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Economic And Asymmetric Information As Moderation Variables, Credit Risk And Credit Prices

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Abstract: Profitability denotes a company's capacity to generate earnings within a specified timeframe. Companies that thrive and exhibit profitability are perceived as successful and typically garner favour among shareholders. This study examines profitability in the context of a company's ability to generate earnings within a specified timeframe, which is crucial for shareholder favour and business success. It focuses on the banking sector in Indonesia, encompassing 33 listed entities, with eight selected for the research sample. Employing hypothesis testing and analytical techniques, the study finds that asymmetric information and fluctuations in profitability do not affect credit pricing. Instead, credit risk positively impacts credit pricing, along with positive contributions from asymmetric information and profitability. This suggests that profitability does not hinder creditworthiness improvements. Asymmetric information does not affect credit pricing, making selling bank loans risky. Further research on credit pricing at a larger scale is warranted.
Keywords: Credit Risk; Information Asymmetry; Loan Prices; Profitability.

Abstrak: Profitabilitas mengacu pada kemampuan sebuah perusahaan untuk menghasilkan keuntungan selama periode tertentu. Perusahaan yang berhasil dan menguntungkan dianggap sukses dan cenderung menarik minat dari para pemegang saham. Penelitian ini menganalisis profitabilitas dalam konteks kemampuan perusahaan untuk menghasilkan laba dalam jangka waktu tertentu, yang sangat penting bagi pemegang saham dan keberhasilan bisnis. Penelitian berfokus pada sektor perbankan di Indonesia, mencakup 33 perusahaan yang terdaftar, dengan delapan perusahaan yang dipilih sebagai sampel penelitian. Dengan menggunakan pengujian hipotesis dan teknik analisis, penelitian ini menemukan bahwa informasi asimetris dan fluktuasi profitabilitas tidak mempengaruhi penetapan harga kredit. Sementara itu, risiko kredit memiliki dampak positif terhadap penetapan harga kredit, bersama dengan kontribusi positif dari informasi asimetris dan profitabilitas. Dimana profitabilitas tidak menghalangi peningkatan kelayakan kredit. Informasi asimetris tidak berpengaruh terhadap penetapan harga kredit, sehingga membuat penjualan kredit bank menjadi usaha yang berisiko. Penelitian lebih lanjut mengenai penetapan harga kredit pada skala yang lebih besar diperlukan.
Kata Kunci: Asimetri Maklumat; Harga Pinjaman; Keuntungan; Risiko Kredit.

INTRODUCTION

Banks rely predominantly on their lending activities as a critical source of revenue. In the banking sector, lending is typically the most significant contributor to credit risk, representing a substantial portion of a bank's portfolio. The primary concern is the risk of

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financial loss, often due to borrowers' inability to repay the principal amount borrowed (Glazkova & Hanova, 2022).

To mitigate this credit risk, banks have developed a credit pricing model that draws upon principles from the field of price theory. Credit pricing is a strategic management activity financial institutions undertake to determine appropriate interest rates for their various banking products. These rates are calculated by considering the specific composition of assets and liabilities within the bank's portfolio.

In essence, credit pricing models help banks establish interest rates that align with the inherent risk associated with their lending activities. By carefully considering factors such as the creditworthiness of borrowers, prevailing market conditions, and the overall financial health of the institution, banks can make informed decisions about pricing their loan products. This approach safeguards against potential financial losses and allows banks to maintain a competitive edge in the marketplace by offering rates that attract borrowers while ensuring the institution's profitability and stability.

In Indonesia, bank loans remain the predominant external source of business financing (Yudisthira & Barthos, 2022). Given the pivotal role that bank loans play in facilitating corporate funding in the country, it becomes imperative for financial institutions to determine loan pricing based on comprehensive risk evaluations meticulously. A pertinent issue in this context is the relatively high Non-Performing Loan (NPL) rate in Indonesia, which has prompted concerns regarding the adequacy of risk assessments conducted by lenders and their ability to establish suitable loan pricing.

The continued reliance on bank loans as a primary means of financing underscores the critical importance of these loans for Indonesian businesses. These loans provide companies the necessary capital to invest in expansion, operations, and various projects. Consequently, the accurate pricing of loans is essential to ensure that borrowers are charged interest rates that reflect the level of risk associated with their creditworthiness and the purpose of the loan.

The elevated NPL rate in Indonesia serves as a significant point of contention. A notable portion of loans extended by banks should be repaid as agreed upon, which can adversely affect the financial stability of borrowers and lenders. The high NPL rate raises questions about whether lenders have diligently assessed their risk when determining loan terms and pricing. If risk assessments are not conducted thoroughly and accurately, it can lead to loans being priced inadequately, potentially contributing to higher default rates and financial instability in the banking sector.

The determinants of credit pricing decisions are strongly influenced by specific economic theories, with "asymmetric information theory and moral hazard theory" playing a prominent role in shaping these decisions (Rinjani, 2022). However, when examining the Indonesian context, it becomes evident that asymmetric information is particularly pertinent and challenging. This challenge arises primarily due to the need for a robust supervision system from creditors and the country's relatively weak financial system regulations.

Asymmetric information refers to the unequal distribution of information between borrowers and lenders, where borrowers possess better or more information about their financial position and the intended use of funds than the lenders. In Indonesia, this information disparity is exacerbated by the limited oversight mechanisms to monitor and verify the accuracy of borrowers' disclosures. Furthermore, the regulatory framework

within the financial system is less stringent than in some other regions, which can further exacerbate the problem.

An unequal distribution of information between lenders and borrowers gives rise to asymmetric information (Atmojo, 2021). The borrower possesses a different quantity and quality of information than the lender. Due to this information asymmetry, lenders face difficulties distinguishing between "high-quality and low-quality loans", which can lead to the erroneous practice of charging higher loan prices to high-quality borrowers or vice versa. This phenomenon is known as adverse selection due to information asymmetry. High-quality information in financial statements holds significant value and considerably impacts loan pricing. Suppose the information is deemed credible enough by information providers in a company or a country. In that case, quality information is of utmost importance as it influences the decision-making processes of capital providers and other stakeholders in investments and credit. Furthermore, the quality of companies' financial and nonfinancial disclosure increases their competitiveness in the investment market (Ibrahimov et al., 2022).

Asymmetric information significantly influences the pricing of loans, typically leading creditors to adopt differential interest rates, often called base lending rates, for borrowers based on the extent of their asymmetric information problems. In cases where borrowers have substantial issues related to asymmetric information—creditors have limited knowledge about the borrower's actual financial condition or intentions—lenders tend to charge higher interest rates. Conversely, for borrowers with lower asymmetric information problems, lenders may offer loans with lower interest rates. These base lending rates are crucial determinants in the borrowing decisions made by companies, as they often rely on loans to fund their day-to-day operations and cover various expenses.

In addition to the impact of asymmetric information, the quality of a company's accounting practices also holds significance in loan pricing. High-quality accounting practices provide a clear and accurate picture of a company's financial position and performance. This, in turn, aids lenders in making more reliable future financial predictions for the borrower. With accurate financial predictions, borrowers can better assess their ability to repay loans within the predetermined timeframes.

Credit risk has become one of the main challenges in risk management in recent years (García, 2017). Effective credit risk management is critical to the comprehensive risk management approach and a banking organisation's long-term success (Anastasiia Petruk & Roman Stadniichuk, 2020). Tunay et al. (2020) find that expansive credit policies, such as public credit guarantee programs, can positively affect economic growth but may negatively impact the riskiness of credit portfolios and the soundness of the banking sector. Credit risk, often assessed in terms of credit hazard, becomes a pivotal variable in the execution of banking operations.

Furthermore, the loan amount lenders provide to borrowers reflects the borrower's quality in determining the spread given (Rinjani, 2022). In the financial realm, the term "maturity" refers to “the last payment date of a loan or other financial instrument, at which point the principal (and any remaining interest) must be paid.” This implies that the riskier a company is perceived to be, the shorter the maturity period lenders will tend to offer, allowing for re-evaluation. Consequently, lenders will provide a high spread to compensate for the higher risk associated with the company (Chung & Phan, 2020).

Another factor to consider is the presence of collateral in the loan. Awaya et al.

(2017) define collateral as "specific assets pledged as a guarantee for a loan." Additionally, Thakor (2020) assert that borrowers can enhance their credit risk profile by providing collateral.

Evaluating a business entity's performance involves analysing financial and nonfinancial aspects. According to Janudin & Septiningrum (2021), profitability is the most suitable criterion for gauging a bank's performance. From an investor's standpoint, the growth of profitability and the level of profitability attained by a company are pivotal indicators in assessing its prospects (Ilmi, 2017). These measures are crucial in understanding the level of investment that investors are willing to commit to the company, considering the desired returns. As noted by Rustimulya & Muchtar (2019), The greater the bank's profitability, the greater the ability of banks to meet liquidity needs.

Profitability can be quantified using the Return on Assets (ROA) metric, which evaluates the efficiency of a company in utilising its assets to generate profits. ROA serves as a reflection of the returns achieved by a bank based on its capital and asset holdings. A higher level of profitability results in a higher ROA, signifying that the company is effectively leveraging its assets to generate profits.

Previous research by Bryan et al. (2022) shows that asymmetric information is insignificant in loan pricing. However, research by Maleki Mehr (2020) and Thai et al. (2021) demonstrates that asymmetric information and earnings management significantly affect firm value. Additionally, Walke et al. (2018) find that loan pricing impacts the level of credit. Numerous studies have examined loan pricing and the factors considered in determining loan prices. Given these insights, the primary aim of this study is to investigate the influence of asymmetric information and credit risk, as lenders consider, on loan pricing through profitability.

This research article introduces novel insights into the banking sector's credit pricing domain, focusing on publicly traded banking firms in Indonesia. While the paper primarily lays out the variables under examination and their interrelationships, its contribution to finance and banking can be summarised in several significant aspects. First, it delves into the often-overlooked dimension of information asymmetry and how it influences credit pricing, thus adding to our comprehension of the intricate dynamics in financial markets where information is not uniformly accessible. Second, the research underscores the critical role of credit risk management in shaping credit pricing decisions. The finding that credit risk significantly reduces credit prices provides practical implications for banks, highlighting the necessity of effective risk management for profitability and long-term viability.

Furthermore, this study brings a novel perspective by introducing the concept of profitability as a moderator in the relationship between information asymmetry, credit risk, and credit pricing. This approach contributes depth to understanding how profitability can mitigate the impact of information asymmetry. Lastly, the article emphasises the importance of adopting a balanced approach to credit pricing, considering a range of factors. This guidance encourages financial institutions to make well-informed decisions that align with risk management objectives, enhance competitiveness, and ensure sustainability. In essence, the novelty of this research lies in its ability to illuminate the intricate interactions and priorities within the banking sector concerning credit pricing, offering valuable insights for researchers, professionals, and policymakers as they navigate the complexities of credit pricing and risk management.

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THEORETICAL REVIEW

Credit Pricing. Credit pricing is a pivotal aspect of banking operations, and it hinges significantly on managing credit risk, with bank default being a primary determinant, as noted in the work of Anagnostopoulou and Tsekrekos (2017). Credit risk is the foremost risk banks face when they engage in lending activities. It revolves around the possibility that borrowers may fail to meet their repayment obligations, leading to financial losses for the lending institution.

Banks rely on accounting information as a critical tool to assess and manage this risk effectively. This information allows users of financial statements to make informed predictions about a company's future cash flows. However, an inherent challenge in the lending process is the presence of uncertainty in the quality and quantity of financial information borrowers provide. This uncertainty can significantly impact the decisions made regarding loan pricing.

When borrowers withhold or provide incomplete information, they may do so to make the information they provide appear more reliable for predicting future cash flows. Such behaviour can influence the determination of loan pricing, specifically the loan spread, which encompasses all components of the loan's pricing structure. Loan pricing is not merely a straightforward calculation, but a complex process influenced by various factors, including the quality and completeness of financial information borrowers provide.

In this particular study, credit pricing is quantified using the base interest rate as a proxy. The base rate, or credit interest amount, is determined through various factors and configurations. It is important to note that determining the base rate is not a random process but involves the application of specific measures. Factors such as costs and risks must be considered to establish a fair and balanced base interest rate. Failing to consider these factors can lead to an imbalance between income and expenditure for the lending institution, affecting its overall financial stability.

Credit pricing, subject to the interplay of supply and demand dynamics in the credit market, exhibits notable fluctuations (Li et al., 2021; Zhou et al., 2021). These fluctuations in credit prices influence the decision-making processes related to production and pricing, particularly within the context of credit policies. Furthermore, the volatility of credit prices exacerbates instability in production levels and pricing (Hendricks et al., 2020). As production levels and prices are contingent upon actual market demand, producers must make informed decisions considering demand and supply disruptions within the credit policy context. Numerous studies have been conducted to explore the disruptions in credit prices.

Information Asymmetry. The weak regulatory system in Indonesia's financial sector and the need for monitoring systems resulting from inadequate creditors give rise to a substantial challenge in asymmetric information. Additionally, independent institutions must provide ratings on private debt by financial institutions. The issue of asymmetric information has led to considerable research on loan pricing in Indonesia. It is observed that commercial banks have lower levels of asymmetric information compared to non-banks. As a result, commercial bank creditors tend to charge lower loan pricing rates than non-bank creditors.

Information asymmetry is a situation that arises when managers within a company

possess more extensive knowledge of the organisation's internal information and prospects compared to shareholders and other stakeholders. Consequently, specific critical outcomes and details about the company's operations and performance remain exclusive to those accessing this privileged information.

In the context of this research, the market-to-book value ratio of shares serves as a critical metric for quantifying information asymmetry, as highlighted by Cui et al. (2018). The market-to-book value ratio of shares is a financial indicator that offers insights into the extent of information asymmetry within a company.

To compute this ratio, two critical components are considered. The first component is the Market Value of Shares, which represents the value at which the company's shares are actively traded. The collective actions and decisions of participants in the stock market, including investors, traders, and speculators, determine this figure. The second component is the Total Equity, also known as the Book Value of Equity. This metric measures the company's net assets, reflecting the value of shareholders' equity. Typically derived from the balance sheet, it accounts for the difference between a company's assets and liabilities. Combining these two components provides a meaningful ratio that helps evaluate a company's financial health and market perception.

The calculation of the market-to-book value ratio of shares involves dividing the market value of shares (MVE) by the total equity (BEV), often based on figures from the end of the previous fiscal year (MVE / BEV).

This ratio is a valuable tool for assessing a company's level of information asymmetry. When the market value of shares significantly deviates from the book value of equity, it may indicate that investors and market participants possess differing perceptions and expectations about the company's future performance, possibly due to disparities in access to information. Consequently, a high market-to-book value ratio could suggest higher information asymmetry, whereas a lower ratio might indicate a more balanced flow of information between managers and stakeholders.

H1: Information asymmetry has a positive influence on credit pricing.

Credit Risk. Credit risk is an inherent part of banking and financial operations, originating from financial institutions' obligations and various activities, with lending being a primary source of risk exposure. It represents a bank's potential loss if borrowers or counterparties fail to meet financial obligations (Rose, 2017). One significant challenge in credit markets is information asymmetry, where borrowers possess more information about their credit risk than lenders. This information imbalance can lead to a situation known as adverse selection, where high-risk borrowers actively seek loans while lenders lack precise risk assessment capabilities. However, to address this issue, introducing credit scoring technology has emerged as a promising solution (Diaz-Serrano & Sackey, 2018; Kawai et al., 2022; Lu & Boateng, 2018). Credit scoring technology streamlines the assessment of borrowers' creditworthiness using a systematic approach that includes various indicators and algorithms. By utilising this technology, lenders can better evaluate the credit risk associated with potential borrowers, thus improving their ability to make informed lending decisions.

Credit scoring systems employ data analysis and statistical models to evaluate loan applicants' creditworthiness objectively. Through advanced algorithms and historical

data, these systems provide lenders with a comprehensive assessment of an applicant's creditworthiness. This analysis helps lenders quantify the level of risk associated with granting credit to a specific individual, enabling them to make more informed decisions about loan approvals, interest rates, and credit limits. The use of credit scoring systems enhances the efficiency and fairness of credit evaluations, reducing potential biases that can arise from subjective assessments and contributing to the stability and soundness of lending institutions.

The implementation of risk-based pricing, made possible by credit scoring, has proven advantageous for both borrowers and financial institutions (D. D. Yessenaman et al., 2023). Lenders can customise interest rates and terms based on an applicant's credit risk profile. This approach enhances the value of credit extended, particularly for low-risk applicants, while appropriately accounting for the higher risk associated with specific borrowers (Walke et al., 2018). The highest-risk borrowers can experience approximately 3 per cent less yearly appreciation than the lowest-risk borrowers (Hayunga et al., 2019). When determining bank credit and lending rates, multiple factors include the cost of funds/deposits, the negative impact of reserve accounts and liquidity, overhead costs, and the average net return (Blanco-Oliver et al., 2021). Taking these factors into account helps banks balance profitability and risk management in their lending practices.

In summary, credit risk arises from the obligations and activities of financial institutions, primarily in lending. Credit scoring technology addresses the challenge of information asymmetry, enabling more accurate creditworthiness assessments. Risk-based pricing, supported by credit scoring, benefits both borrowers and financial institutions, enhancing the overall profitability and value of credit extended. In this study, credit risk is evaluated using overhead costs, encompassing all the expenses incurred by a bank in its operations (excluding funding costs). Banks with high loan volumes tend to have lower overhead costs if they can efficiently manage their expenses (Blanco-Oliver et al., 2021).

H2: Credit Risk has a positive influence on credit pricing.

Profitability. The profitability assessment can use the Return on Assets (ROA) metric. ROA is a tool for companies to measure their capacity to generate profits through their existing asset base. One of the assets banks utilise to generate profits falls within their assets category, as bank assets encompass bank liabilities and capital. ROA is commonly employed to measure the rate of return on total assets, factoring in interest expenses and taxes (Cai et al., 2019). ROA evaluates a bank's profit-generating ability based on its capital and asset holdings, indicating its profitability (Yunanto et al., 2019). ROA utilises profitability to assess how effectively a company employs its assets for profit generation. A higher level of profit generated corresponds to an elevated ROA, indicating greater efficiency in leveraging assets for profit generation.

H3: ROA has a positive influence on credit pricing.

The Moderating Role of Profitability. This study investigates the role of profitability as a moderating variable between information asymmetry, credit risk, and

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credit pricing. Jensen and Meckling discuss agency problems that can arise between managers and shareholders within a company. They argue that the ownership structure of a corporation influences managers' decision-making behaviour. In equity-based ownership, managers may prioritise their utility at the expense of other shareholders, leading to conflicts of interest. Such conflicts represent a common agency problem, which may necessitate additional monitoring costs to mitigate hidden actions that disadvantage shareholders. These hidden actions by managers contribute to information asymmetry, specifically moral hazard. Thus, equity-based companies experience higher levels of information asymmetry than sole proprietorships.

The present study explores profitability's moderating role in the relationship between information asymmetry, credit risk, and pricing. In support of this investigation, Vitolla et al. (2020) shed light on agency problems between managers and shareholders within a company. They assert that a corporation's ownership structure significantly influences managers' decision-making. In particular, the discussion highlights potential conflicts of interest when managers prioritise their utility within equity-based ownership structures, often at the expense of other shareholders. Such conflicts represent a prevalent agency problem, necessitating additional monitoring costs to mitigate hidden actions that may disadvantage shareholders. These hidden actions by managers contribute to information asymmetry, specifically in the form of moral hazard, whereby managers have incentives to take risks that may not align with the best interests of the shareholders.

Consequently, companies with equity-based ownership structures generally experience higher levels of information asymmetry when compared to sole proprietorships. The complex dynamics within equity-based companies, including conflicting interests and the potential for moral hazard, contribute to an environment characterised by more significant information asymmetry. The study explores how profitability functions as a moderating variable within this context. Profitability, as a measure of a company's ability to generate profits, is expected to play a crucial role in shaping the relationship between information asymmetry, credit risk, and credit pricing. By analysing the impact of profitability on this relationship, the study aims to provide insights into how companies can leverage profitability to manage the challenges posed by information asymmetry and credit risk.

Research by Jiang et al. (2018) demonstrates that disclosing new information about corporate credit quality can reduce information asymmetry in the credit market. Third-party credit rating agencies serve as valuable tools for identifying high-quality firms; however, caution is needed that misuse of credit ratings can increase information asymmetry (Terovitis, 2018). Sometimes, investors rely solely on credit ratings instead of conducting their analyses, hindering an accurate understanding of a company's quality. Credit rating agencies employ diverse methodologies, which can yield conflicting ratings, thereby perplexing investors. Furthermore, these agencies heavily rely on information provided to them without always conducting thorough verification, leading to potential inaccuracies in their assessments.

Nevertheless, credit rating agencies can serve as supplementary tools alongside monitoring and screening activities to mitigate information asymmetry. However, they should be more than just relied upon as standalone solutions. However, it is essential to note that credit rating agencies faced criticism for their role in the 2007 financial crisis, as pointed out by Utzig (2020). Consequently, investors are advised to minimise their

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reliance on credit rating agencies by considering broader indicators and factors when making investment decisions. By adopting a more comprehensive approach, investors can enhance their decision-making process and mitigate potential risks associated with solely relying on credit ratings.

Lending is a central bank activity, serving as a fundamental pillar of their operations as financial institutions. The ability to extend credit, even when holding substantial funds from customer deposits, is essential for banks to remain financially viable. Failing to do so can have dire consequences, potentially leading to significant financial losses for the bank, as highlighted by Kasmir (2017).

Banks, by their role as financial intermediaries, inherently bear various risks, with one of the most prominent being the risk associated with lending funds to the public. This credit risk arises from the possibility that borrowers may default on their loan obligations, resulting in potential losses for the bank. A previous study conducted by Mei et al. (2019) demonstrated a noteworthy correlation between increased credit risk and a decline in the profitability of companies. This suggests that as the level of credit risk rises, profitability ratios are expected to decrease, signalling financial challenges for the lending institution.

Furthermore, an additional dimension to this relationship is explored by Toumi (2020), highlighting that an increase in the cost-to-income ratio, a measure of operational efficiency, is associated with heightened bank risk. This indicates that inefficiency in utilising a bank's resources may lead to increased risk exposure. In turn, this increased risk is presumed to contribute to a decrease in profitability, as poor management practices can result in underutilisation of the bank's resources, affecting its overall financial health.

H4: Profitability positively moderates the relationship between information asymmetry and credit pricing.

H5: Profitability positively moderates the relationship between credit risk and credit pricing.

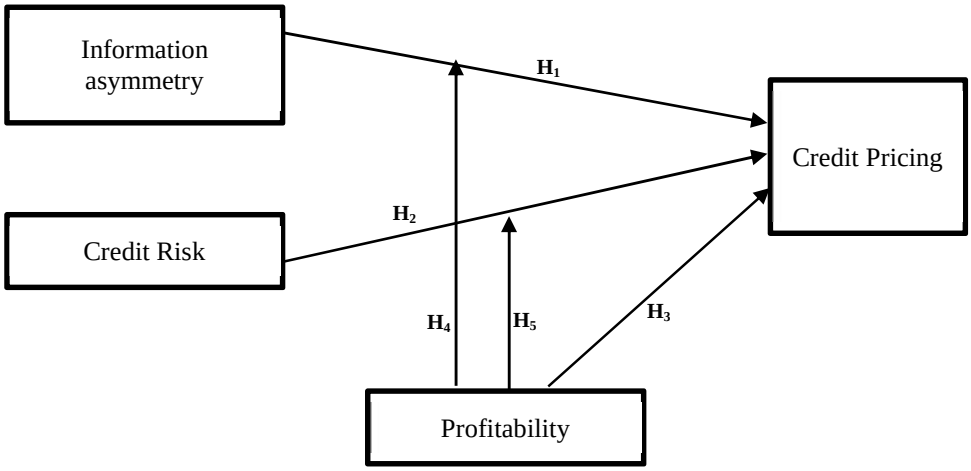

Figure 1. Research Model

METHODS

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The methodology employed in research holds immense significance as it serves as a vital tool for scrutinising research objectives (Hair et al., 2019). Employing suitable investigative techniques is crucial to meet research objectives and address practical and theoretical issues. In this study, a quantitative research approach was adopted. Quantitative research aligns with the positivist philosophy of investigating specific populations or samples to test predefined hypotheses (Sugiyono, 2017). Secondary data sources were the basis for collecting data in this study. Subsequently, structural equation modelling in Eviews 9 was employed to test the proposed hypotheses.

Data Collection. According to Kestenbaum & Kestenbaum (2019), a population is a specific group of subjects or objects characterised by distinct qualities chosen by researchers to conduct a study and draw meaningful conclusions. In the context of this research, the target population consists of the financial statements of publicly traded banking firms listed on the Indonesia Stock Exchange from 2015 to 2020, encompassing a total of 33 companies. The formation of the research sample followed a purposive sampling approach, guided by several criteria: firstly, the inclusion of banking companies listed on the Indonesia Stock Exchange that had published financial reports between 2015 and 2020; secondly, the selection of companies that consistently provided financial reports throughout the entire study period; thirdly, the consideration of companies that presented their financial statements in the Indonesian rupiah currency to eliminate variations caused by exchange rates; fourthly, the retention of companies that remained listed on the stock exchange for the entire duration of the research; and lastly, the inclusion of companies possessing complete and necessary data and information for calculating variables such as information asymmetry, credit risk, profitability, and credit prices. Consequently, the sample for this study was composed of eight banking companies listed on the Indonesia Stock Exchange, resulting in a dataset of 48 data points collected from these eight companies throughout six study periods.

Data Analysis. This study used statistical analysis, specifically multiple regression equations, to analyse the data. The software used was Eviews 8.0. The data used in the analysis was panel data, which combines time series and cross-sectional data. Hypothesis testing was done using Moderated Regression Analysis (MRA), a technique that includes an interaction element in the regression equation. The regression equation is as follows:

$$C = \alpha + \beta_1 I + \beta_2 C + \beta_3 P + \beta_4 P (I * P) + \beta_5 P (C * P) + \varepsilon \quad (1)$$

In the context of the equation above, the detail can be explained as follows: variables include CP (Credit Price), IAS (Information Asymmetry), CRS (Credit Risk), and PRO (Profitability). The equation involves multiple regression coefficients, denoted as β1, β2, β3, β4, and β5, which represent the respective weights assigned to these variables. Additionally, a constant parameter, α, influences the overall model. To account for any unexplained variations in the equation, we introduce an error term, ε. The interplay of these components helps us understand and quantify the intricate connections between credit pricing, information asymmetry, credit risk, profitability, and other factors in a financial context.

Before hypothesis testing, descriptive tests must be carried out. In addition, the

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classical assumption test is also conducted to avoid a biased linear estimation model.

RESULTS

This section will present the findings and analyses from our research, offering an in-depth examination of the data collected and the insights drawn from the study. Tables and figures will represent the results and emphasise the noteworthy discoveries made visually. The results illuminate diverse facets of the research, including the interrelationships among various variables and their potential implications. These discoveries contribute to a more profound comprehension of the subject matter and offer valuable insights for future research endeavours and practical applications.

Table 1 shows that the average value of the information asymmetry variable is 1.297, with a standard deviation of 0.838. This indicates that the average value is higher than the standard deviation, suggesting relatively good results. The standard deviation closely reflects the variance, indicating a normal data distribution. The minimum value for information asymmetry is 0.00002, while the maximum is 3.398. These results indicate significant fluctuations in revenue management.

Table 1. Descriptive Statistical Data

	IAS	CRS	CP	PRO
Mean	1.294	20.743	30.649	0.014
Medium	0.973	16.472	27.848	0.015
Maximum	3.398	80.633	75.679	0.039
Minimum	0.00002	0.103	10.114	-0.041
Std. Dev	0.838	19.672	15.823	0.011
Skewness	0.662	0.873	0.774	-2.088
Kurtosis	2.393	3.057	2.837	12.359
Jarque- Bera	4.241	6.098	4.840	210.040
Probability	0.120	0.047	0.089	0.000
Sum	62.274	995.669	1.471.171	0.685
Sum Sq. Dev.	33.034	18,188.930	11,767.600	0.006
Observations	48.000	48.000	48.000	48.000
Cross sections	8.000	8.000	8.000	8.000

Source: Eviews Data Panel Regression Output 9.0, 2023

Regarding credit risk, the mean value is 20.743, with a standard deviation of 19.672. The mean is higher than the standard deviation, considered a favourable outcome. The standard deviation accurately represents the variance, resulting in a typical data distribution. The minimum credit risk recorded is 0.103, while the maximum is 80.633. These findings demonstrate considerable variability in credit risk.

The credit price variable has a mean of 30.649 and a standard deviation 15.823. Similarly, the mean surpasses the standard deviation, indicating positive results. The standard deviation closely aligns with the variance, suggesting a normal data distribution. The minimum credit price is 10.114, and the maximum is 75.679, illustrating substantial

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fluctuations in credit prices.

Regarding profitability, the average value is 0.014, accompanied by a standard deviation of 0.011. Once again, the mean exceeds the standard deviation, which is desirable. The standard deviation accurately reflects the variance, indicating a normal data distribution. Profitability ranges from a minimum of -0.041 to a maximum of 0.039. These results indicate that profitability experiences relatively minor fluctuations.

The results of testing the coefficient of determination are:

Table 2. Fixed Effect Model t Test Results

Variable	Coefficient	Std. Error	t- Statistic	Prob
C	20.622	4.476	4.461	0.000
IAS	0.835	1.880	0.444	0.659
CRS	0.427	0.087	4.911	0.000
PRO	5.879	132.564	0.044	0.965

Source: Eviews Data Panel Regression Output 9.0, 2023

Table 2 reveals that information asymmetry has a t-value of 0.444, resulting in a significance value of 0.659 with an alpha of 0.050. Based on this, we can conclude that the significance value, 0.659, is greater than the alpha value, 0.050. Therefore, we can infer that information asymmetry does not significantly affect the price of credit (in the positive direction). On the other hand, credit risk does affect the price of credit. In the table above, credit risk is shown to have a t-value of 4.911, yielding a significance value of 0.000 with an alpha of 0.050. Consequently, we can conclude that the t α value is significant and is less than 0.000. This implies that profitability does not impact the price of credit (in the negative direction).

Table 3. Moderated Regression Analysis Test Results

R-square	0.375	Dependent variable (mean)	0.014
Adjusted R-squared	0.206	Dependent Variable (SD.)	0.011
SE Regression	0.010	Akaike information criterion	-6.129
Residual sum of squares	0.004	Schwarz criterion	-5.700
Log-likelihood	1,581.076	Hannan-Quinn criterion	-5.967
F-statistic	2,216.774	Durbin-Watson Statistic	1.805
Prob (F-statistic)	0.039		

Source: Eviews Data Panel Regression Output 9.0, 2023

The R-squared value is 0.375, then converted to a percentage format. This indicates how much the independent variables contribute to the dependent variable. Specifically, in this study, the asymmetry in information, credit risk, and profitability account for 37 per cent of the variability in the real earnings management variable. The factors or variables that were not considered in this regression model account for the remaining 63 per cent of the variability in the data.

Table 4. Moderated Regression Analysis Test Results

Variable	Coefficient	Std. Error	t- Statistic
C	1,820.135	1,245.640	1,461.205

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IAS	3,435.786	4,873.220	0.705
CRS	0.313	0.285	1.099
PRO	1,145.142	6,785.854	0.169
IAS*PRO	-665.533	2,682.886	-0.248
CRS*PRO	1,248.975	1,821.210	0.686

Source: Eviews Data Panel Regression Output 9.0, 2023

The regression equation for panel data, considering the moderator effect of information asymmetry and the relationship between credit risk and credit price, as presented in **Table 4**, can be expressed as follows:

CP = 1,820.135 + 3,435.786*IAS + 0.313*CRS + 1,145.142*PRO – 665.533*IAS*PRO + 1,248.975*CRS*PRO……..……..…… (2)

Several conclusions can be drawn from Formula 2, indicating that profitability reduces the impact of information asymmetry on credit pricing. Based on the test results presented above, it can be observed that the significance t-value of the interaction variable (0.538) between information asymmetry and credit risk is greater than 0.050. The resulting coefficient is -665.533, and the profitability of Real Profit Management is 3.436. Consequently, the profitability variable cannot decrease (or increase) the impact of information asymmetry on credit pricing.

Furthermore, profitability reduces the impact of credit risk asymmetry on credit pricing. Examining the test results mentioned above, the t-value of the interaction variable between credit risk and credit pricing (0.497) is greater than 0.050. The resulting coefficient is 1,248.975, and the credit risk coefficient of the credit score is 0.313. Therefore, we can deduce that the profitability variables cannot decrease (or strengthen) the relationship between credit risk and pricing.

DISCUSSION

The findings reveal that information asymmetry has not been an effective mechanism to overcome loan pricing in banking and rejects hypothesis H1. This suggests that banks generally have lower information asymmetry compared to non-banks. Consequently, commercial banks tend to charge lower loan rates than non-bank lenders because uninformed customers must consider the fees and commissions charged from lending activities. Therefore, this study deviates from previous research by Tchamyou et al. (2018), suggesting that information asymmetry influences loan pricing due to its economic impact on the spread of loan pricing.

However, this study aligns with the findings of Agarwal (2022), which indicate that information asymmetry may not significantly affect loan pricing. However, other factors, such as diversification and contract terms, may play a role. Another study by Beck et al. (2018) reveals that foreign creditors generally offer lower loan pricing than domestic creditors. Domestic and private creditors have the highest loan pricing, followed by public creditors, while government creditors have the lowest loan pricing. The comparison between government and foreign creditors shows little difference, likely due to the low default risk associated with government borrowers.

Furthermore, the study confirms that credit risk significantly reduces the price of

credit, supporting hypothesis H2. This result implies that credit risk can be an effective mechanism to overcome loan pricing in banking. According to Rose (2017), there are several indicators to calculate credit risk, such as the ratio of loans written off from the bank's books to total loans and leases, loan losses to total loans and leases, or equity capital. This research aligns with a study conducted by Walke et al. (2018), which explains that credit risk affects loan pricing by optimising the impact of credit risk on borrowers. Credit risk arises from the failure of loan repayment by the debtor at maturity, thereby eliminating the bank's source of income. Consequently, if interest rates are higher, the likelihood of banks experiencing problems is very high. Hence, borrowers are expected to pay off loans before maturity to prevent banks from incurring losses.

Conversely, profitability has no positive effect on loan pricing, and hypothesis H3 is rejected. This study uses return on assets (ROA) to measure profitability. It does not align with the research conducted by Martín-Oliver et al. (2020), which explains that return on assets affects loan pricing by optimising the impact of loan interest rates on borrowers. ROA represents one of the steps for companies to generate profits by utilising existing assets at the bank, and loans granted are one of the assets banks use to generate profits. Profitability can moderate the relationship between information asymmetry and credit prices, supporting hypothesis H4. These results are consistent with the research of Ardiyani & Yadnyana (2023), which shows that “credit disbursed has a positive effect on profitability.” However, “profitability cannot strengthen the relationship between credit risk and credit prices, and hypothesis H5 is rejected." This result indicates that "the greater the credit extended by the bank, the greater the credit risk it will face. The risk manifests as non-current credit payments or non-performing loans, known as the Non-Performing Loan (NPL) ratio in banking terms. The occurrence of non-performing loans leads to losses for the bank as the funds channelled in the form of credit are not repaid, and interest income cannot be received, resulting in decreased bank profitability." An increase in the NPL ratio also affects the decline in public confidence and the bank's health. These findings align with the research conducted by Atmojo (2021), which states that "NPL hurts profitability," as well as the research conducted by Sari et al. (2020), which states that NPL hurts credit disbursed. According to Khalfaoui & Derbali (2021), strict bank regulations on lending increase profitability, and a high rate of return sends a positive signal and enhances bank profitability. Banks' credit distribution activities involve risk, and as the bank extends more credit, the credit risk it faces increases. Credit risk refers to the risk banks face when lending funds to the public, such as insufficient credit payments or defaults.

Furthermore, increased information asymmetry exposes primary regulators to higher credit risk, leading businesses to expect higher-priced credit. Commercial banks can reduce asymmetric information better than investment banks, resulting in more affordable credit pricing decisions (Bryan et al., 2022). Credit risk refers to the risk of the borrower's inability to fulfil their obligations as stated in the credit agreement (Chowdhury, 2021), which can include bankruptcy or late payment of credit interest. The higher the credit risk, the greater the supervisory ability required by the lender.

Collateral is often associated with riskier loans, as it is typically required in credit transactions that demand tighter supervision (Fang et al., 2020). It serves as a signal of higher-risk loans and necessitates increased monitoring compared to loans without collateral (Jensen & Meckling, 1976). Lenders perceive collateralised loans as riskier,

leading to higher loan spreads charged to borrowers (Wijaya & Moro, 2022). The seniority of the borrowing company only significantly affects the loan spread lenders offer. A negative correlation indicates that more senior borrowers receive lower spreads (Godlewski & Weill, 2021). This is because seniority reduces the lender's need for intensive monitoring, as senior borrowers tend to have established reputations, better access to information, and greater financial stability. In summary, collateralised loans are viewed as riskier, resulting in higher loan spreads. However, borrower seniority mitigates risk perception, leading to lower spreads as the need for monitoring decreases.

This study presents a theoretical framework based on Loan Pricing and Agency Theory. The findings are consistent with Loan Pricing Theory, showing that profitability moderates the relationship between information asymmetry, credit risk, and loan pricing. While one of the moderation hypotheses is not supported, the other hypothesis is accepted, aligning with Loan Pricing Theory's view that excessively high loan interest rates can lead to adverse selection problems and moral hazard among high-risk borrowers (Gupta & Hansman, 2022). Previous research has overlooked the influence of asymmetric information and credit risk when utilising Loan Pricing Theory and Agency Theory. Additionally, this study significantly contributes to the literature by examining the impact of information asymmetry, credit risk, profitability, and loan pricing. Thus, it addresses several important factors that affect loan pricing. Except for hypotheses H1, H3, and H5, all other hypotheses are supported and consistent with Loan Pricing Theory and Agency Theory. Future researchers can further investigate H1, H3, and H5 in different contexts to assess their alignment with Loan Pricing Theory and Agency Theory.

Managerial Implication. Based on the insights of Su & Zhang (2017), the lending rate is expected to stay the same if it appropriately accounts for the borrower's risk. Agency problems can arise due to conflicts between different managers or agents. Such problems can occur in two situations. Firstly, conflicts within the debtor's company can lead to new agency conflicts between creditors and debtors when credit is extended. Secondly, conflicts can arise between depositors and creditors/debtors. The first situation can occur among stakeholders in the company, which increases the risk of moral hazard and agency costs. In such cases, the potential for conflicts between creditors and debtors will be higher when loans are granted, resulting in a cost for creditors.

The field of research and improvement in this area offers a multitude of promising avenues. The significance of information asymmetry, particularly within the banking industry, has been widely recognised. Investors rely on accurate and comprehensive information to make well-informed decisions, and it is their rightful expectation to understand the extent of information asymmetry prevailing in the market. Various methodologies can be employed to assess and quantify information asymmetry, and one approach that holds promise is the utilisation of analyst forecasts as a proxy indicator. Regrettably, due to insufficient data on the banks examined in this study, incorporating analyst forecasts was not feasible. Nonetheless, one potential extension of this research could involve investigating information asymmetry in Islamic and conventional banks, leveraging analysts' forecasts to measure information availability and transparency. Such an exploration could shed light on the variations in information asymmetry between these two banking systems, providing valuable insights for investors and researchers alike.

By undertaking this proposed extension, researchers can further expand our

understanding of information asymmetry, its implications, and potential mitigation strategies within the banking sector. This would contribute to the ongoing body of knowledge in the field, facilitating more informed decision-making and potentially enhancing financial markets' overall efficiency and stability.

A rise in operational risk negatively affects the financial performance of universal banks. By examining the outcomes related to credit risk, we can deduce that excessive bank leverage arises from losses caused by insufficient systems. Consequently, the bank is compelled to make higher interest payments. The repayment of debt obligations reduces the bank's incoming funds, thus adversely affecting its financial performance (Gadzo et al., 2019). From a portfolio concentration perspective, inefficiencies in the process and information asymmetries lead to inappropriate investment portfolio selection. Additionally, communication distortions between management and bank shareholders result in the adoption of inappropriate leverage policies (Gadzo et al., 2019). This continuous phenomenon, as noted by Gadzo and Asiamah (2018), leads to banks having high leverage, ultimately eroding their net interest income.

The findings reveal that higher credit risk is associated with lower lending profitability. Banking companies that face credit risk often experience financial disruptions as they incur losses due to funds not being fully repaid. Consequently, when such companies seek capital through borrowing, they may need more funds to provide loans, leading to decreased profitability. In addition, imbalanced information tends to emerge in credit business transactions due to weaknesses in risk assessment by credit officers, a lack of independent rating agencies to rank debtors' obligations effectively, and hidden agendas of potential debtors. High information asymmetry gives rise to agency conflicts between creditors and debtors, with debtors acting as agents of creditors. As agents, debtors are responsible for adhering to the credit agreement. However, designing fair credit contracts becomes challenging when creditors face high information asymmetry.

Consequently, agency conflicts between creditors and debtors may arise, resulting in adverse selection, increased credit pricing, and elevated risk. These consequences must be managed through effective monitoring systems, covenant agreements, legal lending limits, selective lending, credit guarantees and insurance, and credit restructuring. Dealing with the consequences of information asymmetry primarily focuses on reducing its impact rather than preventing it from causing further losses. However, if credit failure has already occurred, options such as liquidation or restructuring are typically considered, with credit restructuring being a promising option when debtors still demonstrate good potential and a willingness to cooperate with creditors.

CONCLUSION

The research findings presented in this study shed light on the association between credit pricing in the banking sector. One key observation is that variables associated with asymmetric information do not significantly influence credit prices, whereas credit risk emerges as a prominent driver of credit pricing. This suggests that banks prioritise assessing and managing credit risk over information asymmetry concerns when establishing credit prices. Furthermore, this study highlights the crucial role of credit risk

and profitability in shaping credit prices. Even highly profitable banks cannot completely offset the impact of information asymmetry on credit pricing, indicating a multifaceted interaction between profitability, credit risk, and information asymmetry within the banking industry.

To navigate the complexities of credit pricing effectively, it is evident that a balanced approach is required. Such an approach should consider various factors, including credit risk, information asymmetry, and profitability. By doing so, banks can make informed decisions regarding credit pricing, aligning with their risk management objectives and enhancing their competitiveness and sustainability in the financial market. This research provides valuable insights that can help financial institutions pursue prudent lending practices and optimal pricing strategies in the ever-evolving landscape of the banking industry.

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