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Bank Risk Taking Behaviour and Performance: Evidence from Indonesian Bank

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Abstract: This study aim to assess the impact of risk management and internal control on Indonesian Banks' risk-taking behaviour and performance. By assessing sample of 60 Banks spanning from 2013 and 2022 using the Generalized Least Square random effect estimator model, results show that while risk management and internal control lower credit risk and operational risk, they have no significant impact on liquidity risk. This impact is more pronounced for Government owned Banks than for privately owned Banks. Furthermore, the research demonstrates that risk management and internal control improve Banks' performance particularly in ROA and ROE parameters.

Keyword: Risk Management, Internal Control, Risk Taking Behaviour, Performance

INTRODUCTION

Risk refers to the likelihood of encountering unfavorable outcomes due to a specific event and Banks are required to effectively handle risks to preserve their stability (Abid et al. 2021). The Indonesian government has implemented several risk management laws through the Financial Services Authority (*Otoritas Jasa Keuangan* or OJK). The regulations encompass the oversight of Banks by the Board of Commissioners and Directors, the strategy for managing risks, the identification and control of risks, the information systems for risk management, and the internal control systems (OJK 2016). The significance of risk management and internal controls in the banking industry should not be underestimated, as banks, which serve as crucial support systems for a nation's economic progress, are currently experiencing economic instability, sluggish growth, and instances of fraudulent activities (Koutoupis & Malisiovas, 2023).

Multiple studies have shown that implementing risk management and internal control measures can decrease Banks' risk-taking behaviour (Abid et al. 2021), and boost profitability and financial performance (Abid et al. 2021; Koutoupis & Malisiovas 2023). The primary emphasis of the research is on Banks located in Asia (Abid et al. 2021), while another study examines Banks in the United States (Koutoupis and Malisiovas 2023). Additionally, there are studies that specifically examine risk management and risk-taking behaviours in Banks from ASEAN countries (Nguyen & Dang 2022) and European Banks (Qureshi and Lamarque 2021).

Nainggolan et al. (2022) conducted a study on the impact of board characteristics on risk management effectiveness in Indonesian and Malaysian Islamic Banks. While the Banking industry recognizes the importance of risk management and internal controls, there is a scarcity of empirical information regarding the efficacy of these practices, specifically among Indonesian Banks.

The previous study primarily examined the influence of the number of risk committees and the level of independence among these committees on risk management parameters (Abid et al. 2021; Kacem & Harbi 2022; Qureshi & Lamarque 2022) while internal control parameter use in the previous study utilize Board of Directors (BOD) number, BOD independencies (Abid et al. 2021; Nguyen & Dang 2022; Nainggolan et al 2022; Djebali & Zaghdoudi 2020; Lee & Hoy 2020; Kapil & Mishra 2019) and Audit Committee (Koutoupis & Malisiovas 2023, Nguyen & Dang 2022). Due to the adoption of a two-tier board structure in Indonesia (Jaffar et al., 2013) and the requirement by the OJK for the establishment of various risk committees, such as the Risk Monitoring Committee under the Board of Commissioners and the Risk Management Committee under the Board of Directors (OJK 2016), this study will focus on the characteristics of risk management and internal control in Indonesian banks, as mandated by regulatory requirements.

The measurement of Banks' risk-taking behaviour parameters will be conducted by employing liquidity risk and operational factors, as examined in the studies conducted by Abid et al. (2021), as well as credit risk, as explored in the works of Abid et al. (2021), Koutoupis and Malisiovas (2023), Nainggotan et al. (2022), and Lee and Hoy (2022). The performance of the Bank will be assessed via the utilization of Return on Asset (ROA), Return on Equity (ROE) as examined by Kacem and Harbi (2022), and Net Interest Margin as investigated by Koutoupis and Malisiovas (2023). The primary objective of this study is to analyze the impact of risk management and internal control on the risk-taking practices and performance of domestic banks in Indonesia. Additionally, this research seeks to explore the following hypotheses: (1) Risk management has a detrimental effect on banks' propensity for risk-taking; (2) Risk management has a positive effect on banks' performance; (3) Internal control has a detrimental effect on banks' propensity for risk-taking; and (4) Internal control has a positive effect on banks' performance. This study utilizes a sample of conventional public banks that are owned by the government or BUMN (Badan Usaha Milik Negara), banks that are managed by regional governments or BUMD (Badan Usaha Milik Daerah), and publicly listed private conventional banks.

The structure of this research is organized as follows. Section 2 delves into an examination of relevant scholarly literature studies pertaining to the risk management, internal audit, Banks' risk taking behaviour and performance. Secton 3 provides a detailed account of the data and models used. The descriptive analysis of the results are presented in Section 4 and Section 5 explain the conclusion of this study.

METHOD

The research approach employed in this study pertains to Figure 1, which illustrates the analysis of the impact of risk management and internal control on risk-taking behaviours and the performance of banks. The dataset included in this research comprises the Conventional General Bank, which encompasses 4 (four) state-owned Banks, 24 (twenty-four) Banks owned by regional governments, and 32 (thirty-two) publicly traded commercial banks. The data spans the period from 2013 to 2022, with total 580 observations.

This research will examine several risk management and internal control factors as independent variables, and risk management behaviour and performance drawing upon previous studies conducted by Abid et al. (2021), Koutoupis and Malisiovas (2023), Kacem

and Harbi (2022), Qureshi and Lamarque (2022), and Nguyen and Dang (2022). Appendix 1 contains detailed information about the variables use in this study.

The characteristics associated with risk management in a previous study conducted by Abid et al. (2021) included the presence of a risk committee, the size of the risk committee, the frequency of risk committee meetings, the presence of a chief risk officer, and the independence of the Chief Risk Officer (CRO). In accordance with the regulations set forth by the Financial Services Authority in POJK No. 18/POJK.03/2016, it is mandatory for all banks to appoint a Chief Risk Officer as a member of their Directors. Hence, the variables pertaining to the visibility of the Chief Risk Officer and the level of independence were deemed irrelevant for the purposes of this study. The risk committee in Indonesian Banks is comprised of two committees, namely the Risk Monitoring Committee under the Board of Commissioners and the Risk Management Committee under the Directors, as stipulated in POJK No. 18/POJK.03/2016. Hence, this research endeavor aims to examine the influence of Risk Monitoring Committee Size (RM1), independence (RM2), meeting frequency (RM3), as well as the Risk Management Committee Size (RM4) and meeting frequency (RM5) as factors within the context of risk management.

The variables employed in the study conducted by Abid et al. (2021), Koutoupis and Malisiovas (2023), and Nguyen and Dang (2022) pertaining to internal control involve the utilization of the number of Board of Directors in Banks and their independence as their determining factors. In this study, we consider the number of Board of Commissioners (IC1) and Directors (IC3) as separate variable of internal control, as Indonesia has implemented a two-tier board structure where the Board of Directors is divided into two independent entities (KNKG, 2021). The measurement of independence will be measure only for the Board of Commissioners (IC2). The significance of the Audit Committee was emphasized by Nguyeng and Dang (2022). Consequently, this study will incorporate the number of audit committees (IC4) and their level of independence (IC5) as variables related to internal control.

Banks commonly encounter risks such as credit risk, liquidity risk, and operational risk and Basel Committee on Banking Supervision identifies these hazards as the primary risks encountered by Banks (Abid et al. 2021). Hence, this study will specifically examine the Bank's propensity for risk-taking by utilizing the credit risk (CR), liquidity risk (LR), and operational risk (OR) (Abid et al. 2021; Koutoupis & Malisiovas 2023; Kacem & Harbi 2022; Nguyen & Dang 2022).

The assessment of credit risk will be conducted by evaluating the loss reserves resulting from a decline in the credit value in relation to the overall credit amount refer to Sammet et al. (2018). This ratio serves as an indicator of the Bank's capacity to accept or handle a credit that has failed (Abid et al. 2021). The measurement of liquidity risk can be determined by calculating the ratio of the total loan amount to the total deposit amount as a ratio to quantifies the degree to which financial institutions employ liquid deposits as a means to fund non-liquid credit. The assessment of operational risk can be conducted using a quantitative approach by calculating the standard deviation of Return on Assets (ROA), where a greater ROA deviation standard signifies increased volatility and operating risk inside the Bank (Abid et al. 2021).

Banks' performance Koutoupis and Malisiovas (2023) propose that profitability can serve as an additional metric for evaluating the performance of the Bank. Typically, the assessment of Banks' profitability can be conducted through the utilization of key financial metrics like as return on assets (ROA) and return on equity (ROE) (Kacem & Harbi 2022), or alternatively, by employing the net interest margin. (Ozili 2015; Koutoupis & Malisovas 2023). ROA ratio is measured by dividing the total assets from each year and collected on Bank, while ROE ratio is calculated by calculating the ratio of Banks' net income to equity (Nguyen and Dang 2022). Net interest income is a financial metric that quantifies the disparity between the

interest paid on obligations and the interest gained on assets, thus it is the ratio of net interest income to average interest-earning assets, given as a percentage (Lartey et al. 2013).

The control variable used in this study is the size of the bank based on the type of Bank ownership (Bank Type), as well as the core capital of the Bank (KBMI) (Abid et al. 2021; Koutoupis & Malisovas 2023). The findings of Lee and Hooy's (2020) analysis indicate a notable correlation between state-owned banks and increased levels of credit risk and return volatility. Prior research indicates that state-owned banks have exhibited below-average performance, diminished loan quality, lower efficiency, and degraded profitability (Iannotta et al., 2007; La Porta, Lopez-de-Silanes, & Shleifer, 2002; Shaban & James, 2018; Zhou, Gao, & Zhao, 2017). Another study also shows that Bank that owned by government has a potential inclination among banks to partake in high-risk ventures when they maintain a direct association with the government. Moreover, research undertaken by Brandao-Marques, Correa, & Sapriza (2020), Lassoued, Sassi, & Ben Rejeb Attia (2016), Wang, Wong, & Xia (2008), and Zhu & Yang (2016) has provided evidence of a direct relationship between state ownership and risk-taking.

The equation model used in this study refers to the equation model in a previous study by Abid et.al (2021) with the following model:

$$Risk_{i,t} = \alpha_0 + \alpha_1 RM1_{i,t} + \alpha_2 RM2_{i,t} + \alpha_3 RM3_{i,t} + \alpha_4 RM4_{i,t} + \alpha_5 RM5_{i,t} + \alpha_6 IC1_{i,t} + \alpha_7 IC2_{i,t} + \alpha_8 IC3_{i,t} + \alpha_9 IC4_{i,t} + \alpha_{10} iC5_{i,t} + \alpha_{11} PI6_{i,t} + \alpha_{12} Control_{i,t} + error \quad (1)$$

$$Performance_{i,t} = \alpha_0 + \alpha_1 RM1_{i,t} + \alpha_2 RM2_{i,t} + \alpha_3 RM3_{i,t} + \alpha_4 RM4_{i,t} + \alpha_5 RM5_{i,t} + \alpha_6 IC1_{i,t} + \alpha_7 IC2_{i,t} + \alpha_8 IC3_{i,t} + \alpha_9 IC4_{i,t} + \alpha_{10} IC5_{i,t} + \alpha_{11} IC6_{i,t} + \alpha_{12} Control_{i,t} + error \quad (2)$$

Where $Risk_{i,t}$ is the proxy of credit, liquidity, and operational risk for Bank *i* at time *t*, while $Performance_{i,t}$ is the proxy of ROA, ROE, and NIM for Bank *i* at time *t*.

The analysis is conducted using the Generalized Least Square (GLS) random-effect estimator that has been used in several previous study by Abid et al (2021), Abedifar et al. (2013), Mollah & Zaman, (2015) and Safiullah & Shamsuddin (2018) The selection of the random effect estimator over the fixed-effects model is based on the limitation of the fixed-effects model in accounting for temporal and cross-firm variable fluctuations. The risk management and compliance practices of banks remain very consistent throughout time, and there are no significant shifts in the ownership types of banks (Abid et al. 2021). According to Batalgi (2008) and Wooldridge (2010), random effect models are better suitable for our empirical models when there is dummy variable. This is because fixed-effects models exclude the influence of individual dummy variables.

Tabel 1. Descriptive Analysis Of Sample

	Full Sample					Sample GB	Sample PB	
Variable[1]	**Mean**	**SD**	**Min**	**Median**	**Max**	**Mean**	**Mean**	**P Value[2]**
Independent Variables: Risk Management								
RM1	4,122	1,433	2	4	10	3,970	4,252	0,004*
RM2	0,890	0,216	0,08	0,833	1	0,811	0,809	0,502
RM3	11,081	9,436	2	9	72	15,790	7,064	<2.2e-16*
RM4	10,560	5,994	2	9	48	11,038	10,153	0,101
RM5	5,879	4,303	1	4	58	5,644	6,080	0,094
Independent Variables: Internal Control								
IC1	4,360	1,851	1	4	11	4,161	4,530	5,940e-05*
IC2	0,597	0,151	0,2	0,6	1	0,627	0,573	0,003*
IC3	5,726	2,411	2	5	15	5,333	6,061	1,364e-05*

	Full Sample					Sample GB	Sample PB	
Variable[1]	**Mean**	**SD**	**Min**	**Median**	**Max**	**Mean**	**Mean**	**P Value[2]**
IC4	3,724	1,068	1	3	8	3,888	3,585	0,009*
IC5	13,881	9,840	0	11,5	72	18,052	10,323	<2.2e-16*
Dependent Variables: Bank Risk Taking								
CR	0,029	0,049	0,001	0,021	1,009	0,031	0,028	0,369
LR	1,113	2,088	0,124	0,884	47,264	1,018	1,195	0,005*
OR	0,008	0,018	1,1e10-5	0,003	0,190	0,006	0,009	0,050*
Dependent Variables: Bank Performance								
ROA	0,037	0,026	0,0003	0,034	0,307	0,044	0,031	<2.2e-16*
ROE	0,155	0,145	0,0003	0,140	1,381	0,207	0,110	<2.2e-16*
NIM	0,106	0,243	0,0027	0,085	5,055	0,113	0,100	9,314e-12*
Control								
BE	17,182	41,678	0,009	2,940	293,622	19,42	15,27	0,601

[1] All variables are as defined in Appendix
[2] (*) differs significantly at a 5% confidence rate

RESULTS AND DISCUSSION

Descriptive Analysis

The present study was carried out on a sample of 60 banks, comprising 4 banks (7%) that are state-owned (*Badan Usaha Milik Negara* or BUMN), 32 Banks (53%) that are regional owned (*Badan Usaha Milik Daerah* or BUMD) and 24 banks (60%) that are private-owned banks (PB). This study will incorporate data from BUMN and BUMD Bank institutions inside a single category, specifically government-owned banks (GB). Sharia banks were not included in the study's sample due to distinctions in operational procedures, product attributes, and guiding principles that set them apart from conventional banks (Hanggraeni, 2019).

Tabel 1 report the descriptive statisctics of all variables considered, and the statistics also present the mean values of all the variables for subsample of government-owned banks (GB) and private-owned banks (PB). It was observed that the number of Risk Monitoring Committee members (RM1) is smaller than the number of Risk Management committee members (RM4) in both the complete sample, GB, and PB. This suggests that banks generally possess an understanding of the importance of risk management in their day-to-day operations. The Risk Management Committee under Board of Directors plays a vital role in ensuring the effective implementation of risk management practices in these operations. As per the Financial Services Board (FSB 2013), the Chief Risk Officer (CRO) and the risk management function bear the responsibility of overseeing the firm's risk management throughout the entirety of the business. Their primary objective is to maintain the firm's risk profile within the agreed-upon risk appetite statement (RAS), as approved by the board. The risk management role is accountable for the identification, quantification, surveillance, and suggestion of measures to regulate or alleviate hazards, as well as the provision of summaries and breakdowns of risk exposures.

The Risk Monitoring Committee has a much higher number of meetings compared to the Risk Management Committee, although having a smaller number of members. In GB, the Risk Monitoring Committee holds roughly three times more meetings than the Risk Management Committee, which is extremely remarkable. The government demonstrates its dedication as a stakeholder in the GB through its efforts to provide efficient risk management. This finding is consistent with the research conducted by Lee and Hooy (2020), which suggests that having a monitoring committee on the board of state-owned banks reduces their inclination to take risks. In the area of internal control variables The Bank has demonstrated compliance with POJK No. 17/2023 on *Penerapan Tata Kelola bagi Bank Umum*, which mandates that the independent Commissioners constitute a minimum of 50% (fifty percent) of the total Board of Commissioners members (OJK 2023). This is evidenced by the average ratio of independent Commissioners (PI2) being 59,7%. Nevertheless, the study unveiled a lack of adherence, as it

was observed that the Bank had a number of independent commissionaires below 50%, which falls below the minimal threshold (20%) as indicated in the data. Additionally, an inconsistency was identified with respect to the quantity of Commissioners. In accordance with the regulations stipulated in POJK No. 17/2023, which mandates a minimum of three Commissioners (OJK 2023), there exist banks, notably those under the ownership of the Regional Government and private banks, that possess a commissioner count of less than three. The independence parameters of the board of commissioners (IC2), number of audit committees (IC4), and audit committee meetings (IC5) are significantly higher in GB compared to other countries. The number of Commissioners (IC1) and Directorates (IC3) in the PB is significantly higher in comparison to the GB. This results is consistent with the research conducted by Dupire and Slagmulder (2019), which supports the notion that financial enterprises under state control tend to have a more autonomous Risk Committee. Additionally, it is observed that boards with greater independence tend to establish more autonomous Risk Committees.

There is no significant variance in credit risk between GB and PB. The findings of Bank in Asia Abid et al. (2021) diverge from the present analysis, since they indicate that privately owned banks exhibit notably elevated credit risk levels in comparison to government-owned banks. This observation implies that Conventional Banks in Indonesia exhibit a similar level of credit risk tolerance and are not influenced by the ownership of the bank. The distinction is evident in the examination of liquidity risk and operational risk, wherein private-owned banks exhibit notably higher risk values. This finding contradicts the results reported by Abid et al. (2021) at Bank in Asia, which indicate that Private-Owned Banks exhibit lower levels of liquidity and operating risk compared to State-owned Banks. According to the study conducted by Iannota, Nocera, and Sironi (2013), it was observed that GB exhibit lower default risk but higher operating risk compared to private banks. This finding suggests that the presence of governmental protection in GB encourages higher levels of risk-taking, which does not entirely correlate with the findings observed in Indonesian banks. Despite the presence of governmental protection, the risk taking behaviour associated with GB in Indonesia remains lower in comparison to PB.

The results indicate that GB had higher performance compared to PB in terms of ROA, ROE, and NIM variables. According to the findings of Mahdi et al. (2023), State-owned banks consistently exhibit superior performance in terms of income, profitability, and bank health when compared to both national private banks and international private banks. Young (2017) explain that multicollinearity refers to the occurrence of correlation across components inside multiple regression models. A Pearson correlation coefficient indicating a substantial presence of multicollinearity is seen, with a value approaching 0.8. The Pearson's Pairwise Correlation analysis results in Table 2 indicate that all coefficient values are below 0.8, suggesting a low likelihood of collinearities.

Variance Influence Factor (VIF) analysis is conducted to verify multicollinearity. According to Belsely (1991), variables with VIF coefficients over 10 exhibit significant relationships. The VIF result is displayed in Table 3, indicating that all coefficient values in the VIF analysis are below 10. This suggests that there are no collinearities in the data, allowing for the examination of the linear regression model.

Tabel 2. Pearson Pairwise Correlation Matrix

Variables[1]	RM1	RM2	RM3	RM4	RM5	IC1	IC2	IC3	IC4
RM1	1,00								
RM2	-0,35	1,00							
RM3	0,06	0,07	1,00						
RM4	0,08	-0,01	0,01	1,00					

RM5	0,14	-0,15	0,05	0,03	1,00				
IC1	0,66	-0,22	0,15	0,07	0,19	1,00			
IC2	-0,14	0,12	0,11	-0,12	-0,07	-0,27	1,00		
IC3	0,58	-0,17	0,11	0,14	0,20	0,61	-0,24	1,00	
IC4	0,70	-0,28	0,19	0,08	0,11	0,51	-0,05	0,46	1,00
IC5	0,01	0,15	0,72	0,06	-0,01	0,16	0,07	0,20	0,10
CR	-0,13	-0,02	0,04	0,04	-0,11	0,11	-0,01	0,06	0,09
LR	0,00	0,02	-0,03	-0,04	-0,01	-0,07	0,04	-0,08	0,00
OR	-0,01	-0,02	-0,06	-0,04	-0,02	-0,01	0,01	-0,08	0,01
ROA	0,10	0,00	0,16	0,06	0,05	0,18	0,02	0,16	0,13
ROE	-0,02	-0,05	0,13	0,08	0,10	-0,05	0,08	-0,04	0,07
NIM	0,00	0,08	-0,01	-0,02	0,12	0,01	0,01	0,00	-0,04
BT	0,10	0,00	-0,46	-0,07	0,05	0,10	-0,18	0,15	-0,14
BE	0,43	-0,08	0,21	0,03	0,13	0,62	-0,08	0,72	0,41
	IC5	**CR**	**LR**	**OR**	**ROA**	**ROE**	**NIM**	**BT**	**BE**
IC5	1,00								
CR	0,02	1,00							
LR	-0,02	0,17	1,00						
OR	-0,07	0,26	0,01	1,00					
ROA	0,14	0,34	0,06	0,52	1,00				
ROE	0,16	0,04	-0,04	0,33	0,52	1,00			
NIM	-0,02	0,71	0,01	0,01	0,14	0,02	1,00		
BT	-0,39	-0,03	0,04	0,08	-0,25	-0,33	-0,03	1,00	
BE	0,18	0,11	-0,04	-0,06	0,27	0,01	0,08	-0,05	1,00

[1] All variables are as defined in Appendix

Tabel 3. Variance Infuence Factor (VIF)

Variables[1]										
RM1	**RM2**	**RM3**	**RM4**	**RM5**	**IC1**	**IC2**	**IC3**	**IC4**	**PI5**	**BT**	**BE**
2,813	1,222	2,485	1,069	1,067	3,725	1,159	4,556	2,222	2,470	1,552	2,347

[1] All variables are as defined in Appendix

Tabel 4. Regression Results For The Link Between Risk Management, Internal Control, Bank Risk-Taking Behaviour, And Performance (All Sample)

Variables[1]	**CR**	**LR**	**OR**	**ROA**	**ROE**	**NIM**
RM1	- 0,007	- 0,117	- 5,548e-04	4,593e-04	-1,324e-03	0,016
	(0,002***)	(0,146)	(0,280)	(0.365)	(0,428)	(0,099*)
RM2	- 0,020	0,212	1,153e-03	4,657e-03	-0,032	0,123
	(0,029**)	(0,324)	(0,383)	(0,187)	(0,148)	(0,010**)
RM3	2,186e-04	-5,885e-03	-7,084e-05	-5,677e-05	1,664e-03	-1,964e-03
	(0,263)	(0,350)	(0,282)	(0,367)	(0,043**)	(0,124)
RM4	2,893e-04	-6,795e-03	-2,392e-04	3,085e-04	1,371e-03	-9,188e-04
	(0,229)	(0,343)	(0,054*)	(0,069*)	(0,110)	(0,316)
RM5	-1,510e-03	1,295e-03	2,075e-04	2,666e-04	4,238e-03	7,891e-03
	(0,002***)	(0,478)	(0,144)	(0,162)	(0,003**)	(0,001**)
IC1	2,723e-03	-0,087	8,345e-03	1,625e-03	-2,914e-03	4,803e-03
	(0,121)	(0,192)	(0,170)	(0,092*)	(0,331)	(0,337)
IC2	6,874e-03	-0,019	1,728e-03	2,670e-03	0,017	0,024
	(0,320)	(0,488)	(0,371)	(0,354)	(0,341)	(0,367)
IC3	-4,130e-03	-0,105	-1,170e-04	-1,809e-04	-1,391e-03	-0,014
	(0,015**)	(0,103)	(0,049**)	(0,427)	(0,399)	(0,063*)
IC4	-1,308e-03	0,110	5,093e-04	2,644e-04	4,044e-03	-0,019
	(0,333)	(0,200)	(0,324)	(0,432)	(0,319)	(0,098*)

Variables[1]	CR	LR	OR	ROA	ROE	NIM
IC5	1,933e-04	0,012	-2,443e-05	2,615e-05	1,465e-03	4,368e-05
	(0,283)	(0,200)	(0,421)	(0,438)	(0,061*)	(0,489)
BT	- 3,503e-03	0,339	2,783e-03	-1,333e-02	-0,097	-0,030
	(0,310)	(0,100)	(0,145)	(5e-03***)	(5,591e-08***)	(0,159)
BE	0,012	0,177	-2,053e-04	1,010e-02	5,859e-03	0,101
	(0,072*)	(0,306)	(0,473)	(0,009***)	(0,400)	(0,006***)

[1] All variables are as defined in Appendix
Z-statistics in parentheses. *p < 0.10; **p < 0.05; ***p < 0.01.

Tabel 5. Regression Results For The Link Between Risk Management, Internal Control, Bank Risk-Taking Behaviour, And Performance (GB Sample)

Variables[1]	CR	LR	OR	ROA	ROE	NIM
RM1	- 0,012	- 0,099	-1,793e-03	2,155e-03	-0,013	0,069
	(0,012**)	(0,048**)	(0,077*)	(0.108)	(0,114)	(0,003***)
RM2	- 0,013	0,151	4,626e-03	1,458e-03	-0,062	0,068
	(0,249)	(0,225)	(0,136)	(0,403)	(0,048**)	(0,219)
RM3	-4,690e-05	1,267e-03	-1,265e-04	-1,587e-04	1,876e-03	-1,018e-03
	(0,463)	(0,406)	(0,129)	(0,158)	(0,032**)	(0,333)
RM4	- 1,057e-03	0,012	- 2,671e-04	2,871e-04	3,832e-03	3,009e-03
	(0,058*)	(0,109)	(0,089*)	(0,125)	(0,002***)	(0,172)
RM5	2,775e-03	0,011	1,888e-04	6,734e-04	1,019e-03	0,015
	(0,003***)	(0,194)	(0,251)	(0,030**)	(0,304)	(0,006***)
IC1	1,698e-03	-0,012	2,975e-04	-1,150e-04	-8,689e-03	2,670e-03
	(0,346)	(0,411)	(0,395)	(0,469)	(0,157)	(0,447)
IC2	-6,855e-03	-0,040	-3,400e-03	-9,635e-04	0,016	0,020
	(0,378)	(0,432)	(0,244)	(0,444)	(0,355)	(0,422)
IC3	-6,528e-03	-0,040	-1,408e-03	-9,781e-04	-8,763e-03	-0,037
	(0,069*)	(0,205)	(0,085*)	(0,246)	(0,161)	(0,036**)
IC4	-4,257e-03	-0,034	1,476e-03	1,671e-03	8,404e-03	-0,044
	(0,235)	(0,308)	(0,148)	(0,195)	(0,239)	(0,056*)
IC5	8,788e-05	1,878e-03	9,346e-05	1,459e-04	1,441e-03	1,003e-03
	(0,431)	(0,368)	(0,212)	(0,185)	(0,078*)	(0,336)
BE	0,017	-0,057	6,148e-03	0,017	0,062	0,044
	(0,160)	(0,398)	(0,096*)	(0,002***)	(0,038**)	(0,295)

[1] All variables are as defined in Appendix
Z-statistics in parentheses. *p < 0.10; **p < 0.05; ***p < 0.01.

Tabel 6. Regression Results For The Link Between Risk Management, Internal Control, Bank Risk-Taking Behaviour, And Performance (PB Sample)

Variables[1]	CR	LR	OR	ROA	ROE	NIM
RM1	- 3,135e-03	0,179	1,400e-03	1,766e-03	8,281e-03	-0,01
	(0,085*)	(0,195)	(0,157)	(0.191)	(0,212)	(0,054*)
RM2	6,583e-03	0,275	2,412e-03	9,080e-03	-1,930e-03	0,127
	(0,264)	(0,339)	(0,357)	(0,168)	(0,484)	(0,008**)
RM3	-1,387e-03	-0,016	-1,145e-04	7,347e-05	-1,223e-03	-3,458e-03
	(0,411)	(0,393)	(0,383)	(0,446)	(0,333)	(0,141)
RM4	2,944e-03	-0,022	1,429e-04	1,979e-04	-7,350e-04	-3,570e-03
	(0,194)	(0,243)	(0,233)	(0,257)	(0,318)	(0,024**)
RM5	2,417e-03	-0,011	2,451e-04	3,391e-05	5,977e-03	9,508e-04

Variables[1]	CR	LR	OR	ROA	ROE	NIM
	(0,283)	(0,389)	(0,183)	(0,464)	(0,001***)	(0,332)
IC1	1,718e-03	-0,155	1,812e-03	3,197e-03	1,274e-03	8,828e-03
	(0,204)	(0,206)	(0,075*)	(0,041**)	(0,446)	(0,214)
IC2	6,716e-03	-0,111	0,019	1,060e-02	0,082	-0,098
	(0,362)	(0,476)	(0,070*)	(0,267)	(0,184)	(0,157)
IC3	-1,536e-03	-0,147	-1,339e-03	5,124e-05	-2,188e-03	4,567e-03
	(0,156)	(0,147)	(0,078*)	(0,485)	(0,378)	(0,285)
IC4	2,556e-03	0,248	2,428e-04	5,202e-04	8,04e-03	0,013
	(0,164)	(0,160)	(0,443)	(0,412)	(0,258)	(0,178)
IC5	3,653e-04	0,046	2,851e-04	-4,824e-04	1,945e-03	1,626e-03
	(0,193)	(0,120)	(0,136)	(0,098*)	(0,156)	(0,232)
BE	3,900e-03	0,260	1,423e-04	0,015	1,086e-03	0,180
	(0,282)	(0,341)	(0,487)	(0,007***)	(0,486)	(3,165e-07***)

[1] All variables are as defined in Appendix
Z-statistics in parentheses. *p < 0.10; **p < 0.05; ***p < 0.01.

Hypothesis Analysis

Table 4 provides a comprehensive analysis of the impact of risk management and internal controls on the Bank's propensity for taking risks and its overall performance. The findings pertaining to the sample GB are mostly displayed in Table 5, whereas Table 6 focuses mainly on the sample PB. This paper provides a thorough examination of the coefficients pertaining to the impact of risk management and internal control on risk behaviour and bank performance. In addition, the symbol "( )" is employed to emphasize the statistical significance (p-value) of the data acquired from the statistical analysis of effect.

The examination of the full sample revealed that risk management variables had an impact on both credit and operational risk. The credit risk is significantly negatively influenced by the number Risk Monitoring Committee member (RM1), the independence of the Risks Monitoring Committee (RM2), and the frequency of Risk Management Committee (RM5) meetings. Similar findings were observed in the GB sample, wherein the number of Risk Monitoring Committee (RM1), the level of independence from the Risks Monitoring Committee (RM2), and the frequency of Risk Management Committee (RM5) meetings exhibited a negative and statistically significant impact on credit risk. Contrary to the overall conventional bank sample, the GB sampling revealed that the number of the Risk Monitoring Committee (RM1) had an influence on both liquidity risk and operational risk in the GB samples.

In the PB sample, only the number of Risk Monitoring Committee (RM1) had a negative and significant impact on credit risk. The findings from the analysis conducted on the PB sample indicate that there was no significant impact of the overall risk management variable on liquidity risk and operational risk. The results indicate that the initial hypothesis, which suggests a negative correlation between risk management and risk taking in Indonesian Banks, was confirmed across all banks in the sample. This was particularly evident in the parameter number of Risk Monitoring Committee members (RM1), the independence of the Risks Monitoring Committee (RM2), and the frequency of the Risk Management Committee (RM5), particularly in relation to Credit Risk.

This observation is consistent with the research undertaken by Abid et al. (2021), which demonstrates a negative correlation between the existence of a risk committee (RC) and credit risk (CR), liquidity risk (LR), and operational risk (OR). These findings also align with previous research conducted by Aljughaiman & Salama (2019) and Malik et al. (2021), indicating that risk committees enhance the quality of governance and reduce bank risk-taking.

POJK regulations regarding liquidity risk are outlined in POJK No. 42 /POJK.03/2015, which addresses the Bank responsibility for maintaining a sufficient liquidity coverage ratio.

The regulatory authority mandates that the Bank furnish both the minimum capital requirement (*modal minimum*) and supplementary capital (*modal penyangga*) as a contingency measure. The supplementary capital consists of three components which are (1) the Capital Conservation Buffer, which is established at 2.5% of the risk weighted capital (*Asset tertimbang manajemen risiko*, ATMR); (2) the Countercyclical Buffer, which ranges from 0% to 2.5% of risk weighted capital; and (3) the Capital Surcharge for Systemic Banks, which is set between 1% and 2.5% of risk weighted capital (OJK 2015). The implementation of stringent regulations pertaining to the minimum capital requirement for banks has the potential to ensure that all conventional banks examined in this study had adequate capital, hence mitigating the impact of risk management variables on the liquidity risk of the banks.

An examination of the role of risk management on Bank performance reveals that various risk management characteristics have an impact on the Bank performance (Table 4). The NIM is positively and significantly influenced by the number of members in the Risk Monitoring Committee (RM1) and the Risk Monitoring Independence Committee (RM2). The frequency of meetings held by the Risks Monitoring Committee (RM3) has a notable and favourable influence on Return on Equity (ROE), however the quantity of members in the Risk Management Committee (RM4) influences ROA. The Risk Management Committee meeting (RM5) strongly and positively affects the Return on Equity (ROE) and Net Interest Margin (NIM).

The GB sample (Table 5) yielded comparable findings, indicating that the variables RM1, RM2, RM3, RM4, and RM5 had a favourable and statistically significant impact on the bank's performance. Only the risk management factors had a positive impact on NIM and ROE in the PB sample. The performance of privately-owned banks (Table 6) is not influenced by the frequency of meetings held by the Risk Monitoring Committee (RM3). This outcome is consistent with the findings of Kacem and Harbi (2022), who propose that banks with a substantial risk committee tend to exhibit enhanced performance indicators such as ROA and ROE. A study conducted by Battaglia and Gallo (2015) indicates that there are positive associations between the risk committee, and both return on equity (ROE) and return on assets (ROA). The findings show that banks with larger risk committees tend to exhibit superior profitability. The findings of this investigation support the acceptance of the second hypothesis, which posits that risk management has a favourable impact on the performance of banks.

The impact of internal control parameters on bank risk-taking behaviour is constrained to the number of directions (IC3). Within the whole sample of banks (Table 4), IC3 exhibits a statistically significant negative influence on both Credit Risk and Operational Risk. Similar results were observed in the GB sample (Table 5). The impact of internal controls on PB sample (Table 6) is limited to operational risk, specifically in relation to the parameters of the number of commissioners (IC1), number of independent commissars (IC2), and number of directions (IC3). The findings of the investigation also indicate that the internal control factors do not have an impact on liquidity risk. These findings align with the examination of how risk management affects the liquidity risk of banks. When liquidity coverage restrictions are in place, as specified by the Financial Authority Services, it motivates banks to mitigate their liquidity risk. Consequently, the impact of risk management and internal controls on risk mitigation is not deemed significant. Hence, the acceptance of the third hypothesis pertaining to the influence of internal control on bank risk-taking behaviour is contingent upon the availability of Directors variables that specifically affect credit risk and operational risk.

The analysis revealed that the number of Commissionaires (IC1) has a significant beneficial effect on ROA, while the number of audit committee (IC5) meetings has a considerable positive effect on ROE. The consistency of this observation is shown across all Bank samples (Table 4) and GB (Table 5). Only the number of Commissionaires (IC1) has an impact on the ROA for PB (Table 6). This finding is consistent with the research undertaken

by Koutopis and Malisiovas (2023), which indicates that the number of board members has a notable impact on the profitability of banks.

The findings of this study indicate that board independence (IC2) does not have a significant impact on either dimension of bank performance or bank risk taking behaviour. This finding contradicts the results of Kacem and Harbi's (2022) study, which demonstrated a favourable relationship between independence from the Board and ROE. The reason for this could be attributed to the regulations set by the OJK, which stipulate that the Bank must have a minimum of 50% independent Board of Commissioners, as stated in POJK number 55/POJK.2016 on Bank's Governance (OJK 2015). The statistical analysis conducted in Table 1 revealed an average independence attainment of 59.7%. This indicates that a significant proportion of the Bank has adhered to the specified conditions and does not exert a substantial influence on bank risk-taking behaviour and performance.

The investigation findings also revealed several adverse effects of internal control on the performance of banks. This phenomenon is particularly evident in the variables of Number of Directors (IC3) and Number of Audit Committee (IC4) across all banks included in the sample. According to GB. Eisenberg et al (1998), the size of the Board of Directors can potentially have a detrimental impact on the Bank's performance. This is primarily attributed to the challenges faced by the Bank in decision-making, which arise from difficulties in coordination and communication.

Based on the analysis conducted, it is not possible to fully accept the fourth hypothesis that posits a positive relationship between internal control and banks' performance. This is due to the presence of various variables within internal control that have a negative impact on bank performance. The overall research reveals that the variables related to risk management and internal control have a more significant impact on GB (Table 5) and PB (Table 6). The collective results of the subsample analysis suggest that there is considerable variation in the quality of risk governance procedures between SOBs and POBs. Risk governance measures have been found to be more successful in decreasing risk and enhancing financial performance in the context of Great Britain. This finding contrasts with the results reported by Abid et al. (2021), which indicate that risk governance measures are more efficacious in mitigating risk and enhancing financial performance in privately held banks compared to government-owned banks. The analysis result show that even government-owned banks in Indonesia exhibit a higher degree of governmental protection (Iannota, Nocera, and Sironi, 2013) these banks demonstrate a significant level of independence and impartiality in their risk oversight tasks.

CONCLUSION

Indonesian government through the Financial Services Authority has implemented various regulations pertaining to conventional banks in the country. The primary aim of this law is to enhance the governance of banks, minimize and alleviate risk, and enhance the performance of banks.

This study aims to enhance our comprehension of the influence of risk management and internal control on risk-taking behaviour and performance within Indonesian banks, encompassing both government-owned and privately-owned institutions. This study demonstrates that risk management variables have a substantial impact on reducing credit risk and operational risk. Additionally, internal control variable specifically by the number of Directors consistently contributes to the reduction of credit risk and operational risk. Risk management variables and internal control variables use in this study do not have an impact on liquidity risk. This is likely a result of the implementation of regulations on liquidity coverage ratio in banks.

This study also revealed that risk management variables have a favourable impact on the performance of banks. However, it was observed that only the number of board of

commissioners has a statistically significant positive effect on both the overall bank sample and privately held banks. Additionally, it is important to highlight that this study identified many detrimental impacts of internal control on the performance of banks, with internal control significantly diminishing performance (NIM).

The analysis results also indicate that the variables pertaining to risk management and internal control exert a more pronounced influence on government-owned banks in comparison to pr-owned banks. In summary, our findings support the idea that risk reduction mechanisms drive banks to implement cautious risk management practices, which in turn impact bank performance.

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