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Impact of Social Factors on Bank Performance: Evidence from Bangladesh

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Abstract

This paper investigates the link ofnonconventional factors like regulationquality,business environment, political stability, and rule of lawwiththe bank performance in Bangladesh for the period of 2000-2023. The analysis relies on Vector Autoregressive (VAR) model, Granger causality test and Impulse Response Function (IRF) to determine the impact of this four variables on the business performance of banks in Bangladesh. The findingshows thatimprovement in regulatory quality, political stability, and business environment significantly reduce Non-performing Loan (NPL) leading to better banking performance. Improvement in the rule of law does not have any immediate impact on NPL. It may bedue to stricter enforcement of law forces the banks to acknowledge and report more bad loans. However, rule of law is seen as beneficial for the long-term stability because it promotes a more transparent and accountable system. The study concludes thatpersistent political stability,improved business environment, and higher regulation quality are essential for enhancedbanking performance. So it is recommendedthat harmonized reforms, continuous monitoring, and capacity building for the relevant institutions are necessaryso that the availability of these three social pillars of bank performance is ensured.

Keywords: Political Stability, Business Environment, Regulation Quality, Bank Performance.
JEL Classification: D41, G10, G38, L51.

1 Introduction

The banking sector is a strong pillar of the Bangladeshi economy which mobilises savings and allocating credit for productive expenditure, which directly supports GDP growth and industrial development. Its stability and performance is important driver of overall economic health. Failures or crises in the banking sector can have a systemic and devastating impact on the entire economy. As an emerging market economy, Bangladesh's financial sector is often more sensitive to non-economic shocks compared to developed nations (Bardhan, 2015). Research identifying these sensitivities is vital for building resilience. Bangladesh, at times, experiences political uncertainty or instability. Research linking this to bank performance is essential because political turmoil can make unstable environments that disrupt business operations, leading to borrower defaults and a rise in NPL, which directly harms bank performance and survival. Studies have shown a significant positive impact of political stability on firm performance in Bangladesh. Instability creates an unpredictable operating environment, deterring domestic and foreign direct investment (FDI), which reduces the pool of high-quality borrowers and limits business for banks (Alzarooni et al., 2025). A weak business environment, characterized by excessive bureaucracy, poor infrastructure, and non-transparent administrative processes, directly increases the operational cost and risk exposure for banks. This research helps quantify the extent to which a poor environment

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erodes profitability and efficiency of banks in Bangladesh. A weak rule of law is a major problem for banks. This is critical because as inefficient or slow legal systems make it difficult for banks to enforce contracts and recover collateral from defaulters, contributing to high NPL and capital shortfall. The effectiveness of the rule of law inducing loan repayment is shown to condition the effect of bank regulation. Further, if the perception is that loan default has few legal consequences, it encourages a culture of non-payment, fundamentally undermining credit discipline in banking system.

Research on the dependence of bank performance on nonconventional variables or social factors like political stability, business environment, regulation quality, and rule of law in Bangladesh is critically important due to the central role the banking sector plays in the country's economy, coupled with the inherent vulnerabilities of an emerging market and with evolving fragile institutional quality of the country. This line of research may explore beyond the traditional focus on internal financial market specific issues (like capital adequacy, management skill, imperfect market, industrial backwardness, loan quality, etc.) and general macroeconomic determinants (like GDP growth, savings rate, level credit demand, inflation, etc.) to address the deeper, systemic inherent influences that shape the operational context for financial institutions, some historically and socially or culturally acquired country specific factors of financial inefficiency of a third-world country which are absent on high efficient market of the first world.

Historically, research on bank performance in Bangladesh (and in many developing countries) has focused on conventional financial metrics — capital adequacy, asset quality, management, earning, and liquidity, interest rate spread, or loan-deposit ratio, etc. However, this approach overlooks the broader institutional and governance environment, which can deeply affect banking operations in ways that financial and economic alone cannot explain (Alzarooni et al., 2025). Beyond traditional indicators many other nonconventional variables also matter the bank performances. For example, political instability may lead to erratic economic policy, affecting loan recovery, investor confidence, and risk management those incur greater uncertainty for the banks. Similarly, regulatory quality can impact how well banks are supervised and whether they follow risk-averse practices. Further, business environment influences credit demand, loan performance, and operational risk. Additionally, rule of law determines how effectively contracts are enforced and disputes resolved, affecting non-performing loans (NPL).

Bangladesh has made remarkable economic progress, but governance challenges persist. The World Bank and other international indices often cite low scores in governance indicators such as political stability, control of corruption, regulatory effectiveness, and rule of law. In such an environment banking sector vulnerabilities are amplified (World Bank Group, 2025). Moreover, political patronage and regulatory capture can distort credit allocation. Likewise, weak rule of law leads to poor loan recovery, rising default rates. Therefore, studying these variables is not optional but essential for crafting effective banking policy. So, this research is critically important for Bangladesh.

In a bank-dominated financial system like Bangladesh's, economic growth is tightly linked to banking sector performance. Poor regulatory enforcement can lead to rising NPL, as seen in the recent banking crisis. Similarly, political interference in bank can cause credit misallocation — financing unviable or politically connected projects. In the same way, a weak legal environment means delays in loan recovery and greater credit risk. If banks cannot operate in a predictable, fair, and rules-based environment, their performance will deteriorate, which will affect credit supply, in-

vestor and depositor confidence, and overall financial inclusion and economic development (Longo, 2025).

In recent years, Bangladesh has faced a sharp rise in NPL because of unprecedented scale of political interference in the banking sector. As a result, public criticism over politically exposed borrowers is mounted and public trust on financial system fall in record level of depth. State sponsored banking scandals involving weak regulation and lack of accountability raises question of regulators role as well. That is why these real-world issues point directly to the non-financial, institutional factors that this research aims to examine.

Given Bangladesh's economic goals and challenges, including significant political interference, the stability of its banking sector is critically important. Skyrocketing NPL are a key symptom of vulnerabilities, signaling deficiencies in asset quality and risk management that threaten broader economic growth. The nation's recent experience with unprecedented level of NPL offers a unique opportunity to study the effects of socioeconomic and political factors on banking performance.

The stability of Bangladesh's banking sector is under severe threat due to an exceptionally high NPL ratio of 24% in the March quarter 2025 (as per Bangladesh Bank's BBQ report). This unprecedented level of NPL poses a substantial risk to the entire financial system and the economy. Although the regulation quality and the rule of law (legal framework) are intended to safeguard stability and mitigate NPLs, their effectiveness in Bangladesh is highly questionable. Crucially, the dynamic relationship and impact of the interplay between frameworks on banking stability remain an under-investigated area.

Traditional research often focuses on what regulations exist (e.g., capital adequacy ratios). However, the quality of regulation and supervision implementation i.e. how effectively the rules are enforced, is equally important, especially in developing economies where enforcement capacity can be weak (Engkus et al., 2019). Research can determine how institutional quality factors like control of corruption and political stability enhance the positive effect of regulations on bank stability. The findings provide evidence-based guidance for the Bangladesh Bank and the government. If, for instance, political stability is shown to be a major determinant of bank performance, it provides a powerful economic argument for policies aimed at institutional strengthening and political predictability to protect the financial sector. Research on institutional factors supports the central bank's move from a reactive, compliance-based supervision to a forward-looking, risk-based approach that incorporates broader systemic and institutional risks into its regulatory framework. This research thus offers evidence-based insights into how nonconventional variables directly affect bank profitability, risk-taking, and solvency. So, it will also provide some policy recommendations for improving governance, thereby stabilizing the banking sector.

Existing banking research about the nexus between regulation, bank performance, and business risk typically under examined not only in Bangladesh but also across globally. This study fills that void by specifically analyzing the dynamic interplay among them: regulatory quality, the rule of law, political stability and business atmosphere with banking stability indicated by NPL within the context of Bangladesh. The research uses a Vector Autoregressive (VAR) model to generate a more nuanced and context-specific understanding of such indicators in shaping the health of the Bangladeshi banks.

The remainder of the article systematically presents the research. We first conduct a literature review to summarize existing knowledge on the impact of legal, business, regulatory, and political environments on NPL. This section is followed by a methodology section, which explains our use of a VAR model

to dissect the dynamic nexus between political stability, business environment, regulation quality, the rule of law, and NPLs. We then present and interpret the empirical results, which are thoroughly discussed to highlight their significance for theory and practice. The final section is the conclusion, which encapsulates the study's main contributions, provides policy recommendations, and outlines directions for future inquiry.

2 The Institutional Crisis in Bangladesh: Governance, Political, and Business Issues

Since its starting, Bangladesh has made remarkable social and economic progress by reducing poverty, improving life expectancy, making advances in food security, etc. (World Bank Group, 2025). However, many governance indicators suggest persistent and serious problems in how law, regulation, political stability, and the business operation environment in practice. These weaknesses limit inclusive development, undermine confidence in institutions, and hamper investment and sustainable growth. The country's history of terrible rivalry among political parties, marked by periods of political clash, military and autocratic rule, have contributed to a governance framework that struggles to uphold the rule of law, ensure regulatory quality, maintain political stability, and foster a sound business environment (Hoque, 2018; McKeown, 2024). These deficiencies are further exacerbated by rampant public sector corruption, which, as noted by Transparency International (TI), has repeatedly positioned the country among the most corrupt globally, scoring 23 in the year 2024 Corruption Perceptions Index (CPI) and being the lowest in South Asia after Afghanistan (TIB, 2025). The updated comparative data for Bangladesh on rule of law, regulatory quality, political stability, corruption perception, and business climate, with tabulated data drawn from the related sources. The figures in the following Tables 1 and 2 help put the qualitative picture.

Table 2: Comparative Table Over Recent Years

Year	Regulatory Quality	Rule of Law	Political Stability	CPI Score/Rank
2022	−0.93	−0.60	−0.91	25 / 147th
2023	−0.91	−0.50	−0.91	24 / 149th
2024	N/A	N/A	N/A	23 / 151st

Note: N/A indicates data not yet available from the World Bank for many governance indicators.
Source: [1] TheGlobalEconomy.com; [2] Transparency International Bangladesh; [3] World Justice Project.

2.1 Rule of Law per External Measure Also Low

Rule of law refers to a situation in which laws are clear, publicised, stable, and applied evenly; fundamental rights are protected; the independence of the judiciary; and that legal processes are accessible and just for all. The World Justice Program (WJP) ranking (127/142) confirms that in many dimensions (access to justice, fundamental rights, constraint on government powers, etc.), Bangladesh is performing poorly. Small improvement in 2024 was modest. While there is some slight improvement recently (for example, WB rule of law improved from ~ -0.60 in 2022 to -0.50 in 2023) and the WJP very modest increase in 2024, Bangladesh continues to perform poorly relative to global averages. The WJP ranking being very low indicates widespread perception of legal and judicial weaknesses. The concept of the Rule of Law, though enshrined as a fundamental principle in the Constitution of Bangladesh, is frequently undermined in practice (Hoque, 2018). The legal framework and its implementation suffer from several structural and political flaws:

In regard to judicial independence and due process, despite the separation of the higher and lower judiciary, issues remain, such as

Table 1: Key Data & Indicators for Bangladesh

Indicator	Value	Year	Notes
Regulatory Quality[1]	−0.91	2023	Scale: −2.5 (weak) to +2.5 (strong)
Rule of Law[1]	−0.50	2023	Same −2.5 to +2.5 scale
Government Effectiveness[1]	−0.70	2023	−2.5 to +2.5 scale
Political Stability[1]	−0.91	2023	High risk of political violence/instability
CPI (TI/TIB)[2]	23/100	2024	151st out of 180 countries
CPI (TI/TIB)[2]	25	2022	147th out of 180 countries
Business Climate Index[1]	58.75/100	FY2023–24	Down from ∼ 61.95
Rule of Law (WJP)[3]	0.38/1.00	2023	127th of ∼ 142 countries

Source: [1] TheGlobalEconomy.com; [2] Transparency International Bangladesh; [3] World Justice Project.

the control of district and session judges' transfers and promotions by the law ministry, which contradicts judicial independence (Hoque, 2018). Moreover, recent reports highlight a gross travesty of the rule of law, where arrested political figures have been denied bail and the higher judiciary has maintained silence, raising concerns about the machinery of justice falling silent (McKeown, 2024). The use of laws like the Special Power Act of 1974 and section 54 of the criminal code allows for arbitrary arrest and preventive detention, often employed as a political weapon against opponents (Hoque, 2018).

Impunity and Law Enforcement: The effectiveness of law enforcement agencies is often questioned due to their poor record on human rights and perceived service to the government as "enforcers," which allows them to act arbitrarily. The resulting culture of impunity contributes to extrajudicial killings and a general lack of accountability for those with political connections (McKeown, 2024). The huge backlog of unsettled cases, which was forecast to reach 5 million by 2020, also represents a severe constraint on civil justice and the timely enforcement of law (Hoque, 2018). Weak rule of law leads to corruption, under enforcement of contracts, arbitrary decisions, and reduced investor confidence. It makes bureaucracy more discretionary, increases risks for entrepreneurs, and deepens inequality when powerful actors escape accountability.

2.2 Poor Regulatory Quality and Business Environment

Regulatory quality refers to the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development; reduce regulatory burden, avoid unnecessary red tape; ensure consistency and transparency of rules; etc.

Persistent weaknesses of regulatory quality is clear in Bangladesh. Regulatory quality, rule of law, government effectiveness and political stability are all in significant negative territory on the WB governance indicators scale. These are not small deviations; for example, Bangladesh's rule of law score of −0.50 in 2023 is an improvement over earlier but still well below many peer countries, and still far from neutral or positive. It remains deeply negative and close to the historical average, indicating entrenched problems. The improvement (from −0.93 to −0.91) is marginal. This reinforces the point that regulation remains burdensome, inconsistent, or inefficient in practice.

The quality of the regulatory environment in Bangladesh presents a significant barrier to private sector development and investment

(Rowshan, 2020). The country's percentile rank for regulatory quality was reported at 18.87% in 2023 by the World Bank, indicating a poor ability of the government to formulate and implement sound policies.

2.3 Business Environment

Poor regulatory quality increases the cost of doing business (time, official fees, informal payments), increases risk of unexpected regulatory changes, discourages foreign and domestic investment. It also tends to favour well connected firms over others, stifling competition and innovation.

The business environment encompasses all the external factors, including regulation, infrastructure, financial sector performance, ease of starting or growing business, availability of utilities, labour laws, judicial certainty, tax policy, etc. A favorable business environment encourages investment, innovation, employment, and competitive markets. Business environment is in deteriorating trend. The Business Climate Index (BBX) index's drop below 60 (58.75) in FY2023–24 signals a worsening business climate, especially since this is a home grown index tracking many dimensions of business environment: ease of starting business, regulatory information, paying taxes, access to finance, etc. The decline in the BBX from ~ 62 to ~ 59 in a single year is a significant drop, especially in a country that is trying to steadily attract investment and improve ease of doing business. It suggests that businesses are feeling increasing friction in regulation, tax, compliance, infrastructure, finance, etc.

Businesses are routinely confronted with a complex regulatory landscape characterized by over-regulation, lack of transparency, and poor accountability (McKeown, 2024). Regulations are often vague, open to interpretation, and announced without prior notice, consultation, or impact assessment, leading to regulatory unpredictability. This ambiguity grants undue discretion to regulatory officials, increasing the cost of doing business and disproportionately affecting small firms (McKeown, 2024).

2.4 Volatile Political Stability

Political stability refers to the likelihood that the government will be stable, free of violent upheaval, abrupt or unconstitutional changes, or severe political conflict. For business and governance, political stability matters for policy consistency, reducing risk, ensuring security for citizens and firms, etc.

The very negative value (-0.91) shows high perceived risk of instability, violence, or politically motivated disruptions. This is a serious drag for business and investor confidence. The country has been suffering from brutal military and autocratic political rule since its inception in 1971. Bangladesh's political landscape is highly polarized and prone to instability, reflecting its history of chronic dynastic power politics.

The World Bank's index of political stability and absence of violence/terrorism in Bangladesh, which measures the likelihood of a government being destabilized by unconstitutional or violent means, stood at -0.91 points in 2023, with a historical average of -1.18 points. This consistently low ranking places Bangladesh well below the global average and indicates a high risk of political volatility.

Recent political turmoil and tensions escalated significantly in 2023 and 2024, culminating in the resignation of Prime Minister Sheikh Hasina in August 2024 following violent, student-led, anti-government demonstrations driven by rising living costs, a stagnant labor market, crackdowns on dissent, and corruption. This crisis has led to a major political vacuum and exacerbated economic risks, including a downgrade of the country's credit rating.

Low political stability increases risk premiums for investment; undermines trust among citizens and foreign partners; causes interruptions of business operations (due to strikes, protests, curfews, etc.). It also tends to encourage short termism in governance, where policies are made for immediate political survival rather than long term growth.

2.5 Institutional Barriers and Corruption

Institutional inefficiencies are compounded by bureaucratic hurdles and corruption, which is cited as a common issue making it difficult for businesses to navigate regulatory compliance (McPherson, 2025). Key recommendations for reform focus on streamlining cumbersome registration and licensing processes through a single digital platform and introducing greater transparency to eliminate undocumented fees (McPherson, 2025). Bangladesh's Corruption Perception Index (CPI) score of 23 (2024) is among the worst globally; the country has slipped in rank and scored its lowest in over a decade. This suggests perceptions (and likely realities) of corruption remain high. The CPI scores signal a deterioration. The fact that Bangladesh's score has remained in the 20s for years, and is now declining to its lowest levels in over ten years, indicates both perception of corruption remains high and possibly the corruption problem may be worsening in reality.

2.6 Banking Sector Fragility and Systemic Risk

The stability of Bangladesh's financial sector is intrinsically linked to the weak governance framework, with the banking sector currently facing a severe crisis of confidence (McPherson, 2025).

Corruption in the banking sector is the result of the structural weaknesses of the sector. The banking sector is plagued by long-standing structural weaknesses, including high levels of NPL, low capital adequacy, and operational inefficiencies (McPherson, 2025). Academic analysis highlights that governance issues, regulatory capture, political interference in lending, and related-party lending have historically fostered a "loan default culture" and worsened performance (McPherson, 2025). State-owned banks, in particular, have been used to lend to politically-linked persons and remain heavily undercapitalized (McPherson, 2025).

Vulnerability and Systemic Risk: The high system NPL ratio, particularly in state-owned banks ($\approx$ 20%), raises significant concerns about the sector's sustainability and its potential impact on the overall economy (McPherson, 2025). The World Bank notes that strengthening supervisory enforcement and improving transparency are critical steps for restoring financial sector stability (McKeown, 2024). The fragility of the banking system is so pronounced that S&P classifies Bangladesh's banking sector risk as '9' (out of 10, with 10 being the weakest) (McPherson, 2025).

2.7 Interconnections and Overall Implications

Poor rule of law and regulatory quality amplify each other. For example, laws may exist that protect property rights or enforce contracts, but weak judicial or law enforcement capacity, political interference, or corruption make enforcement inconsistent. Political instability (or perceived instability) increases regulatory risk: businesses fear changes in leadership or policy that may affect contracts, licenses, or regulatory compliance. Such uncertainty also raises cost of capital. International perception regarding country's rule of law and corruption status matters. Bangladesh's low ranks on corruption perceptions index (CPI), regulatory indicators, etc., reduce foreign direct investment (FDI) and can hurt trade relations or access to global supply chains. According to TIB, in CPI 2024

Bangladesh scored 23 and ranked 151st out of 180 — its lowest in 13 years. Social and economic costs of corruption is also unlimited. Corruption and weak governance mean that public resources are diverted; inequality increases (since powerful actors benefit more); services (health, education, utilities) suffer; citizen trust erodes. Violent political events also increases various types of risk. Protests, violence, legal suppression, and shifts in power can disrupt business operations, supply chains, infrastructure delivery, etc. Banking sector instability undermines business environment such as loans may be hard to access, borrowing expensive or risky, non-performing loans (NPL), insider loans, or lack of transparency damages trust. Evidence suggests many banks have suffered large losses/fraud cases.

Finally, Bangladesh's journey toward sustainable development is severely hampered by a crisis of institutions where the rule of law is compromised by political influence and arbitrary power, regulatory quality is weakened by ambiguity and discretion, and political stability remains volatile and fragmented. Its social and economic achievements have been substantial, but if governance, legal, regulatory, and political weaknesses are not addressed, they will increasingly become constraints to progress. The rule of law is unevenly applied; regulatory quality remains weak; political stability is fragile; business environment suffers from corruption, bureaucratic inefficiency, unstable policies, and weak infrastructure. The high levels of corruption serve as the common thread, linking political and bureaucratic misconduct to the structural weaknesses in the business environment and the precarious state of the banking sector. Addressing these deep-seated institutional challenges, including strengthening judicial independence, enhancing regulatory transparency, combating corruption, and restoring confidence in the financial system, is essential for the country to unlock its full economic potential. To move toward sustainable, inclusive development, Bangladesh will need not just high level commitments, but real structural reforms in institutions, consistent enforcement, and stronger accountability.

3 Theoretical Discourse: Banking and Financial Performance

The analysis of the interaction among the regulatory framework and legal framework, political and business environment with banking performance in Bangladesh is grounded in several key theories that explain their interconnected relationships:

3.1 Banking Performance

Banking performance refers to the banking industry's capacity to absorb economic shocks and continue functioning without significant disruption, making it a cornerstone of overall national financial health. This performance is influenced by factors like the solvency of individual banks, the strength of the financial system, and the efficacy of legal and regulatory frameworks (Agarwal, 2025). In this study, banking performance is specifically measured by the NPL ratio. This ratio indicates the percentage of loans in default (or near-default), reflecting the quality of the bank's loan portfolio and its ability to manage credit risk.

Banking theory emphasizes that a resilient banking system is crucial for broader financial performance. This theory argues that effective regulation and a strong legal framework are necessary to prevent systemic crises and bank failures. Banking stability itself is defined as the sector's resilience to shocks and its capacity to maintain core functions during stress. In the context of Bangladesh, the effectiveness of the nation's political, business, regulatory and legal environments in mitigating risks directly has influence the performance of its banking sector.

3.2 Political Environment

A congenial political environment helps a bank run properly by reducing uncertainty and risk, ensuring the effective operation of the legal and regulatory framework, and promoting overall economic performance. A stable political environment, characterized by the absence of violence, conflict, and abrupt government changes, prevents shocks that could destabilize the economy. This predictability makes it easier for banks to plan their long-term lending and investment strategies. Political instability is directly associated with a higher probability of banking crises and an increase in NPL (Saliba et al., 2023). In contrast, a stable environment fosters healthy business operations and employment, increasing borrowers' ability to repay their debts, thereby keeping NPL ratios low. A strong political environment with robust institutions limits the ability of politicians to pressure state-owned banks, or even private banks, into making politically-motivated, sub-optimal loans (e.g., lending more during election years to favored groups). This helps banks maintain credit quality and profitability. Political stability is a key factor for attracting both domestic and foreign investment. This influx of capital boosts overall economic growth, which, in turn, increases the demand for bank credit and improves the financial health of bank customers. A predictable political climate, low corruption, and effective governance contribute to high investor confidence. This encourages bank depositors to keep their money in the system and for international banks to engage in cross-border lending, ensuring banks have a stable and diverse funding base. A functioning political system allows the government bureaucracy and central bank to execute timely, coordinated fiscal and monetary policies necessary to stabilize the economy and support the banking system during crises, acting as a crucial "lender of last resort."

3.3 Rule of Law

The rule of law is also highly crucial. The legal framework comprises the foundational body of laws and rules that govern banking operations and the enforcement of regulations. Key elements include rules on consumer protection, anti-money laundering, insolvency, and banking oversight. A robust legal framework ensures that banks operate within a clear and predictable environment, which is vital for maintaining financial system trust. In this study, the strength of this system is gauged using the Rule of Law Index. This index assesses the extent to which agents trust and adhere to established social norms, specifically covering property rights, contract enforcement, law enforcement, and judicial quality. Banks rely on the legal system to enforce loan contracts, seize collateral from defaulting borrowers, and resolve disputes efficiently. A strong, non-corrupt judiciary ensures that banks can recover losses, which is fundamental to maintaining financial soundness. A congenial political environment supports an independent and effective regulatory body. Good regulation, characterized by transparent rules and proper supervision, ensures banks maintain adequate capital, manage risk prudently, and prevents excessive risk-taking, all of which contribute to systemic stability of the banks in operation (Brighi and Mussoni, 2025). Clear and secure property rights, backed by law, assure banks that the assets they take as collateral (such as real estate or machinery) can be legally possessed and sold if a borrower defaults. This factor lowers the credit risk of lending.

Theory of financial law posits that the legal framework is a critical determinant of financial development and stability. This theory underscores the need for a robust legal system that effectively enforces contracts, protects property rights, and resolves disputes. Such a system creates the predictable, secure environment essential for banking stability. In Bangladesh, the effectiveness of this legal framework directly impacts both investor con-

fidence and the overall stability of the banking sector.

3.4 Business Environment

A good business environment is vital for a bank's health as it directly influences the quality of the bank's assets (loans), its profitability, and its overall performance. It acts as the fertile ground which is necessary for both the bank and its customers to succeed in business. A robust business environment is characterized by stable and high GDP growth. When the overall economy is expanding, businesses and individuals are financially healthy, employment is high, and incomes are rising, financial health of the bank automatically become sound (Hacker, 2019). This makes it easier for borrowers to meet their debt obligations, which directly reduces the bank's NPL ratio. A low NPL ratio is the primary indicator of a healthy balance sheet. A stable business climate provides predictability for companies regarding demand, costs, and regulatory changes. This confidence encourages long-term investment and reduces the risk of sudden bankruptcies or financial distress among corporate borrowers. A thriving business environment leads to high demand for loans for expansion, capital expenditure, and new ventures (Mason and Brown, 2014). Since the underlying risk is lower, banks can confidently expand their lending portfolios, which increases interest income, the main source of their profitability. A competitive and efficient business environment encourages banks to innovate, manage costs effectively, and diversify their revenue streams (e.g., through fee-based services like advisory or investment banking), further enhancing their profitability and resilience. A transparent environment with low corruption reduces the chance of politically influenced lending or 'crony capitalism' where credit is allocated based on connections rather than creditworthiness. This protects the bank's capital from being squandered on bad loans.

3.5 Regulatory Issues

Defined as the collective system of laws, regulations, and standards instituted by supervisory authorities to govern financial entities, the regulatory framework is intended to mitigate systemic risk, ensure market integrity, and foster banking stability. Central to this framework, as stipulated by the Basel Committee, are requirements for capital adequacy, liquidity management, risk control, and active supervision (Vousinas, 2015). Regulation is only effective if the law can successfully enforce compliance and address breaches. For the purposes of this research, the efficacy of the framework is quantified by the regulation quality index, which reflects the government regulatory body's competence in formulating and executing policies that facilitate private sector expansion.

The Regulatory Dialectic Theory points out that regulatory measures are not static but evolve dynamically through an interaction between regulators and financial institutions (Currie et al., 2019). This means frameworks constantly adapt to both bank behavior and changing market conditions. Effective regulation, exemplified by standards like Basel III, is therefore essential for banking stability, as it actively mitigates systemic risks and enhances institutional resilience.

Based on the above discussion, it can be intuited that economic and financial outcomes are heavily shaped by social issues like political stability, business environment, rule of law, regulation qualities, institutional structures, etc. which good conditions reduce risk and build financial health in the financial system. The interdependence of the bank performance and these indicators are, therefore, paramount for banking stability. For Bangladesh's banking sector, harmonized improvement of these social parameters is the key to ensuring sustainable banking performances.

3.6 Expected Signs of the Factors with Bank Performance

The social indicators variables are generally expected to have a negative correlation with NPL. This means that as these variables improve (become more stable or effective), NPL is expected to decrease. Table 3 describes the insights behind this claim:

4 Literature Review

The existing research on regulatory quality, the rule of law, and NPL is vast. This review synthesizes empirical studies into two key areas: the impact of the regulatory framework on banking stability and the influence of the legal framework on banking stability.

Shen and Chang (2006) analyzed 129 nations over 25 years and found that stronger legal protection for creditors significantly reduced NPL. This reduction, by enabling banks to better manage credit risk, promotes overall banking stability. The authors recommend that countries strengthen their legal systems to boost creditor protection and, consequently, banking stability.

Investigating the impact of prudential regulation on bank performance, Kale et al. (2015) analyzed capital, liquidity, and risk management across multiple nations. Their panel data revealed that stricter rules — especially for capital and liquidity — resulted in enhanced stability, higher profitability, and fewer NPL. The study advocates for regulators to continuously enforce and strengthen these prudential measures to ensure a healthy banking industry.

Bougatef (2016) examines the effect of regulatory quality and bank-specific features on NPL in 15 MENA countries for the period of 2004–2012, by employing a dynamic panel data model. The study concluded that higher regulatory quality significantly reduces NPL. The regulatory impact is more noticeable for the banks with low capital base, liquidity, and bank size. The author suggested that strengthening regulatory quality and robust supervision are key to ensuring the banking performance.

Khan (2017) has conducted a review of post-crisis legislative changes across various central banks, utilizing the IMF's database to assess adjustments in four areas: institutional goals, operational decision-making, accountability measures, and data collection authority. The examination determined that a substantial number of central banks amended their statutes to elevate financial performance to a core objective, equal in standing to price stability. The author underscored that well-defined legal and governance frameworks are essential prerequisites for maximizing central bank efficacy and banking performance, advocating for perpetual legislative refinement to successfully navigate dynamic financial environments.

Alber and Ramadan (2022) cross-nationally analyzed the link between regulatory quality (using the World Bank's index) and banking performance (using ROA and ROE). Their findings showed a positive correlation: higher regulatory quality was associated with more stable banking sectors and improved performance. They concluded that policymakers should focus on enhancing regulatory quality and enforcement to create a stable banking environment.

Laeven and Levine (2009) have studied investigating the CEO pay, legal systems, and bank performance, and have found that banks in common law countries are typically less stable than those in civil law countries. They suggest this disparity is due to differences in banking laws affecting how CEOs are compensated and the level of risk they are incentivized to take. They recommend boosting financial stability by improving legal frameworks and tying CEO compensation to long-term stability targets.

Mwambuli and Hemed (2023) studied the factors influencing NPL variations across 75 coun-

Table 3: Expected Signs of the Variables

Influencing Factor	Expected Correlation with NPL	Rationale
Rule of Law	(−) Negative	A strong, predictable Rule of Law ensures contracts are enforced efficiently and collateral can be seized quickly. This reduces default incentives and bank losses, thereby lowering NPLs.
Political Stability	(−) Negative	High Political Stability reduces economic uncertainty and systemic risk. A stable environment supports business health and borrower repayment capacity, thus reducing NPLs.
Regulation Quality	(−) Negative	Effective Regulatory Quality leads to better banking supervision and sounder lending practices (e.g., proper credit risk assessment), which directly contributes to lower NPLs.
Business Environment	(−) Negative	A high score on the congenial business condition indicates a healthy overall business climate. Strong economic activity and high investor confidence enable firms and individuals to repay debt, which lowers NPLs.

Source: Authors' own compilation based on theoretical framework.

tries (2005–2021) using a dynamic panel data model. They found that a higher rule of law index (a measure of legal quality) and political peacefulness have a significant, negative effect on NPL. They suggest that a better legal system lowers credit risk by improving the information environment and the loan recovery process.

Malik et al. (2025) explore how resilience in Pakistan's banking sector is shaped by income diversity, political steadiness, and the strength of regulatory frameworks. Analyzing data from 33 scheduled banks spanning 2007 to 2021, their findings reveal that banks with broader income sources are better equipped to weather economic turbulence. Political stability emerges as a key stabilizing force, mitigating operational risks and fostering stronger financial outcomes. Likewise, robust regulatory quality proves instrumental in reinforcing institutional performance and long-term viability.

4.1 Research Gap

Despite providing valuable insights, current literature on banking performance suffers from significant gaps, especially concerning Bangladesh. This topic also exhibits a strong regional bias, focusing heavily on industrialized and emerging markets while neglecting low-income nations. It limits the understanding of how legal and regulatory systems function in diverse institutional settings like developing countries. Another major drawback is the lack of combined analysis, i.e., most studies examine the political or regulatory frameworks in isolation, overlooking their crucial interaction in shaping financial performance.

This work could be among the first empirical studies to quantify how these social variables affect banking in the Bangladeshi context. This contributes not only to academic understanding but also to regional policymaking and global development by improving regulatory frameworks, enforcement, and autonomy. It will provide insights for strengthening the rule of law, contract enforcement, and bankruptcy laws both developed and developing nations. In Bangladesh it will also give important signals in reducing political interference in state-owned and private banks. For private and foreign banks running in the country, it will enhance the predictability and transparency of the business environment impact on their business. This research bridges economics, finance, political science, and law,

making it highly interdisciplinary and valuable for academics, policymakers, bank executives, supranational development organizations (e.g., WB, IMF, ADB, etc.). For bank management, this research helps to develop more comprehensive risk models that incorporate political, legal, regulatory and business risks, allowing for better strategic decisions on lending, provisioning, and capital allocation. For foreign and domestic investors, a quantified understanding of how nonconventional social factors affect bank performance provides a clearer picture of the true risk of investing in the Bangladeshi banking sector, potentially attracting more stable, long-term capital by showing how these risks can be mitigated through good governance.

5 Variables and Data Issues

Utilizing an annual time series dataset spanning 2000–2023, this research investigates the dynamic relationship between political stability (PS), business environment (BE), regulatory quality (RQ), the rule of law (RL), and banking performance (Gross NPL ratio) in Bangladesh. The NPL data were gathered from the Annual Reports of Bangladesh Bank and the remaining all other data are collected from WDI Table of WB. Since data has strong background, the rigor of findings and analyses is guaranteed.

Each variable is pivotal, acting as a good proxy of social conditions, will be used as influencers of banking performance robustness. Using these specific indices ensures our measures are consistent, comparable, and accurately reflect the social and institutional environment for banking business. The variable description and data sources are presented in Table 4.

6 Methodology

6.1 Estimation Process

To analyze the interactions between Bangladesh legal system, regulatory environment, and financial stability, this study uses a Vector Autoregressive (VAR) methodology.

Table 4: Variable Description and Sources

Variable	Notation	Description	Source
Non-Performing Loans (NPL) Ratio	NPLRatio	Proportion of loans that are in default or close to being defaulted.	BB
Business Environment	BE	Shows the overall Business Environment of the Country	WDI of WB
Regulatory Quality Index	RQ	Captures the ability of the government and central bank to formulate and implement sound policies and regulations.	WDI of WB
Rule of Law Index	RL	Captures the extent to which agents have confidence in and abide by the rules of society.	WDI of WB
Political Stability	PS	Political stability is a precondition and underlined issue for smooth function of any financial system	WDI of WB

Source: Authors' own construction.

Every endogenous variable in the system is treated by a VAR model as a function of the lagged values of all other endogenous variables. Understanding the intricate relationships between the variables under investigation is made possible by the VAR model's strength, which is its capacity to analyze and evaluate several time series at once. The VAR approach's robustness, which is backed by its extensive use in empirical research, highlights its applicability for the study and guarantees that the subtleties of how legislative and regulatory frameworks affect banking stability

are carefully considered. The mathematical representation of the VAR model is as follows:

The general format for a VAR model incorporating the variables NPL, business environment, political stability, regulation quality, and rule of law can be expressed as a system of linear equations.

For a VAR(p) model, where p is the number of lags, the general matrix form is:

$$VAR(p) = C_0 + A_1 B_{t-1} + \cdots + A_p B_{t-p} + u_t \tag{1}$$

Where:

- C_0 is the intercept (constant term)
- $A_1, \ldots, A_p$ are coefficient matrices
- B_{t-p} are the lags of the endogenous variables
- u_t is the error term (white noise disturbance)

The p in VAR(p) represents the number of lag periods included in the model.
The endogenous variables vector (Y_t) contains the values of all K variables at time t. In this case, $K = 5$:

$$Y_t = \begin{bmatrix} NPL_t \\ BE_t \\ PS_t \\ RQ_t \\ RL_t \end{bmatrix} \tag{2}$$

Intercept vector (c) is a $K \times 1$ vector of intercepts:

$$c = \begin{bmatrix} c_1 \\ c_2 \\ c_3 \\ c_4 \\ c_5 \end{bmatrix} \tag{3}$$

The matrices defining the autoregressive vectors and their coefficient matrices (A_j) are: for each lag $j \in \{1, \ldots, p\}$, A_j is a $K \times K$ matrix of coefficients. The element a_{jik} represents the impact of the k-th variable's value at time $t - j$ on the i-th variable's value at time t.

$$A_j = \begin{bmatrix} a_{j11} & a_{j12} & a_{j13} & a_{j14} & a_{j15} \\ a_{j21} & a_{j22} & a_{j23} & a_{j24} & a_{j25} \\ a_{j31} & a_{j32} & a_{j33} & a_{j34} & a_{j35} \\ a_{j41} & a_{j42} & a_{j43} & a_{j44} & a_{j45} \\ a_{j51} & a_{j52} & a_{j53} & a_{j54} & a_{j55} \end{bmatrix} \tag{4}$$

Finally, the error term vector (u_t) is as follows:

$$u_t = \begin{bmatrix} u_{1t} \\ u_{2t} \\ u_{3t} \\ u_{4t} \\ u_{5t} \end{bmatrix} \tag{5}$$

This is a $K \times 1$ vector of error terms, assumed to be $u_t \sim N(0, \Sigma)$.
The matrix equation expands into a system of five individual linear equations, where each variable's current value is modeled as a function of the intercept and the lagged values of all five variables:

6.2 Equation for NPL ($\mathbf{NPL_t}$)

The following equation (2) presents the empirical equations for non-performing loans (NPL) ratio, regulatory quality, business environment, political stability, and the rule of law:

$$\begin{aligned} \Delta NPL_t = \alpha_1 &+ \beta_{11} \Delta RQ_{t-1} + \beta_{12} \Delta RL_{t-1} \\ &+ \beta_{13} \Delta BE_{t-1} + \beta_{14} \Delta PS_{t-1} \\ &+ u_{1t} \end{aligned} \tag{6}$$

Where:

- ΔNPL_t is the first-differenced non-performing loans (NPL) ratio
- ΔRQ_t is the regulatory quality index
- ΔRL_t is the rule of law index
- ΔBE_t is the business environment index

- ΔPS_t is the political stability index
- α_1 is the intercept term
- β_{ji} are the coefficients for the lagged endogenous variables
- u_{1t} is the error term for each equation

Now we shall concentrate on the estimation process of the VAR model which involves the following steps:

6.3 Estimation Process

6.3.1 Descriptive Statistics

Table 5 postulates an overview of the variables by descriptive statistical measures. The data reveals that the mean ratio of NPL stands at 3.96%, accompanied by a significant variability as evidenced by a standard deviation of 5.03. Regarding regulatory quality, the average score is −0.91 with minimal fluctuations in the dataset, as suggested by a standard deviation of 0.067. Concerning the rule of law, the mean score recorded is −0.727 with a moderate range of dispersion shown by a standard deviation of 0.142. In case of political stability, the average score is −1.27 with minimal fluctuations in the dataset, as suggested by a standard deviation of 0.281.

Further, according to the business environment variable, the mean score recorded is 2.8 with a moderate range of dispersion shown by a standard deviation of 0.2513. Together, these statistical figures offer a crucial quantitative overview of the dataset, laying groundwork for further analytical inference.

6.4 Unit Root Test Results

We have conducted second generation unit root tests for the panel data which are Levin, Lin, and Chu (LLC) along with two other famous unit root tests.

Table 6 shows the estimated results of the second generation unit root tests. The null hypothesis is that the series has a unit root, meaning that it is non-stationary and has a stochastic trend. The alternative hypothesis is that the series does not have a unit root, meaning that it is stationary.

Table 6: Second Generation Unit Root Test of Panel Data

Test	Trend	Trend and Intercept	None
In Level Form			
Levin, Lin & Chu (LLC)	−1.26341	0.28215	−1.08455
Im, Pesaran & Shin (IPS)	0.13103	−0.12753	NA
ADF	7.82120	12.1522	10.2553
PP	9.60278	13.2529	11.5250
In First Difference			
Levin, Lin & Chu (LLC)	−8.58148***	−6.60962***	−9.36525***
Im, Pesaran & Shin (IPS)	−8.20666***	−6.40844***	NA
ADF	63.2961***	50.4159***	82.5757***
PP	65.3886***	67.3747***	84.3839***

Note: *** indicates the statistic is significant at the 1% level of significance.
Source: Authors' own calculation.

The combined unit root test results for the variables percentage of NPL, Business Environment, Regulatory Quality, Political Stability, and Rule of Law, as conducted using the Levin, Lin, and Chu Test, Im, Pesaran, and Shin Test, Augmented Dickey-Fuller (ADF) test, and Phillips-Perron (PP) tests, were considered for understanding the stationarity of the time series data. Results of all the tests postulate that they are jointly stationary at the first difference, with p-values less than 0.01, rejecting the null hypothesis of a unit root. The robustness of the results across all tests shows the stationarity of all the series after first differencing, allowing us to conduct further econometric modeling.

6.5 Lag Selection

For choosing the optimal time lag, we have conducted lag selection tests up to 3 years maximum lag. We observed that Akaike Information Criterion (AIC), Hannan-Quinn Information Criterion (HQIC), and Schwarz's Bayesian Information Criterion (SIC). Table

Table 5: Descriptive Statistics

Statistic	NPL (%)	Political Stability	Regulatory Quality	Business Environment	Rule of Law
Mean	3.9590	−1.2731	−0.9106	2.8000	−0.7267
Median	2.2000	−1.2567	−0.9174	3.0000	−0.7429
Maximum	41.6100	−0.8956	−0.8113	3.0000	−0.4529
Minimum	−1.1800	−1.8638	−1.0818	2.5000	−0.9786
Std. Dev.	5.0260	0.2814	0.0670	0.2513	0.1416
Skewness	1.2540	−0.2090	−0.5472	−0.4082	0.0819
Kurtosis	2.9434	2.0910	3.3662	1.1667	2.3257
Jarque-Bera	5.2445	0.8342	1.1098	3.3565	0.4012
Probability	0.0726	0.6590	0.5741	0.1867	0.8182
Observations	20	20	20	20	20

Source: Authors' own calculation.

5 in Appendix shows the values of individual criteria for 3 lags. An asterisk indicates the optimal lag according to that criterion. The results of the various tests are unable to suggest us any fixed value of lag order. So, we have decided to conduct our tests by FPE test criteria which gives us a mediocre lag order 2.

7 Estimated Results of the VAR Model

The core feature of a VAR model is that every variable in the system is a function of its own lagged values and the lagged values of all other variables in the system. However, although we have given the result of all the equations (Table 6 in Appendix), we shall discuss here only about our target equation where NPL is the dependent variable.

In the empirical analysis of the banking sector of Bangladesh, the VAR model results in Table 6 in Appendix reveals significant relationships. NPL equation is our target equation. This equation confirms that Regulatory Quality (RQ), Political Stability (PS), Business Environment (BE), and NPL ratio have significant negative impact on NPL. However, Rule of Law (RL) has no significant impact on NPL ratio. Further, RQ, PS, and BE have negative significant impact on NPL by their first order, second order, and first order lag respectively. The results indicate that a decrease in RQ, PS, and BE significantly increase the NPL. Specifically, a one-unit decrease in RQ leads to a 34.18 unit increase in the NPL. This statistically significant result (at the 5% level) suggests that improvements in regulatory quality significantly enhance banking performance by reducing the proportion of NPL. This finding suggests that stringent regulatory practices are associated with lower levels of NPL and higher banking performance. So, effective regulation and risk management standards are crucial for the resilience of the banking sector. Similarly, an increase in the political stability (PS) significantly decreases the NPL. Specifically, a one-unit increase in political stability leads to a 15.21 unit decrease in the NPL. This statistically significant result (at the 5% level) suggests that improvements in the political environment might lead to stricter enforcement of banking rules and norms in the industry which reduces NPL. Thus, political stability is essential for better performance of the banking sector.

Likewise, an increase in the Business Environment (BE) significantly decreases the NPL in the banking sector of Bangladesh. Specifically, a one-unit decrease in BE leads to a 24.03

unit increase in the gross NPL ratio. This statistically significant result (at the 5% level) means that improvements in BE significantly enhance banking performance by reducing the proportion of NPL. This finding suggests that a congenial business environment is a boon for the banking sector as expansion of business activities helps bank clients in keeping good relations with banks and helps them in the loan repayment process, which ultimately lessens the NPL of the banks. So, a positive business environment is a precondition for a healthy banking sector.

The nexus between rule of law and legal base is critical in shaping banking performance. However, our result shows that rule of law does not have any significant impact on NPL ratio for the banking sector of Bangladesh. This finding is not consistent with the conventional knowledge that strict imposition of regulatory rules is required to ensure better banking business as it increases client confidence in the banking sector.

7.1 Other Estimation and Their Interpretation

Once the model is estimated, advanced techniques are used to interpret the dynamic interactions:

7.1.1 Stability of VAR Model

The VAR model's validity and stability test results presented in Table 7 and Figure 1 are crucial for the integrity of its results. Our analysis confirms that the model passes the stability test, with all eigenvalues situated within the unit circle, as per the stability condition. This positioning of the eigenvalues is a robust indicator of the model's reliability and its ability to produce consistent, accurate forecasts. The VAR model's adherence to the stability condition underscores its validity, ensuring that it remains a dependable tool for economic analysis and policy-making decisions.

7.1.2 Impulse Response Function (IRF)

This analyzes how each variable responds over time to a shock (unexpected change) in another variable. This is crucial for understanding the effect of regulatory policy or legal changes on banking stability.

The impulse response function (IRF) graphs in Figure 2 in Appendix illustrate the dynamic relationships among Regulatory Quality (RQ), Business Environment (BE), Political Stability (PS), Rule of Law (RL), and non-performing loan (NPL) ratio in Bangladesh. A positive shock to PS leads to a decrease in NPL ratio, indicating that improvements in political environment reduce non-performing loans (NPL), thereby enhancing banking business. This effect is significant and persists over time, as indicated by the confidence intervals not crossing zero.

Conversely, a positive shock to RQ initially leads to an increase in NPL ratio, suggesting that improvements in regulatory strictness might initially increase more NPL due to stricter enforcement. However, this effect diminishes over time, indicating that while the initial impact might be an increase in NPL, the long-term effect contributes to a healthier and business-friendly banking environment.

Further counterintuitively, the IRFs indicate that shocks in BE increase NPL within the model's time frame. The results provide insights that improvement in BE may not bring any immediate good outcome for banks in Bangladesh. However, this effect is also significant and persists over time, but the shock does push the impact up to that extent where NPL ratio goes over zero.

Even though RL does not give any significant impact on NPL, IRF shows the positive impact on NPL ratio. This finding of variable Rule of Law index on the NPL suggests that improvements in the legal framework might initially lead to a decrease in non-performing loans (NPL) but increase in the longer term period. This counterintuitive result can be explained by the stricter enforcement and recognition of NPL that come with a stronger legal

framework. This finding supports the idea that stronger legal enforcement can bring out underlying weak issues in the banking sector, leading to an increase in NPL. Over time, however, a robust legal framework is expected to contribute to long-term banking stability by ensuring clear and predictable legal environments. The IMF (2009) emphasized that a strong legal framework is essential for maintaining confidence in the financial system and protecting the rights of depositors and creditors. Therefore, while the initial impact might be an increase in NPL, the long-term benefits of a strong legal framework are crucial for banking sector performance.

7.1.3 Variance Decomposition

This technique reveals the proportion of movement in a variable that is due to its own shocks versus the shocks originating from the other variables in the system. The results show that in the proposed model, NPL is mostly explained by itself. Among the four independent variables, BE plays the crucial role in explaining the NPL ratio in Bangladesh which explains up to 30 percent of the variability of NPL in the chosen model. Further, PS, RQ, and RL explain the NPL up to 11%, 7%, and 5% respectively.

7.1.4 Pairwise Granger Causality Tests

Granger causality test is a powerful, easily explainable, and highly intuitive tool in research especially testing the causal relationship between dependent and independent variable. The findings of this method in our model are as follows: The Granger causality test results in Table 7 indicate that except rule of law (RL), all other variables like Political Stability (PS), Business Environment (BE), and Regulatory Quality (RQ) have causal influence on the NPL ratio, as evidenced by the p-values less than 5 percent. Rule of Law (RL) is found insignificant in predicting the NPL ratio.

Table 7: Pairwise Granger Causality Tests for NPL by Other Variables

Null Hypothesis	Obs	F-Statistic	Prob.
BUSINESSENV does not Granger Cause NPL	18	−14.5021	0.0005
NPL does not Granger Cause BUSINESSENV	18	−0.0553	1.1506
POLITICALSTABILITY does not Granger Cause NPL	18	−12.5412	0.0006
NPL does not Granger Cause POLITICALSTABILITY	18	−1.1506	0.3467
REGULATORYQUALITY does not Granger Cause NPL	18	−4.0696	0.0373
NPL does not Granger Cause REGULATORYQUALITY	18	−1.8614	0.1946
RULEOFLAW does not Granger Cause NPL	18	−0.4008	0.6778
NPL does not Granger Cause RULEOFLAW	18	−2.2381	0.1461

Source: Authors' own calculation.

These findings suggest that while regulatory and legal frameworks in Bangladesh have a predictive relationship with banking performance (measured by NPL ratio), the causality does not extend in the opposite direction. Additionally, the Granger causality test results support the use of a VAR model to investigate the relationship among variables might be a correct step.

8 Conclusion

In conclusion, the empirical investigation in the banking sector of Bangladesh, relying on Vector Autoregressive (VAR) and Granger causality analyses, along with impulse response function (IRF), has revealed a nuanced relationship among political stability, business environment, regulation quality, rule of law, and NPL ratio. The findings indicate that

improvements in political stability, business environment, and regulatory quality significantly reduce the NPL ratio, thereby enhancing banking business performance by reducing credit risk and improving the health of the banking sector. Conversely, enhancements in these three social indicators decrease NPL due to stricter enforcement and recognition of NPL loans. The IRF analysis complements this by highlighting the responsiveness of nonperforming loans ratio to shocks in BE, PS, and RQ, while shocks in RL have no important impact. The empirical link among them reveals that improvements in one might initially challenge the other, emphasizing the need for harmonized reforms to achieve durable banking future. The Granger causality results complement this by highlighting the significant combined influence of RQ, PS, and BE on NPL ratio.

Based on the findings of this study, it is recommended that government, regulators, central bank, policymakers, ministry of finance, bank owners, and managements should focus on enhancing RQ, BE, and PS through stringent practices, such as capital adequacy requirements and risk management, to reduce NPL and improve stability. Strengthening the legal framework is also crucial, despite the no impact on NPL, as it ensures long-term health of the bank by fostering a transparent and accountable banking environment. Harmonizing regulatory and legal reforms is essential to avoid conflicts and create a cohesive approach for bank business. Continuous monitoring and evaluation of these frameworks, along with capacity building for regulatory and legal institutions, will ensure
their effectiveness and efficacy to changing economic conditions, thereby supporting promotion of banking sector in Bangladesh.

Disclosure Statement

Views expressed in this paper are the authors' own and do not necessarily reflect the views of institutions they are affiliated with.

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Appendices

Table 8: Selection of Optimal Lag Order

VAR Lag Order Selection Criteria
Endogenous variables: NPL, BE, PS, RQ, RL
Exogenous variables: C
Date: 10/01/25 Time: 21:41
Sample: 1996–2024
Included observations: 26

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-89.33512	NA	0.000975	7.256547	7.498489	7.326218
1	11.57344	155.2439*	2.96e-06	1.417428	2.869077*	1.835450
2	44.14677	37.58461	2.11e-06*	0.834864	3.496222	1.601239
3	74.38255	23.25829	2.94e-06	0.432112*	4.303178	1.546839*

Note: * indicates lag order selected by the criterion.
LR: Sequential modified LR test statistic (each test at 5% level).
FPE: Final prediction error.
AIC: Akaike information criterion.
SC: Schwarz information criterion.
HQ: Hannan–Quinn information criterion.

Table 9: Vector Autoregression Estimates

Date: 10/01/25 Time: 21:14
Sample (adjusted): 2001–2017
Included observations: 17 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	NPL	BE	PS	RQ	RL
NPL(-1)	0.214007	0.008214	0.031591	0.000916	0.045172
	(0.30804)	(0.00743)	(0.02489)	(0.00545)	(0.08978)
	[0.69474]	[1.10486]	[1.26917]	[0.16820]	[0.50316]
NPL(-2)	0.389714	-0.004101	-0.044551	0.006915	-0.002277
	(0.27948)	(0.00674)	(0.02258)	(0.00494)	(0.08145)
	[1.39441]	[-0.60795]	[-1.97272]	[1.39906]	[-0.02796]
BE(-1)	-24.02579	1.012304	1.348878	-0.361354	3.862372
	(11.8121)	(0.28507)	(0.95447)	(0.20889)	(3.44257)
	[-2.03401]	[3.55109]	[1.41322]	[-1.72987]	[1.12195]
BE(-2)	-3.749660	-0.288523	-0.008273	0.265965	2.468293
	(7.88652)	(0.19033)	(0.63727)	(0.13947)	(2.29849)
	[-0.47545]	[-1.51590]	[-0.01298]	[1.90698]	[1.07388]
PS(-1)	-2.460352	-0.387080	-0.346649	-0.122805	-0.181053
	(5.45477)	(0.13164)	(0.44077)	(0.09647)	(1.58977)
	[-0.45105]	[-2.94036]	[-0.78646]	[-1.27305]	[-0.11389]
PS(-2)	-15.20830	0.341387	0.416678	0.023040	-0.406841
	(5.74600)	(0.13867)	(0.46430)	(0.10162)	(1.67465)
	[-2.64676]	[2.46183]	[0.89743]	[0.22673]	[-0.24294]
RQ(-1)	-34.18008	0.048829	0.856304	0.120168	6.628115
	(16.3712)	(0.39510)	(1.32287)	(0.28952)	(4.77130)
	[-2.08782]	[0.12359]	[0.64731]	[0.41506]	[1.38916]
RQ(-2)	8.079640	0.210892	-0.050841	0.666067	6.828856
	(20.0777)	(0.48455)	(1.62237)	(0.35507)	(5.85156)
	[0.40242]	[0.43523]	[-0.03134]	[1.87590]	[1.16701]
RL(-1)	2.608413	0.065011	-0.137516	-0.072134	0.433988
	(1.80702)	(0.04361)	(0.14602)	(0.03196)	(0.52665)
	[1.44349]	[1.49073]	[-0.94179]	[-2.25728]	[0.82406]
RL(-2)	-0.239002	-0.053273	-0.075632	0.051773	-0.527204
	(1.11922)	(0.02701)	(0.09044)	(0.01979)	(0.32619)
	[-0.21354]	[-1.97228]	[-0.83629]	[2.61575]	[-1.61624]
C	12.81866	0.861136	-1.409583	0.162654	5.726608
	(19.1393)	(0.46190)	(1.54655)	(0.33847)	(5.57806)
	[0.66976]	[1.86433]	[-0.91144]	[0.48056]	[1.02663]
R-squared	0.974977	0.982922	0.809187	0.763149	0.950736
Adj. R-squared	0.933271	0.954459	0.491166	0.368398	0.868629
Sum sq. resids	31.04636	0.018082	0.202714	0.009710	2.637087
S.E. equation	2.274729	0.054898	0.183809	0.040228	0.662959
F-statistic	23.37773	34.53312	2.544441	1.933239	11.57921
Log likelihood	-29.24124	34.06926	13.52602	39.35487	-8.281879
Akaike AIC	4.734263	-2.714030	-0.297179	-3.335867	2.268456
Schwarz SC	5.273401	-2.174892	0.241959	-2.796729	2.807594
Mean dependent	11.94706	3.235294	-1.228021	-0.893199	14.29412
S.D. dependent	8.805901	0.257248	0.257678	0.050618	1.829095

Determinant resid covariance (dof adj.)	2.50E-09
Determinant resid covariance	1.37E-11
Log likelihood	92.01506
Akaike information criterion	-4.354713
Schwarz criterion	-1.659022
Number of coefficients	55

Table 10: Variance Decomposition of the VAR Model

Cholesky One S.D. (d.f. adjusted)
Cholesky ordering: NPL, BE, PS, RQ, RL

Period	S.E.	NPL	BE	PS	RQ	RL
1	2.274729	100.0000	0.000000	0.000000	0.000000	0.000000
2	3.009236	69.44458	17.90260	6.019513	1.574730	5.058570
3	3.644118	48.61885	26.52336	8.956430	8.774471	7.126891
4	3.927272	42.01491	30.93536	11.83400	8.286250	6.929488
5	4.027872	40.36863	33.49936	11.49854	8.035880	6.597587
6	4.369546	47.24356	30.43078	9.822212	6.860935	5.642512
7	4.470116	47.82490	30.08341	9.390917	6.555829	6.144939
8	4.652177	46.10886	30.45302	10.88819	6.716881	5.833048
9	4.824365	45.79569	30.66837	11.77575	6.304847	5.455339
10	4.901989	45.03341	30.17452	11.52804	7.816460	5.447570

Note: Cholesky One S.D. (d.f. adjusted). Cholesky ordering: NPL, BE, PS, RQ, RL

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Table 11: Stability Test of the VAR Model

Root	Modulus
0.966717	0.966717
-0.847633 – 0.423167i	0.947392
-0.847633 + 0.423167i	0.947392
0.704780 – 0.502395i	0.865515
0.704780 + 0.502395i	0.865515
-0.191143 – 0.809875i	0.832125
-0.191143 + 0.809875i	0.832125
0.273209 – 0.749443i	0.797689
0.273209 + 0.749443i	0.797689
0.588676	0.588676

Note: No root lies outside the unit circle.
VAR satisfies the stability condition.

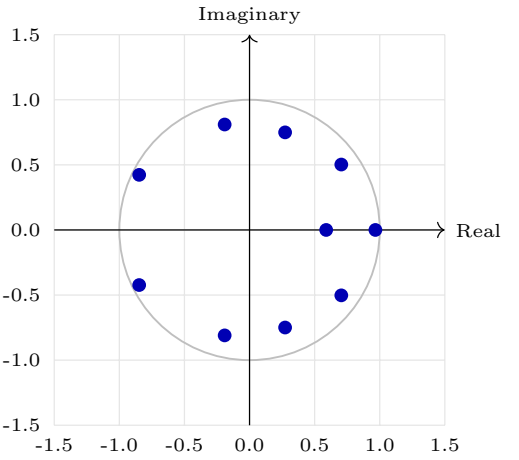

Figure 1: Inverse Roots of AR Characteristic Polynomial

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Response to Cholesky One S.D. (d.f. adjusted) Innovations
±2 analytic asymptotic S.E.s

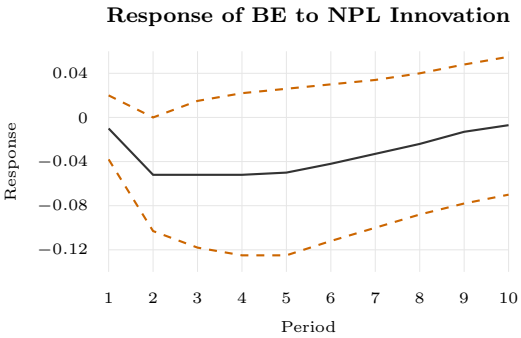

Figure 2: Response of Business Environment (BE) to NPL Innovation

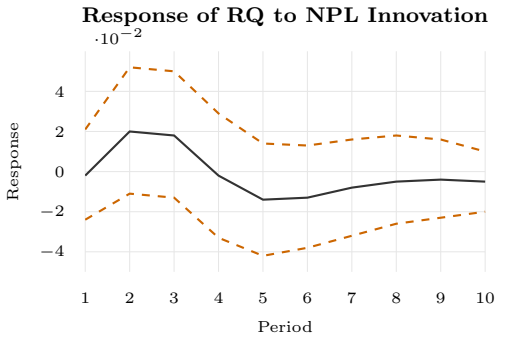

Figure 4: Response of Regulatory Quality (RQ) to NPL Innovation

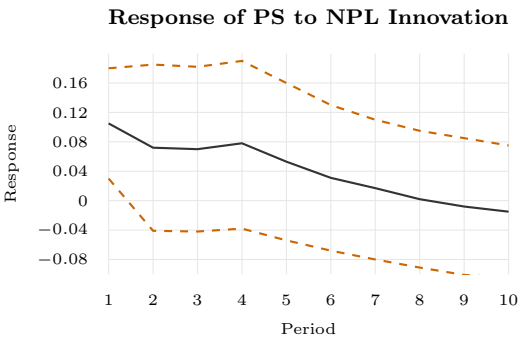

Figure 3: Response of Political Stability (PS) to NPL Innovation

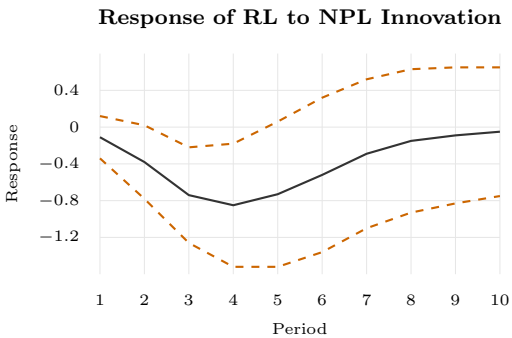

Figure 5: Response of Rule of Law (RL) to NPL Innovation