effect on Budget Performance. Financial technology acts as an *enabler* that accelerates the process of preparation, implementation, administration, reporting, and accountability of state finances. Integrated systems such as SAKTI and SPAN allow *real-time* monitoring of budget absorption, so that leaders can respond to deviations quickly and accurately, while improving data accuracy and reducing manual errors. These findings are in line with (Novitasari et al., 2024) who concluded that the use of financial technology has a positive effect on performance through increased efficiency and transparency, and Cevik (2024) who confirmed the positive impact of financial technology adoption on public sector performance and transparency.

The Influence of Financial Behavior on Budget Performance. Financial Behavior has a positive and significant effect on Budget Performance with the largest path coefficient in the model, making it the most important determinant of budget performance. These findings show that budget performance is not solely determined by structural and technological factors, but is highly dependent on the human behavior that manages it, such as careful planning, consistent monitoring, waste avoidance, reporting accountability, and orientation to meaningful outputs. These results are in line with Nabila et al. (2023) who prove that financial management as a proxy for financial behavior is a critical mediator, and Ummam et al. (2023) who affirm that the behavior of the apparatus in performance-based budgeting is a determining factor for the quality of implementation and achievement of budget performance.

The Effect of Budget Constraints on Budget Performance through Financial Behavior. Financial Behavior has been proven to mediate the influence of Budget Constraints on Budget Performance. Although budget constraints have a direct negative impact on budget performance, they also encourage the formation of better financial behaviors that ultimately improve budget performance. Thus, the total effect of budget constraints is a combination of negative direct effects and positive indirect effects, so that the negative impact is mitigated; budget constraints act as a catalyst that encourages employees to prioritize activities and use resources more efficiently.

The Influence of Financial Technology on Budget Performance through Financial Behavior. Financial Behavior has been proven to mediate the influence of Financial Technology on Budget Performance. Financial technology not only has a direct impact on budget performance through increasing operational efficiency, but also through the formation of employee financial behavior. This confirms the perspective of *technology acceptance behavior* which states that the impact of technology on performance is mediated by changes in user behavior (Rebekah & Afjal, 2025). Financial technology such as SAKTI and *e-budgeting* shape the discipline of employee financial behavior through standardization of procedures and information transparency, so its implementation needs to be accompanied by a comprehensive behavior change management program.

The Influence of Internal Control on Budget Performance through Financial Behavior. Financial Behavior is proven to mediate the influence of Internal Control on Budget

Performance with the largest indirect influence value among the three mediation channels. The magnitude of this indirect influence indicates that internal control is the most powerful factor in shaping financial behavior which then improves budget performance. This mechanism is relevant to the concept of *tone at the top*, which is the commitment of leaders to internal control that creates an organizational culture that encourages the apparatus to behave according to integrity and accountability standards. Cuadrado-Ballesteros and Bisogno (2022) emphasized that budget transparency and accountability have a positive impact on financial performance and the sustainability of the government's budget. Thus, strengthening internal control has a twofold effect: directly improving budget performance as well as indirectly through the formation of better financial behavior.

CONCLUSION

Based on the partial least squares structural equation modeling (PLS-SEM) analysis of data from 210 financial management employees at the Ministry of Finance, this study concluded that budget constraints, internal control, and financial technology had positive and significant effects on employees' financial behavior. Budget constraints had a negative and significant effect on budget performance, whereas internal control and financial technology had positive and significant effects. Financial behavior demonstrated a positive and significant effect on budget performance, with the largest path coefficient among the examined predictors, indicating its substantial role in explaining budget performance. Furthermore, financial behavior mediated the relationships between budget constraints, internal control, and financial technology and budget performance, with the strongest indirect effect observed in the internal control pathway. These findings suggested that adaptive financial behavior could help mitigate the adverse effects of budget constraints on budget performance.

Accordingly, the Ministry of Finance was advised to leverage budget constraints as an opportunity to strengthen a culture of efficiency by establishing expenditure prioritization guidelines, implementing flexible budget reallocation mechanisms, and introducing nonfinancial recognition programs for organizational units demonstrating consistent efficiency and effectiveness in budget management. The Government Internal Control System (Sistem Pengendalian Intern Pemerintah, SPIP) should be strengthened through the implementation of the Three Lines Model, which clarifies the responsibilities of budget management units, risk management and compliance functions, and the Inspectorate General as the internal audit function. Financial digital transformation should also be accelerated through integration with the Electronic-Based Government System (Sistem Pemerintahan Berbasis Elektronik, SPBE), supported by targeted financial technology training and professional certification for government personnel. Additionally, financial management competencies and behavior-based assessments should be incorporated into the selection, appointment, and reassignment processes for financial management officials, including commitment-making officials, treasurers, and payment order signing officials. Theoretically, this study contributed to the literature on government budget performance by establishing financial behavior as a mediating variable and providing empirical support for the relevance of behavioral economics in public sector financial management in Indonesia.

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All authors contributed to the preparation of this article. Andhika Jefri, Endang Etty Merawati, Zulkifli, Tri Widyastuti, was responsible for the conceptualization of the study, data collection and analysis, interpretation of the results, and manuscript preparation. The other authors contributed to the review, editing, and final approval of the manuscript.

GENERATIVE AI STATEMENT
The authors declare that no generative artificial intelligence was used in the preparation of this article.

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