

Does corporate governance affect bank risk management? Case study of Indonesian banks

Corporate
governance
and bank risk
management

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Abstract

Purpose – The purpose of this study is to examine the relationship between corporate governance and risk management of Indonesian banks.

Design/methodology/approach – Implementation of good corporate governance is measured by good corporate governance composite rating, which is the result of bank's self-assessment. Bank risk managements are measured by market risk, credit risk, liquidity risk and operational risk.

Findings – The study results showed that good corporate governance implementation in Indonesia was able to influence bank risk. There were differences in credit risk, liquidity risk and operational risk in banks with different governance ratings, but not at market risk.

Originality/value – The effectiveness of risk management and good corporate governance implementation is needed to enable banks to identify problems early, to follow up on rapid improvements and to be more resilient to crises. This study is an analysis of the relationship between corporate governance and banks' risk management in Indonesia. In particular, risk management is measured by four risks: market risk, credit risk, liquidity risk and operation risk.

Keywords Corporate governance, Risk management, Market risk, Credit risk, Liquidity risk, Operational risk

Paper type Research paper

1. Introduction

Through the previous years, not a few researchers and practitioners are already loyal to good corporate governance (GCG) practices in the corporate, government or education sectors. Research on corporate governance practices has been widely practiced, but the results also vary. It must be admitted that the practice of corporate governance cannot be equated between countries, even between companies will certainly have its uniqueness. Some researchers have evolved measurements of corporate governance variables to get the best measurements that assess the effectiveness of their implementation. In many countries, it also gives special ratings or predicates that reward corporate governance best practices.

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Declaration: The effectiveness of risk management and good corporate governance implementation is needed to enable banks to identify problems early, to follow up on rapid improvements and to be more resilient to crises.

Funding: There's no specific funding in this research.

Availability of data and material: The author used corporate governance as independent variable and bank risk management as dependent variable. Risk management was measured by four risks, that is, market risk, credit risk, liquidity risk and operational risk.

Code availability: The software used is SPSS statistical software.

Conflict of interest: The author declares that there's no conflict of interest.



Measured by GIM, good governance according to [Bhagat and Bolton \(2008\)](#) has a positive effect on companies' performance. The GIM index constructed by [Gompers et al. \(2003\)](#). [La Porta et al \(2000\)](#) states that corporate governance is to a huge degree a set of instruments through which exterior financial specialists secure themselves against confiscation by the insiders. In general, corporate governance deals with ownership and control. The agency problem to be solved by corporate governance mechanisms between shareholders and managers, between majority and minority shareholders and between shareholders and other stakeholders encourages the need for an effective and reliable corporate governance control mechanism. Corporate governance in one form has mechanisms to protect investors. In many countries, investor protection is very important because of the overt acquisition creditors and minority shareholders by the controlling shareholder ([La Porta et al., 2000](#)).

Since the 1980s, financial markets have experienced rapid innovation and internationalization of financial flows. In this case, banks as financial intermediation institutions are more exposed to financial, operational and environmental risks. In the late 1980s, margins obtained by traditional banking businesses began to wane and capital adequacy requirements increased. Within the face of strong competition within the keeping money industry, banks are increasingly innovating and incorporating new business areas that focus on superior information and knowledge management capabilities.

The rapidly expanding internal and external environment of the banking system and the increasingly complex risk of banking business activities require GCG practice and risk management, thus mitigating risk from an early basis. GCG practices and risk management for banks can increase shareholder value and for regulatory authorities will facilitate an assessment of possible losses faced by banks that may affect bank capital and as a basis for valuation in setting strategy and focus of bank supervision.

Bank failures can stem from manager behavior or compensation contracts. Manager incentives may conflict with shareholders and creditors. Agency problems may arise from excessive salaries, inadequate risk management efforts or risk shifts from creditors to shareholders ([Calomiris and Carlson, 2016](#)). Their study used a proprietary structure, a corporate governance structure, equipment for managing risk, the level of risk in national banks. They linked different ownership structures (specifically the level of managerial ownership), a comparison in industrial governance policies, risk outcomes and banks' approaches to risk management, listed their portfolio structure options. The results showed that different bank conditions could result in the determination of managerial compensation as well as inheritance structure and bank obligations. Banks that support concentrated administrative proprietorship tend to have greater managerial compensation, the risk of debt default paying off, greater cash holdings and lower proportion of debt in capital. About risk management, [Chen and Ling \(2016\)](#) found that various risks faced by banks, such as interest liquidity risk, rate risk and credit risk, are related to each other, but these interactions can be moderated through corporate administration and administrative instruments.

Our study attempts to look at the relationship between corporate governance and risk management of Indonesian banks. This study is contributing to the existing little literature. Implementation of corporate governance was measured by governance composite rating, which is the result for self-assessment by the bank. While bank risk management was measured by four risks that can be measured quantitatively: operational risk, market risk, liquidity risk and credit risk.

2. Literature review

2.1 Agency theory

Office hypothesis considers that corporate administration as an "operator" for shareholders will act with full mindfulness for its interface, not as an astute and reasonable shareholder as expected within the stewardship demonstrate. Office hypothesis considers that

administration cannot be trusted to act as well as conceivable for the open intrigued in common or shareholders in specific.

In subsequent developments, agency theory received a broader response because it was seen as more reflective of the reality. Various thoughts on corporate governance evolve with agency theory where the administrations of a company must be administered and controlled to guarantee that administration is carried out in full compliance with pertinent rules and directions. This effort generates agency costs, which according to this theory should be issued in such a way that the cost of reducing losses incurred by noncompliance rises to the increment in authorization costs.

Agency cost includes the costs of supervision by shareholders, costs incurred by management to produce transparent reports, including independent audit fees and internal controls and the costs incurred by the decline in shareholder value as a form of “bonding expenditures” granted to management in the form of options and benefits to align management interests with shareholders. Nevertheless, the potential for the emergence of agency problems persists because of the separation between management and company ownership, especially in public companies.

2.2 Corporate governance and risk management for commercial banks

The increasing complexity of risks faced by banks will create an increasing need for corporate governance practices by banks. To enhance the efficiency of the bank, strengthening the compliance and protecting stakeholders' interest with regulations and ethical standards relevant to the banking industry, good corporate governance is required. Within the hypothesis of GCG, performing artists in government include the state government, open division and private division (Fernandes and Fresly, 2017). Improving the standard of execution of corporate governance is one of the initiatives pointed at moving forward the inside state of the keeping money framework.

Execution of corporate administration standards is at the slightest realized in (1) execution of obligations and duties of executives and board of commissioners; (2) completeness and execution of obligations of committees and working units that perform internal control functions; (3) implementation of compliance function, internal audit and external audit; (4) implementation of risk management; (5) arrangement of stores to related parties and arrangement of significant reserves; (6) a vital arrange; and (7) straightforwardness of money-related and nonfinancial conditions. Therefore, in a situation of a planned top-down strategic change in government, what is needed is learning flow from the organization to the individuals (Limba *et al.*, 2019).

Bank is required to conduct its own assessment of its soundness using a risk-based bank rating (RBBR), both individually and in consolidation, which includes, among others, the assessment of corporate governance factors. GCG is one instrument to strengthen internal conditions of national banking. Therefore GCG is a prerequisite for sustainability bank (Binhadi, 2007). With endeavors to move forward the quality of administration and operations of the bank by reinforcing GCG from 2004 to 2006, BI developed a Bank Regulation Indonesia (PBI) concerning GCG as one standard for minimum GCG implementation for commercial banks. On the January 30, 2006, Governor of BI signed the PBI Number 8/4 / PBI / 2006 concerning implementation of GCG for commercials bank. Implementation of corporate governance in banking industry should always be based on five basic principles of transparency, accountability, responsibility, independence and fairness. To guarantee the operation of the fundamental standards of corporate administration, banks should conduct periodic self-assessment that at least includes 11 factors for the assessment of governance implementation: (1) execution of the obligations and duties of the board of chiefs; (2) execution of the obligations and duties of the executives; (3) execution and completion of

the obligations of the board; (4) dealing with clashes of intrigued work; (5) execution of the compliance work; (6) execution of the inner review work; (7) execution of the outside review work; (8) execution of chance administration counting inside control framework; (9) conveyance of reserves to relates parties and nitty gritty exposures; (10) divulgence of banks' budgetary and nonfinancial conditions, GCG execution reports and inner announcing; and (11) strategic plan. In addition, other information related to governance implementation beyond the 11 assessment factors of governance implementation should be considered, such as problems arising from the impact of remuneration policy on a bank or internal bank disputes that disrupt the operational and/or business continuity of the bank. For example, the determination of bonuses based on the achievement of targets at the end of the year, where targeting is very high (ambitious), resulting in unhealthy practices by management or bank employees in achievement.

Global financial crisis has prompted the need to improve the effectiveness of risk management and governance implementation so that banks are capable of finding issues early, following up on timely and swift progress and becoming more resilient to crisis situations. Based on Bank Indonesia direction concerning the rating of well-being of commercial banks utilizing hazard approach, the appraisal of administration execution is assembled into an administration framework comprising of three perspectives of administration, to be specific administration structure, administration handle and administration result.

In an effort to improve the quality of governance implementation, banks are required to periodically conduct their own comprehensive assessment of the adequacy of governance implementation, so that banks can immediately establish action plan, which includes corrective action needed if there is still deficiency in the implementation of governance. The use of digital technologies should be guided by an overarching policy to help ensure strategic coherence across the administration. In order to apply the principle of transparency, banks are required to yield reports on the usage of governance and for banks that already have a homepage must also inform the bank's homepage.

According to [Tunggal \(2013\)](#), GCG may be a framework that regulates, manages and supervises commerce control forms to extend share esteem, as well as a form of attention to stakeholders, employees and surrounding communities. Self-assessment of governance factors is an appraisal of bank administration on the execution of administration standards. Each rating factor is ranked according to a comprehensive and structured analysis framework. The determination of governance ranking is undertaken based on a comprehensive and structured analysis of the results of the assessment of the implementation of governance principles and other information related to bank governance. Governance rankings are categorized into five ratings, Ranks 1–5. The smaller GCG ranking rank order reflects better governance implementation.

Risk is a possible failure as a result of a specific event. Risk management is a collection of methodologies and procedures used to define, calculate, track and regulate risks that occur from all of a bank's business activities. Risks that can expose banks include market risk, credit risk, liquidity risk, compliance risk, operational risk, reputation risk, strategic risk and legal risk. Banks are required to apply chance administration viably. Implementation of risk management includes at least: (1) active supervision of the board of directors and board of commissioners; (2) the adequacy of risk management policies and procedures and the determination of risk limits; (3) adequacy of risk identification, measurement, monitoring and control processes and risk management information systems; and (4) a comprehensive internal control system. In order to implement effective risk management processes and systems, banks are required to help chance administration committees and hazard administration units. Banks are moreover required to yield a chance profile to FSA (Financial Services Authority). It may assess the application of risk management to banks and banks shall provide information and data relating to implementation of risk management to FSA.

Chen and Ling (2016) analyzed the part of corporate governance relation to credit risk, interest rate risk and liquidity risk faced by banks. The results indicated that interest rate risk, liquidity risk and credit risk are interrelated and that these interactions can be mitigated through corporate governance and regulation. Meanwhile, De Andres and Vallelado (2008) measured corporate governance mechanisms through the composition and size of the board of commissioners. The part of the boards of commissioner relates to the ability of the boards of commissioner to oversee and provide management advice, and the larger portion of independent commissioners proves to be more efficient in monitoring and advising functions and creating more corporate value. Our study attempts to examine the relationship between corporate governance and risk management of Indonesian banks. Implementation of corporate governance was measured by governance composite rating, which is the result for self-assessment by the bank. While bank risk management was measured by four risks that can be measured quantitatively, that is, credit risk, market risk, operational risk and liquidity risk.

Based on the aforementioned research, the hypotheses that can be developed in this research are:

- H1. Corporate governance affects market risk.
- H2. Corporate governance affects credit risk.
- H3. Corporate governance affects liquidity risk.
- H4. Corporate governance affects operational risk.

3. Methodology

3.1 Research method

We used corporate governance as independent variable and bank risk management as dependent variable. Risk management was measured by four risks, that is, credit risk, market risk, operational risk and liquidity risk.

Market risk is the risk on administrative accounts and balance sheet positions including derivative transactions, due to changes in market conditions, including the risk of changes in option prices. Market risks include, among others, exchange rate risk, interest rate risk, commodity risk and equity risks. Market risks was measured by:

$$\text{Market Risk} = \frac{\text{Total Derivatives}}{\text{Total Assets}}$$

Credit risk is the risk due to the failure of the debtor and/or other party in fulfilling the obligation to the bank. Credit risk is generally found in all bank activities whose performance depends on the performance of counterparty, the issuer or the borrower's performance. Credit risk was measured by:

$$\text{Credit Risk} = \frac{\text{Non Performing Loan}}{\text{Total Loans}}$$

Liquidity risk is a risk due to inability of bank to meet the obligations due from sources of cash flow financing and/or of high-quality liquid assets that can be mortgaged, without disrupting the activity and financial condition of the bank. Liquidity risk was measured by:

$$\text{Liquidity Risk} = \frac{\text{Total Liquid Assets}}{\text{Total Deposits}}$$

Operational risk is the chance due to insufficiency and/or nonfunctioning of inner forms, human mistake, framework disappointment and/or the presence of outside occasions influencing the bank operations. Operational risk was measured by:

$$\text{Operational Risk} = \frac{\text{Risk Weighted Assets for Operational Risk}}{\text{Total Assets}}$$

Corporate governance was measured by governance composite rating. The determination of the GCG factor ranking was based on a comprehensive and structured analysis of the results of implementation of governance principles of commercial banks and other information related to GCG.

3.2 Research model

We used MANOVA (Multivariate Analysis Of Variance) to test hypothesis. MANOVA is a statistical test to measure the influences of categorical independent variables on multiple dependent variables at the same time on quantitative data scale (Fernandes and Fresly, 2017). We propose our model as follows:

$$\text{Market Risk}_{it} = a_1 + b_1 \text{Corporate Governance}_{it} + e_{1it}$$

$$\text{Credit Risk}_{it} = a_2 + b_2 \text{Corporate Governance}_{it} + e_{2it}$$

$$\text{Liquidity Risk}_{it} = a_3 + b_3 \text{Corporate Governance}_{it} + e_{3it}$$

$$\text{Operational Risk}_{it} = a_4 + b_4 \text{Corporate Governance}_{it} + e_{4it}$$

3.3 Data sources and sample

The sample utilized in this study is all of Indonesian banks during the period of 2010–2016, which has derivative transactions. Data sources were obtained from annual report and bank financial statements. From the determination of samples, then we obtained a sample of 106.

4. Results and discussions

We obtained the distribution of the number of banks with GCG composite ratings of 1–3 (Table 1) because the smaller GCG ranking order reflects better governance implementation. For number of banks with GCG rank 1, there are 32 firm-years; rank 2 there are 68 firm-years; and rank 3 there are 6 firm-years.

Box's test is used to test MANOVA assumptions that require that the covariance/variance framework of the subordinate variable is the same (Fernandes and Panjaitan, 2019). It can be seen in Table 2 that Box's M test esteem is 206,674 and F -test esteem is 8,267 with 0.000 centrality level distant underneath 0.05 so the invalid theory that covariance/variance network is the same is rejected. This implies that the covariance/variance lattice of the subordinate variable is diverse. The results of this test contradict MANOVA assumption; however, although the F -test yields robust value despite violating MANOVA assumption, analysis can still be continued.

Table 1.
Between-subjects
factors

		<i>N</i>
CG	1	32
	2	68
	3	6

The multivariate test in Table 3 is used to test whether corporate governance factors influence a group of dependent variables (credit risk, market risk, operational risk, liquidity risk). This study uses four groups of dependent variables, then we use Wilks' lambda test. Wilks' lambda is a probability distribution used in multivariate hypothesis testing, especially with regard to the likelihood-ratio test and MANOVA. Wilks' lambda distribution is defined from two independent Wishart distributed variables as the ratio distribution of their determinants (Kanti *et al.*, 1979). Wilks' lambda multivariate test results showed *F*-test value of 3.596 and significance at 0.001. This means that there is a relationship between corporate governance with the four dependent variables (credit risk, market risk, operational risk, liquidity risk).

Table 4 shows the results of the variance test of each dependent variable. MANOVA expects that each subordinate variable has the same fluctuation through Levene's test. Levene's test is an inferential statistic used to assess the equality of variances for a variable calculated for two or more groups (Levene, 1960). If the value of significance is above 0.05, then the subordinate variable has the same change. Levene's test showed that only credit risk

Box's <i>M</i>	206.674
<i>F</i>	8.267
df1	20
df2	670.958
Sig.	0.000

Note(s): Tests the invalid speculation that the watched covariance lattices of the subordinate factors are break even with over bunches
a. Design: Intercept + CG

Table 2.
Box's test of equality of covariance matrices^a

Effect		Value	<i>F</i>	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	0.748	74.388 ^b	4.000	100.000	0.000
	Wilks' Lambda	0.252	74.388 ^b	4.000	100.000	0.000
	Hotelling's Trace	2.976	74.388 ^b	4.000	100.000	0.000
	Roy's Largest Root	2.976	74.388 ^b	4.000	100.000	0.000
CG	Pillai's Trace	0.248	3.567	8.000	202.000	0.001
	Wilks' Lambda	0.764	3.596 ^b	8.000	200.000	0.001
	Hotelling's Trace	0.293	3.625	8.000	198.000	0.001
	Roy's Largest Root	0.224	5.650 ^c	4.000	101.000	0.000

Note(s): a. Design: Intercept + CG
b. Exact statistic
c. The statistic is an upper bound on *F* that yields a lower bound on the significance level

Table 3.
Multivariate tests^a

	<i>F</i>	df1	df2	Sig.
Market_Risk	5.007	2	103	0.008
Credit_Risk	1.665	2	103	0.194
Liquidity_Risk	5.104	2	103	0.008
Operational_Risk	17.719	2	103	0.000

Note(s): Checks the null hypothesis that the dependent variable's variance in error is equal among classes
a. Design: Intercept + CG

Table 4.
Levene's test of equality of error variances^a

variables have the same variance because of the value of significance above 0.05, while the market risk, liquidity risk and operational risk variables have significance below 0.05 (different variance). This violates MANOVA's assumptions. Although the assumption of the same variance is violated, MANOVA is still robust so the analysis can continue.

Analysis of variance (ANOVA) is a collection of statistical models and their associated estimation procedures (such as the "variation" among and between groups) used to analyze the differences among group means in a sample (Hutahayan *et al.*, 2019). Table 5 shows the test results on ANOVA univariate effect for corporate governance factor on operational risk, credit risk, liquidity risk and market risk variables. The importance of *F*-test values is utilized to test this. *F*-test values for the relationship between market risk and corporate governance is 1,390 and a substantial value above 0.05, indicating that there is no distinction in market risk between corporate governance groups. The *F*-test value for the corporate governance/credit risk relationship is 2,650 and the significance value is below 0.10 (statistically significant at 10%). This means that there is a difference of credit risk among the categories of corporate governance.

F-test values for the relationships between corporate governance and liquidity risk is 2,418 and the significance value is below 0.10 (statistically significant at 10%), which means that there is a difference of liquidity risk among the categories of corporate governance. *F*-test for the relationships between corporate governance and operational risk is 9,019 and the significance value is below 0.01 (statistically significant at 1%). This means that there is a difference in operational risk among different categories of corporate governance.

Table 6 shows the comparison between the categories of governance ratings of banks with exposure risks. The results showed that there was no difference in market risk management among governance rank categories. While in credit risk management, a bank with first rating governance is different from a bank with third rating governance, but a bank with first governance rating does not differ from a bank with second rating governance and a bank with second rating governance does not differ from banks that have third rating governance.

The multivariate test results showed that there is a relationship between corporate governance and the four dependent variables (credit risk, market risk, operational risk, liquidity risk). While the ANOVA univariate test results shows that there is a difference in

Source	Dependent variable	Type III sum of squares	df	Mean square	<i>F</i>	Sig
Corrected Model	Market_Risk	0.000 ^a	2	0.000	1.390	0.254
	Credit_Risk	0.001 ^b	2	0.001	2.650	0.075
	Liquidity_Risk	0.263 ^c	2	0.131	2.418	0.094
	Operational_Risk	0.231 ^d	2	0.115	9.019	0.000
Intercept	Market_Risk	0.000	1	0.000	4.969	0.028
	Credit_Risk	0.030	1	0.030	147.208	0.000
	Liquidity_Risk	4.678	1	4.678	86.054	0.000
	Operational_Risk	0.957	1	0.957	74.798	0.000
CG	Market_Risk	0.000	2	0.000	1.390	0.254
	Credit_Risk	0.001	2	0.001	2.650	0.075 ^{**}
	Liquidity_Risk	0.263	2	0.131	2.418	0.094 ^{**}
	Operational_Risk	0.231	2	0.115	9.019	0.000 [*]

Note(s): a. *R* Squared = 0.026 (Adjusted *R* Squared = 0.007)

*Statistically significant at 1%

b. *R* Squared = 0.049 (Adjusted *R* Squared = 0.030)

**Statistically significant at 10%

c. *R* Squared = 0.045 (Adjusted *R* Squared = 0.026)

d. *R* Squared = 0.149 (Adjusted *R* Squared = 0.132)

Table 5.
Tests of between-
subjects effects

Dependent variable		(I) CG	(J) CG	Mean difference (I-J)	Std. Error	Sig
Market_Risk	Tukey HSD	1	2	-0.0027049	0.0018881	0.328
			3	0.0013198	0.0039183	0.939
		2	1	0.0027049	0.0018881	0.328
			3	0.0040246	0.003751	0.533
		3	1	-0.0013198	0.0039183	0.939
			2	-0.0040246	0.003751	0.533
Credit_Risk	Tukey HSD	1	2	-0.0042831	0.0030779	0.349
			3	-0.0139792	0.0063873	0.078**
		2	1	0.0042831	0.0030779	0.349
			3	-0.0096961	0.0061146	0.256
		3	1	0.0139792	0.0063873	0.078**
			2	0.0096961	0.0061146	0.256
Liquidity_Risk	Tukey HSD	1	2	-0.1095147	0.0499835	0.077**
			3	-0.0560833	0.1037283	0.851
		2	1	0.1095147	0.0499835	0.077**
			3	0.0534314	0.0992983	0.853
		3	1	0.0560833	0.1037283	0.851
			2	-0.0534314	0.0992983	0.853
Operational_Risk	Tukey HSD	1	2	-0.0253341	0.0242473	0.55
			3	-0.2129301*	0.0503193	0.000*
		2	1	0.0253341	0.0242473	0.55
			3	-0.1875960*	0.0481703	0.001*
		3	1	0.2129301*	0.0503193	0.000*
			2	0.1875960*	0.0481703	0.001*

Note(s): Based on observed means. *Statistically significant at 1%
The error term is Mean Square (Error) = 0.013. **Statistically significant at 10%

Table 6.
Multiple comparisons

operational risk, liquidity risk, and credit risk among different categories of corporate governance.

Meanwhile, in liquidity risk management, there is a difference between banks with first rating governance and third rating governance. However, there is no difference between a bank with first rating governance and a bank with second rating governance, and a bank with second rating governance is not different from a bank with third rating governance. In operational risk management, a bank with first rating governance is different from a bank with third rating governance, while a bank with second rating governance is different from a bank with third rating governance, but a bank with first rating governance does not differ from a banks with second rating governance.

Bank is an intermediary institution, which in conducting its business activities is dependent on public funds and trust both from within and outside the country. Banks face different dangers in conducting trading exercises, whether credit risk, operational risk, market risk or liquidity risk. The managing an account division can be overseeing in many directions to ensure the interface of the community, counting the arrangements administering the commitment to meet least capital in understanding with the conditions of each bank, making a managing an account division as a profoundly directed division.

The banking crisis in Indonesia that began in the late 1997 was not solely due to the economic crisis, but also caused by the absence of GCG and ethics. Therefore, efforts to restore confidence to the Indonesian banking sector through restructuring and recapitalization can only have long-term and fundamental impacts if accompanied by three other important actions: (1) adherence to prudential principles; (2) application of GCG; and (3) efficient supervision by the Banking Supervisory Authority.

Implementation of corporate governance is indispensable to build public trust and the international world as a necessary condition for the banking world to grow well and healthy. Therefore, Bank for International Settlement (BIS) as an institution that examines the continuous prudential principles that must be embraced by banks has also issued guidelines for the implementation of GCG for banking. Similar guidelines are issued by other international institutions.

Banks as financial institutions with an increasingly complex business environment make them increasingly exposed to risk. Risks can be defined as adverse events and are closely related to conditions of uncertainty. Risk cannot be avoided, but an organization can manage these risks so that organizational goals can still be achieved. Basically, risk management is conducted through risk identification, risk evaluation and measurement processes and risk management.

This study has proved that effective corporate governance implementation is able to mitigate risks that expose commercial banks, whether credit risk, market risk, operational risk and liquidity risk. The keeping money industry incorporates an exceptionally vital part within the economy of a nation. Destitute administration on the national economy quality will have a negative impact. The execution of great keeping money exercises alongside solid GCG usage standards can have a positive affect on budgetary execution and hazard relief of banks.

Bank maintains a division of risk management that assists board of directors in applying governance principles, particularly those related to risk managements. This division is mindful for observing the position of risk as a whole (composite), each risk, each functional activity, as well as doing stress testing. In addition, the division also develops and evaluates the exactness of models utilized to degree risks, analyzes proposed modern items and exercises from the hazard perspective, monitors the application of risk managements by introducing an integrated risk control program and setting the exposure limits. The main responsibility lies in the management of four key risks, namely market risk, credit risk, liquidity risk and operational risk.

Market risk represents risk on the balance sheet position and administrative account, including derivative transactions, due to overall changes in market conditions, including the risk of changes in option prices. Those risks should be defined, assessed, tracked and managed by the business unit's autonomous units. Market risk recognition aims at identifying transactions/products that are exposed to market risk, classifying market risk based on defined parameters and promoting market risk and control assessment.

Our results indicate that there are no significant differences in market risk for each category of corporate governance ranking. The main components of market risk are interest rate risk, stock risk, commodity risk and foreign exchange risk. Exposures to market risk arise from banks that take deliberate or possibly speculative positions from the bank's (dealer) market activities. Most of the book risk in trading books originates from the treasury business activities, both domestic and overseas branches, while the banking book market risk comes from all bank activities.

The application of corporate governances in banks with ratings of 1, 2 and 3 shows no different results in terms of market risk management. This means that regardless of corporate governance ranking, trading book and banking book activities have a great exposure to the bank. Therefore, the bank is obliged to always monitor and manage market risk continuously and strictly. Some banks included in the sample even have special governance and organization where business risk management is efficient and autonomous. Also its treasury operations are separated into three parts: back office, front office and middle office. Market risk management is carried out by tracking closely the movement of market indicators that may influence banks, such as trade rates, intrigued rates, stock costs and product costs.

The second risk of our concern is credit risk. The results show that there are differences in credit risk management at banks with corporate governance ratings of 1, 2 and 3. In terms of credit risk management, a bank with first governance rating is different from a bank with third rating. However, there is no difference between banks with second governance rating and third rating.

Credit risk is a risk arising from the failure of the borrower and/or other party to fulfill its obligations. The application of credit risk management to banks with first governance ratings is made through the design of organizational structures that describe the involvement of all parties related to credit risk management (directors, committees, internal audit units, board of directors, operating units and risk management divisions). While in a bank with third governance rating, although it also has the same organizational structure, it has a credit risk profile also with a rating of 3 (high risk category). Furthermore, banks with third governance ratings have higher NPL ratio compared to first governance rating. This indicates that in the case of credit provision to debtor customers, banks with third governance ratings are more aggressive than those with first governance rating.

The reason for lending to banks with third governance ratings seems justifiable. (Diamond and Dybvig, 1983) state that bank is more concerned with the Diamond–Dybvig framework, which implies that theoretically, credit risk is associated with liquidity risk through borrower default and withdrawal of funds by depositors' customers. They point out that business investment often requires spending in the present to earn future returns. Therefore, entrepreneurs prefer long-term loans (in this case low liquidity). The same principle applies to individuals seeking financing like housing or vehicles. On the other hand, individual savers (households and companies) may have sudden and unpredictable cash needs, due to unexpected expenses. Thus, these savers ask for a liquid account that allows them to immediately access their savings (in this case, savers prefer short-term deposits).

The third risk that is the focus of this research is liquidity risk. The results show that banks with first governance rating differ from those with third governance rating. Liquidity risk, as mentioned in the preceding paragraph, is strongly related to credits risk, and the result of this research is also consistent with different tests on credit risk. Liquidity risk is related to the likelihood that banks will not be able to meet short-term commitments to investors, financial specialists and leasers, and the fulfillment of the least statutory; because lacked of funds or failed to sell the resources at a reasonable cost. Liquidity chance administration is pointed at moderating the likelihood of the bank not being able to get financing sources for money stream.

Banks with first governance ratings have been able to manage liquidity risk to meet any financial obligations at the right time and to maintain optimum and adequate liquidity levels. To bolster liquidity administration, banks have set up liquidity hazard administration approaches that incorporate liquidity administration, ideal support of liquidity saves, foundation of financing methodologies, early caution frameworks, cash stream projections, development profiles, liquidity limit determination and contingent financing plans. Banks with third governance ratings also have some liquidity risk management tools, but a more aggressive crediting strategy has allowed banks to stipulate impairment losses on loans.

Finally, at operational risk, a bank with first governance rating is different from a third governance rating, while a bank with a second governance rating is different from a bank with a third governance rating. In all cases, a third governance rating bank has risk management different from banks with first and second ratings. Operational risk is the hazard due to insufficiency and/or glitch of inner forms, human mistake, framework disappointment and/or the nearness of outside occasions influencing bank operations. Operational dangers are sourced from inside forms, human resources (HR), data innovation frameworks and foundation and outside occasions. Corporate governance in banks with first

governance rankings broadly alludes to the components utilized to address organization issues and control hazard inside the company.

5. Conclusions and recommendations

Our results showed that corporate governance implemented in banks is able to influence bank operational risk managements, liquidity risk managements, especially in market risk managements and credit risk managements. Furthermore, credit risk management at a bank with first governance rating is different from a bank with third governance rating. Liquidity risk management at a bank with first governance rating is different from that of third governance rating. The latter, operational risk management at the bank with first governance ranking is different from banks that have third governance rating, and banks that have second governance rating are also different from the bank with third governance. In general, the bank with first governance raking has the distinction of managing credit risk, operational risk and liquidity risk, with a bank with third governance rating. However, it is not at market risk that any governance-rated bank has no difference in terms of risk management.

Our study only looks at corporate governance based on governance ratings of self-assessment results expressed by banks in annual reports. Many banks do not disclose their composite value in annual reports. The value of governance composites is very useful for researchers to examine the influence of governance in more depth for the conducting bank risk management. In terms of market risk management, this study found no difference between the categories of governance ratings of banks. To improve market risk measurement, the next research should use value at risk of market risk, but disclosure of value at risk of market risk in the bank's annual report is still limited to large banks only. For banking regulators, banks should be encouraged to fully disclose governance implementation and risk management, including in terms of measurement used. For further research it might use more advanced analysis method and there is a supplement to the related data.

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