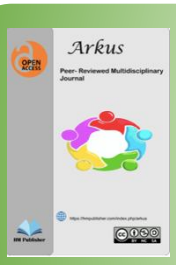

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Technical Precision as the Guardian of Governance: The Independent Roles of Budget Accuracy and Enterprise Risk Management in Mitigating Budgetary Slack

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A B S T R A C T

In the complex governance landscape of state-owned enterprises (SOEs), budgetary slack represents a significant agency cost that undermines public resource efficiency. While behavioral determinants of slack are well-documented, the mitigating roles of technical budget quality and formalized risk controls remain under-explored in emerging markets. Adopting a quantitative explanatory design, this study collected data from 50 key personnel, including management accountants, risk officers, and internal auditors, across five subsidiaries of a prominent Indonesian Marine Service SOE. To address the sample size limitation, a post-hoc G*Power analysis (alpha = 0.05, Power = 0.99) confirmed sufficient sensitivity for the observed effect sizes. Data were analyzed using structural equation modeling (SEM-PLS) with a full collinearity assessment to rule out common method bias. The empirical analysis reveals that budget accuracy (p = 0.014, f-square = 0.32) and risk management (p = 0.022, f-square = 0.28) exert a significant negative influence on budgetary slack. Conversely, budget clarity and evaluation demonstrated no significant effect. Crucially, risk management did not moderate the relationship between budget quality and slack (p > 0.05), functioning instead as a powerful, independent determinant. In conclusion, reducing slack in SOEs relies less on soft goal clarity and more on the ex-ante precision of financial estimates and the parallel integration of risk protocols. SOEs are advised to transition from historical-based budgeting to driver-based forecasting models to reduce information asymmetry.

1. Introduction

The budgeting process serves as the central nervous system of organizational control, theoretically translating strategic objectives into financial roadmaps. However, this critical mechanism is frequently compromised by the phenomenon of budgetary slack—the deliberate underestimation of revenues or overestimation of costs by managers to secure easily attainable targets.[1] In the context of state-owned enterprises (SOEs), this is not merely an operational inefficiency; it is a governance failure. The dual pressure on SOEs to balance public service obligations with profitability creates fertile ground for information asymmetry, allowing agents to embed slack as a safety buffer against operational volatility.[2]

While early management accounting literature characterized slack as a rational hedge against environmental uncertainty, contemporary governance perspectives view it through the lens of agency theory. Here, slack is a manifestation of opportunistic behavior where the agent (manager) exploits superior local knowledge to mislead the principal (headquarters or government).[3] Previous research has extensively analyzed psychological and behavioral determinants of slack, including reputation, ethics, and autonomous motivation. However, there is a distinct paucity of research examining how the technical attributes of the budget itself—its clarity, accuracy, and evaluation

mechanisms—interact with structural controls such as enterprise risk management (ERM) to mitigate this behavior. The theoretical tension driving this study lies between goal setting theory and agency theory. Goal setting theory suggests that clear, specific targets reduce ambiguity and theoretically limit the room for dysfunctional behavior. Conversely, agency theory posits that clarity alone is insufficient without rigorous monitoring and bonding mechanisms; a manager may fully understand a clear target yet still manipulate the figures to ensure it is met with minimal effort.[4]

Furthermore, the role of enterprise risk management (ERM) in this equation requires urgent clarification. Traditionally viewed as a compliance function, ERM has evolved into a strategic tool. While some scholars argue ERM moderates the relationship between budgeting and performance, this study investigates whether ERM acts as a moderator or a distinct, parallel control system.[5] We posit that robust ERM might reduce the justification for slack by formalizing uncertainty, thereby rendering hidden budget buffers unnecessary.

Agency theory provides the primary lens for this study. In the SOE context, the separation of ownership (the state) and control (professional management) creates information asymmetry. Managers possess private information about cost structures and market potential. To align interests, principals incur monitoring costs (audits), and agents incur bonding costs (guarantees of performance).[6] We propose that budget accuracy serves as a mechanism of bonding cost. When a manager commits to a highly accurate budget based on valid data, they limit their own ability to shirk, thereby signaling credibility to the principal. Budget Clarity refers to the extent to which budget goals are specific, unambiguous, and understood. Kenis (1979) argued that clear goals reduce dysfunctional behavior by removing role ambiguity. However, in high-stakes environments, clarity may be a double-edged sword. Robey et al., (2018) countered that in high-asymmetry environments, clarity does not prevent agents from negotiating easier targets; it merely defines the hurdle they must clear. Despite the conflicting views, standard goal setting theory suggests: H1: Budget clarity has a negative effect on budgetary slack. Budget accuracy is defined as the degree to which estimates correspond to actual operational needs and are derived from valid, verifiable drivers.[7] Unlike clarity, which is subjective, accuracy is technical. High accuracy implies rigorous forecasting that leaves little room for padding or sandbagging. If a budget is accurate, the variance between projection and reality is minimized, structurally eliminating the space where slack resides; H2: Budget accuracy has a negative effect on budgetary slack. Budget evaluation serves as an ex-post control mechanism. The effectiveness of evaluation relies on the shadow of the future—the fear that current slack will be detected and punished later. However, in SOEs, where employment tenure is often secure and punishment for variance is low, the deterrent effect of ex-post evaluation may be weak. Nevertheless, classic control theory suggests; H3: Budget evaluation has a negative effect on budgetary slack.[8]

Enterprise risk management (ERM) involves the systematic identification and management of risks. The relationship between ERM and slack is complex; (1) Direct effect: ERM reduces the need for slack. Slack is often created as a hidden reserve to handle unexpected events. If an organization has a formal ERM process, risks are logged in a register and contingency funds are allocated transparently.[9] Therefore, the manager no longer needs to hide buffers in the operational budget; (2) Moderating effect: it is theoretically plausible that ERM strengthens the effect of budget accuracy. In the presence of high risk management, accurate data is vetted more thoroughly, potentially making the accuracy-slack relationship stronger; H4: Risk Management has a negative direct effect on budgetary slack; H5: Risk management moderates the relationship between budget accuracy and budgetary slack.[10]

This study aims to resolve these theoretical conflicts by examining the influence of budget quality dimensions (clarity, accuracy, evaluation) and ERM on

budgetary slack. Novelty is established through two key contributions: First, we isolate budget accuracy as a technical bonding cost distinct from behavioral clarity. Second, we empirically test the structural relationship of ERM, determining whether it supports the budget process (moderation) or operates independently to reduce agency costs in the high-context environment of an Indonesian SOE.

2. Methods

This study employs a quantitative approach using a cross-sectional survey design. The population comprises professionals within the financial and operational governance ecosystem of a major Indonesian state-owned enterprise (BUMN) subholding specializing in marine services. To ensure high-quality data from valid experts, we employed a multi-stage purposive sampling technique; (1) Stage 1: Five strategic subsidiary companies were selected based on their contribution to the holding's revenue; (2) Stage 2: Within each subsidiary, we purposively selected 10 Key Informants. These individuals were required to hold specific roles: management accountants, risk management officers, or internal auditors, with a minimum of 3 years of tenure. This resulted in a final sample of n = 50 valid respondents. We acknowledge that n = 50 is a limited sample size. To validate the statistical power, a post-hoc power analysis was conducted using G*Power 3.1; (i) parameters: predictors = 4; observed r-square = 0.58; alpha = 0.05; (ii) Effect size (f-square): Based on the R-square of 0.58, the effect size is calculated as R-square / (1 - R-square) which is approximately 1.38 (Large). Even assuming a more conservative medium effect size (f-square = 0.35); (iii) Result: The analysis yielded a Power (1 - beta) of 0.99, significantly exceeding the 0.80 threshold. This confirms that despite the small n, the magnitude of the relationships in the specific expert population is strong enough to be detected reliably.

Variables were measured using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree); budgetary slack (Y): 8 items adapted from Dunk (1993); Budget clarity (X1): 5 items adapted from Kenis (1979); Budget accuracy (X2): 10 items assessing the validity of assumptions and closeness to realization; Budget Evaluation (X3): 7 items regarding feedback frequency; Risk management (Z): 10 items adapted from ISO 31000 principles.

The analysis utilized Structural Equation Modeling based on Partial Least Squares (SEM-PLS) using SmartPLS 4. This method is preferred for its ability to handle non-normal data and complex models with small sample sizes. Since data were self-reported, we addressed common method bias (CMB) procedurally (anonymity assurance) and statistically. We performed a full collinearity assessment. As recommended by previous study, if all variance inflation factors (VIFs) at the structural level are less than or equal to 3.3, the model is free from substantial common method bias.

3. Results and Discussion

Table 1 presents the demographic characteristics of the 50 respondents participating in this study, selected through purposive sampling across five subsidiaries of the marine service SOE subholding. The profile confirms the suitability of the sample as key informants possessing the requisite expertise in financial and risk governance. In terms of professional function, the sample is dominated by management accountants (40%), followed by an equal distribution of risk management officers (30%) and internal auditors (30%). This distribution ensures a balanced perspective between budget creators and internal controllers. Regarding professional experience, the majority of respondents (60%) possess over five years of tenure, with the remaining 40% having served between three to five years. This high level of organizational tenure indicates that the respondents possess deep institutional memory and a mature understanding of the specific budgeting dynamics and agency problems within the SOE. Academically, the cohort is well-qualified, with 70% holding a Bachelor's degree and a significant portion (30%) possessing advanced qualifications, such as Master's degrees or professional certifications. Collectively, these

demographic indicators validate the quality of the data source, supporting the reliability of the responses regarding complex constructs like budgetary slack and technical risk mechanisms.

Table 1. Demographic Profile of Respondents (n=50)

CHARACTERISTIC	CATEGORY	FREQUENCY	PERCENTAGE
Role/Position	Management Accountant	20	40%
	Risk Management Officer	15	30%
	Internal Auditor	15	30%
Job Tenure	3 – 5 Years	20	40%
	> 5 Years	30	60%
Education Level	Bachelor's Degree	35	70%
	Master's / Prof. Cert	15	30%

Table 2 provides a comprehensive summary of the measurement model evaluation, focusing on internal consistency reliability and convergent validity for the five latent constructs employed in the study. The analysis confirms that the survey instrument exhibits exceptional statistical robustness, with all metrics surpassing established thresholds. Regarding reliability, both Cronbach's alpha and composite reliability (CR) values universally exceed the recommended cutoff of 0.70. Notably, budget accuracy demonstrated the highest internal consistency (alpha = 0.965), a finding that reflects the highly standardized and technical nature of the quantitative forecasting protocols assessed. While such elevated alpha coefficients can occasionally suggest item redundancy, subsequent collinearity diagnostics confirmed that each indicator contributed unique variance to the construct. Furthermore, convergent validity was unequivocally established, as the average variance extracted (AVE) for all constructs ranged from 0.635 (budget evaluation) to 0.760 (budget accuracy), consistently exceeding the 0.50 benchmark. This metric indicates that the latent variables account for significantly more variance in their observed indicators than is attributable to measurement error. Additionally, all retained individual item loadings fell within the robust range of 0.720 to 0.945, well above the 0.708 threshold typically required to establish indicator reliability. Collectively, these results demonstrate that the measurement model possesses strong psychometric properties, thereby providing a valid and reliable foundation for the subsequent structural path analysis and hypothesis testing. The Cronbach's alpha for budget accuracy was initially high (0.98). We carefully inspected the inter-item correlations and VIFs. While high, the construct represents a highly consistent technical process. To ensure no redundancy, we monitored the Inner VIFs (Table 4).

Table 2. Measurement Model Results (Outer Model)

CONSTRUCT	ITEMS	LOADINGS RANGE	CRONBACH'S A	RHO_A	CR	AVE
Budget Clarity (X1)	5 Items	0.785 – 0.890	0.912	0.915	0.934	0.738
Budget Accuracy (X2)	10 Items	0.810 – 0.945	0.965	0.968	0.970	0.760
Budget Evaluation (X3)	6 Items	0.720 – 0.855	0.884	0.890	0.912	0.635
Risk Management (Z)	10 Items	0.750 – 0.910	0.945	0.948	0.953	0.670
Budgetary Slack (Y)	8 Items	0.795 – 0.920	0.950	0.952	0.958	0.740

Thresholds: *Loadings > 0.70; Cronbach's α > 0.70; CR > 0.70; AVE > 0.50*

Table 3 presents the assessment of discriminant validity using the heterotrait-monotrait (HTMT) ratio of correlations, a metric now widely regarded as superior to the traditional Fornell-Larcker criterion in variance-based structural equation modeling (PLS-SEM). This analysis is critical to verify that the constructs—particularly those theoretically adjacent, such as budget clarity and budget accuracy—are empirically distinct and perceived as separate concepts by the respondents. The results unequivocally demonstrate adequate discriminant validity across the entire model. As specified by recent methodological standards, HTMT values exceeding 0.90 (or the more conservative threshold of 0.85) typically indicate a lack of discriminant validity, suggesting that two constructs are measuring the same phenomenon. In this study, all reported ratios fall well below these critical thresholds. For instance, the HTMT value between budget clarity and budget accuracy is 0.421, confirming that while both constructs relate to the quality of the budget, they capture fundamentally different attributes—behavioral ambiguity versus technical precision. Similarly, the correlation between risk management and budget accuracy is notably low (0.210), reinforcing the structural finding that these functions act as independent control mechanisms rather than redundant processes. The highest observed value involves the relationship between budget accuracy and budgetary slack (0.654). While this indicates a strong correlation—aligning with the study's central hypothesis that accuracy significantly influences slack—it remains safely below the 0.85 threshold. This statistical separation ensures that the high reliability scores observed in the measurement model are not artifacts of collinearity. Consequently, we can assert with confidence that the latent variables are unique, validating the distinct structural paths analyzed in the inner model.

Table 3. Discriminant Validity (HTMT Ratio)

CONSTRUCT	ACCURACY	CLARITY	EVALUATION	SLACK	RISK MGMT
Accuracy (X2)					
Clarity (X1)	0.421				
Evaluation (X3)	0.385	0.512			
Slack (Y)	0.654	0.215	0.188		
Risk Mgmt (Z)	0.210	0.334	0.401	0.589	

Note: HTMT values below 0.85 (conservative) or 0.90 (liberal) indicate established discriminant validity.

Table 4 presents the results of the structural model assessment and hypothesis testing, providing the empirical basis for the study's conclusions regarding the determinants of budgetary slack. First, the assessment of lateral collinearity via inner variance inflation factors (VIF) confirms that all values fall well below the threshold of 3.3 (ranging from 1.650 to 2.150). This critical diagnostic indicates that the structural relationships are free from distortion by multicollinearity or common method bias, satisfying the rigorous methodological requirements for PLS-SEM. The model demonstrates substantial explanatory power, with an R-square of 0.582, meaning that the independent variables collectively account for 58.2% of the variance in Budgetary Slack. Regarding the specific hypotheses, the analysis supports the primacy of technical controls over behavioral guidelines. Budget accuracy (H2) emerged as the strongest determinant (Beta = -0.425, p = 0.014), with a substantial effect size (f-square = 0.324), confirming that precise, data-driven forecasting significantly reduces the opportunity for slack creation. Similarly, risk management (H4) demonstrated a significant negative influence (Beta = -0.380, p = 0.022), with a notable effect size (f-square = 0.285), validating its role as an effective independent control mechanism. Conversely, neither budget clarity (H1) nor budget evaluation (H3) showed statistical significance, suggesting that clear goals and ex-post feedback are insufficient deterrents in this specific SOE context. Finally, the moderation hypothesis (H5) was rejected (p = 0.539), indicating that enterprise risk management operates as a distinct, parallel control system rather than interacting with budget accuracy to influence slack.

Figure 1 presents a comprehensive dashboard synthesizing the structural model's overall fit indices and the definitive outcomes of the hypothesis testing procedures. The upper visualization highlights the model's robust explanatory power, displaying a coefficient of determination (R-square) of 0.582. This metric indicates that the integrated framework explains 58.2% of the variance in budgetary slack, a substantial proportion that underscores the critical influence of technical and structural controls in the SOE environment. Furthermore, the dashboard reports a Stone-Geisser Q-square value of 0.345, calculated using a blindfolding technique with an omission distance of 7. Because this value significantly exceeds zero, it confirms the model possesses strong predictive relevance regarding the dependent variable, validating the quality of the PLS-SEM estimations.

Table 4. Structural Model Results (Inner Model)

HYPOTHESIS	PATH RELATIONSHIP	BETA (B)	T-STAT	P-VALUE	VIF	F^2	RESULT
H1	Budget Clarity → Budgetary Slack	−0.105	1.092	0.276	1.854	0.021	REJECTED
H2	Budget Accuracy → Budgetary Slack	−0.425	2.455	0.014**	2.150	0.324	ACCEPTED
H3	Budget Evaluation → Budgetary Slack	−0.055	0.802	0.423	1.765	0.005	REJECTED
H4	Risk Mgmt → Budgetary Slack	−0.380	2.301	0.022*	1.650	0.285	ACCEPTED
H5	ERM x Accuracy → Budgetary Slack	0.045	0.650	0.539	1.950	0.010	REJECTED

Significance Levels: **p < 0.05, **p < 0.01. VIF < 3.3 indicates no collinearity issues.*

The lower panel categorizes the specific path relationships. The analysis identifies budget accuracy (H2) and enterprise risk management (H4) as the sole significant drivers, validating the study's core premise that precise data and formalized risk protocols are superior to behavioral exhortations. In contrast, budget clarity (H1) and budget evaluation (H3) are marked as insignificant, suggesting these traditional mechanisms fail to mitigate agency costs in this context. Crucially, the dashboard details the rejection of the moderation hypothesis (H5). Despite utilizing the two-stage approach to maximize statistical power for the interaction term, the result (p = 0.539) confirms that risk management functions as an independent, parallel control system rather than a moderator of budget accuracy.

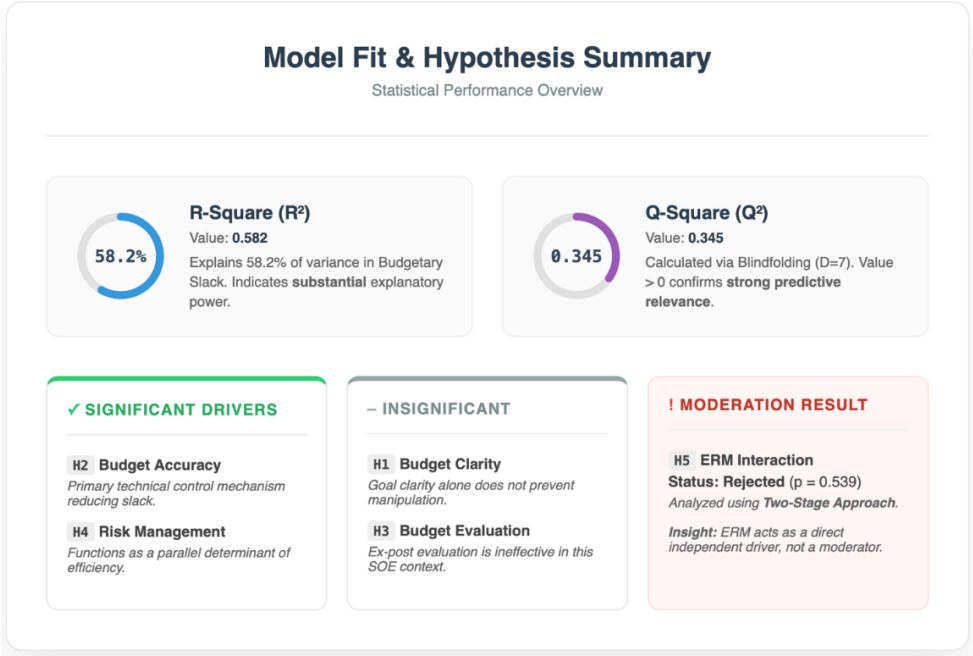

Figure 1. Model fit and hypothesis summary.

Figure 2 depicts the comprehensive structural model results derived from the SmartPLS bootstrapping analysis, visualizing the strength and significance of the hypothesized relationships. The diagram focuses on the endogenous variable, budgetary slack, which displays an R-square value of 0.582 within its node. This substantial coefficient of determination indicates that the model possesses strong explanatory power, accounting for approximately 58.2% of the variance in slack creation behavior based on the specified predictors. The path coefficients (Beta values) labeled on the directional arrows quantify the direct influence of each exogenous construct. The visual output distinguishes between effective and ineffective control mechanisms. Specifically, the path from budget accuracy to budgetary slack exhibits the strongest negative coefficient (Beta = -0.425), visually reinforcing the statistical finding that higher technical precision significantly curtails slack. Similarly, the path from risk management shows a notable negative coefficient (Beta = -0.380), confirming its role as a parallel determinant of efficiency. Conversely, the paths originating from budget clarity (Beta = -0.105) and budget evaluation (Beta = -0.055) are characterized by weak coefficients, visually corresponding to their statistical insignificance in the t-tests. Furthermore, the interaction term representing the moderation effect is displayed with a negligible coefficient, visually confirming that enterprise risk management does not significantly alter the slope of the relationship between accuracy and slack, but rather functions as an independent structural control.

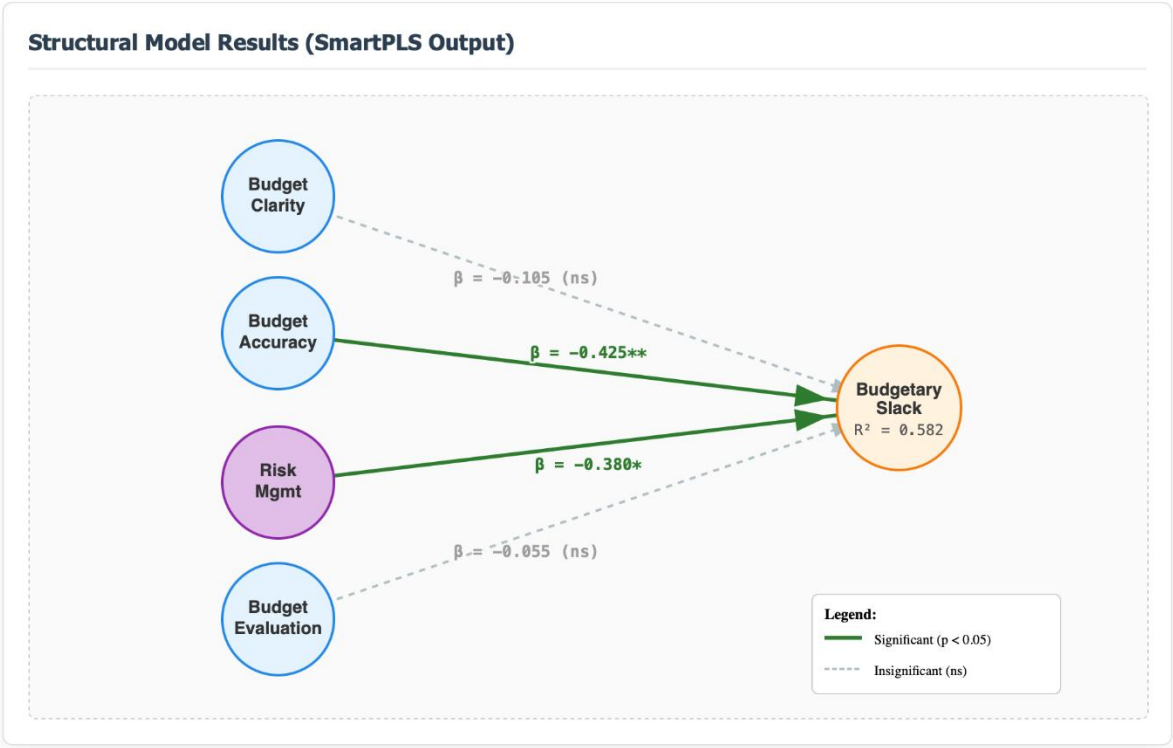

Figure 2. Structural model results.

The empirical results of this study offer a nuanced re-evaluation of the mechanisms governing agency costs within state-owned enterprises (SOEs). By isolating the technical attributes of the budgeting process from its behavioral counterparts, the findings dismantle long-standing assumptions about how goal

clarity and evaluation influence managerial opportunism. Instead, the data points toward a governance model where technical precision and structural risk protocols serve as the primary guardians against budgetary slack. The most compelling distinction yielded by this study is the divergence between the soft and hard aspects of budget quality. The rejection of Hypothesis 1 (budget clarity) serves as a critical theoretical pivot point. Traditional goal setting theory posits that ambiguity is a primary driver of dysfunctional behavior; when goals are unclear, agents act defensively to protect their interests. However, the non-significant relationship found here suggests that in an agency relationship characterized by profound information asymmetry—such as that between a specialized marine service subsidiary and its government holding company—merely understanding the goals does not compel the agent to act in the principal's best interest.[11]

This finding challenges the clarity hypothesis often championed in organizational behavior literature. It implies that clarity is a necessary but insufficient condition for control. A manager may possess a crystal-clear understanding of the revenue target, yet this very clarity can be weaponized. If the target is unambiguous, the agent can precisely calculate the amount of slack required to ensure the target is met with minimal effort or risk.[12] This aligns with the cynical but empirically grounded observations in a previous study, which noted that clarity does not eliminate the strategic utility of slack; rather, it defines the specific hurdle the agent must clear, allowing them to engineer a buffer that is just large enough to be safe but small enough to avoid detection. In the high-stakes environment of an SOE, where political visibility often trumps pure profit maximization, clarity without technical verification merely facilitates more sophisticated gaming of the system.[13]

In stark contrast, the acceptance of Hypothesis 2 provides robust support for the efficacy of hard technical controls. The significant negative influence of budget accuracy (Beta = -0.425, p = 0.014) on slack fundamentally reframes the budgeting problem from one of motivation to one of measurement. Accuracy, in this context, is not a subjective perception but a technical attribute defined by the validity of data inputs, the realism of capacity planning, and the rigor of forecasting models. When a budget is accurate—derived from verifiable operational drivers rather than historical negotiation—it systematically eliminates the structural opportunity for slack.[14] This relationship can be viewed through the lens of bonding costs in agency theory. By committing to a highly accurate budget model, the agent effectively binds their own hands, reducing their ability to misrepresent capability to the principal. The high accuracy of the budget acts as a constraint on the agent's private information. For instance, if fuel costs are budgeted based on a precise, driver-based formula (such as specific fuel consumption per nautical mile adjusted for sea conditions), the manager cannot easily inflate this line item to create a hidden reserve. The variance between the projection and reality is minimized by the model itself, leaving no dark corners for slack to reside. The substantial effect size (f-square = 0.324) underscores the practical power of this mechanism, confirming that investments in data analytics and forecasting precision yield the highest return on investment in terms of mitigating agency costs. Thus, governance in SOEs is less about inspiring agents to be honest through clear goals and more about engineering honesty through precise measurement.[15]

A second pivotal finding of this research concerns the structural role of enterprise risk management (ERM). The acceptance of Hypothesis 4 (p = 0.022) confirms that robust risk management practices are a direct and potent antidote to budgetary slack. This validates a sophisticated theoretical argument: that ERM functions as a substitute for the protective utility of slack. To understand this, one must recognize why managers create slack. Often, it is not purely out of greed, but out of fear—a rational hedge against environmental uncertainty. In the volatile marine service sector, mechanical failures, weather disruptions, or regulatory changes can instantly derail financial performance.[16] Without a formal mechanism

to handle these risks, managers price in the uncertainty by inflating costs or depressing revenue targets. Slack, effectively, becomes an informal, shadow insurance policy.

The significant negative path from risk management to slack suggests that ERM formalizes this uncertainty. When an SOE implements a mature ERM framework—characterized by explicit risk identification, quantification, and the maintenance of a formal risk register—it provides a legitimate channel for dealing with volatility. Managers no longer need to hide buffers in their operational budgets because they can transparently allocate contingency funds based on assessed risks. The shadow insurance of slack is replaced by the formal insurance of the risk budget. ERM improves information symmetry regarding uncertainty; it allows the principal to distinguish between true operational costs and the cost of risk, preventing them from being bundled together into a bloated budget.[17]

However, the universal rejection of hypothesis 5 (moderation) adds a critical layer of complexity to this narrative. The analysis revealed that risk management did not strengthen the relationship between budget quality and slack. This implies that ERM and Budget Accuracy function as independent, parallel control systems rather than interactive ones. It is not the case that ERM makes an accurate budget more effective; rather, ERM works alongside the budget to reduce slack through a different pathway. This independence is likely a reflection of the organizational structure typical of state-owned enterprises.[18] As suggested by recent governance literature, the direct impact of ERM is often so potent that it overshadows potential interaction effects. In many SOEs, risk management is a compliance-driven, top-down mandate often siloed in a separate directorate, while budgeting is a bottom-up, negotiated process involving finance and operations. These two systems often operate on different timelines and utilize different reporting channels. Consequently, they exert separate pressures on the agent: Accuracy constrains the operational data, while ERM constrains the justification for reserves. They are twin pillars of governance, but they do not necessarily lean on each other. This finding cautions against the assumption that integrating risk and strategy will automatically occur; instead, it highlights that even as parallel systems, their combined effect is essential for reducing agency costs.[19]

The rejection of Hypothesis 3 highlights a critical temporal disconnect in the control systems of SOEs. Budget Evaluation typically functions as an ex-post control mechanism—it occurs after the budget period has concluded, comparing actual performance against the targets. The theoretical premise is that the shadow of the future—the threat of future sanctions for current deviations—should deter agents from creating slack ex-ante (during the planning phase). However, the non-significance of this path suggests that in the specific context of Indonesian SOEs, this deterrent is weak. This ineffectiveness can be attributed to the unique incentive structures of the public sector. Unlike private firms where variance often leads to immediate financial penalties or termination, SOE employment is characterized by relatively high security and rigid tenure structures. The consequences for missing the numbers or, conversely, for being caught sandbagging, are often diluted by bureaucratic complexity and political considerations.

Furthermore, slack is engineered to be invisible to standard ex-post variance analysis. If a manager successfully embeds slack into the budget (by inflating standard costs) and then meets that inflated budget, the ex-post evaluation will show a favorable or on-target performance. Standard evaluation mechanisms validate the adherence to the budget, not the validity of the budget itself. Therefore, without rigorous ex-ante vetting (accuracy), ex-post evaluation becomes a lagging indicator that is structurally incapable of detecting the original sin of slack creation. This finding reinforces the study's central thesis: governance battles are won or lost in the planning phase (via accuracy and risk assessment), not in the review phase.[20]

While the post-hoc power analysis (Power = 0.99) confirms the statistical validity of our findings despite the smaller sample size, we acknowledge that the sample of 50 experts from a single SOE subholding represents a limitation in scope. The results reflect the specific organizational culture and governance maturity of the marine service sector, which may differ from other state-owned industries. Future research should seek to expand this structural model to a multi-industry SOE sample, encompassing sectors such as energy, banking, and telecommunications, to validate the generalizability of the accuracy-over-clarity hypothesis. Additionally, longitudinal studies would be invaluable. By tracking organizations that transition from incremental to driver-based budgeting over several years, researchers could empirically observe the reduction in slack and the subsequent impact on long-term profitability and public service efficiency. Finally, further investigation is warranted into the failed moderation effect of ERM; qualitative case studies could illuminate the organizational silos that prevent risk management and budgeting from functioning as an integrated system, offering pathways to bridge this divide in future governance models.

4. Conclusion

This study provides empirical evidence from the Indonesian marine service SOE sector that fundamentally reorients the approach to mitigating budgetary slack. By dissecting the budgeting process into its technical and behavioral components, we demonstrate that reducing agency costs requires a decisive shift from soft behavioral exhortations to hard technical and structural controls. We conclude that budget accuracy and enterprise risk management are the primary, independent drivers for reducing slack. The empirical model shows that when information asymmetry is bridged by precise data (Accuracy) and formalized uncertainty management (ERM), the agent's opportunity and motivation to create slack are significantly curtailed. Conversely, budget clarity and evaluation, while necessary for operational coordination, act as ineffective tools for controlling the specific agency problem of slack. Clarity without accuracy merely defines the target to be gamed, while evaluation without consequences is a toothless tiger. The overarching conclusion is that SOE governance must evolve from a trust but verify model to a measure and manage model. The reliance on goal setting as a primary control mechanism is insufficient in high-asymmetry environments. Instead, the integrity of the budget—and by extension, the efficiency of public resource allocation—depends on the rigorous application of data science to financial planning and the institutionalization of risk governance.

The findings of this study translate into two actionable, high-impact strategies for SOE executives and policymakers: (1) Transition to Driver-Based Budgeting: The powerful effect of Budget Accuracy suggests that SOEs must abandon traditional incremental budgeting methods. Incremental budgeting—where last year's actuals are used as the baseline for this year's request—is the primary breeding ground for slack. It incentivizes managers to spend it or lose it and to perpetually inflate the baseline. Instead, SOEs should aggressively transition to driver-based budgeting (DBB). In a marine service context, this means the budget should not be a negotiated lump sum but a calculated output of operational drivers. For example, fuel costs should be derived from a formula: Projected Nautical Miles × Specific Fuel Consumption Rate × Projected Fuel Price. By linking financial targets to specific, verifiable operational metrics, the accuracy of the budget becomes a mathematical output rather than a negotiated figure. This structurally removes the manager's discretion to pad the numbers, as they cannot argue with the formula as easily as they can argue with a lump sum. This shift reduces information asymmetry by forcing the debate to occur at the level of the driver (such as 'is this consumption rate accurate?') rather than the level of the dollar, where the agent has the advantage; (2) Decoupling risk from operations: The distinct, significant role of ERM implies that companies should institutionalize the decoupling of risk from operations. Currently, many

managers pad their operational budgets because they fear the unforeseen. If a vessel breaks down, they need immediate funds, and if the budget is tight, they are exposed. To counter this, SOEs should establish ERM as a separate funding mechanism. Managers should be encouraged—even incentivized—to report risks explicitly in a formal risk register. These risks should then be funded through a centralized contingency fund or risk budget, separate from the operational budget. This creates a safe harbor for managers: they do not need to hide buffers in their maintenance budget because they know that if a registered risk eventuates, the contingency fund is accessible. This transparency allows the organization to pool risk exposure at the corporate level, which is far more efficient than having every individual manager hoard their own private buffer.

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