INTEGRATION OF RISK STRATEGY OF PT BUKIT ASAM, TBK SUBSIDIARIES

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Abstract

Risk management in State-owned enterprise (SOEs) in Indonesia presents difficulties from operational risks to regulatory complexity. SOEs that have subsidiaries, such as PT Bukit Asam Tbk (PTBA) struggle with the effective implementation of structured and comprehensive risk management frameworks. This research aims to identify and propose a precise method for developing a risk strategy (Risk Capacity, Risk Appetite, Risk Tolerance, and Risk Limit) that can be integrated from the SOE holding company to its subsidiaries, and to strengthen the risk management framework's resilience for reliable and efficient implementation. The methodology employing quantitative followed by qualitative approach and stick to Indonesian Ministry of SOEs guidelines (PERMEN BUMN PER-2/MBU/03/2023 and SK-6/DKU.MBU/10/2023). Independent variables influencing the framework include financial metrics (NWC, Retained Earnings, NOPAT), regulatory requirements, and best-practice allocation models (equity-based, profit-based, asset-based). The dependent variable is the successfully integrated and defined risk strategy for the holding and its subsidiaries. Data includes financial reports of subsidiaries of a major Indonesian SOE for the 2019-2023 period, alongside qualitative data from Focus Group Discussions (FGDs) and questionnaires. Results for a representative subsidiary indicate a NOPAT-based Risk Capacity of 102.000 million rupiah, a Risk Appetite of 17% of Risk Capacity, and Risk Tolerance of 18.7%. The equity-based Risk Limit distribution method yielded 2.838 million rupiah, differing from SK-6/DKU.MBU/10/2023 calculations with comparisons with Altman Z-Score.

Keywords: Risk Strategy, Risk Limit, Risk Appetite, Risk Tolerance, Risk Capacity

INTRODUCTION

PT Bukit Asam Tbk (PTBA), as a prominent State-Owned Enterprise (SOE) in Indonesia that operates under a mandate to implement effective Risk Management (RM) to enhance its corporate governance, ensure accountability, and sustain its performance (Horvey, & Odei-Mensah, 2024). This strategic focus aligns with global standards such as ISO 31000:2018, which provides a comprehensive framework for identifying, evaluating, and mitigating risks across various operational sectors (ISO, 2018). The Ministry of SOEs in Indonesia actively oversees the adoption of RM practices, championing transparency and fostering a pervasive culture of risk awareness at all organizational levels. The Indonesian government, through the Ministry of SOEs, has established specific regulatory instruments, including Ministerial Regulations and their accompanying Technical Guidelines, to direct and standardize these practices. These regulations, such as PERMEN BUMN No. PER-2/MBU/03/2023 concerning Guidelines for Governance and Significant Corporate Activities of State-Owned Enterprises, and the crucial technical guideline SK-6/DKU.MBU/10/2023, mandate a structured approach to RM (BUMN, 2023). The Ministry actively oversees the adoption of these practices, championing transparency and fostering a pervasive culture of risk awareness at all organizational levels.

Despite the regulatory framework, the implementation of risk management in SOEs faces several challenges. One major issue is the lack of uniformity in risk management maturity across different enterprises and tend to silo (Lisdiono, et al., 2022). This gap in implementation leads to inconsistent practices, making it harder for the government to evaluate risks on a consolidated level. Furthermore, many SOEs still view risk management as a compliance requirement rather than a value-adding strategic function, which hinders the integration of risk management into everyday decision-making (Fraser, et al.,2024). Furthermore, many SOEs still perceive risk management primarily as a compliance exercise rather than a value-adding strategic function. Compounding these issues is a frequently noted shortage of skilled risk management professionals capable of leading comprehensive risk assessments and implementing effective mitigation strategies (Phaladi & Marutha, 2023).

PT Bukit Asam Tbk is one of Indonesia's leading coal mining companies, and its roots can be traced back to 1919 when it started as a Dutch colonial mining company. Located in Tanjung Enim, South Sumatra, Bukit Asam primarily operates in coal mining and has expanded into energy generation and another industry. The company plays a significant role in Indonesia’s energy sector as a supplier of coal for both domestic consumption and export. As part of the state-owned mining holding, Mining Industry Indonesia (MIND ID), it holds a strategic position in Indonesia's national energy strategy. PTBA has 13 subsidiaries and affiliate companies operating in various business lines, whose management processes require effective risk management control & supervision so that they are expected to achieve good performance in business. The following is an organization structure & glimpse of the business profiles of PTBA subsidiaries and affiliates that will implement integrated risk management.

However, the implementation of integrated RM across its subsidiaries presents specific challenges. These include varying levels of risk awareness and business process understanding among subsidiaries, leading to non-uniform RM applications. The completeness of RM organizational structures within many subsidiaries is often inadequate, frequently hampered by cost efficiency considerations that conflict with regulatory

expectations. Additionally, there are difficulties in adapting to evolving reporting systems mandated by new regulations and ensuring the completeness of risk documentation, including risk taxonomies, consistently across the group.

The core business issue addressed in this research is the significant challenge faced by the Holding Company in accurately calculating, and subsequently integrating, its Risk Limit, Risk Appetite, Risk Tolerance, and Risk Capacity across its diverse subsidiary and affiliate companies (Fedulova, & Skopenko, 2020). Effective integration of these metrics is crucial for informed decision-making, compliance with regulatory standards, and the strategic balancing of risk and opportunity to support sustainable long-term growth (Li, et al., 2022). An internal stakeholder analysis indicates that subsidiaries currently possess relatively low power in strategic decision-making, which, while highlighting an imbalance, also presents an opportunity for the Holding Company to drive a more harmonized and top-down approach to standardizing and integrating risk management procedures.

To address the identified business issue, this research seeks to answer the following primary questions:

1. How can the SOE Holding Company Group develop its risk strategy (encompassing risk limit, appetite, tolerance, and capacity) in a manner that is effectively integrated with its holding subsidiaries?
2. What specific process improvements should the Holding Company prioritize in its subsidiaries' current risk management practices to address identified gaps and weaknesses?

The objectives of this final project are therefore:

1. To identify and propose a precise method for defining a risk strategy (Risk Capacity, Appetite, Tolerance, and Limit) that can be quantitatively measured and effectively integrated into the business risk performance assessment by the Holding Company for its subsidiaries and affiliates.
2. To propose and improve a robust risk management framework that can be applied consistently across all subsidiaries and affiliates.

This research focuses specifically on the subsidiaries of the Holding Company, as their risks are intrinsically linked to the parent company's core business strategy and overall operational integrity. The primary emphasis is on developing efficient risk strategies and calculation techniques for these subsidiaries, utilizing the framework provided by SK-6/DKU.MBU/10/2023 and other standardized risk-based approaches (BUMN, 2023). This study does not concentrate on the initial stages of risk management, such as detailed business process identification, exhaustive risk identification, or the establishment of Key Risk Indicators (KRIs) for each subsidiary; these are considered as existing inputs for the purpose of this research, which focuses centrally on the risk strategy components. The quantitative analysis utilizes financial data collected over the five-year period from 2019 to 2023 to ensure a comprehensive and trend-aware assessment. The aim is to develop a scientifically grounded method that allows the Holding Company and its subsidiaries to make more informed decisions, effectively balancing risk with opportunity to support long-term growth.

REVIEW OF LITERATURE

Effective RM in SOEs is underpinned by established frameworks and specific regulatory requirements. ISO 31000:2018 provides a common framework for identifying,

analyzing, evaluating, and managing risks effectively, emphasizing integration, structure, and context-specific customization through its principles, framework, and process pillars (ISO, 2018). In Indonesia, the governance framework for SOEs is further detailed by regulations such as PERMEN BUMN No. PER-2/MBU/03/2023 and the technical guideline SK-6/DKU.MBU/10/2023 (BUMN, 2023). These regulations emphasize transparency, accountability, and integrated RM in strategic decisions, and SK-6 specifically outlines a hierarchical risk strategy structure comprising Risk Capacity, Risk Appetite, Risk Tolerance, and Risk Limit.

Risk Capacity (RC) is the maximum risk a company can absorb, calculated in monetary units using indicators like Net Working Capital (NWC), Retained Earnings (RE), and Net Operating Profit After Tax (NOPAT), serving as the foundational constraint (Brigham, & Ehrhardt, 2017). Risk Appetite (RA) is the risk level a company is willing to take to achieve its goals, determined by historical loss data and strategic plans, reflecting risk culture and top management accountability (Fedulova, & Skopenko, 2020). Risk Tolerance (RT) is the maximum deviation from RA that can be operationally tolerated, acting as a safety buffer calculated as a percentage above RA based on past losses and management judgment. Risk Limit (RL) is the operational distribution of Risk Tolerance to subsidiaries or work units, stated quantitatively, and ensuring exposure remains acceptable (Li, et al., 2022).

To measure the capacity of Risk Limits to subsidiaries, considering the capacity, performance, and risk exposure of each entity, it uses best practices, such as those from Bank Mandiri, to utilize Equity-Based, Profit-Based, and Asset-Based allocation methodology (Chen, et al., 2022). The Equity-Based approach, in particular, is favored for its stability and alignment with capital preservation principles (Martinez, & Roca, 2021). The Altman Z-Score model is often used as a complementary tool to predict bankruptcy risk based on financial ratios, providing an early warning signal (Rashid, & Khan, 2023). Integrating RM into strategic and governance frameworks involves a process from business process mapping, risk identification using risk registers, establishing Key Risk Indicators (KRIs), assessing inherent risk, and calculating the risk strategy components.

RESEARCH METHOD

This research uses a mixed-methods approach, beginning with a quantitative phase to assess risk management through systematic calculation of various risk metrics, followed by a qualitative phase involving interviews and focus group discussions (FGDs) to deepen insights. This approach aims to provide a comprehensive analysis of the risk management framework within a major Indonesian State-Owned Enterprise (SOE) holding company and its subsidiaries.

The population for this research includes the SOE holding company and its 13 subsidiary and affiliate companies. The sample for quantitative financial data analysis consists of financial reports from these subsidiaries covering the period 2019-2023. For qualitative data, a purposive sampling approach was used, targeting risk managers and relevant employees from various subsidiaries for questionnaires (23 samples) and FGDs.

The independent variables or input factors considered for developing the integrated risk strategy include:

1. Financial data from subsidiaries (e.g., Net Working Capital, Retained Earnings, Net Operating Profit After Tax),

$$NWC = CA - CL$$

where:
CA = Current Asset
CL = Current Liability

Retained Earnings (RE)

$$RE = Beginning\ Retained\ Earnings + Net\ Income\ (or\ Loss) - Dividen\ Paid$$

Net Profit After Tax (NOPAT)

$$NOPAT = EBIT \times (1 - Tax\ Rate)$$

where:
EBIT = Earning Before Interest & Taxes

2. Regulatory guidelines for SOEs (specifically SK-6/DKU.MBU/10/2023)

$$Risk\ Appetite = \%Percentage\ RRE\ from\ RCxRisk\ Capacity_{(NWC/RE/NOPAT)}$$

Where:
RRE = Residual Risk Exposure.
To calculate the risk tolerance, in terms of example of NWC:

$$\%Risk\ Tolerance = \%Risk\ Appetite + (\%Risk\ Appetite \times 10\%)$$

For Risk Tolerance, in terms of example of NWC:

$$Risk\ Tolerance_{NWC} = RC_{NWC} \times \%Risk\ Tolerance$$

(This is example for NWC, for RE and NOPAT calculated in Appendix D)

For risk limit,

$$Risk\ Limit_{NWC} = Risk\ Capacity \times \%Limit\ of\ NWC_{avg}$$

(This is example for NWC, for RE and NOPAT calculated in Appendix D)

3. Best-practice risk limit allocation models (Equity-based, Profit-based, Asset-based, drawing from Bank Mandiri's practices)

But first, regarding the risk limit it is said that we refer to historical data that we forecast for the next trends. The following formula for Risk Limit allocation to subsidiaries is taken from common risk management practices in multi-entity corporations and financial institutions, including referring to Bank Mandiri's internal risk distribution methodology and ISO 31000:2018 principles. This approach has been aligned and validated through FGD with SOE Ministry to ensure regulatory compliance and practical implementation. At this point we use this formula:

Approach 1: Proportionate Distribution Based on Subsidiary Equity

$$Risk\ Limit\ for\ Subsidiary = \frac{Subsidiary\ Equity}{Total\ Equity} \times Total\ Risk\ Limit$$

Approach 2: Profit Contribution-Based Allocation

$$Risk\ Limit\ for\ Subsidiary = \frac{Subsidiary\ Net\ Profit}{Total\ Net\ Profit\ Consolidation} \times Total\ Risk\ Limit$$

Approach 3: Revenue or Asset Contribution Weighting

$$Risk\ Limit\ for\ Subsidiary =$$

$$\frac{Subsidiaries\ Revenue\ Assets \times Total\ Risk\ Limit\ PTBA}{Total\ Revenue\ or\ Assets}$$

The Altman Z-score is calculated using the following formula:

$$Altman\ Z - Score = 1.2A + 1.4B + 3.3C + 0.6D + 1.0E$$

where:
A = working capital / total assets
B = retained earnings / total assets
C = earnings before interest and tax / total assets
D = market value of equity / total liabilities
E = sales / total assets
Altman developed a modified Z-score for emerging economies in considering the variations in capital structures, accounting procedures, and economic conditions:

$$Z' = 3.25 + 6.56A + 3.26B + 6.72C + 1.05D$$

Qualitative input derived from FGDs and questionnaires regarding risk perceptions and existing practices. The dependent variables or target outputs of this research are the defined and integrated Risk Capacity, Risk Appetite, Risk Tolerance, and Risk Limit applicable to both the SOE holding company and its individual subsidiaries, culminating in an improved and consistently applicable risk management framework.

RESULTS AND DISCUSSION

The quantitative analysis began with calculating Risk Capacity (RC) for the subsidiaries of the SOE holding company, using Net Working Capital (NWC), Retained Earnings (RE), and Net Operating Profit After Tax (NOPAT) as per SK-6/DKU.MBU/10/2023 guidelines. For a representative subsidiary (e.g., PT BMI), RC based on NOPAT was determined to be 102,000 million, reflecting its operational profitability. Despite a negative NWC trend, improvements were noted, and RE also showed recovery (Hopkin, 2018). Risk Appetite (RA) was established as a percentage of RC, informed by historical residual risk exposure from comparator subsidiaries (PT BEI & PT BPI) which averaged 12-17% of RC. For the representative subsidiary, a strategic RA of 17% of NOPAT-based RC was adopted, resulting in an RA of 17,340 million.

Risk Tolerance (RT) was calculated as RA plus a 10% margin, based on expert judgment and common practice, yielding 18.7% of RC. For the representative subsidiary, this translated to an RT (NOPAT-based) of 19,074 million. Risk Limit (RL) calculations were performed using several methods. The SK-6/DKU.MBU/10/2023 approach, based on historical averages of financial indicators applied to RC, yielded an RL (NOPAT-based) of 4.168 million rupiah for the representative subsidiary. Distribution methods based on best practices (Bank Mandiri's) were also applied:

RL for the representative equity-based subsidiary was 2.838 million rupiah. This method is preferred for its stability and alignment with regulatory principles emphasizing capital strength (Martinez, & Roca, 2021). For Profit-Based: RL was 6.985 million rupiah, and for Asset-Based RL was 12.308 million rupiah. The Altman Z-Score analysis for the representative subsidiary yielded scores of 0.62 (original model) and 1.04 (emerging market model), both indicating a position within or near the distress zone (Rashid, & Khan, 2023).

This contrasts with the more positive outlook from the SK-6/DKU.MBU/10/2023 RC calculations, suggesting the Altman Z-Score acts as a more cautious early warning tool for bankruptcy risk, while the SK-6 method focuses on establishing financial sustainability and operational resilience (Smith, et al., 2024). Qualitative data from questionnaires (23 participants from various subsidiaries) indicated general agreement on understanding RM policies (39.13% "Agree") and RM's role in supporting daily work (78.26% "Agree"). However, on RM creates value (43,48% “Agreed”) and whether the risk strategy accurately reflects subsidiary strategy (47,83% "Agreed") points to areas for improvement. Most respondents supported integrated RM but emphasized the need for adjustments to subsidiary capabilities and more assistance due to limited human resources. FGDs with subsidiaries and holding company representatives reinforced the preference for the equity-based distribution for RL due to its stability and regulatory alignment. The discussion highlights the necessity of choosing a primary RL allocation method (equity-based is recommended for its conservatism and stability) while using other methods and the Altman Z-Score as complementary perspectives for a holistic risk view. The variation in results underscores the importance of a framework that not only calculates these parameters but also provides a clear rationale for their integration and consistent application across a diverse SOE group (Fraser, et al., 2024).

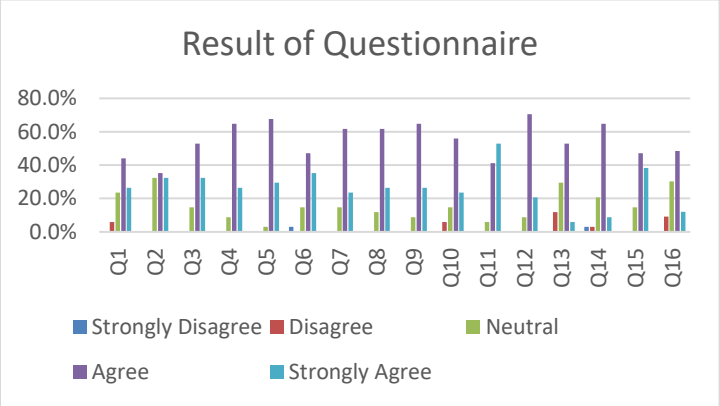

Figure 1

Table 1
Risk Capacity for NWC Calculation(in million rupiah)

Company	Year	Current Assets	Current Liabilities	NWC	NWC Average	RC Min	RC Adjusted
PT BMI	2019	392.992	1.459.411	-1.066.419	-1.096.968	238.116	238.000
PT BMI	2020	260.918	1.444.361	-1.183.443			
PT BMI	2021	298.552	1.620.115	-1.321.563			
PT BMI	2022	647.331	1.622.070	-974.739			
PT BMI	2023	604.277	1.542.955	-938.678			

Table 2
Risk Capacity for RE Calculation (in million rupiah)

Company	Years	RE	RE Average	RE Minimum	RE Adjusted
PT BMI	2019	-562.743	-631.481	211.965	212.000
PT BMI	2020	-799.937			
PT BMI	2021	-848.446			
PT BMI	2022	-554.992			
PT BMI	2023	-391.288			

Table 3
Risk Capacity for NOPAT Calculation (in million rupiah)

Company	Years	NOPAT	NOPAT Average	NOPAT Minimum	NOPAT Adjusted
PT BMI	2019	58.534	75.747	101.673	102.000
PT BMI	2020	-25.086			
PT BMI	2021	16.052			
PT BMI	2022	265.286			
PT BMI	2023	63.949			

Table 4
Risk Appetite (RA) for AAP PTBA: PT BEI & PT BPI as Representative Case

Company	Years	% Residual Risk Exposure Value to Risk Capacity
PT BEI	2020	10,0%
PT BEI	2021	14,0%
PT BEI	2022	13,0%
PT BEI	2023	9,0%
PT BPI	2021	13,0%
PT BPI	2022	6,0%
PT BPI	2023	17,0%
	Average	12%
	Min	6%
	Max	17%

Table 5
Risk Appetite of PTBA Subsidiaries (in million rupiah)

Companies Name	Risk Capacity	Risk Appetite
	NOPAT	
PT BMI	102.000	17.340
PT BAP	56.000	9.520
PT IPC	197.000	33.490
PT BEI	23.000	3.910
PT BPI	277.000	47.090

Table 6
Risk Tolerance (RT) & Risk Capacity calculation (in million rupiah) for PTBA's 5 Subsidiaries

Company Name	Risk Capacity			Risk Tolerance		
	NWC	RE	NOPAT	NWC	RE	NOPAT
PT BMI	238.000	212.000	102.000	44.506	39.644	19.074
PT BAP	115.000	128.000	56.000	21.505	23.936	10.472
PT IPC	113.000	367.000	197.000	21.131	68.629	36.839
PT BEI	159.000	79.000	23.000	29.733	14.773	4.301
PT BPI	113.000	2.065.000	277.000	21.131	386.155	51.799

Table 7
Risk Limit calculation based on SK-6/DKU.MBU/10/2023 (in million rupiah)

Company Name	Risk Capacity			Risk Limit		
	NWC	RE	NOPAT	NWC	RE	NOPAT
PT BMI	238.000	212.000	102.000	17.244	8.435	4.168
PT BAP	115.000	128.000	56.000	8.332	5.093	2.289
PT IPC	113.000	367.000	197.000	8.187	14.602	8.051
PT BEI	159.000	79.000	23.000	11.520	3.143	940
PT BPI	113.000	2.065.000	277.000	8.187	82.163	11.320

Table 8
Overview of RL calculation results with Equity Base (in million rupiah)

Company Name	Lv1 Subs Distribution	Lv2 Subs Distribution	Limit Distribution
PTBA	199.411		199.411
PT IPC	4.680		4.680
PT BAP	3.471	1.959	3.471
PT BPI	41.891		41.891
PT BMI	2.838	1.110	2.838
PT BEI	1.708	1.068	1.708

Risk Limit calculation is done based on the proportion of equity of each subsidiary to the total equity of direct subsidiaries. The formula and calculation example can be seen in Appendix D.

Table 9
Overview of RL calculation results with Profit Based (in million rupiah)

Company Name	Lv1 Subs Distribution	Lv2 Subs Distribution	Limit Distribution
PTBA	229.076		229.076
PT IPC	7.889		7.889
PT BAP	3.802	29	3.802
PT BPI	5.178		5.178

PT BMI	6.985	312	6.985
PT BEI	1.071	153	1.071

Risk Limit calculation is done based on the proportion of equity of each subsidiary to the total equity of direct subsidiaries. The formula and calculation example can be seen in Appendix D.

Table 10
RL calculations with Asset-Based (in million rupiah)

Company Name	Lv1 Subs Distribution	Lv2 Subs Distribution	Limit Distribution
PTBA	233.406		233.406
PT IPC	1.939		1.939
PT BAP	3.211	1.925	3.211
PT BPI	2.569		2.569
PT BMI	12.308	6.295	12.308
PT BEI	567	343	567

Risk Limit calculation is done based on the proportion of equity of each subsidiary to the total equity of direct subsidiaries. The formula and calculation example can be seen in Appendix D.

Table 11
Altman Z Score of 5 Subsidiaries

Company Name	Year	RC Original (rupiah)	Altman Z Score	RC Emerging Market (rupiah)	Altman Z Score (Emerging Model)
PT BMI	2023	1.255.275.999.337	0,62	16.400.942.518	1,04
PT BAP	2023	-537.663.000.000	2,48	-429.808.404.148	6,95
PT IPC	2023	-56.438.553.111	4,72	-237.126.678.000	11,37
PT BEI	2023	-225.568.000.000	13,64	-163.839.910.001	13,64
PT BPI	2023	-474.339.138.000	12,01	-474.339.138.000	12,01

CONCLUSION

This research demonstrates that developing an integrated risk strategy encompassing Risk Capacity, Appetite, Tolerance, and Limit for an SOE holding company and its subsidiaries requires a data-driven, mixed-method approach that aligns with regulatory mandates (such as PERMEN BUMN PER-2/MBU/03/2023 and SK-6/DKU.MBU/10/2023) and international standards like ISO 31000:2018.

For the representative subsidiary, the study established:

1. Risk Capacity (RC): NOPAT-based RC of 102.000 million rupiah, indicating robust medium- to long-term operational profitability,
2. Risk Appetite (RA): Set at a strategic 17% of NOPAT-based RC (17,340 million), reflecting a willingness to take measured risks for growth.
3. Risk Tolerance (RT): Calculated at 18.7% of NOPAT-based RC (19,074 million), providing a buffer beyond the RA.
4. Risk Limit (RL): The equity-based allocation method yielded an RL of 2,838 million. This method is deemed most appropriate due to its stability, conservatism, and alignment with regulatory principles and corporate finance best practices. Calculations

based on SK-6/DKU.MBU/10/2023 and other distribution methods (profit-based, asset-based) provided varying RL figures, emphasizing the need for a primary, justified approach. The Altman Z-Score, indicating a distress zone for the subsidiary (0.62 original, 1.04 emerging), serves as a crucial early warning for bankruptcy risk, complementing the more prospective SK-6 framework which focuses on long-term strategic risk management and resilience.

Qualitative findings confirmed support for integrated RM but highlighted the need for tailored implementation, training, and addressing resource limitations within subsidiaries. The equity-based approach for RL distribution received endorsement for its stability and regulatory compliance (Martinez, & Roca, 2021). Ultimately, the study advocates for a consistent, measurable, and regulation-based RM framework, prioritizing the equity-based method for risk limit allocation, to ensure effective and uniform risk management across the SOE holding group and its subsidiaries, while addressing identified gaps in risk comprehension and documentation (Hopkin, 2018).

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