# A Literature Review on Risk-Based Premium: Interest Income Versus Moral Hazard

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**Abstract.** The function of the deposit insurance is to guarantee depositors fund to stabilize the banking industry. However, the higher the percentage of the insurance can increase moral hazard which in the long run causes instability in the banking industry. The application of a risk-based premium and a limited guarantee are expected to reduce moral hazard from both the bank and the customer side. The purpose of this study was to examine the role of deposit insurance institutions in the banking industry, especially the application of risk-based premiums. More specifically, this study analyzes several previous research related to risk-based premiums, bank performance, and moral hazard practices. The results of this study were propositions that explain the effect of risk-based premiums with different time lags. This study also provides several propositions related to the crisis and the interest rate that can be tested empirically in future research. The implication of the study emphasizes that the application of risk-based premiums can stabilize the banking industry in case bank have comprehensive risk management, appropriate interest rate policies, and good economy condition.

**Keywords:** bank · banking industry stability · credit risk · interest income · moral hazard · risk-based premium

## 1 Introduction

The financial crisis during 1997 and 2008 can be a lesson for the banking industry about the importance of security and customer trust in the banking industry. Currently, the growth of the banking industry in Indonesia is growing rapidly. Despite the COVID-19 pandemic, according to a survey conducted by Bank Indonesia in 2021, credit disbursement only increased in the first quarter of 2021, seen from the weighted net balance of 49.4% from 25.4%. New credit distribution in the first quarter of 2021 is expected to come from working capital loans, followed by investment loans and consumption loans. (Bank Indonesia, 2021).

Meanwhile, The number of credit in the fourth quarter of 2020 was still limited, influenced by investment credit growth. The survey results also explain that credit distribution in the first quarter of 2021 is not as strict as the previous period. This is indicated


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by the Lending Standard Index (ILS) of 0.4%, lower than 3.2% in the previous quarter. The performance of the bank tends to be stable but declines in 2020, indicated by a decreasing in ROA, NIM, and increasing in BOPO. Table 1 shows bank performance data based on several indicators.

The decrease in strictness in lending indicates that banks are faced with higher credit risk, so risk management is important because the banking industry is sensitive with changes in economic conditions. Based on Bülbül et al., (2019), credit risk management begins with establishing credit criteria. Banks must have sufficient information to assist banks in conducting a comprehensive assessment of the debtor's risk profile. The selection of credit transactions and commitments must consider the level of profitability by ensuring an analysis of costs, the possibility of default, and calculation of capital requirements (Kusi et al., 2017). However, if the bank has too rigid criteria, it may lose the opportunity to disburse credit. In addition, the bank is not able to perform its main function as an intermediary institution which will reduce the bank's interest income.

The existence of a deposit guarantee institution is able to provide security for creditor. Based on the Government Regulation in Lieu of Law Number 3 of 2008, the amount of funds guaranteed by IDIC (Indonesia Deposit Insurance Corporation) is 2 billion per customer. On the one hand, the existence of a deposit insurance institution with a high amount of guarantee funds can provoke banks to do moral hazard. Banks deliberately become risk seekers in order to get high interest income by channeling risky loans. To prevent moral hazard, IDIC has set a guarantee interest rate that becomes a benchmark and if it is not followed, customer funds are not guaranteed by IDIC.

In addition to set the interest rate, moral hazard can be prevented by applying a risk-based premium (differential premium system). Risk-based premium means that the premium paid will be different and depend on the bank's risk classification (Camara et al., 2020). If the bank is classified as higher risk, it will pay a higher premium compared to a low-risk bank. The premium system is considered to be fair so the moral hazard will decrease. Banks will compete to improve the quality of risk management as well as asset and liability management.

However, the risk-based premium has several constraints (Gómez-Fernández-Aguado et al., 2014). If a risk-based premium is applied, the bank will tend to be risk

**Table 1.** Bank Performance in 2016–2020

| Indicator (Conventional Bank) | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|
| Capital Adequacy Ratio (CAR) | 22,93% | 23,18% | 22,97% | 23,4% | 23,89% |
| Return on Asset (ROA) | 2,23% | 2,45% | 2,55% | 2,47% | 1,59% |
| Net Interest Margin (NIM) | 5,63% | 5,32% | 5,14% | 4,91% | 4,45% |
| Operating Expenses/ Operating Income (BOPO) | 82,22% | 78,64% | 77,86% | 79,39% | 86,58% |
| Loan to Deposit Ratio (LDR) | 82,17% | 82,49% | 82,28% | 82,60% | 82,54% |

Source: Indonesian Banking Statistics – Financial Services Authority averse. Banks will always try to reduce the risk to avoid paying high premiums. Banks will increase the criteria for prospective debtors which on the one hand the bank will avoid credit risk but the bank will lose the opportunity to get higher interest income. Thus, a risk-based premium causes a decrease in interest income even though the bank will avoid the risk.

The application of a risk-based premium policy can cause banks to avoid moral hazard (Mao & Cheng, 2020). In addition, banks can improve risk management and be more selective in lending to avoid credit risk. However, in the short term, banks are forced to lose the opportunity to extend credit, thereby reducing earning assets and lower interest income, which may affect the bank's operational performance. Using a deductive approach and compiling a literature review, this study provides several propositions related to the crisis and loan interest rates.

## 2 Overview

### 2.1 Mechanisms of the Deposit Insurance Corporation

Deposit insurance refers to government guarantees that guarantee that customers will get their funds back in full or in part if the bank defaults on ("TARP Other Bank Bailouts Bail-Ins around World," 2020). Deposit insurance institutions can prevent the occurrence of financial distress in banks by three mechanisms. The first mechanism is the Prudential Mechanism. Prudential Mechanism can reduce the probability of financial distress but does not apply to deposit insurance at the individual bank level. In fact, deposit insurance can exacerbate moral hazard problems and encourage banks to take excessive risks that increase the likelihood of future bailouts, bail-ins, or other settlement methods. For example, theoretical research that develops the Diamond and Dybvig model to include investments in risky assets and analyzes the impact of deposit insurance on bank risk-taking behavior and market incentives for bank supervision (Cooper & Ross, 2002).

Deposit guarantees encourage banks to take additional risk because potential losses are shared with the deposit guarantee fund, otherwise profits are taken by the bank. As long as the expected return on risk taking is greater than the sum of the explicit costs of insurance premiums and regulatory costs, banks will tend to take excessive risks ("TARP Other Bank Bailouts Bail-Ins around World," 2020). Moral hazard can be prevented by implementing premium is risk-based, so the bank has to pay a higher premium if it takes on a higher risk. Prudential mechanisms can work well during a crisis. Deposit insurance allows banks to continue to supply credit during a recession as well as support the real economy.

The second mechanism is the certification mechanism which assures the market that bank deposits and deposits are safe. Diamond & Dybvig, (1983), provide a framework in which the existence of a deposit guarantee eliminates the customer's intention to make a withdrawal from the bank because the deposit guarantor guarantees that the customer will get his funds back, regardless of when the customer will withdraw funds and whether the bank goes bankrupt. Thus, the sequence of customers in withdrawing funds is no longer an obstacle and reduces the possibility of a bank run because there is a guarantee that customers will get their money back from a deposit guarantee institution (Rivera, 2020). Deposit insurance schemes can help security in the banking sector and prevent a contagious bank run that will lead to either a bail out or a bail in.

Deposit insurance can also work through a subsidy mechanism by providing loans to banks with interest rates in accordance with the risk-free interest rate due to government protection. The government's role makes creditors think that the government will be responsible in the event of bankruptcy, thereby reducing the expected interest rate. ("TARP Other Bank Bailouts Bail-Ins around World," 2020). These implicit subsidies can increase bank capital through increased income and provide a competitive advantage to banks that have deposit guarantees compared to those that do not. Even if risk-based deposit insurance premiums can be determined precisely, deposit insurance will still be a support because of the competitive advantage it provides to banks when compared to other banks that do not have such access. Government guarantees are especially beneficial for small banks because they allow them to withdraw deposits without incurring an unduly high risk premium.

### 2.2 Banking Stability

According to the World Bank, (2020), a stable financial system is able to allocate resources, assess and manage financial risks, maintain job availability, and stabilize price movements which will have an impact on monetary stability. A financial system is said to be stable when the financial system is able to eliminate financial imbalances that arise as a result of unexpected adverse events. In a stable state, the system will directly respond to shocks, one of which is through a self-correction mechanism, preventing other events that have an effect on the real economy or on other financial systems. Financial stability is very important for economic growth, because most transactions in the real economy are carried out through the financial system.

Banking stability is an important aspect of economic conditions in both developed and developing countries (Beck et al., 2010). Policy makers have made many efforts to reform the banking system with the aim of increasing bank stability in response to the global financial crisis (Cihak et al., 2016). In addition, most economic activities always involve the banking sector, so it is important to promote and improve the effectiveness of the monetary policy transmission mechanism and the efficiency of the allocation of funding sources in the economic system (Kasri & Azzahra, 2020). With this important role, the health and stability of banks are two fundamentals that must be maintained in an economy.

### 2.3 Deposit Insurance and Moral Hazard

The main purpose of the deposit insurance system is to create stability in the financial system and protect small customers when the bank fails to pay. A good deposit insurance system will achieve this goal and significantly reduce the risk of bank rushes and disruptions disrupting banking operations. It also contributes to the smooth running of the payment system and credit mechanism.When considering the mechanism of a deposit insurance system, policy makers should consider the moral-hazard issue. Moral hazard refers to the tendency for banks to take risks because they have collateral compared to without collateral (Anginer & Demirguc-Kunt, 2018). Moral hazard can increase the risk of bankruptcy. In addition, because the funds are guaranteed, customers no longer monitor the financial health of the bank. (Ngalawa et al., 2016).

Policymakers can avoid moral hazard without compromising the benefits of a deposit insurance by imposing a limited guarantee, charging premiums based on the bank's risk profile, changing ratings according to the expected risk level, imposing losses on uninsured customers, other creditors, and shareholders when the bank fails. (Orits, 2019). In addition, the implementation of good corporate governance by requiring banks that have deposit guarantees to follow accounting practices and sufficient capital as well as increasing the transparency of financial information can minimize costs for deposit guarantors (Yilmaz & Muslumov, 2008). When moral hazard is controlled, deposit insurance can contribute to financial stability while maintaining market discipline. Therefore, policy makers must consider appropriate trade-offs between moral hazard and market discipline in the context of the current objectives, laws, political environment, and financial situation.

## 3 Methods

The type of study is qualitative. The methodology used in this research is a literature study that will be used as the basis for building a proposition. Literature studies are useful when the aim is to provide an overview of a particular problem (Snyder, 2019). Literature study is used to evaluate knowledge related to a particular topic. These results can be used to make research plans, identify gaps in research, or discuss specific problems. Literature studies are useful for developing existing theories.The stages used include:

1. Develop Topics and Research Questions

The topic will be discussion is the application of risk-based premiums in the banking industry with the research question, what is the role of the application of risk-based premiums on banking performance? The researcher emphasizes the role of risk-based premiums that can reduce the potential for moral hazard but on the one hand interest income can decrease, so it is necessary to analyze this with a longer time lag.

2. Literature review on all articles related to the topic and research question

Literature review related to deposit insurance, risk-based premiums, moral hazard, and several other articles that related this to several other variables such as interest rates and crisis conditions.

3. Selecting literature by considering the quality of the study and Synthesis of selected literature

Several literatures are selected as the reference of many studies to ensure the quality of the studies. The literature will be synthesized and used as the basis for formulating propositions.

4. Formulate a proposition and Develop suggestions for further research and implications for related parties

The related propositions and suggestions and implications are listed in the next chapter.

# 4 Result

## 4.1 The Impact of Risk-Based Premium on Banking Performance

When a risk-based premium policy is implemented, banks that were previously loose in lending will be more selective in providing credit (Angkinand & Wihlborg, 2010). When the risk-based premium has not been applied, the bank will maximize the benefits derived from the function of the expected return and risk values. When premiums are not risk-based, banks can invest in assets with higher expected returns and higher risk without paying higher interest rates on deposits (Wu et al., 2021). With the increase in the coverage of deposit insurance, there is a tendency for banks to choose portfolios with higher expected returns and risks. If more deposits are insured, the cost of guaranteeing deposits to the bank increases. Thus, when deposit insurance premiums increase, banks will also have the same incentive to increase risk to achieve the desired rate of return. Bank will try to reduce the level of risk when a risk-based premium is applied. This is done by the bank so as not to have to pay high premiums. Banks will become risk averse which results in banks losing the opportunity to get higher interest income. In addition, banks need time to improve risk management and credit disbursement criteria have become more stringent. This adjustment requires time and higher bank operating costs in addition to reduced interest income opportunities.

**Proposition 1: Cross sectionally, risk-based premium has a negative effect on bank performance at time 1.**

However, in the next lag, banks can improve the quality of risk management better to improve the quality of assets and liabilities. Banks will have a new perspective that is more selective in lending and asset allocation. According to (Gómez-Fernández-Aguado et al., 2014), banks will change their system. Moral hazard can be prevented and replaced by incentives for management if banks can manage risk well. The bank already has the right credit disbursement criteria, the principles of governance have been applied comprehensively, so that bank risk can be minimized which results in a small amount of premium to be paid. The bank's operations have adjusted and have been running well.

**Proposition 2: Longitudinally, risk-based premium has a positive effect on bank performance at time 2.**

## 4.2 The Impact of Risk-Based Premium on Banking Performance During Financial Crisis

During a crisis, many prospective debtors need credit so that the loan application is high (Chen & Wang, 2008). On the one hand, the crisis caused the number of deposits in banks to decrease because many people needed fresh funds. The crisis puts banks at high risk followed by reduced savings, if the premium applied is a risk-based premium, it will further reduce the chances of the bank to earn interest income and the bank's intermediary function will decrease.

**Proposition 3: Cross sectionally, financial crisis strengthen the negative effect of risk-based premiums on good bank performance at 1**

If the crisis persists for a long time, even though the bank has good and strong risk management in terms of credit criteria, the number of customers will decrease and the number of debtors will increase. This condition still causes banks to have a high risk, although the risk may be lower than the previous period. So the risk-based premium still reduces the stability and the bank's performance declining.

**Proposition 4: Longitudinally, financial crisis weaken the positive effect of risk-based premiums on bank performance at time 2.**

### 4.3 The Impact of Lending Rate on Risk-Based Premium

When a risk-based premium is applied, the bank will improve its risk management performance but on the one hand the opportunity to earn interest income is reduced. However, if the interest rate is high, the interest income can be covered from the prevailing interest rate, so the bank's performance can be better. In a ceteris paribus condition, bank profits increase with an increase in interest rates. Maigua & Mouni (2016) argue that the banking system as a whole is helped by an increase in interest rates and supports improving financial performance in the short term. Bank's financial performance is very important in supporting operational activities.

**Proposition 5: Cross-sectional, interest rates weaken the negative effect of risk-based premiums on bank performance at 1.**

When the bank finally has better risk management, asset quality increases, risk-based premiums can have a positive impact on banking performance. On the one hand, the higher the interest rate, the higher the interest rate, the higher the interest rate, but the higher the interest rate indicates a risk (Lee et al., 2017). Prospective debtors will not apply for credit to the bank if the interest continues to be high and the interest expense paid to depositors is also getting higher. So in the long run, high interest rates can have a negative impact on bank performance.

**Proposition 6: Longitudinally, interest rates weaken the positive effect of risk-based premiums on bank performance at time 2.**

## 5 Discussion

Deposit insurance institutions have several mechanisms that can be applied in order to protect customer funds and support the existence of the banking industry. This mechanism has several advantages and disadvantages, so that in choosing the right mechanism, IDIC must consider several conditions. Policy makers are faced with a trade-off between moral hazard versus interest income and market discipline, so policy makers must consider aspects in as much detail as possible in order to provide optimal policies. The impact of applying a risk-based premium if viewed from a narrow time horizon can be detrimental to the bank, especially if the bank does not have the right credit criteria and the risk is high so that the premium charged will be even higher.

However, when viewed from a longer period of time, risk-based premiums are able to prevent the moral hazard that leads to the risk of bank bankruptcy – even if the deposit insurance company implements a full guarantee, it can create market shocks and have other impacts. If the deposit guarantee continues to implement a full guarantee, the bank will increasingly maximize its utility which is directly proportional to the risk. So in the long term, risk-based premiums can prevent banks from going bankrupt and make banks develop more sustainably.

The current crisis conditions, including the Covid-19 pandemic, have made customers withdraw money from the bank. Savings in the bank decreased and was followed by an increase in the number of debtors who failed to pay which caused the risk to the bank to increase. Thus, when a risk-based premium is applied, the premium paid will be higher. Although in the next period the bank had good risk management, the crisis conditions caused an imbalance in the supply and demand for money in the bank.

Interest rate policy also plays an important role in the implementation of risk-based premiums. At the beginning of the period, high interest rates can help the bank in covering the costs required due to the policy. The decline in interest income was due to the fact that banks had to be more selective in being covered by rising interest rates. However, the interest rate also indicates risk so that at the end the risk-based premium cannot run effectively if the interest rate is still high.

## 6 Conclusion

This study aims to elaborate the role of deposit insurance on banking stability. This study examine the role of the application of risk-based premiums in the banking industry. The result showed a several proposition related to the application of risk-based premiums. This study also provide advice and policies regarding the application of risk-based premiums. First, If a deposit insurance institution wants to apply a risk-based premium, it should have given prior discourse to commercial banks so that banks can prepare themselves to manage their risks, so the negative impact of adjustments will not be felt for too long. Second, Banks should have good risk management and credit criteria therefore banks can be more sustainable, looking more from a long-term perspective, and have good criteria so that there is no bank run. Banks can design policies for management – instead of doing moral hazard by channeling risky credit, it is better to use it to compensate management if the bank has a low risk. This study also showed The need for the role of the government and related agencies in bridging the LPS and commercial banks regarding the application of risk-based premiums. For bank customer, higher literacy in saving funds or applying for credit in banks is also needed.

In conditions of a prolonged crisis, the application of a risk-based premium should be reconsidered to make it more effective. The result also showed a policy from the government during a crisis to increase economic activity and prevent the risk of default through IDIC is needed. Bank will increase the interest rate when the IDIC initially applies a risk-based premium, but when the bank has a risk management structure and the right credit criteria, the interest rate can be lowered. Banks also can improve their performance by seeking non-interest income to support the operational aspect, then customers and debtors better understand the concept of interest rates that interest rates can be viewed as income at the same time interest rates can also indicate risk. Customers can also see the bank's classification based on the risks that have been grouped by IDIC and confirm whether it is in accordance with the risks that can be borne.

## 7 Limitation

The empirical tests to prove the propositions is needed, so it can be proven quantitatively. In carrying out the empirical test, it is necessary to select the right proxy and in accordance with the operational definition. The future research also need to consider other factors that may affect the application of risk-based premiums, such as bank size, bank age, bank ownership, and bank liquidity level. This study can be improved by selecting a more comprehensive literature, for example starting with a bibliometric study first.

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