NON-PERFORMING LOANS IN BANGLADESH'S BANKING SECTOR: WHAT HAS STATE INTERVENTION ACHIEVED?

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Abstract

The banking sector of Bangladesh has been overburdened with a high volume of non-performing loans which risk pushing the financial system of Bangladesh over the precipice of a full-fledged financial crisis. State intervention in the banking sector has failed to address the crux of the problem: governance. Therefore, the myriad measures taken by the government have only aggravated the situation further. The aim of the study is to provide empirical evidence of the determinants of NPL in the banking sector of Bangladesh, so that appropriate state intervention may be designed to rectify the problem. A composite index of governance was calculated through a principal component analysis of six indicators of governance, namely voice and accountability index, political stability index, government effectiveness index, regulatory quality index, rule of law index, and control over corruption index, and defined as the predicted score of the first principal component. The estimation results from the multivariate non-parametric local-linear kernel regression models show that governance has a negative and statistically significant relationship with non-performing loans is all banks, as well as in state-owned commercial banks, development finance institutions and private commercial banks. Interestingly, credit growth was not found to be a statistically significant determinant of NPL for banks in Bangladesh. On the other hand, interest rate affected NPL in DFIs and FCBs, but not NPL in SCBs, PCBs or all banks in general. These results provide evidence that governance is the primary determinant of NPLs in the banking sector of Bangladesh. Therefore, measures to reduce NPL in the banking sector of Bangladesh must prioritise improving the state of governance as a central objective.

Key words: non-performing loans, governance, state intervention, Bangladesh

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1. INTRODUCTION

The banking sector of Bangladesh has been facing a number of serious challenges due to malpractices, scams and heists. These have affected the overall performance of the sector, which is reflected through various efficiency and soundness indicators. The asset quality rating reflects the quantity of existing and potential credit risk associated with the loan and investment portfolios, other real estate owned, other assets, as well as off-balance sheet transactions. The most commonly used measure of a bank's asset quality is its non-performing loans (NPLs). A loan that is in already in default, or close to being in default can be classified as a NPL (Bangladesh Bank, 2017). Non-performing loans are also referred to as non-performing assets (NPAs) since loans are recorded as assets in a commercial bank's balance sheet. This is because loans create a stream of cash flows for a bank through the repayment of the principal and interest payments. According to the International Monetary Fund (IMF), loans should be classified as NPLs if: i) payments of principal and interest are past due by 90 days or more, ii) interest payments equal to 90 days interest or more have been capitalized, refinanced, or rolled over, and/or iii) sufficient evidence exists to classify a loan as non-performing even in the absence of a 90 day past due payment, such as when the debtor files for bankruptcy. The 90-day mark is recommended as an upper threshold, and the IMF does not discourage more strict definitions of NPLs (IMF, 2006). However, there is no universal definition of a NPL, and it is acknowledged that definitions that may be appropriate in one country may not be equally appropriate in another. It is for this reason that cross-country comparability of NPLs is difficult, and adjustment of the figures may be required. However, the 90 day time period is the most widely used by countries to determine whether a loan is non-performing (Cortavarria, Dziobek, Kanaya, & Inwon, 2000).

NPLs are a direct threat to the financial health and development of a country. It may appear that NPLs are rather innocuous, and that they occur merely because borrowers are unable to pay back loans which are associated with high interest. However, studies have shown that in general, high interest rates are not causally related to high level of NPLs in Bangladesh (Ahmed & Islam, 2006) (Mujeri & Younus, 2009) (Hossain, 2012). Evidently, for small and medium enterprises (SMEs), high interest rates could be a reason behind NPLs (Jahan, 2016).

The reality is that NPLs originate from uncertainty and corruption, both of which have detrimental effects for the growth of the banking sector of a country (Park, 2012) (Moshirian & Wu, 2012) (Lin, 2012) (Serwa, 2010). Research has shown that the reasons behind the high amount of NPLs in Bangladesh include political instability, corruption, poor governance, and weak rule of law (Banerjee, et al., 2017) (Alam, Haq, & Kader, 2015).

Poor management of state-owned commercial banks, coupled with malpractices and corruption, has contributed to the high levels of NPL (CPD, 2018a and CPD, 2018b). Contrary to all established norms of banking, state owned commercial banks (SCBs) have been awarding loans based purely on political grounds (Habib, 2017). Consequently, even routine assessment of the potential risks associated with the borrower is not carried out by these banks. Credit-worthiness is judged mainly by political worthiness. As a result, having good political credentials is perceived to be adequate to obtain large loans. Additionally, the government's tendency to fund loss-making state-owned enterprises, through SCBs, has aggravated the problem of NPLs even further. Research has shown that on average, only 33 per cent of first-time rescheduled loans, and 30 per cent of third time rescheduled loans, were recovered during 2011–2014 (Habib, 2017). Over the same time period, loans worth Tk. 45,527.4 crore were

written off by the banking sector. Evidence has also emerged that only 14 per cent of bank officials consider the borrower selection process to be extremely effective (Habib, 2017).

A cross-country comparison of NPLs shows that five South Asian countries, Bangladesh, Bhutan, India, Maldives, and Pakistan, had NPLs exceeding 8 per cent of total loans in 2017. On the other hand, eight South-East Asian countries, Brunei, Cambodia, Indonesia, Malaysia, Philippines, Singapore, Thailand, and Vietnam, all had NPLs below 4 per cent of total loans in 2017 (Annex Figure 2). Hence, high NPLs appear to be a South Asian phenomenon. Understandably, South Asian countries' banking sectors are caught in a myriad of problems which is reflected through high NPLs. But what is to be noted is that, in contrast to Bangladesh, a number of these countries have initiated concrete measures to tackle the situation.

The severity of high NPLs in Bangladesh is underestimated by the policymakers. Repeated concerns have been expressed by relevant stakeholders regarding the constant deterioration of banking performance and its potential implications for the sustainability of the sector. Given that the financial sector of the country is mainly bank-based, the poor health of the banking sector will also adversely impact economic growth. Therefore, rectifying the problems is of critical importance. In view of the above, this paper aims to investigate the reasons behind high volume of NPLs in the banking sector of Bangladesh. The main research objectives of this paper are: i) to describe the trends of NPLs in the banking sector of Bangladesh; ii) to evaluate the effectiveness of state intervention in the banking sector of Bangladesh; and iii) to empirically analyse the factors that influence NPLs in the banking sector of Bangladesh. The remainder of this paper is structured as follows: Section 2 contains an overview of the trends of NPLs in the banking sector of Bangladesh, Section 3 examines the role that state intervention has played in the banking sector of Bangladesh, Section 4 describes the data used and the variables selected, Section 5 briefly discusses the methodology used to conduct the empirical analysis, Section 6 explains the results of the empirical analysis and Section 7 ends the paper with a set of conclusions to reduce the volume of NPLs in the banking sector of Bangladesh.

## 2. NON-PERFORMING LOANS IN BANGLADESH'S BANKING SECTOR

NPLs have become a central feature of the plot that describes the story of the banking sector of Bangladesh. Violin plots of the distribution of NPLs as a percentage of total loans show that development finance institutions (DFIs) had the highest median value of NPL as a percentage of total loans over the past two decades, followed by state-owned commercial banks (SCBs), private commercial banks (PCBs) and foreign commercial banks (FCBs) (Figure 1). From this it may appear that a reason behind NPLs in Bangladesh may be that poor farmers who borrow from DFIs are unable to repay their loans. Unfortunately, as the subsequent analysis will elucidate, nothing could be farther from the truth.

Figure 1: Violin plots of distribution of NPLs as a percentage of total loans, 1996-2018
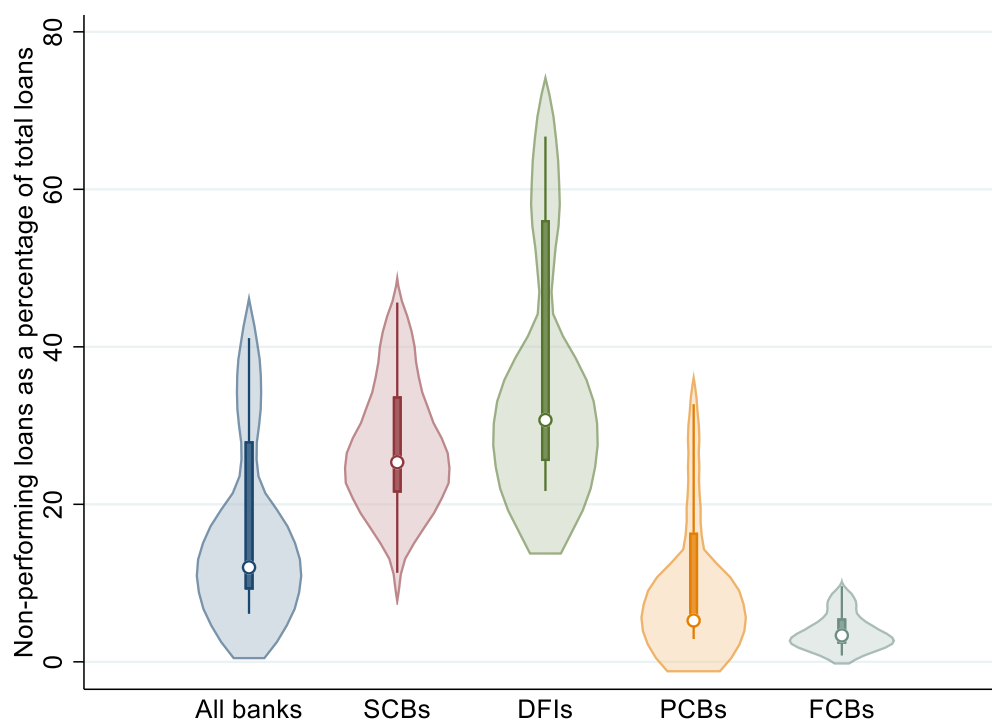
NPL as a share of total outstanding loans increased from 10.41 per cent in June 2018 to 11.69 per cent in June 2019 (Bangladesh Bank, 2019a). As of June 2019, both PCBs and FCBs had NPLs greater than 5 per cent of total loans, while SCBs had NPLs in excess of 30 per cent of total loans. Interestingly, since December 2016 NPL in DFIs has been falling continuously while NPL in SCBs has been on the rise. NPL as a percentage of total loans in DFIs fell from 33.12 per cent in June 2014 to 17.80 per cent in June 2019. On the other hand, NPL as a percentage of total loans in SCBs rose from 23.23 per cent in June 2014 to 31.60 per cent in June 2019.

Figure 2: Gross NPL (as a percentage of total loans) by type of banks
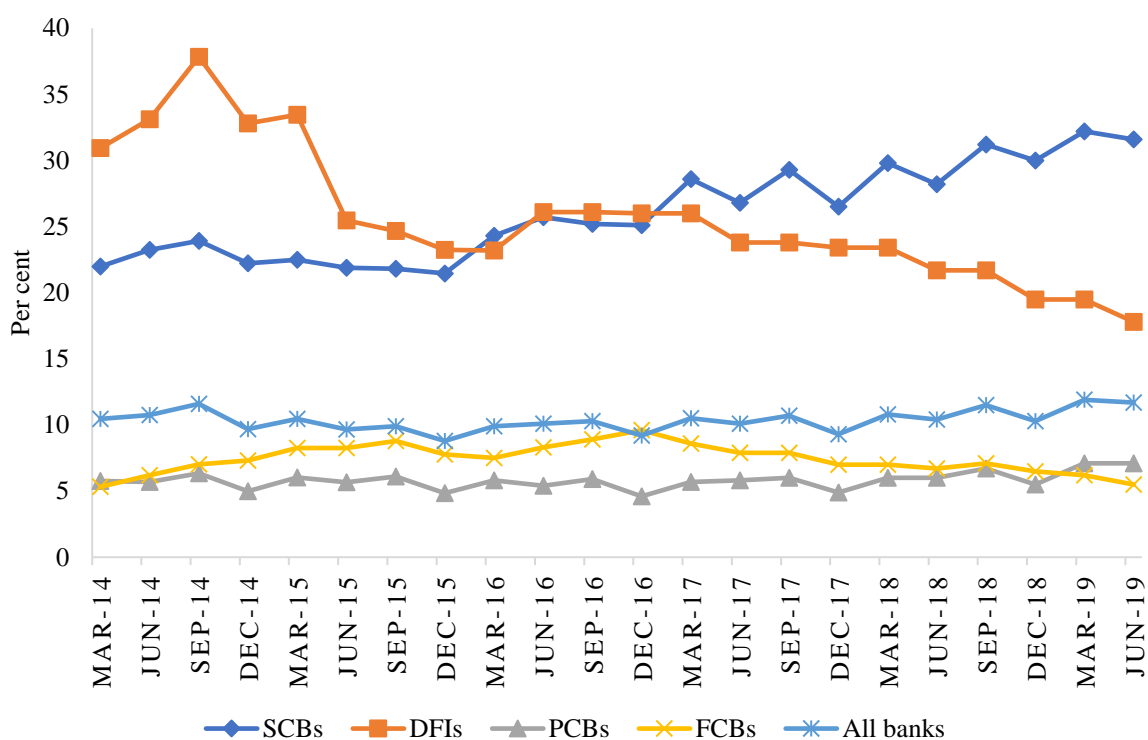
Disaggregating the absolute volume of NPLs shows that from the first quarter of fiscal year (FY) 2018 to the fourth quarter of FY2019, SCBs' share of NPLs had been 49 per cent on average, while FCBs' share of NPLs had been 2 per cent on average. DFIs share of NPLs had fallen from 7 per cent in the first quarter of FY 2018 to 4 per cent in the first quarter of FY 2019. PCBs' share of NPLs rose from 42 per cent in the first quarter of FY2018 to 46 per cent in the fourth quarter of FY2019. Such high concentration of NPLs in the PCBs reveals that NPL is clearly not a problem affecting the SCBs only.

Figure 3: Distribution of NPL, by type of bank (as a percentage of total NPL)
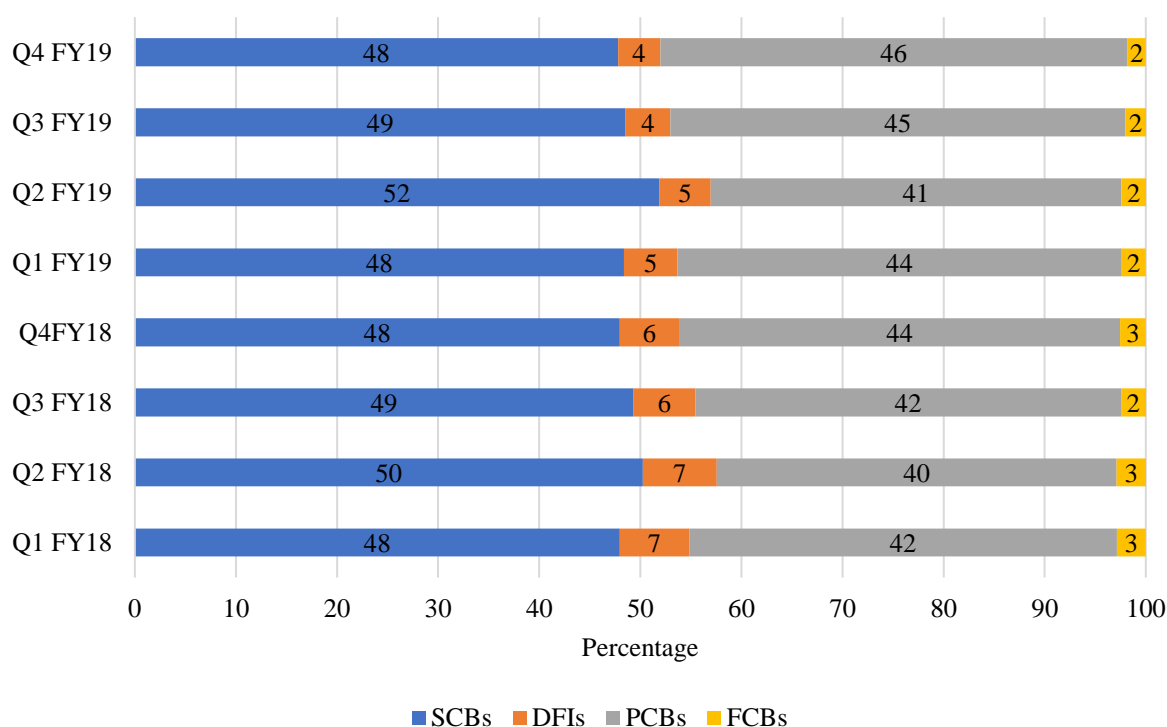
Source: Authors' illustration based on data from Bangladesh Bank

Table 1 shows that the amount of NPLs in Bangladesh has been rising at a fast pace in recent years, and that NPL in 2019 was greater than the annual budget allocation for education and health combined.

Table 1: NPL compared to GDP and budget allocations for education and health sectors

FY	Amount of NPLs[i] (in billion BDT)	Gross NPL as percentage of total loans	NPL as percentage of GDP	Education budget as percentage of GDP	Health budget as percentage of GDP
2010	227	7.3	2.85	1.95	0.79
2011	226	6.1	2.47	2.01	0.80
2012	427	10.0	4.05	1.78	0.73
2013	406	8.9	3.39	1.73	0.71
2014	502	9.69	3.74	1.87	0.70
2015	594	8.79	3.92	1.85	0.69
2016	622	9.23	3.59	2.18	0.73
2017	742	9.31	3.76	2.19	0.34
2018	893	10.41	3.73	2.09	0.89
2019	1124	11.70	4.43	2.10	0.90

Source: CPD compilation from Bangladesh Bureau of Statistics (BBS), Bangladesh Bank Annual Report (various years), Budget documents (various years), Ministry of Finance (various years).
Note: i) NPL data is for calendar years; all other data are for fiscal years.

As of June 2019, total volume of NPLs in the banking sector was BDT 1,12,430 crores. This money could have been used to build three road bridges like the Padma Multipurpose Bridge (Cost: BDT 30,193 crores) or build five metro rails like the Dhaka Mass Rapid Transit Development Project (Metro Rail) (Cost: BDT 21,985 crores). Thus, the opportunity cost of NPLs in the banking sector of Bangladesh is outrageous.

Conventional economic theory postulates that higher risk should be compensated with higher return (LeRoy & Werner, 2014). In the context of banking, this means that loans which are at greater risk of being defaulted should be assigned with higher interest rates (Freixas & Rochet, 2008). However, it is observed that the reality in the banking sector of Bangladesh was quite the contrary. For example, credit provided for consumer finance had a weighted average lending rate of 11 per cent even though its NPL rate was only 4 per cent, while credit provided for trade and commerce had a weighted average lending rate of 10 per cent despite its NPL rate being as high as 11 per cent (Figure 4) (Rahman, Hoque, & Siddique, 2019). In essence, good borrowers were being punished with high interest rates while bad borrowers were being rewarded with low interest rates. This again shows that the market, succumbing to its own whims and vested interests, has become quite distorted, which calls for urgent attention and actions on the part of the regulators.

Figure 4: Overall NPL rate and weighted average lending rate in 2017
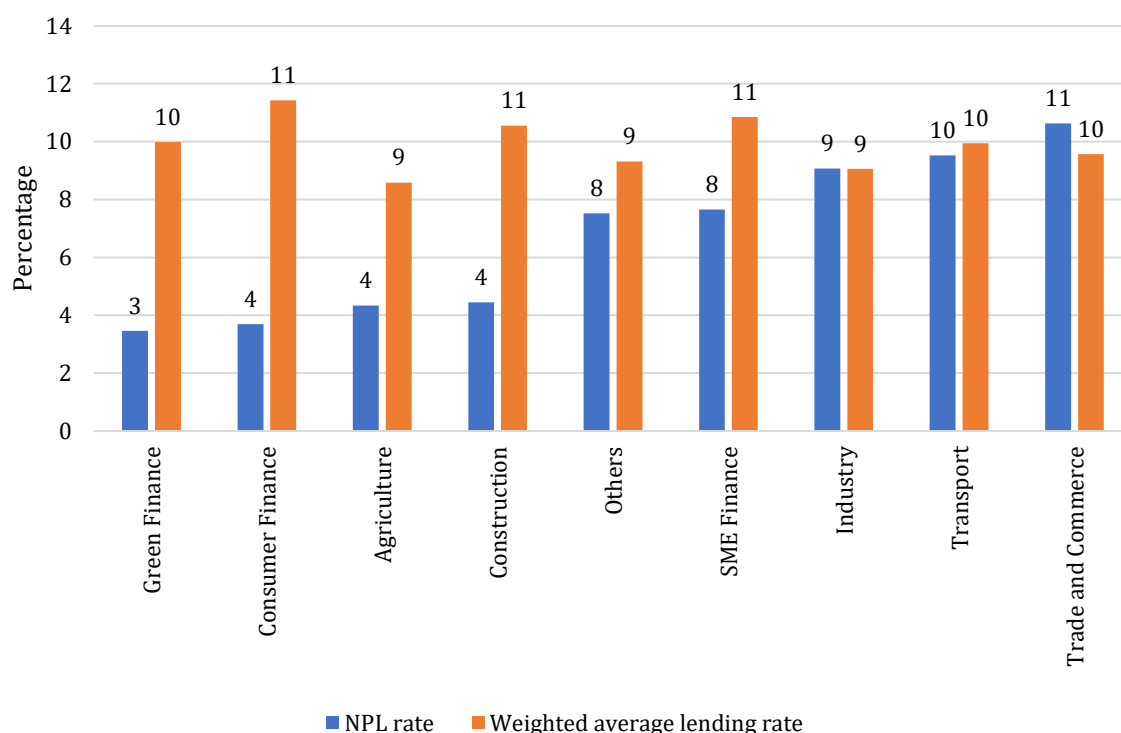
Source: Bangladesh Bank data, adapted from (Rahman, Hoque, & Siddique, 2019)

3. STATE INTERVENTION IN BANGLADESH'S BANKING SECTOR

Bangladesh Bank, the central bank of Bangladesh, has a wide gamut of macroprudential regulations designed to limit systemic risk and reduce the incidence of disruptions in the financial system that may jeopardise the real economy. There are broad regulations such as countercyclical capital buffer, capital conservation buffer, limit on leverage ratio and cap on credit growth that are applicable for the banking sector. There are also regulations for the household sector, such as cap on credit growth to the household sector, cap on loan-to-value ratio, cap on debt service-to-income ratio, limit on amortization periods, restrictions on unsecured loans and exposure caps on household credit. Corporate lending is also regulated by monitoring banks' indebtedness to large corporate borrowers. Liquidity coverage ratio, net stable funding ratio, loan to deposit ratio, cash reserve ratio and statutory liquidity ratio are used to regulate the liquidity position of banks. The central bank also has tools such as the Interbank Transaction Matrix and Bank Health Index which it uses to examine the threat of

systemic risks and financial contagion. Despite being armed with such a potent regulatory arsenal, Bangladesh Bank has been unable to rein in the rise in the volume of NPLs in the banking sector of Bangladesh. This is because the poor state of governance in the country has pushed the banking sector towards crisis.

In 2013, the government approved licenses of nine new private commercial banks: Meghna Bank Limited, Midland Bank Limited, Modhumoti Bank Limited, NRB Bank Limited, NRB Commercial Bank Limited, NRB Global Bank Limited, South Bangla Agriculture and Commerce Bank Limited, The Farmers Bank Limited, and Union Bank Limited. All of these banks had two things in common: they were all backed by politically powerful owners and the economic rationale of these banks was very weak. For example, a study showed that 95 per cent of the officials believed that the new banks were redundant (Nabi, 2016). Despite such findings, nine new PCBs were still given the green signal.

On 17 February 2019, Bangladesh Bank approved three new private commercial banks: Bengal Commercial Bank, People's Bank and Citizen Bank (Dhaka Tribune, 2019) (Daily Star, 2019a) (Daily Star, 2019b). According to the Bank Company (Amendment) Act 2013, the central bank will decide to grant licenses to new commercial banks after considering the need for such banks and the overall state of the economy. Ironically, this principle is not followed in Bangladesh is case of issuing bank licenses. Compared to the size of the economy, the number of banks is already higher than required. Political pressure works for the issuance of bank licenses more than economic justification. It appears that over time, license for opening a new commercial bank has, in fact, become a tool for misappropriation of public money.

Crony capitalists use banks as vehicles for reaching their goal of financial oligarchy. Two detrimental amendments of dubious nature have been made to the Banking Company Act in 2018, which undermined the cause of good governance. The tenure of board of directors was increased from six years to nine years, and up to four family members would be allowed to be on the Board, instead of the earlier two per family. These changes are apprehended to reinforce crony capitalism in a sector of the economy that is already impaired by poor governance.

In the early months of 2019, the government of Bangladesh announced that a special audit will be undertaken in all banks to identify honest and dishonest borrowers (Financial Express, 2019a) (Daily Star, 2019c) and on the basis of this audit, honest borrowers who are unable to repay loans for legitimate reasons will be allowed to pay off loans with a 2 per cent down payment on the loan amount and 7 per cent interest over 12 years (Financial Express, 2019b) (Daily Observer, 2019). However, a clear, concrete and quantifiable definition of an honest borrower and a legitimate reason for non-payment should be declared before extending such privileges to any borrower. There was some speculation that the single borrower exposure limit would be withdrawn for honest borrowers (Financial Express, 2019c). Unfortunately, repeal of the single borrower exposure limit would make banks vulnerable to risky large loans.

Bangladesh Bank issued a circular on 21 April 2019, stating that if any instalment of a fixed term loan is not repaid within the fixed expiry date, then the amount of unpaid instalment shall be categorised as overdue only after six months of the expiry date (Bangladesh Bank, 2019b). Such benefits offered by the central bank will simply encourage more people to become defaulters. On 16 May 2019, Bangladesh Bank's BRPD Circular No. 04, titled "Incentives to Good Borrowers", announced that borrowers with no record of bad loan default in the last one year will be offered a 10 per cent rebate. Such incentive for good borrowers seems trivial compared to the incentives provided to bad borrowers. On 16 May 2019, Bangladesh Bank's

BRPD Circular No. 05, titled "Special Policy on Loan Rescheduling and One Time Exit", announced that: i) defaulters will be allowed to pay only a 2 per cent down payment; ii) 10-year loan repayment period, with a one-year grace period; iii) rescheduled loans would have to be repaid at only 9% interest rate; iv) banks may waive all interest for defaulters, depending on the bank-client relationship; v) a "One Time Exit" will allow defaulters to pay the bare minimum, which includes bank's cost of funds and principal loan amount, with a condition of having to pay the outstanding amount within a year. These measures will provide more incentive for defaulters to normalise bad debts. Moreover, bad borrowers getting longer time to repay loans than good borrowers is rather surprising. It should be noted that the 9 per cent interest that was offered for rescheduled loans, falls within the lowest range of interest rates. This also means that those who had initially taken loans at a higher interest rates could now repay at a much lower rate. Hence, this may encourage borrowers to default on their loans to avail a lower interest rate. Providing waivers based on relationships can be dangerous and may tend to legitimise corruption in banks by providing regulatory support. The so-called 'One Time Exit' policy is quintessentially a general amnesty to loan defaulters, which cannot be justified on moral grounds. Ironically, large defaulters of SCBs did not avail this policy. On the other hand, PCBs, which account for almost half of all NPLs, were reluctant to offer such facilities. Initially, defaulters were asked to apply within 90 days starting from 16 May 2019, but the central bank extended the time period two more times, which allowed even more loan defaulters to avail the facilities. Finally on 23 October 2019, Bangladesh Bank's BRPD Circular Letter No. 23 announced that no more applications from loan defaulters would be considered under the "Special Policy on Loan Rescheduling and One Time Exit", and applications submitted till 20 October 2019 will have to be settled by 19 November 2019 or the date fixed after disposal of the writ petition filed with the High Court.

In essence, it appears that the central bank had offered such privileges on the premise that loan defaulters are mostly honest and were genuinely finding it difficult to repay loans because of high interest rates. Unfortunately, this assumption was too simplistic and naïve given the large number of wilful defaulters. Such special privileges offered to loan defaulters may lead to a moral hazard problem since it could encourage all borrowers to take greater risks.

An explicit illustration as to how the Bangladesh Bank's sovereignty is disrupted by the Financial Institutions Division (FID) of the Ministry of Finance (MoF) is observed in the mandate of the FID, which clearly states the primary function of FID is the "administration and interpretation of the Bangladesh Bank Order, 1972 (P.O. No. 127 1972) and orders relating to the specialized banks and other matters relating to state-owned banks, insurance and financial institutions" (MoF, 2017). By asserting this function in their mandate, the MoF has established their authority to oversee the governance of Bangladesh Bank.

What aggravates the concern of Bangladesh Bank's lack of independence is that, the board of directors, managing directors and deputy managing directors for the SCBs is controlled by the MoF, as opposed to being administered by the Bangladesh Bank (Islam, 2017). In SCBs, specifically Agrani Bank, the managing director was appointed by the MoF, despite Bangladesh Bank's opposition to his appointment (Alo, 2018). In September 2009, another controversial incident influenced by the MoF was the appointment of the chairman of BASIC Bank, under whose leadership, BDT 4,500 crore were embezzled, impeding the financial health of the once robust bank (Daily Star, 2017). Although the Chairman resigned on 5 July 2014 as per Bangladesh Bank's advice, the fact remains that the MoF did not take any concrete actions to remove the individual responsible for the corruption rather gave him an opportunity to resign (Islam, 2018).

In recent years, NPLs have spiralled upwards, partly due to the fresh funds offered by the government in every budget to recapitalise the NPL-struck banks. Recurrent recapitalisation of SCBs by the government has emerged as an issue of grave concern, and the government has taken recourse to this measure on a regular basis. It has been estimated that the GoB has spent BDT 15,705 crore in recapitalising the banks during the period FY2009-FY2017 (CPD, 2018a).

4. DATA AND VARIABLES

In order to empirically analyse the factors that influence NPLs in the banking sector of Bangladesh, a number of variables were selected based on review of the literature and consultation with experts. A number of past studies have uncovered a relationship between the growth rate of credit and NPLs (Salas & Saurina, 2002) (Khemraj & Pasha, 2009) (Espinoza & Prasad, 2010). This is mainly because excessively high growth of credit may indicate that banks are engaging in aggressive lending practices without proper compliance to due diligence requirements. Therefore, credit growth, defined as the annual percentage change in total bank credit (sum of advances, bills and investment, excluding inter-bank) was included as a determinant of NPL. Review of the literature shows that interest rates may also be an important determinant of NPLs (Chaibi & Ftiti, 2015) (Das & Ghosh, 2007) (Khemraj & Pasha, 2009) (Louzis, Vouldis, & Metaxas, 2012). In Bangladesh, the official narrative of the government has also been that high NPLs are mainly due to high interest rates. Hence, interest rate, defined as the rate of interest on advances in scheduled banks (weighted average as at end month) was also included as a determinant of NPL. However, from the discussion in the preceding sections of this paper, it is clear that the crisis of governance is the main driving factor behind high NPL in the banking sector of Bangladesh. Therefore, a composite indicator of governance was included as a determinant of NPL. The composite index of governance was calculated through a principal component analysis of six indicators of governance, namely voice and accountability index, political stability index, government effectiveness index, regulatory quality index, rule of law index, and control over corruption index, and defined as the predicted score of the first principal component.

Table 2 lists all the variables, along with their definitions and sources. Since the variables were measured in various units on different scales, they were standardised to make them unit free and scale independent.

Table 2: Variables

Variable	Definition	Source of data
Voice and accountability index	Reflects perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. Ranges from approximately -2.5 (weak governance) to 2.5 (strong governance).	
Political stability index	Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. Ranges from approximately -2.5 (weak governance) to 2.5 (strong governance).	Worldwide Governance Indicators, World Bank
Government effectiveness index	Reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such. Ranges from approximately -2.5 (weak governance) to 2.5 (strong governance).	
Regulatory quality index	Reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Ranges from approximately -2.5 (weak governance) to 2.5 (strong governance).	

Variable	Definition	Source of data
Rule of law index	Reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Ranges from approximately -2.5 (weak governance) to 2.5 (strong governance).	
Control over corruption index	Reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Ranges from approximately -2.5 (weak governance) to 2.5 (strong governance).	
Governance	Composite index of governance calculated through a principal component analysis of six indicators of governance, namely voice and accountability index, political stability index, government effectiveness index, regulatory quality index, rule of law index, and control over corruption index, defined as the predicted score of the first principal component	Authors' calculations based on Worldwide Governance Indicators, World Bank
NPL in SCBs	Non-performing loans in state-owned commercial banks	Department of
NPL in DFIs	Non-performing loans in development finance institutions	Off-site
NPL in PCBs	Non-performing loans in private commercial banks	Supervision
NPL in FCBs	Non-performing loans in foreign commercial banks	(DOS),
NPL in all banks	Non-performing loans in all commercial banks	Bangladesh Bank
Credit growth	Growth rate of total bank credit (sum of advances, bills and investment, excluding inter-bank)	Statistics Department,
Interest rate	Rate of interest on advances in scheduled banks (weighted average as at end month)	Bangladesh Bank

Source: Authors' compilation based on sources indicated

5. METHODOLOGY

Prior to estimating the models, a series of statistical tests were conducted, in line with the modus operandi of conventional time series analysis. In order to check for unit roots in the variables, augmented Dickey-Fuller unit root tests of the variables at level and first difference were conducted. To check if there is any long-run association between the variables used in this study, autoregressive distributed lag (ARDL) bounds test was conducted. If two variables are cointegrated, then they will also have a causal relationship between them in at least one direction (Engle & Granger, 1987) (Lütkepohl & Krätzig, 2004). Therefore, causality analysis is conducted using a vector error-correction model (VECM) approach for short run causality and a Granger causality approach for long run causality.

It is not possible to identify the correct functional form of the equation that can specify the determinants of non-performing loans of Bangladesh's banking sector. Thus, assumption of arbitrary functional forms may lead to specification errors and biased estimation results. Therefore, traditional techniques of estimating cointegrating equations, such as dynamic ordinary least squares or fully modified ordinary least squares cannot be used. Moreover, due to the small number of observations for the independent variables, caution must be exercised before including them in a model specification. This is because each parameter which is estimated in a multiple regression model consumes one degree of freedom. Thus, including extraneous terms in an equation reduces the degrees of freedom available to estimate the variability of the parameters. If the sample size is small, then there may not be sufficient degrees of freedom to calculate the confidence intervals.

Keeping these issues in mind, a composite index of governance was created using principal components analysis of six indicators of governance namely, voice and accountability index, political stability index, government effectiveness index, regulatory quality index, rule of law index and control over corruption index. Since the composite index of governance represented multiple independent variables, the number of parameters to be estimated could be reduced

from eight to three. The composite index of governance constituted of a number of highly correlated variables, each of which represented a specific dimension of governance. Statistically, composite index of governance was defined as the predicted score of the first principal component.

Using these indicators, five models were estimated using non-parametric local-linear kernel regression. Non-parametric regression models are well suited for exploratory analysis since they do not make any assumptions regarding the functional form of the specification. This means that parameter estimates, along with bootstrap standard errors, can be obtained from a model without having knowledge of the underlying functional form of the equation.

6. RESULTS

To begin the empirical analysis of the determinants of NPL in the banking sector of Bangladesh, a composite index of governance was created using principal components analysis. The six indicators of governance were found to be highly correlated (Annex Table 1), which meant that they were suitable for a principal components analysis. The results from the principal components analysis show that 51 per cent of the variation in the six indicators of governance could be explained by their first principal component and 80 per cent of the variation in the six indicators of governance could be explained by their first two principal components (Table 3, Annex Table 2, Annex Figure 1). The overall Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy yielded a value of 0.64, which is greater than the minimum required value of 0.50 (Annex Table 3). Therefore, constructing a composite index using the six indicators of governance is statistically justified.

Table 3: Summary results of principal components analysis

		Explained variance by components		
	Eigenvalue	**Proportion**	**Cumulative**	**Bias**
Component 1	3.070345** (0.928454)	0.5117 (0.0936)	0.5117 (0.0936)	0.266251
Component 2	1.723643*** (0.4637197)	0.2873 (0.0804)	0.7990 (0.0475)	-0.116314
Component 3	0.571192*** (0.1493983)	0.0952 (0.0325)	0.8942 (0.0275)	-0.014503
Component 4	0.3444236*** (0.0748655)	0.0574 (0.0202)	0.9516 (0.0140)	-0.057551
Component 5	0.1778479*** (0.0361762)	0.0296 (0.0296)	0.9812 (0.0068)	-0.035327
Component 6	0.1125486*** (0.0204495)	0.0188 (0.0068)	1.0000 (0.0000)	-0.042556

Source: Authors' calculations
Note: (i) Approximate standard errors, assuming multivariate normality, in parentheses; (ii) *** $p<0.01$, ** $p<0.05$, * $p<0.1$;
          (iii) Standardised values of all variables are used

Following this, augmented Dickey-Fuller unit root tests of the variables at level and at first difference were conducted (Annex Table 4). Some of the variables were stationary at level, while others were stationary at first difference. To account for this, an Autoregressive Distributed Lag (ARDL) bounds test was carried out to check for cointegration. The results of the ARDL bounds test showed that the F statistic of all five models were above both the bound critical values (Annex Table 5). Hence, there is a long run association between the variables being considered in this study. After confirming the presence of cointegration, Vector Error Correction Model (VECM) was employed to check for short run causal relationships between the variables.

Table 3: Results from VECM causality test

Null Hypothesis	Chi Square Statistic	Probability
NPL in all banks does not Granger cause rate of interest on advances	3.357840	0.0669
Governance does not Granger cause rate of interest on advances	6.665754	0.0098
Growth rate of total bank credit does not Granger cause rate of interest on advances	11.29822	0.0008
Rate of interest on advances does not Granger cause governance	8.374310	0.0038
NPL in DFIs does not Granger cause governance	4.406313	0.0358
Rate of interest on advances does not Granger cause NPL in PCBs	13.60816	0.0002
Governance does not Granger cause NPL in PCBs	7.189977	0.0073
Growth rate of total bank credit does not Granger cause NPL in PCBs	20.08244	0.0000
Growth rate of total bank credit does not Granger cause governance	8.221994	0.0041

Source: Authors' calculations
Note: (i) Only statistically significant results are displayed; (ii) Standardised values of all variables are used; (iii) Probability values shown up to fourth decimal place

The results of the VECM causality test show that, inter alia, governance Granger causes NPL in PCBs in the short run (Table 3). To check for long run causal relationships between the variables, Granger causality test was used. The results of the Granger causality test show that, inter alia, NPL in one type of bank Granger causes NPL in other types of banks in the long run (Table 4). This means that NPL has the potential to create financial contagion in the banking sector of Bangladesh.

Table 4: Results from Granger causality test

Null Hypothesis	F Statistic	Probability
NPL in DFIs does not Granger cause governance	8.78985	0.0063
NPL in all banks does not Granger cause governance	7.11039	0.0120
NPL in PCBs does not Granger cause governance	7.10772	0.0120
Growth rate of total bank credit does not Granger cause NPL in FCBs	8.50278	0.0034
NPL in all banks does not Granger cause NPL in DFIs	3.44666	0.0587
NPL in PCBs does not Granger cause NPL in DFIs	5.42920	0.0168
NPL in PCBs does not Granger cause NPL in all banks	4.28419	0.0337
SCB does not Granger cause NPL in all banks	4.29141	0.0336
NPL in all banks does not Granger cause NPL in SCBs	2.86633	0.0883
NPL in PCBs does not Granger cause NPL in SCBs	3.58888	0.0532

Source: Author's calculations
Note: (i) Only statistically significant results are displayed; (ii) Standardised values of all variables are used; (iii) Probability values shown up to fourth decimal place

Finally, estimation of the multivariate non-parametric local-linear kernel regression models show that governance has a negative and statistically significant relationship with NPL is all banks, as well as in SCBs, DFIs and PCBs (Table 5). This means that an improvement in governance may be expected to result in a fall in NPL. Interestingly, credit growth was not found to be a statistically significant determinant of NPL for banks in Bangladesh. On the other hand, interest rate affected NPL in DFIs and FCBs, but not NPL in SCBs, PCBs or all banks in general. These results provide evidence that governance is the primary determinant of NPLs in the banking sector of Bangladesh. Therefore, measures to reduce NPL in the banking sector of Bangladesh must prioritise improving the state of governance as a central objective. Otherwise, conventional banking regulations developed in Basel, Switzerland or textbook prescriptions will come to no avail.

Table 5: Results of multivariate non-parametric local-linear kernel regression

Variable	NPL in all banks	NPL in SCBs	NPL in DFIs	NPL in PCBs	NPL in FCBs
Mean	15.92828 ***	26.05905***	35.87323***	8.968535***	3.908262***
	(4.029236)	(3.287732)	(6.720995)	(2.306857)	(0.7875127)
Effect					
Credit growth	-1.067478	-0.4513013	-1.784843	-0.8198008	-0.1368727
	(0.7021575)	(0.5298507)	(2.212965)	(0.6422579)	(0.0994548)
Interest rate	8.317259	4.035604	14.26132**	6.044057	1.950012**
	(8.710629)	(11.29945)	(14.26132)	(5.090387)	(0.8809313)
Governance	-7.199228***	-5.837159*	-9.235542***	-4.515104***	0.6903413
	(0.2514579)	(3.149409)	(0.1931995)	(0.4487051)	(0.8618473)
R-squared	0.9553	0.9303	0.9658	0.9687	0.8838

Source: Authors' calculations
Note: (i) Bootstrap standard errors in parentheses; (ii) *** $p<0.01$, ** $p<0.05$, * $p<0.1$; (iii) Automatic bandwidth selection based on cross validation; (iv) Epanechnikov kernel function assumed; (v) Effect estimates are averages of derivatives; (vi) Standardised values of all variables are used

7. CONCLUSION AND RECOMMENDATIONS

The main reason behind the failure of state intervention in the banking sector of Bangladesh is the lack of good governance that has grappled the financial system. Therefore, the crisis of governance must be addressed first and foremost, otherwise the crisis of the banking sector will only get worse. On a different note, failure of the state intervention in the banking sector of Bangladesh does not imply that a neoliberal or laissez faire approach to the financial market, as advocated by the Washington Consensus, will be able to resolve the problems. In fact, such policies will almost invariably result in even more dire circumstances.

The quest for a quick fix to the banking quagmire in Bangladesh is not expected to yield any beneficial outcome for the banking sector in particular, and the overall economy in general. In fact, there are apprehensions that the culture of deception, dishonesty and distrust that is being fostered in the banking sector will cancerously spread to other sectors of the economy and will further degrade the state of good governance in the country. Unless urgent steps are taken to address the emerging issues, the long-run development of the country will be constrained by the banking sector, which has repeatedly proved itself as the weakest link in the economy.

In light of the findings from the aforementioned analysis, the following recommendations are made to policymakers to guide the way forward: i) central bank directives that aide loan defaulters through relaxed loan classification and rescheduling, extended repayment terms, low interest rates, rebates and waivers should be immediately repealed on moral grounds; ii) loans should be classified in accordance with international standards, such as those outlined by the International Monetary Fund's Financial Soundness Indicators guide; iii) repeated rescheduling and writing-offs of NPLs should be stopped permanently; iv) efforts should be made to recover NPLs through out-of-court procedures such as Alternate Dispute Resolution (ADR) and the London Approach; v) Banking Companies Act should be amended to reduce both the number of family members in the board of directors and the tenure of each director; vi) Bankruptcy Act should be amended to remove mortgage-related loopholes that delay the course of justice; vii) single borrower exposure limit for commercial banks should not be removed; viii) loan defaulters should not be provided with more loans from the same bank or from other banks under any circumstances; ix) the central bank should oblige all commercial banks to make their mandatory disclosures under BASEL III in a timely fashion; and x) an independent banking commission should be set up in order to bring transparency in the prevailing situation, identify the root causes of the manifest problems and suggest credible measures for improving the situation sustainably.

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ANNEX

Annex Table 1: Pairwise correlation matrix of governance indicators

Variable	Voice and accountability	Political stability	Government effectiveness	Regulatory quality	Rule of law	Control over corruption
Voice and accountability	1.0000					
Political stability	0.4904*	1.0000				
Government effectiveness	0.5175*	0.7978*	1.0000			
Regulatory quality	0.2922	0.3597	0.5791*	1.0000		
Rule of law	-0.2105	-0.0563	0.0909	0.6793*	1.0000	
Control over corruption	0.2481	0.3377	0.4363	0.6838*	0.6307*	1.0000

Source: Authors' calculations
Note: (i) Stars indicate statistical significance at 5 per cent level; (v) Standardised values of all variables are used

Annex Table 2: Detailed results of principal components analysis

Principal component	Variable	Coefficient	Standard error	P>|z|
Component 1				
	Voice and accountability	0.3098243	0.1949137	0.112
	Political stability	0.4069481	0.1669352	0.015
	Government effectiveness	0.4764745	0.1236731	0.000
	Regulatory quality	0.485544	0.1162143	0.000
	Rule of law	0.274067	0.2450432	0.263
	Control over corruption	0.4477817	0.132627	0.001
Component 2				
	Voice and accountability	-0.4477614	0.1920314	0.020
	Political stability	-0.3964725	0.190233	0.037
	Government effectiveness	-0.28533	0.2024502	0.159
	Regulatory quality	0.2679089	0.2021687	0.185
	Rule of law	0.6340374	0.1170106	0.000
	Control over corruption	0.2951735	0.2002685	0.141
Component 3				
	Voice and accountability	0.775136	0.1112586	0.000
	Political stability	-0.48644	0.176773	0.006
	Government effectiveness	-0.3398901	0.1718209	0.048
	Regulatory quality	0.0887833	0.2647355	0.737
	Rule of law	-0.0376543	0.173749	0.828
	Control over corruption	0.1942027	0.3421619	0.570
Component 4				
	Voice and accountability	-0.0784766	0.3552918	0.825
	Political stability	0.2433413	0.2963366	0.412
	Government effectiveness	-0.2291459	0.2572843	0.373
	Regulatory quality	-0.5516886	0.1355461	0.000
	Rule of law	-0.122501	0.2017164	0.544
	Control over corruption	0.7501678	0.1453556	0.000
Component 5				
	Voice and accountability	0.2322794	0.1788736	0.194
	Political stability	0.5819568	0.1608508	0.000
	Government effectiveness	-0.5482059	0.2513801	0.029
	Regulatory quality	-0.0696381	0.3509856	0.843
	Rule of law	0.4544847	0.2737124	0.097
	Control over corruption	-0.3089289	0.2615935	0.238
Component 6				
	Voice and accountability	0.2063261	0.1516763	0.174
	Political stability	-0.2066161	0.2935246	0.481
	Government effectiveness	0.4722245	0.2737693	0.085
	Regulatory quality	-0.6126823	0.1138615	0.000
	Rule of law	0.5476341	0.2251558	0.015
	Control over corruption	-0.128299	0.2097263	0.541

Source: Authors' calculations
Note: (i) Approximate standard errors, assuming multivariate normality; (ii) Standardised values of all variables are used

Annex Table 3: Results of Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy of principal components analysis

Variable	Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy
Voice and accountability	0.6033
Political stability	0.6860
Government effectiveness	0.6597
Regulatory quality	0.6486
Rule of law	0.4788
Control over corruption	0.7871
Overall	**0.6416**

Source: Authors' calculations
Note: (i) KMO value labels: 0.00 to 0.49 – unacceptable, 0.50 to 0.59 – miserable, 0.60 to 0.69 – mediocre, 0.70 to 0.79 – middling, 0.80 to 0.89 – meritorious, 0.90 to 1.00 – marvellous (Kaiser, 1974); (iii) Standardised values of all variables are used

Annex Table 4: Results of Augmented Dickey-Fuller unit root tests

Variable	At level			At first difference		
	Intercept	Intercept and trend	No intercept or trend	Intercept	Intercept and trend	No intercept or trend
Voice and accountability index	-0.897906 (0.7614)	-0.837303 (0.9389)	0.527991 (0.8188)	-3.114584 (0.0471)	-4.391147 (0.0269)	-3.188544 (0.0036)
Political stability index	-2.757987 (0.0864)	-5.175136 (0.0056)	-1.098517 (0.2319)	-4.611330 (0.0039)	-4.410283 (0.0206)	-5.533017 (0.0000)
Government effectiveness index	-4.105617 (0.0076)	-3.216281 (0.1243)	-0.481216 (0.4887)	-5.004988 (0.0017)	-4.729578 (0.0112)	-5.185077 (0.0001)
Regulatory quality index	-1.702205 (0.4114)	-2.704152 (0.2475)	-0.629277 (0.4288)	-4.599599 (0.0031)	-4.512680 (0.0144)	-4.733206 (0.0001)
Rule of law index	-0.956933 (0.7417)	-2.983917 (0.1754)	-0.920855 (0.3024)	-4.874709 (0.0019)	-4.607253 (0.0123)	-4.490589 (0.0002)
Control over corruption index	-5.059496 (0.0023)	-0.058812 (0.9875)	-3.456144 (0.0025)	-0.072030 (0.9302)	-8.779537 (0.0001)	-1.575394 (0.1049)
Governance	-1.062132 (0.7034)	-2.475694 (0.3333)	-2.025599 (0.0444)	-2.555961 (0.1231)	-2.402727 (0.3634)	-2.598098 (0.0133)
NPL in SCBs	-1.574272 (0.4776)	-1.395424 (0.8320)	-0.809357 (0.3533)	-4.623998 (0.0017)	-3.752972 (0.0465)	-4.675880 (0.0001)
NPL in DFIs	-1.389013 (0.5678)	-0.907961 (0.9360)	-2.935927 (0.0054)	-1.938621 (0.3090)	-5.050370 (0.0034)	-1.377954 (0.1507)
NPL in PCBs	-2.766546 (0.0839)	-2.728352 (0.2386)	-4.630139 (0.0001)	-1.547936 (0.4861)	-6.124598 (0.0004)	-2.774923 (0.0086)
NPL in FCBs	-2.594853 (0.1112)	-1.449975 (0.8142)	0.237716 (0.7454)	-3.732051 (0.0118)	-3.871263 (0.0336)	-3.792810 (0.0007)
NPL in all banks	-1.784239 (0.3774)	-0.188180 (0.9886)	-3.007579 (0.0045)	-2.974260 (0.0547)	-4.331017 (0.0139)	-2.425805 (0.0182)
Credit growth	-2.546938 (0.1187)	-2.433483 (0.3540)	-0.181175 (0.6089)	-6.885693 (0.0000)	-6.934177 (0.0001)	-7.053035 (0.0000)
Interest rate	-2.712246 (0.0886)	-3.734282 (0.0423)	-1.010336 (0.2697)	-3.690837 (0.0128)	-3.539563 (0.0621)	-3.602389 (0.0011)

Source: Authors' calculations
Notes: (i) Optimal lag selection based on the Schwarz Information Criterion (SIC); (ii) Probability values in parentheses; (iii) H_0: a unit root exists; (iv) Standardised values of all variables are used

Annex Table 5: Results of ARDL bounds test

| Dependent variable	F Statistic	Significance level	Bound critical values I (0)	I (1)
NPL in all banks	13.03560***			
		10%	2.72	3.77
		5%	3.23	4.35
		2.5%	3.69	4.89
		1%	4.29	5.61
NPL in SCBs	4.276930*			
		10%	2.72	3.77
		5%	3.23	4.35
		2.5%	3.69	4.89
		1%	4.29	5.61
NPL in DFIs	5.965909***			
		10%	2.72	3.77
		5%	3.23	4.35
		2.5%	3.69	4.89
		1%	4.29	5.61
NPL in PCBs	6.374980***			
		10%	2.72	3.77
		5%	3.23	4.35
		2.5%	3.69	4.89
		1%	4.29	5.61
NPL in FCBs	12.88568***			
		10%	2.72	3.77
		5%	3.23	4.35
		2.5%	3.69	4.89
		1%	4.29	5.61

Source: Authors' calculations
Note: (i) Trend specification: constant (level); (ii) *** $p<0.01$, ** $p<0.05$, * $p<0.1$; (iii) Automatic lag length selection based on Akaike information criterion (AIC); (iv) H_0: no long-run relationships exist (v) Standardised values of all variables are used

Annex Figure 1: Scree plot of eigenvalues after principal components analysis
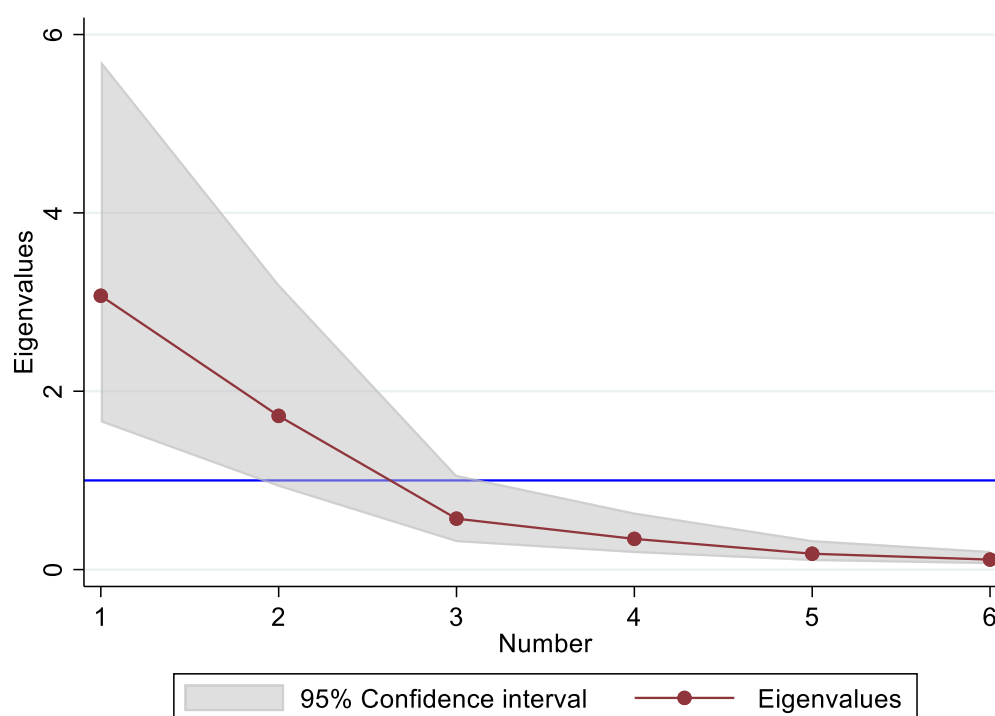
Source: Authors' illustration based on principal components analysis
Note: (i) Horizontal line at eigenvalue equal to 1 shown as reference for Kaiser Criterion

Annex Figure 2: NPL as percentage of total loans in South Asia & South-East Asia in 2017
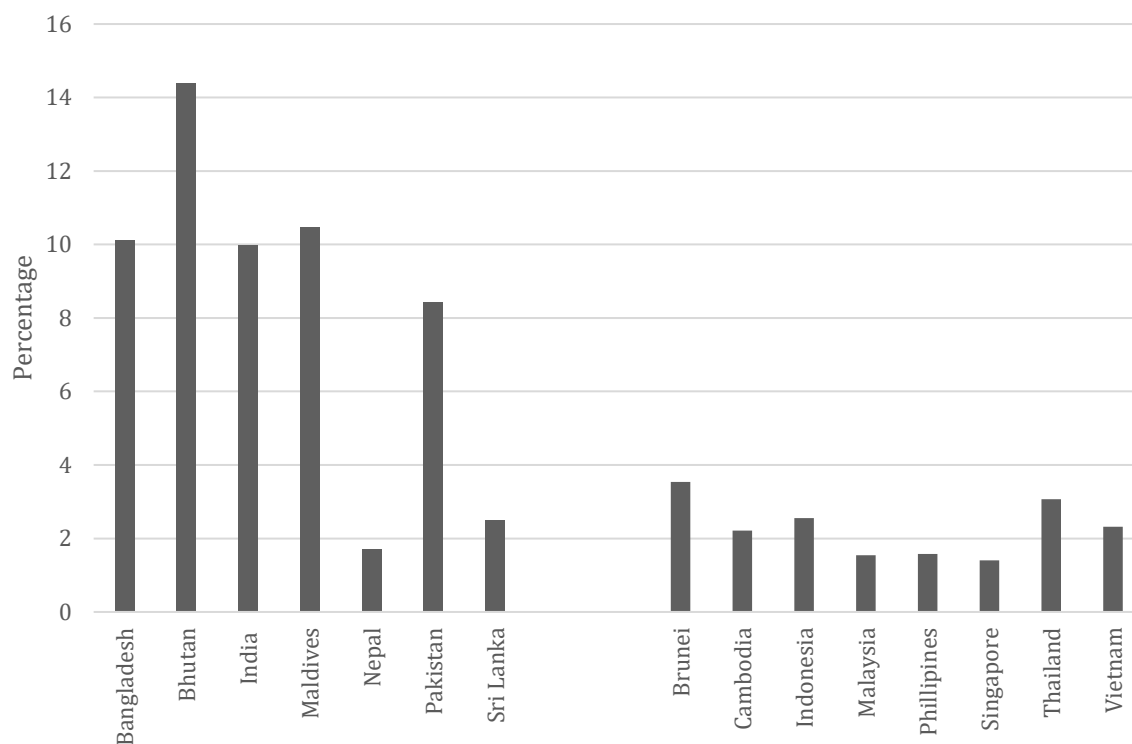
Source: Authors' illustration based on data from Bangladesh Bank and International Monetary Fund