# Navigating Risk and Resilience: Exploring Prudential Policies for Proactive Prevention of Non-Performing Loans (NPLs)

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**Abstract.** Non-Performing Loans (NPLs) refer to loans or credit that have passed a certain time limit without expected interest or principal payments. However, the main challenge faced by NPLs is that they can trigger a domino effect that is detrimental to overall economic stability. This study uses a conceptual approach and a case approach in solving research problems. The results show that prudential policies have an important role to face the challenges of NPLs. The prudential policy actively seeks to prevent the accumulation of NPLs by encouraging financial institutions to adopt responsible and sustainable lending practices. Through rules and guidelines set by regulators, financial institutions are directed to carry out more stringent credit evaluations, minimize credit risk, and ensure that their credit portfolios are well diversified. This arsenal of prudent policies illustrates the comprehensive approach taken by regulators and central banks in preventing NPLs. By synergistically using these various tools, prudential policies serve as a strong shield to maintain the stability and integrity of the financial system. Macroprudential measures are a crucial foundation in maintaining financial system stability and addressing systemic risks originating from NPLs.

**Keywords**: Prudential, Policy, Non-Performing Loan, Credit Risk.

## 1    INTRODUCTION

In the context of the evolving world of financial markets, it is important for us to understand clearly what is meant by Non-Performing Loans (NPLs) and why this phenomenon is a significant risk trigger for financial institutions and their impact on overall economic health. NPLs refer to loans or credit that have passed a certain time limit without expected interest or principal payments. This phenomenon occurs when borrowers are unable to meet their payment obligations, and NPLs become a kind of burden on financial institutions and, more broadly, the economy.

The main challenge faced by NPLs is that they can trigger a domino effect that is detrimental to overall economic stability. NPLs cause direct losses to financial

institutions, reduce productive assets and hinder stable cash flow. However, the impact doesn't stop there. The accumulation of NPLs can undermine the resilience of the financial sector and spread throughout the economy, triggering a reduction in available credit, inhibiting investment, and ultimately hampering economic growth.

Not only that, another challenge is the NPLs which show loans that fail to generate the expected profit. This risk is a major concern for banks, as they try to avoid it.[1] It has been noted that calculating risk allocation is a core conundrum in portfolio management, and consistent risk metrics also offer a basic framework for addressing portfolio risk issues [2].

In this context, prudential policy arrangements have an important role to play in dealing with the challenges of NPLs. This policy actively seeks to prevent the accumulation of NPLs by encouraging financial institutions to adopt responsible and sustainable lending practices. Through rules and guidelines set by regulators, financial institutions are directed to carry out more stringent credit evaluations, minimize credit risk, and ensure that their credit portfolios are well diversified.

It is important to underscore that understanding and overcoming the challenges of NPLs is not a task confined to financial institutions alone. In fact, governments, regulators and other market participants must also collaborate to develop effective strategies. This article will guide the reader through the concrete steps that have been taken in the form of prudent policies to prevent the accumulation of NPLs, helping to promote a more stable financial sector and a more risk-resilient economy.

In the ever-evolving landscape of financial markets, the principle of prudential policy has emerged as a crucial tool that plays a major role in maintaining the stability and integrity of the banking system. Amidst the various complexities and challenges faced by financial institutions, the threat posed by NPLs has been under intense scrutiny because of its potential to damage the balance. This paper has an exploratory aim to reveal the proactive steps contained in the prudential policy framework, an approach specifically designed to prevent the growth rate of NPLs and in this case ensure the sustainability and dynamics of the financial sector.

In a changing context, the financial sector has an increasingly important role to play in driving economic growth. However, this growth cannot be separated from risks that may lurk, including threats arising from NPLs. NPLs refer to loans that fail to generate expected interest or principal payments, and their potential negative impact on overall financial stability has made them a focus of increasing attention.

Addressing this challenge requires a careful strategy, and this is where precautionary policy plays a central role. By basing itself on the principle concept that aims to prevent potential risks and regulate behavior in the financial system, this policy directs financial institutions to act within controlled and sustainable limits. In this case, caution is not just a reaction to existing risks, but is also a proactive effort to prevent these risks from arising in the first place.

In recent years, we have witnessed dramatic changes in the way the financial industry operates, including technological developments that enable easier access to finance and product innovation. However, with this change came new challenges that required a new approach. This article seeks to answer important questions such as how prudent policies have adapted to the digital age, how sustainable approaches and green finance

have been incorporated into prudent policy contexts, and how collaborative efforts from industry players and regulators can shape the foundation for a more resilient and responsive financial sector.

In solving this research problem, the authors use a conceptual approach and a case approach in solving research problems.

## 2 WAREHOUSE OF PRECAUTIONARY POLICY

The different positions of banks in financial markets underscore the importance of risk assessment and mitigation for institutions. The information provided in bank annual reports, financial analyst reports and credit rating reports provides timely risk profiles from various perspectives and viewpoints. Bank management tends to offer a more optimistic portrayal of risk in annual reports to protect their interests. In contrast, analyst reports and credit rating reports have no incentive to cover up, hide, or embellish a bank's risks, contributing to greater emotional alignment in their content. Consequently, a comprehensive evaluation of a bank's risk must incorporate the perspectives of all three parties while adjusting to their emotional approval.

Banks that display low emotional affinity and low emotional scores in both analyst reports and credit rating reports deserve careful consideration for investments. Additionally, regulatory authorities overseeing banks can use emotional similarity metrics across all three types of reports to potentially apply punitive measures against institutions that cloud risk, thereby guiding investment decisions.

While it may initially be intuitive to assume that high alertness of a firm's senior executives increases the threshold for spreading credit risk associated with it, this research contradicts this notion, revealing that senior executive alertness does not change the threshold for spreading credit risk. Due to space limitations, a simulation and comprehensive analysis of the transmission of credit risk associated with corporate senior executive vigilance in the BA scale-free network and the WS small world network will be included in a future section of this paper [3].

The cumulative effect of various regulations on the credit creation process in the banking system is indicated by various balance sheets. His research introduces an agent-based model that simulates commercial banks, each initially endowed with the same amount of equity and reserves. The model integrates two main processes: credit creation and funds transfer.

In the process of credit creation, commercial banks simultaneously generate money and debt through loans, with payments leading to reduced money and outstanding loans. Equilibrium is reached when borrowing matches repayments. The fund transfer process involves random transfers of deposits and reserves between banks, resulting in an exponential distribution of reserves. This mechanism facilitates the creation of a heterogeneous banking system with diverse balance sheets.

To illustrate the constraining effect of multiple regulations on credit creation, thereby deriving expressions for the money supply and the money multiplier when multiple regulations are imposed simultaneously based on the representative bank

model. The most stringent constraints for representative banks depend on their balance sheet structure, which is characterized by the ratio of equity to reserves. In a heterogeneous banking system with varying balance sheets, the binding constraints for each bank may be different. This diversity in binding regulations leads to a reduction in the overall money supply, as revealed by the theoretical analysis and computational results in this study.

Next, we propose a static model that uses a certain distribution of Pareto reserves to characterize bank heterogeneity. The extent of this heterogeneity is measured by the corresponding Gini index. The results show that the decrease in the money supply increases with this higher degree of bank-specific heterogeneity. This study highlights that the response of banks to various regulations, particularly in terms of credit creation, can be different. These findings should encourage economists and policy makers to reconsider money supply mechanisms in the context of various regulatory frameworks. For example, this insight highlights why the money multiplier has decreased despite looser monetary policy in the United States. Depending on the bank's position, addressing a shortfall in reserves effectively supports the money supply. However, if banks face capital constraints, seeking additional capital rather than reserves becomes essential, and increasing reserves can even have a negative effect on multiplying money. Therefore, bankers must identify the position of their bank based on balance sheet data to increase money and credit while complying with central bank and supervisory requirements [4].

Various steps are needed to overcome the problem of accumulation of NPLs in the global banking sector. These steps include the ongoing development of bankruptcy law and the establishment of a framework for negotiated settlements during the pre-bankruptcy phase. In addition, the creation of a functional market for distressed debt, driven by private capital, stands as an important component of the policy mix. The economic model developed in this study explains certain features of this market, including the unique aspect that the incremental value function of a bank may decrease with an increase in the value of the deal and an increase in the cash proportion of the deal.

The analysis shows that it is feasible to build a market for NPLs where the value of NPLs and the rate of transfer of risk out of the banking sector emerges as a result of market dynamics. In many developing countries, the operationalization of these recommendations will involve the role of the market while removing constraints on the operation of private capital. In developed countries, operationalization requires a securitization transition from the scope of unregulated shadow banking to the domain of market activities.

While the role of public capital cannot be completely ignored, it appears that the severe accumulation of NPLs is pressuring policy makers to clean up bank balance sheets in order to revive credit growth. This pressure is increasingly felt when public sector banks dominate the banking landscape. However, this approach can lead to over-allocation of public capital, NPL price inflation, and subsequent financial stress in the Asset Reconstruction Company (ARC).

ARC's performance in China exemplifies how macroeconomic imperatives can drive moral hazard in the operations of poorly funded, publicly funded banks. To mitigate

this risk, it is important to divide the NPL challenge into two segments: long-term NPL and new NPL. For NPLs with long tenors, a national non-performing bank supported by the government with a limited term can be formed to acquire NPLs from banks with notional values. The role of bad banks must be limited to increase the attractiveness of NPLs through debt aggregation. The combined debt that exceeds the value of the individual components can then be sold to the privately funded ARC through a market mechanism.

Given the widespread prevalence of distressed debt, concerted efforts to facilitate borrower rehabilitation and debt recovery are essential. The recommendations outlined in this paper, rooted in theory and informed by Indian data, offer a potential way forward [5].

This section functions as a comprehensive inventory of various precautionary tools used by regulators and central banks to prevent NPLs. This includes aspects such as capital adequacy requirements, supply norms, stress testing, and the supervisory framework.

The arsenal of prudential policies is a kind of collection of instruments prepared by regulators and central banks to face the challenges of NPLs. This section aims to provide an in-depth understanding of the various tools used to prevent the growth of NPLs and secure overall financial stability. In this context, various prudential tools such as capital adequacy requirements, provision norms, stress testing, and supervisory frameworks are included in the prudential policy arsenal.

Capital adequacy requirements are the basis of prudential policies, mandating that financial institutions must maintain adequate capital reserves as a layer of protection against risks that arise. By ensuring that these institutions have sufficient capital to cover possible losses from NPLs, this requirement helps to reduce potential systemic impacts.

Supply norms require financial institutions to allocate reserve funds to cover potential losses associated with troubled assets. When NPLs occur, these funds can be activated to handle these losses without disrupting the ongoing operations of financial institutions.

Stress testing is a powerful tool in understanding the extent to which financial institutions can withstand severe economic stress. By simulating extreme scenarios, including a drastic increase in NPLs, stress testing helps identify potential vulnerabilities and enables financial institutions to take appropriate countermeasures.

The supervisory framework refers to the supervisory rules and measures put in place by regulators and the central bank to monitor and oversee the activities of financial institutions. This includes proactive monitoring of the credit portfolio, risk analysis related to NPLs, as well as periodic reporting to ensure adherence to the precautionary principle.

Concrete cases that demonstrate the effectiveness of these tools can illustrate the importance of prudential policies in dealing with NPLs. For example, during the 2008 global financial crisis, when NPLs increased dramatically, financial institutions that met capital adequacy requirements and had adequate supply norms were better able to deal with the negative impact.

Stress testing has also become a major focus post-crisis, and the European Central Bank conducts comprehensive stress tests on banks in its region. The results of this stress test allow banks to identify vulnerable areas and take corrective action.

In addition, the cases of countries that have adopted strong supervisory frameworks also provide important insights. For example, New Zealand has demonstrated that close monitoring of speculative lending practices can reduce the risk of NPLs and prevent financial crises.

Overall, this arsenal of prudent policies illustrates the comprehensive approach taken by regulators and central banks in preventing NPLs. By synergistically using these various tools, prudential policies serve as a strong shield to maintain the stability and integrity of the financial system.

# 3     MITIGATION OF SYSTEMIC RISK

The impact of monetary and macroprudential policies as well as other controlled variables on bank credit risk in Indonesia using the PMG (Panel Mean Group) approach shows that the long-term effect of monetary policy on credit risk is positive, which means that monetary policy tightening increases bank credit risk. Conversely, in the short term, expansionary monetary policy mitigates bank credit risk. Conversely, macroprudential policy has a negative effect on credit risk, indicating that more prudent policies are effective in reducing bank credit risk.

Additional findings reveal that macroeconomic and bank-specific factors produce more lasting effects in the long term than in the short term. Therefore, achieving better macroeconomic performance, including low and stable inflation and strong economic growth, is important to reduce non-performing loans in the Indonesian banking sector.

Increased bank liquidity and capital also contributed to reducing credit risk in the long term. These findings offer valuable insights for bank leaders to re-evaluate lending strategies to reduce non-performing loans. In addition, the implementation of effective macroprudential and monetary policies by the government is very important to manage credit risk and reduce the ratio of non-performing loans in the Indonesian banking sector.

In principle, the study made a significant contribution. However, it also faces certain challenges, especially relying on secondary data to analyze the factors affecting non-performing loans. In addition, the data set is only sourced from 42 commercial banks operating in Indonesia in early 2010.[6]

Given the large amount of data in the current era, there is a need to analyze several other parameters to improve model performance and understand the underlying causes of credit risk triggers. The main limitation of this study stems from the lack of available comprehensive datasets. Access to more detailed features can result in a better representation of features. Furthermore, exploring combinations of under-sampling and oversampling techniques is essential to overcome multi-class challenges. Integrating additional attributes such as low score, transaction limit, default frequency, job profile, geographic location, and availability of root rights can offer a comprehensive

representation of features, an undertaking to be explored in future research. In addition, a deeper exploration of these features based on advanced feature selection methods such as variable ranking, feature subset selection and embedding techniques is essential.[7]

Non-performing loans are used as a substitute for assessing credit risk and can serve as a key metric in evaluating the potential harm to a country's banking industry. Credit risk encourages banks to face losses in their loan portfolios due to default, requiring each bank to establish credit management criteria.[8] These criteria include establishing and implementing processes that are aligned with the bank's risk profile as well as overseeing credit risk management [9]

Banks provide loans to borrowers as an additional aspect of their profit-driven operations, in addition to their core function. However, when offering loans, they run the risk of not being able to repay. The nature of this risk varies depending on the type of credit, including factors such as fees and collateral.

This related risk does have a broad influence. This is because banks rely on external financial sources to run their operations and initiate credit-based loans to meet domestic market demand. In particular, sudden fluctuations in foreign exchange rates pose a significant challenge to institutions, organizations and individuals with debt obligations in foreign currency. These exchange rate mismatches and contradictions had a negative impact on the bank's capital structure. In addition, the downward trend in banking capital adequacy ratios arose due to soaring concerns regarding foreign exchange.[10]

Crises in various sectors and countries show a tendency to influence each other, setting off a chain reaction due to the complex interactions between local financial and economic systems and their global counterparts. This phenomenon is especially visible in the contemporary world, where globalization is at its peak. A striking illustration of the severe impact of bad loans on the economy is the 2008 'Mortgage' crisis in the United States. The ripple effects of this financial crisis, originating in the United States, reverberated globally, undermining the economic system and triggering business bankruptcy. Key concerns revolve around the potential adverse impact on the entire system, stemming from a disruption in the financial system of banks struggling to recover problem loans. Financial institutions, driven by the profit motive, ignore potential risk factors and cannot carry out a thorough financial analysis of credit seeking companies or firms. As a result, the loans provided by these banks became problematic due to factors such as exchange rate fluctuations, limited company liquidity, overborrowing, and lack of financial discipline.

This situation gave rise to a number of challenges, including disruptions in capital structure, reduced profit margins, high operating costs, poor performance, reduced yield ratios, and adverse effects on depositors. As a result, bank activity shrank, balance sheets were distorted, and instances of bankruptcy emerged due to high interest payments, liquidity flow problems, reduced credit-worthy investment opportunities, and balance sheet recessions. These related problems require state intervention in financial markets to correct socio-economic imbalances.[11]

Based on an innovative dataset consisting of daily Credit Default Swaps (CDS) information, supplemented by bank-level and country-level data, covering 4939 CDS variants from 70 banks in 25 countries over a period of up to 2490 days between 2010 and 2019, we dig deep the influence of macroprudential policy on bank credit risk. Our

study reveals a notable reduction in bank credit risk as a consequence of macroprudential policy interventions. In particular, policies based on strengthening capital, such as tightening the counter-cyclical capital buffer (CCyB), have proven effective in mitigating bank credit risk. The results also offer clear evidence of the beneficial impact of CCyB tightening across the spectrum of bank CDS deployments. This tightening effect causes a shift to the left in the distribution, which includes reducing the mean, median, minimum, and maximum values, while depressing the distribution's spread (as indicated by a reduction in the standard deviation). This tightening step was in line with the increase in the bank's capital ratio.

In addition, our investigation underscores the relevance of bank-specific factors. In particular, increased liquidity, improved capital ratios, increased operational efficiency, superior asset quality and reduced leverage were all associated with reduced bank CDS spreads. This finding underscores the importance of inherent bank characteristics in explaining the dynamics of credit risk.

The macroeconomic environment is also very important. An example of rising inflation is correlated with increasing pressure in the banking sector. Similarly, increases in financial and macroeconomic uncertainty are associated with notable increases in bank CDS deployments. In addition, global uncertainty gauges such as macroeconomic and financial uncertainty, as well as the VIX, exert a more pronounced influence on the spread of the CDS than country-specific EPU indices. This shows the influence of the role of global capital in influencing bank CDS spreads on a global scale.

The recent COVID-19 pandemic has triggered the implementation of various macroprudential policies, especially those aimed at increasing banking liquidity. Further research is needed to fully understand the consequences of this policy on bank CDS spreads [12].

The emergence of macroprudential as a defense shield is important in dealing with systemic risks arising from Non-Performing Loans (NPLs). Awareness of the potential for NPLs to trigger a domino effect throughout the financial system has encouraged regulators and authorities to adopt a broader and strategic approach in maintaining economic stability. This section explores how macroprudential measures work to mitigate the systemic risks associated with NPLs, and delves into critical tools such as the loan-to-value ratio (LTV), countercyclical capital buffers, and debt service ratios.

The loan-to-value ratio (LTV) is a macroprudential tool that refers to the comparison between the value of a loan and the value of the property it guarantees. When the guaranteed assets begin to depreciate or experience a decline in value, LTV regulations will control the amount of loans provided by financial institutions. This not only serves to protect these institutions from the potential for greater losses from depreciating assets, but also helps prevent too large cuts on assets by borrowers facing financial difficulties.

The formulation of a macroprudential supervisory framework is still in the process of being developed, but significant steps have been taken to build a comprehensive and unified structure for this important task, which plays an important role in ensuring the stability of the financial sector. An empirical examination of the European Union's banking system reveals a strong relationship between the trajectory of the economy and

indicators reflecting the financial health of banks. This linkage underscores the need for a collaborative effort between entities charged with financial oversight and government authorities overseeing economic and fiscal policy. Such cooperation is essential for implementing effective and harmonious measures aimed at mitigating systemic risk and maintaining financial stability.

A variety of approaches are used to identify impending financial crises, reflecting differences in the scientific literature on this subject. The empirical analysis carried out in this study allows exploration of various trends and correlations. Nonetheless, this model can be expanded into an early warning system to detect banking crises. In addition, various macro stress tests can be carried out to assess the resilience of the banking system in facing macroeconomic shocks [13].

A countercyclical capital buffer is a form of capital reserve established by regulators to reduce risks associated with economic cycles. When the economy is growing rapidly, regulators may require banks to add capital reserves, thereby providing additional protection when economic conditions worsen and potential NPLs increase. This helps maintain the resilience of financial institutions in the face of extreme economic fluctuations.

Furthermore, the debt service ratio is the ratio between debt payments (interest and principal) to the income of the borrower. This tool works to ensure that borrowers have sufficient financial means to repay their debts on a regular basis. This is especially relevant in preventing the accumulation of NPLs because too many borrowers are unable to meet their obligations.

Data demonstrating the effectiveness of these macroprudential tools can illustrate their impact in real situations. For example, when the UK implemented stricter LTV rules in 2014 to control high housing loan growth, in addition, the financial crisis had a major impact on the functioning of a country's economy. As an illustration, Caprio & Klingebiel calculate that Spain's GDP decreased by around 17% after the banking crisis that occurred in 1977 to 1985.[14] NPLs in this sector experienced a sharp decline. In Spain, where countercyclical capital buffers were strictly enforced after the global financial crisis, financial institutions have become more resilient to sharp economic swings.

Along with regulations and macroprudential tools, effective communication from regulators is also an important element in implementing these measures. When banks and related parties understand the reasons for and benefits of these rules, implementation becomes smoother.

In conclusion, macroprudential measures are a crucial foundation in maintaining financial system stability and addressing systemic risks originating from NPLs. By integrating tools such as LTV, countercyclical capital buffers, and debt service ratios, regulators have powerful tools to control the negative impact of NPLs on the financial system as a whole.

## 4      CONCLUSION

As financial markets continue to develop, the role of prudential policy as a preventive measure against NPLs remains important. By understanding the depth and breadth of these policies, policy makers, regulators and financial institutions can collaboratively build a resilient financial ecosystem that is ready to face the challenges ahead.

This arsenal of prudent policies illustrates the comprehensive approach taken by regulators and central banks in preventing NPLs. By synergistically using these various tools, prudential policies serve as a strong shield to maintain the stability and integrity of the financial system. Macroprudential measures are a crucial foundation in maintaining financial system stability and addressing systemic risks originating from NPLs. By integrating tools such as LTV, countercyclical capital buffers, and debt service ratios, regulators have powerful tools to control the negative impact of NPLs on the financial system as a whole.

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