Proceedings of ICMRED 2025 Symposium: Effective Communication as a Powerful Management Tool
DOI: 10.54254/2754-1169/2025.BL23894

A Study of the Impact of Non-Performing Loans on the Price-to-Book Ratio of Financial Companies

Sihan Cheng

New Channel-UIBE Qingdao A-level Centre, Qingdao, China
sihancheng1115@outlook.com

Abstract: This study investigates the impact of non-performing loan (NPL) ratios on the price-to-book (P/B) ratios of financial institutions, using Ping An Insurance Company of China as a case study. Based on data from 2018 to 2024 and examining landmark real-estate non-performing loan events—such as the defaults Baoneng Group and China Fortune Land Development—the research identify a clear three-phase dynamic: (1) Stabilization (2018–2020), when NPL ratios remained below 2% and P/B ratios hovered between 1.8 and 2.2; (2) Divergence (2021–2023), marked by NPL surges from 1.8% to 6% alongside a steep P/B decline from 2.0 to 0.5; and (3) Partial Recovery (2024), with NPLs retreating to 4% and P/B ratios stabilizing near 1.0. Empirical analysis confirms a significant negative correlation between rising NPL ratios and P/B ratios, driven by increased loan-loss provisions, asset impairments, and deteriorating market sentiment. These findings highlight the importance of robust credit risk management and early warning mechanisms to preserve asset valuations. The study concludes with policy recommendations for financial institutions and regulators, including enhanced risk monitoring, diversified credit exposures, and strengthened supervisory frameworks to mitigate the adverse valuation effects of non-performing loans.

Keywords: Non-Performing Loan, Price-to-Book Ratio(P/B), Real Estate Sector, Three Red Lines Policy, Risk Transmission

1. Introduction

As a pillar industry of China's economy, the real estate sector has witnessed rapid expansion and capital accumulation over the past two decades, involving into one of the most financialized markets worldwide. However, under the long-term policy directive that "housing is for living, not for speculation," the industry has gradually transitioned from a phase of extensive growth to one of more refined regulation. The characteristics of real estate tools are concentration, long capital turnover period, fixed capital flow, capital appreciation and risk. The "Three Red Lines" policy introduced in August 2020—targeting developers' worth debt ratio, net debt to equity ratio, and cash to short-term debt ratio —marked a regulatory intervention to defuse systemic debt risks [1]. While intended to curb excessive leverage, this policy inadvertently triggered liquidity crises among highly leveraged developers: Since 2021, over one-third of China's Top 50 developers have defaulted on debts, while the non-performing loan ratio for real estate in commercial banks surged from 1.8% in 2020 to 3.2% in Q1 2023. Concurrently, non-bank financing channels contracted by 40% year-on-year, and overseas USD bond issuance costs exceeded the 15% warning threshold [2,3]. These cascading

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effects not only exposed the financial fragility of developers but also revealed inherent contradictions between financial asset valuation systems and risk transmission mechanisms.

The dynamic effect of non-performing loans on price-to-book ratios is examined in this paper, with an emphasis on how policy shocks might cause real estate debt crises to ripple through financial valuations. The study provides fresh insights into the ways that growing credit risks and regulatory actions impact institutions and investors by looking at a variety of empirical and theoretical viewpoints. Using metrics like NPL ratios, P/B ratios, and other financial indicators for a more comprehensive evaluation of stability and profitability, the findings will practically assist market participants in implementing a multi-metric strategy to lessen choice biases [4]. In addition, this report offers policymakers data-driven criteria and suggestions that are unambiguous and intended to improve systemic resilience. From a theoretical standpoint, the work links traditional risk metrics to modern valuation frameworks, while contextualizing empirical models within China's evolving policy environment [5]. Overall, the research aims to chart the transmission channels of credit risk, clarify the varied impacts across different sectors, and ultimately propose a robust, cross-validated governance framework that can serve as a blueprint for mitigating potential future crises and guiding policy reform. By integrating historical data and real-time policy shifts, this approach endeavors to offer comprehensive insights for both academic research and industry practice.

2. Case description

Ping An Insurance Company of China, Ltd. (hereinafter "Ping An"), a leading Chinese financial conglomerate, operates across banking, insurance, and asset management. Following the implementation of the "Three Red Lines" policy in 2020, the real estate sector faced severe liquidity crises, with highly leveraged developers defaulting on debts [2]. Ping An, holding substantial real estate-linked loans, emerged as a critical case for analyzing risk transmission.

Project Risk Case Associated with Baoneng Group: The Baoneng City project, which is associated with Baoneng Group, featured a loan default of RMB 5.4 billion and is one of the biggest non-performing loans (NPLs) in Ping An Bank's real estate portfolio. The project went through judicial auction procedures in 2021–2022, which was prompted by the cash issue of Baoneng Group. This case demonstrated systemic weaknesses in risk diversification by highlighting Ping An Bank's excessive concentration of credit exposure to private real estate developers. The real estate non-performing loan balance of Ping An Bank jumped to RMB 1.66 billion in 2021, a 290% increase from the start of the year. RMB 1.2 billion of this increase was caused by the default of a single developer, who was assumed to be Baoneng. The event made clear the dangers of making aggressive loans to highly leveraged private companies in the face of stricter regulations, such as the "Three Red Lines".

China Fortune Land Development Debt Crisis Case: Ping An Bank faced significant risk exposure from China Fortune Land Development (CFLD), a major developer that defaulted in 2021. Ping An Group, the parent company, recorded a massive asset impairment loss of RMB 35.9 billion due to CFLD's collapse, directly impacting Ping An Bank's financial health. Although the bank did not disclose specific loan losses, the event became a catalyst for its soaring real estate NPLs. By 2022, the real estate sector's NPL ratio industry-wide reached alarming levels. Ping An Bank's real estate NPL balance skyrocketed by 537% year-on-year, with the NPL ratio jumping from 0.22% in 2021 to 1.43% in 2022. This reflected broader systemic risks as developers struggled with refinancing amid policy shocks and contracted non-bank financing channels.

3. Analysis on problems

Non-Performing Loan (NPL) serves as a critical metric for evaluating banks' credit risk management capabilities, reflecting the level of credit risk embedded in loan portfolios [6]. As one of the core

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operational risks in banking, credit risk primarily stems from borrowers' failure to meet debt obligations, leading to loan defaults. The NPL ratio is calculated as the proportion of non-performing loans to total loans, with a threshold below 5% generally indicating acceptable asset quality. From a risk management perspective, a lower NPL ratio implies reduced exposure to credit risk for financial institutions. As a result, NPL serves as a crucial metric for evaluating the quality of bank assets and gives regulators quantitative standards to set up early warning systems [7].

Beyond its implications for regulatory oversight, the NPL ratio has a direct bearing on investors' perceptions of a bank's risk-return profile. A lower NPL ratio typically suggests more prudent lending practices and robust credit risk controls, which in turn promote stable profit streams and bolster market confidence. By contrast, an elevated NPL ratio signals a deterioration in asset quality, spurring concerns about the bank's ability to absorb losses, generate future earnings, and maintain sufficient capital buffers. This inverse relationship between asset-quality distress and market valuation lies at the heart of many bank-rating models, where NPL trends are often scrutinized alongside liquidity measures and capital adequacy ratios. In practice, rising NPLs can trigger reputational damage, elevated funding costs, and heightened investor skepticism, all of which feed back into the bank's broader financial health [8].

The P/B ratio is a measure of a company's market value relative to its book value and is calculated using the following formula (1):

$$P/B = MarketPriceperShare/BookValueperShare \quad (1)$$

P/B indicates whether the market assigns a premium or discount to the company's net assets. If P/B less than 1, the stock trades below its book value, suggesting potential undervaluation—but it may also reflect market concerns over asset-quality risks. If P/B higher than 1, investors expect future earnings or growth, common in technology and financial firms. In financial theory, the Non-Performing Loan Ratio (NPL) serves as a key proxy for asset quality [9]. As NPL rises, provisions for bad debts and impairment losses increase, reducing book value per share. Consequently, the market revises down its valuation of net assets, leading to a lower P/B.

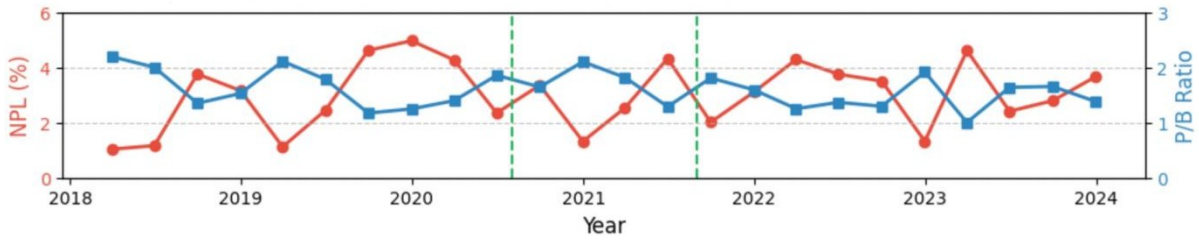

Figure 1: Dynamic relationship between NPL and P/B ratio(ping an real estate)

The provided chart illustrates the inverse correlation between Ping An's real estate non-performing loan (NPL) ratio and its price-to-book (P/B) ratio from 2018 to 2024. Key observations and theoretical interpretations are as follows: First, there was a stabilisation phase from 2018 to 2020. During this time, Ping An's NPL ratio was below 2%, and the P/B ratio stayed within a relatively small range of 1.8 to 2.2. Due in part to the early implementation of the "Three Red Lines" policy, which sought to limit excessive leverage in the real estate industry, this phase is consistent with a more restricted credit climate. Investors saw consistent asset quality and thought Ping An could effectively manage its exposure to real estate developers, which contributed to the generally optimistic market sentiment. Second, from 2021 to 2023 is a divergence phase, the NPL ratio climbed sharply from 1.8% in 2020 to 6% in 2023, while the P/B ratio fell precipitously from 2.0 to 0.5 [10]. The abrupt surge in NPLs coincided with a series of developer defaults, liquidity crunches, and broader financial distress catalyzed by stringent enforcement of the "Three Red Lines". Ping An was forced to increase loan-

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loss provisions, directly impacting its earnings and, in turn, its book value. Market participants became increasingly risk-averse, further depressing the share price as doubts grew about potential spillover effects into other parts of Ping An's portfolio. This downward pressure on valuation underscored the market's heightened sensitivity to credit risk, reaffirming the negative correlation between rising NPLs and declining P/B ratios. Third, 2024 is a partial recovery phase, the NPL ratio receded to around 4%, while the P/B ratio rebounded slightly to 1.0. This partial recovery phase suggests that a combination of asset disposals, regulatory interventions, and improved liquidity conditions helped mitigate some of the worst effects of the credit crisis. However, the P/B ratio did not return to its pre-crisis range, reflecting persistent market skepticism and lingering concerns over whether the measures taken were sufficient to avert future credit shocks.

For financial Institutions, building dynamic risk models. Traditional risk assessment methods (e.g., static models) may fail to predict sudden policy changes, leading to liquidity crises. For example, Ping An's case showed that static models could not warn about abrupt policy shifts. Financial institutions should develop dynamic risk models that integrate regulatory timelines (like the phased "Three Red Lines") and early warnings for bad loans (NPL). These models act like "weather forecasts," simulating how policy changes impact finances, helping institutions prepare in advance to avoid panic selling or cash shortages [11]. Updating data and policies in real time is also crucial to keep models accurate.

For policymakers, implementing policies gradually. Strict "one-size-fits-all" regulations can trigger market panic, as seen in the 2021–2023 real estate crisis. Policymakers should avoid immediate enforcement and instead create transition periods [12]. For example, allow highly leveraged companies to reduce debt step-by-step or offer temporary exemptions for critical sectors like affordable housing. This is similar to "braking slowly" while driving—it reduces risks without causing sudden market freezes. Additionally, a "buffer period" could let companies adjust through financing or restructuring, minimizing short-term shocks.

For investors, use multiple metrics for analysis. Many investors rely only on the Price-to-Book ratio (P/B) to value companies, but this may ignore how bad loans (NPL) distort book values. A better approach is to combine P/B, Return on Equity (ROE), and NPL rates into a dashboard [13]. For instance, if a company's ROE keeps dropping and NPL rises sharply, even a low P/B might hide risks. This is like judging a person's health—you need to check not just weight but also diet and medical reports. Multi-metric tools help investors see the full picture and avoid herd behavior.

4. Conclusion

4.1. Key findings

Among banking financial institutions, non-performing loans has a significant negative impact on the price-to-book ratio (PBV). Specifically, a rising non-performing loans ratio implies deteriorating asset quality and increased credit risk, which can lower investors' valuation expectations of the company, leading to a lower PBV. For example, when a bank's NPL ratio climbs, the market may perceive its future profitability and asset margin of safety to be threatened, which in turn depresses the stock's multiple relative to book value.

4.2. Limitations and future study

This study has achieved some results in exploring the dynamic impact of NPL ratios on price-to-book ratios, but there are still some limitations. First, the study data sample mainly covers the time period from 2018 to 2024, failing to reflect the ongoing impact of economic fluctuations and policy adjustments on banks' asset quality and valuation over a longer cycle; subsequent studies may consider expanding the time period to capture long-term trends. Second, this study uses Ping An

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Insurance as a case study, and although it is representative in revealing the industry's risk transmission mechanism, the differences in the characteristics of different financial institutions and industries may lead to limitations in the generalizability of the conclusions; data from multiple institutions could be introduced into future work to improve the broad applicability of the findings. In addition, the research model still has certain deficiencies between capturing the instantaneous and lagged effects of policy shocks, and subsequent research can try to construct a more dynamic and multivariate model that incorporates macroeconomic, international capital flows and other factors to further improve the theoretical framework of risk transmission . Finally, the combination of big data and artificial intelligence technology to realize real-time risk early warning mechanism will help to further improve the precision and foresight of financial regulation. The above limitations provide a direction of improvement for future research, which is expected to provide more perfect support for financial risk management and policy formulation at the theoretical and practical levels.

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