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The Implementation Of Banking Risk Management In ASEAN Countries

Julia Safitri [1]*, Ira Geraldina[1]
[1]Universitas Terbuka, Indonesia
*Email corresponding author: julia@ecampus.ut.ac.id

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Abstract

The purpose of this study is to empirically examine the impact of credit risk, liquidity risk and interest rate on the performance of banks through capital adequacy. Banking companies in five Southeast Asian countries were used as data source in this quantitative research. The total sample obtained was 175 from 2014 to 2020. This Predictive and exploratory inquiry used Partial Least Squares (PLS) Structural Equation Modelling (SEM) with WarpPLS 7.0 application. The study found that credit risk significantly affected bank performance. The VAF calculation to see whether the capital adequacy as a mediator can be categorised as partial mediation or not also showed a similar finding. A mediation test was carried out using the VAF method where the conditions were 20% < VAF < 80%. From the results of data analysis, capital adequacy showed to be able to mediate the indirect impact of credit risk on bank performance. The result, therefore, validated the Commercial Loan hypothesis, which states that if a bank's productive assets, which consist of short-term loans, are distributed in normal business activities, bank liquidity will be ensured. This study indicated that credit risk in Southeast Asian Countries requires sufficient capital reserves to reduce the occurrence of credit risk which will have an impact on decreasing bank performance.

Keywords : ASEAN Countries, bank performance, risk management

INTRODUCTION

The purpose of implementing risk management is to encourage management to act proactively to reduce the risk of loss, to make risk management a source of competitive advantage, and to excel in company performance. Furthermore, risk management at banks can be carried out in four ways: identifying, measuring, monitoring, and controlling risk (Asher & Wilcox, 2022). Theoretically, in banking, risk management refers to the logical execution and creation of programmes to cover for potential losses. Tursoy (2018) describes that the management of institutions' exposure to losses or hazards, as well as the protection of asset values, is a common emphasis of risk management practices in the banking industry. The financial institutions especially banking has long considered risk management as a requirement to control liquidity concerns, foreign exchange, interest rates and credit as the source of dangers for risk exposure (Khan et al., 2017). Ratnovski (2013) define risk management in banking as the process by which managers address the requirement to identify significant risks, collect consistent, clear operational risk measures, determine which risks to decrease and which to raise and how, and set up systems to monitor the resulting risk position.

The research gap here is to dig deeper on how credit risk influencing bank performance based on James (2013) and Lima (2014). They claimed that the credit risk proxied by Raroc on bank performance i.e., return on assets (ROA) has a negative effect. Meanwhile, research studies by Boda (2016) and Buch et al. (2011) shown credit risk has positive effect on the performance. What is interesting about this study is the novelty offered, where previous research explained that there are

still differences in research on the relationship of credit risk to bank performance, so this research offers novelty, namely capital adequacy, which is evident from the results of data processing carried out by capital adequacy successfully mediating the relationship between credit risk and company performance is quite interesting according to researchers. The urgency of this study sees that there are so many defaults by customers, this has an impact on the company, so this research is expected to be a solution to minimize the decline in company performance. The problem with this research is that there is inconsistency, avoiding the results of research conducted by several previous researchers including (Abbas et al., 2019; Capasso et al., 2020; Boda, 2016; Bruggink et al., 2014) this is related to the phenomenon that occurs, where the decline in company performance is caused by high credit risk and reduced capital so that it becomes one of the risks of decreasing company income, banking companies are different from other companies, where income from customer funds becomes part of the company's income which will later be channelled in the form of a loan.

The goal of this study is to look into the effects of variables related to bank financial performance in Southeast Asian countries. The study is expected to fulfil three objectives. These are their names: 1). Testing and analysing how the risk related to credit, interest rate, and liquidity impacted the performance of bank. 2). Using capital sufficiency as a credit risk mediator, testing and analysing how the risk related to credit, interest rate, and liquidity influenced bank performance. 3). Testing and analysing the impact of capital sufficiency on bank performance as a credit risk mediator.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The Theory of Financial Intermediation

Diamond and Dybig (1983) argue that financial intermediation plays a vital role in understanding why the depositor does not profit from the supervision of an intermediary. As a favourable role in the financial intermediation process, financial intermediation allows enterprises to have the best contracts and achieve significant allocations. Loans and deposits with modest leverage are likely to have a low default probability. However, the chance of default will remain low by using the delegation model of monitoring and diversity of increasing lending and savings. Diamond (1984) established a moral hazard theory of financial intermediation in which the presence of banks as delegated monitoring can minimise monitoring costs from consumers (investors) to borrowers. This mechanism's efficiency will make it easier for borrowers to reduce production costs. Capital providers will entrust the monitoring of borrowers to banks. To protect depositors and shareholders, the bank will then investigate all present and prospective customer actions.

Risk Management Theory

The risk can be in the form of credit risk if the customer does not fulfil his obligations to the Bank. Other risks that can occur are exchange rate, interest rate and operational risks which can often cause the Lender to experience substantial losses. Losses for banks can also happen when there is reputational risk, legal strategic risk, political risk, or country risk. However, the quantification and management of these risks are still difficult to do. Given that not every risk is always a threat to financial institutions, each bank will identify the risks that may arise and conduct risk management according to the level of complexity of its business. In implementing risk management, the processes carried out are: a. Preparing an annual business plan for each business unit by referring to the direction of top management related to the annual targets to be achieved as well as the risks that need to be considered; b. Preparing risk projections must be referenced to the capital position. If the available capital is not sufficient to absorb the loss on risk projections, then a discussion is held at the

senior management level to create a capital deposit or revise the business plan. c. Determining the delegation of authority to each business unit involved to implement it as well as assigning which risk management that needs to be complied within the form of risk limits so that the bank can control overall risk in line with the bank's strategy. d. Business units conduct their functions by complying with predetermined limits. e. The risk management unit monitors the risks exposed by each business unit as well as consolidates all risks and monitors the available capital position. If there is a deviation from the implementation, it is necessary to discuss it with the risk management committee to get a decision or recommendation to top management (Boffey, 1995). The fundamental reason why adequate credit risk management is crucial is that banks have limited cash to sustain loan losses. In general, banks' ability to withstand prospective loan losses is derived from the money earned by previous lucrative loans, but the amount is usually low.

Agency Theory

Agency theory sees a company as a "nexus of contracts," where selfish "principals" and "agents" interact in opportunistic ways (Jensen & Meckling, 1976). Planning a sustainable contract between the owner (principals) and manager (agents) that equalises interests is the core problem of agency theory. The larger the organisation, the more parties involved, the more complicated their relationship, and the more difficult it is to write the aforementioned contract. A study on risk management, namely credit risk, done by Safitri et al. (2020), discovered that credit risk had a detrimental impact on banking performance. This suggests that if client default rates rise, banks' performance will suffer (Safitri, et al., 2020). The role of risk management can increase bank performance (ROA), as all bank firms will be more cautious in risk management with well-identified risk management (Margono et al., 2020). Good credit distribution can then reduce the likelihood of default. Furthermore, Wahyudi et al. (2020) asserted that the higher the credit risk, the lower the bank's performance. According to Safitri et al. (2021), the operational cost ratio is used to assess a bank's efficiency and ability to undertake operational activities. According to this study, giving short-term funding is more beneficial for banks than offering long-term financing. According to Mawardi et al. (2021), interest rates affect banks' ability to manage received income with costs spent.

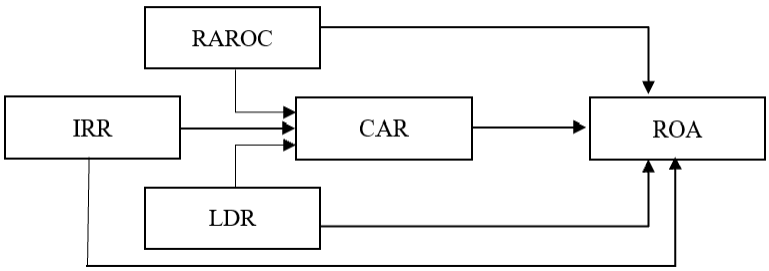

Figure 1. Research Model

Several studies have examined the relationship between profitability and credit risk in banking. According to Ozili (2017), credit risk, as measured by an allowance for loan losses, is a variable that affects greatly on the profitability of African commercial banks. Tarus, et.al. (2012) discovered that credit risk had a favourable influence on commercial bank profitability in terms of net interest margin.

H_1: Credit risk affects banking performance.

Falling interest rates theoretically make savings and time deposits in banks less appealing. People will opt for higher-yielding alternatives, such as the capital market. Stock prices will rise if demand rises owing to a drop in interest rates, and vice versa. A fall in interest rates reduces loan interest costs for businesses, boosting expansion and increasing net profit. An increase in net income can cause the stock market to rise in the long run. This study is in line with the studies conducted by Borio et al. (2017) and Messai dan Jouini (2013).

H_2: Interest rate risk affects banking performance.

A number of studies that had been conducted in European banks indicated that the loan-to-deposit ratio (LDR) and ROA profitability had significantly good correlation (Bourke, 1989). The study suggested that when the bank disburse more money in their reserve to debtors, the bank will earn a larger revenue in the form of interest, resulting in an increase in ROA. It is thus likely that the higher a bank's idle funds, its performance related to profitability would be low, however their risk on liquidity also low. Liquidity itself refers to the capability of a bank to produce adequate funds to fulfil all commitments granted to its clients on any occasion. The LDR ratio for monitoring liquidity is one of the factors included in the Camel technique for analysing a bank's soundness (Bank Indonesia, 2004). Banks with low LDR conditions, which indicates that the quantity of credit disbursed is relatively modest, also have a low possibility to earn interest on loans extended. A bank with a high LDR has a relatively high possibility to earn income from loan interest. Empirical evidence suggests that LDR affects ROA positively but negatively on risk (Lartey1 et al., 2013; Paleni, 2017; Zainelden, 2018).

H_3: Liquidity affects banking performance.

Boffey and Robson (1995) described that the major motive of adequate credit risk management needed is the crucial role for making sure banks have ability to withstand loan losses. In the broadest sense, a bank's ability to sustain loan losses is derived, first, from income earned by additional lucrative loans and, second, from the bank capital. Banks' profits on profitable loans are often modest.

H_4: Credit risk affects banking performance through capital adequacy.

If interest rates rise, the percentage increase in interest revenue will be greater than the percentage raises in interest expenditure, resulting in higher interest revenue and ROA. The second effect, which is negative, happens during the IRR rises as the interest cost trend falls. This will result in a lower fall in interest earning than a decrease in interest costs, resulting in a decrease in profit and ROA (Oberoi, 2017; Gallitschke et al., 2017; Esposito et al., 2015).

H_5: Interest rate risk affects banking performance through capital adequacy.

The liquidity ratio evaluates a company's capacity to meet its short-term financial payment and obligations commitments. Investors benefit from a higher liquidity ratio. Investors will seek out companies with a high liquidity ratio, which will have an impact on share prices, which tend to climb in response to high demand. This increase in stock prices indicates that the company's performance has improved, which will benefit investors by delivering a high rate of return on their investment (JaraBertin et al., 2014; Petria et al., 2015).

H_6: Liquidity affects banking performance through capital adequacy

The Capital Adequacy Ratio (CAR) means a model of a bank's capability to cover is a barometer of a bank's competence to compensate for reducing assets due to losses. The capacity of the CAR is decided by the bank's capability to make profits and the content of allocating money to assets based on risk degree. Law Number 11/3/DPNP issued on 27 January 2009, enacted the calculation of Risk-Weighted Assets (RWA) for Operational Risk Using the Basic Indicator Approach (PID), the CAR ratio considers credit risk, operational risk, and market risk. The CAR set by Bank Indonesia is a minimum of 8%, as stated in BI Regulation Number 10/15/PBI/2008 Article 2 Paragraph 1 and in accordance with the standards set by the Bank of International Settlements (BIS). Several research studies have indicated that to some extent, CAR affects ROA (Rahman et al., 2015; Boadi et al., 2016; Islam & Nishiyama, 2016;).

H_7: Capital adequacy affects banking performance

RESEARCH METHOD

The listed banking institutions in the stock market from 2014 to 2020 are the subject of this study. This documentary contains data in the form of financial statements from Southeast Asian banking organisations. Secondary data was acquired from an annual report with the URL www.idx.co.id and Bloomberg for Southeast Asian countries. Panel/pooling data is used to produce a large sample by mixing time series data with cross-section data. Purposive sampling is used in this study depending on the aims of the investigation and specific criteria. The sample criteria are as follows: 1). Banking companies listed on the Indonesian stock exchange and other ASEAN stock exchanges that publish financial reports for the 2014-2020 timeframe. 2). Banking institutions with complete data on this research variable.

Definition of Operational Variables

Independent Variable

Raroc (return adjusted risk on capital) refers to a risk management instrument used regarding credit risk measurement in the context of risk management at a bank. Raroc was popularised in 1979 by the Bankers Trust and was then adopted and used by other banks. Risk measurement is essential for risk management purposes, according to Zaik et al. (1996), in order to calculate how much each transaction contributes to the bank's total risk.

$$Raroc = \frac{Adjusted\ Income}{Capital\ at\ Risk} \quad \text{.....(1)}$$

Interest Rate Risk (IRR) happens when the measurement method is able to qualify and quantify the principal source of interest rate risk. Changes in net interest income appears to have a relationship with the impact of interest rate risk. Meanwhile, Rate Sensitivity Asset (RSA) and Rate Sensitivity Liability (RSL) refer to the interest rate sensitivity of assets and liabilities in a single group (bucket). These assets and liabilities are repriced or adjusted to be at or near market interest for a given future period. Zengin (2016) defines the rate sensitivity as the sensitivity to interest rate changes.

$$\text{IRR} = \frac{RSA\ (rate\ sensitive\ assets)}{RSL\ (rate\ sensitive\ liabilities)} \text{ x } 100\% \quad \text{.....(2)}$$

Jao and Jao (1974) suggest that a bank that can intermediate is one that can collect deposit money and then distribute it to lender in a secure system or one that has a loan-to-deposit ratio (LDR) that is within the target range.

$$\text{LDR} = \frac{Total\ credit}{Third\ party\ funds} \text{ x } 100\ \% \quad \text{.....(3)}$$

Mediation Variables

Increased risk must be accompanied by an increase in the capital required by the bank to cover any losses. As a result, banks must maintain the bare minimum of core capital to operate their commercial operations. Paid-in capital and additional reserve capital are examples of core capital (Zhang et al., 2008).

$$\text{CAR} = \frac{Bank\ Capital}{Risk\ Weighted\ Assets} \text{ x } 100\ \% \quad \text{.....(4)}$$

Dependent Variable

Banking Effectiveness Financial ratios are generated using financial data from either the income statement or the statement of financial position (balance sheet). Financial ratios can be used to calculate an organization's liquidity, profitability, or solvency. Financial ratios can also forecast the likelihood of a company failing (Paul Geroski, 2013). One of the most important financial performance measures is the return on asset (ROA) ratio.

$$\text{ROA} = \frac{Profit\ before\ tax}{Total\ Asset} \text{ x } 100\ \% \quad \text{.....(5)}$$

Data Analysis

Partial Least Squares (PLS) Structural Equation Modelling (SEM) with WarpPLS 7.0 was utilised in this predictive and exploratory work. PLS-SEM has various advantages, including the ability to operate effectively with limited sample size yet with complex models, and the assumption in SEM-PLS related to data distribution is looser than in other procedures e.g., CB (Covariance-based)-SEM. The following model equation can be used to test hypotheses 1–7:

$$\text{ROA} = \alpha 1 + \beta 1 \text{RAROC} + \beta 2 \text{IRR} + \beta 3 \text{LDR} + \beta 4 \text{CAR} + \epsilon 1 \quad \text{.....(6)}$$

CAR= α2+β5RAROC+ β6IRR + β2LDR +ϵ2.....(7)

RESULTS AND DISCUSSION

Research Model Evaluation Analysis

As previously stated, the assessment for model of research consists of two stages: the measurement model evaluation and by evaluating structural model. The PLS-SEM method is used in the model assessment study using the Warp-PLS version 7.0 application. Because all of the constructs in this study use reflecting indicators, the algorithm technique used in this work for the outer model is PLS mode A. The inner model in this research is linear since it is expected that all relationships between constructs in the model are linear. Sholihin and Ratmono (2013) describe the selection of Stable based on the resampling methodology results in the stability of the route coefficient estimate findings or delivers a P value that is lower than other methods.

Structural Model Evaluation

The inner model (structural model) evaluation attempts to forecast the correlation between variables by calculating 'how much variance can be described and the significant P-value' (Latan and Ghozali, 2016). As a result, the structural model evaluation can provide responses to the hypotheses tested in this work, particularly hypotheses 1, 2, 3, and 7. Meanwhile, in the next analysis, hypotheses 4, 5, and 6 (mediation effect) will be examined by mediation testing. Before analysing the link between components, this research would first assess the goodness of fit of this research model, the results of which are shown in Table 1.

Table 1. Goodness of Fit Model Structural

Criteria	Parameter
Average path coefficient (APC)	0.212/ P<0.001
Average R-squared (ARS)	0.348/ P<0.001
Average adjusted R-squared (AARS)	0.334/ P<0.001
Average block VIF (AVIF)	1.303
Average full collinearity VIF (AFVIF)	1.144
Tenenhaus GoF (GoF)	0.590
Sympson's paradox ratio (SPR)	0.429
R-squared contribution ratio (RSCR)	1
Statistical suppression ratio (SSR)	0,857

Source: Primary data processed, 2023

Table 1 above showed that the model in this study has a satisfactory fit, with the APC has P value of 0.05, AARS, and ARS 0.1, with APC = 0.212, ARS = 0.348, and AARS = 0.334. Similarly, the resulting values of AFVIF and AVIF are 3.3, indicating that there is no difficulty with multicollinearity between exogenous factors and indicators. The resulting GoF is 0.590 > 0.1, indicating that the model fits quite well. SPR and RSCR yield a value of one. Meanwhile, Latan and Ghozali (2016) showed that if SSR is greater than 0.7, it indicates that the model has no causality issues. Hypothesis testing 4, 5 and 6 requires a mediation test method. The mediation test in this study used the Variance Accounted For (VAF) approach. Hair et al. (2013) describe the technique used for mediation testing is the VAF method which are:

1. Examining how exogenous variables have direct effect on endogenous variables in the absence

of mediating variables.

2. If the direct effect mentioned above is considerable, the next step is to investigate the indirect influence from exogenous variables to endogenous variables by making mediating variables inclusive.
3. If the indirect effect found in the above test is significant, the following criteria are used to assess the VAF value and determine the mediating effect:
   a. A VAF of more than 80% indicates that full mediation occurs;
   b. 20% VAF 80% indicates partial mediation;
   c. A VAF of 20% implies that no mediating effect found in the model.

   The Variance Accounted For (VAF) is computed by the indirect effect divided by the total effect (indirect effect plus direct effect).

Table 2. Significance Test of Effect between Variables

Description Path	Path Coefficient	P value
RAROC → ROA	-0.012	0.434
IRR → ROA	-0.123	0.046
LDR → ROA	0.148	<0.001
CAR → ROA	0.265	0.021
Indirect Effect		
RAROC→CAR→ROA	0.894	<0.001
IRR→CAR→ROA	0.012	0.434
LDR→CAR→ROA	0.030	0.342

Table 2 showed that RAROC has no direct effect where the p-value is 0.434 on ROA so that the first hypothesis is rejected. The influence of RAROC on ROA is mediated by CAR with a P-value <0.001 then there is mediation that occurs so that hypothesis 4 is accepted. Meanwhile, IRR, LDR and CAR have a significant direct effect on ROA with the p-value of each variable 0.046, <0.001 and 0.02. Furthermore, the IRR and LDR variables which have the potential not to be mediated by CAR have an indirect influence on ROA. These results therefore show that CAR does not mediate the indirect effect of IRR and LDR on ROA so that it rejects Hypotheses 5 and 6.

The results of the estimation of the significance of the relationship between variables can also be shown in the following model path diagram:

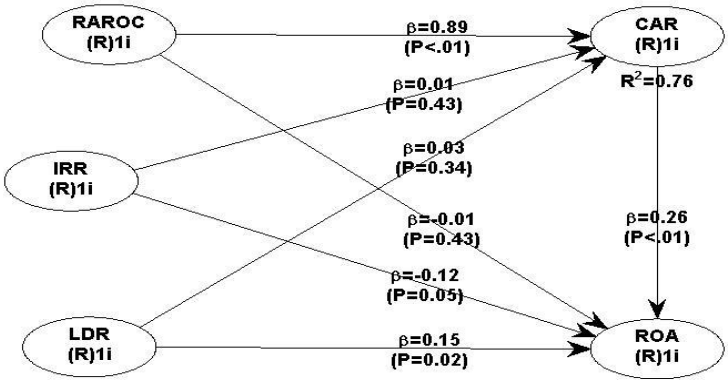

Figure 2. Estimating Relationships Between Variables in Model Path Diagrams

The next step is calculating the VAF value which can be presented in Table 3.

Table 3 Calculation of VAF

Description	Path Coefficient
Indirect effect	0.237
Direct effect	0.029
Total effect	0.894
VAF (indirect effect/total effect)	0.265

According to Table 3, the VAF value is 0.265 or 26.5%. If 20% VAF 80% indicates partial mediation, this figure can meet the VAF standards. As a result, CAR appears to be a partial mediator of RAROC's indirect effect on ROA. These findings support or accept Hypothesis 4, which suggests that RAROC's effect on ROA is mediated through CAR. This study implies that improving bank performance is not exclusively impacted by liquidity, but rather in order to be more effective and enhance bank performance, the proper credit decision must be taken to limit credit risk.

Analysis

The results of the tests demonstrate statistical significance. This implies that there is a large disparity in bank credit risk between countries. Each country will be exposed to varying degrees of financial risk, particularly credit risk. It is the risk of loss ensuing from a customer's inability to meet their obligations to banks. The greater the credit risk, the greater the risk that the banks will face. Arguments from Masood et al. (2012), Zhao & Huchzermeier (2018), and Suprin et al., (2019) are in line with this research by explaining that each country has its own characteristics in terms of risk management. The data processing performed in this study is pertinent to these arguments.

The test results show that the IRR ratio of banks in Southeast Asian countries has significant differences. Market risk is the risk caused by a decline in investment due to various market conditions, such as interest rates and foreign exchange. Interest rate risk is the risk caused by changes in interest rates that cause a company to face the next two types of risks: the risk of changes in income and the risk of changes in market value which in this case is measured by the IRR ratio (Wen, 2017). The higher IRR ratio indicates that the banking performance is getting better, and the banking market risk is getting smaller. This is supported by Zengin (2016) that banks that have a higher number of deposits have a higher interest rate risk. The finding indicated that the level of banking security determines the relationship between interest rate risk and financial performance. As a result, this study offers a set of recommendations. Encouraging policymakers, bank owners, and managers to adopt efficient interest rate risk policies on an ongoing basis, as well as enhancing monetary and financial policies in the banking sector (Al-Slehat, 2022). Stakeholders must endeavour to achieve a balance between interest rate risk, performance, and banking security.

The test results reveal that banking liquidity varies significantly across Southeast Asian countries. This means that the countries face various liquidity risks. Liquidity risk refers to a bank's ability to satisfy its short-term obligations. The bigger the liquidity risk, the lower the risk that banks will face. In contrast, the lower the value of liquidity risk, the greater the risk faced by banks. The finding is in line with the result of Hassan et al. (2019) and Yildirim (2022). Their research found that while decreasing liquidity can initially boost stability, bank management will begin to take risks in order to increase profitability, which cancels out the first good impact and promotes bank

instability.

CONCLUSION

The aim of this research is to explore and analyse the effect of interest rate risk, credit risk, and liquidity on company performance. From the results of data processing carried out and from the hypothesis proposed, namely in the form of a direct relationship the hypothesis is accepted significantly, then the indirect relationship the first hypothesis is accepted, the second hypothesis is rejected and the third hypothesis is rejected, while the seventh hypothesis is accepted. This can be explained that banking has a strategic role in moving the wheels of the national economy. The main function of banking in the economy is to collect public funds and channel these funds to finance production and consumption activities to encourage economic growth. With this strategic role, strong (resilient), competitive and contribute banking is a prerequisite for its success in supporting economic growth in every country, especially ASEAN countries in this study. The application of risk management in banks also plays a role in increasing shareholder value, providing an overview to bank managers regarding potential losses in the future, the capital needed to cover risks, compared to the potential returns generated. The limitation of this research is that it only examines Indonesian banking and ASEAN countries where many ASEAN countries have incomplete data, so that makes this a suggestion for further research which involves banking data in Southeast Asian countries.

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