Monetary Policy and Bank Risk-Taking: Implications for Financial Stability in Emerging Markets

Azhar Hussain [1*] Zahid Hussain [2] Syed Ghazanfer Inam [3] Anees Ur Rahman [4] Iman Hashmat [5]

[1] BS, Department of Business Administration, University of Punjab, Lahore, Punjab, Pakistan.
Email: azharyash7074@gmail.com

[2] BS, Department of Business Administration, University of Punjab, Lahore, Punjab, Pakistan.
Email: zahidhussain.econ@gmail.com

[3] Assistant Professor, Department of Business Administration, Mohammad Ali Jinnah University, Pakistan.
Email: ghazanfer@jinnah.edu

[4] MS Scholar, Department of Management Sciences, Sarhad University of Science & Information Technology, Peshawar, Khyber Pakhtunkhwa, Pakistan. Email: anees.turangzwal@gmail.com

[5] BS Economics, Quaid-i-Azam School of Management Sciences, Quaid-I-Azam University, Islamabad, Pakistan.
Email: khan.imanhashmat@gmail.com

ABSTRACT: This paper analyzes the impact of monetary policy on bank risk-taking in Pakistan, where banks have a large share of government debt. We estimate fixed-effects regressions using a new panel of Pakistan's bank groups constructed from all compendia provided by the State Bank of Pakistan from 2006 to 2025 with Driscoll–Kraay standard errors. There is no overall average impact of the policy rate on bank risk, but this masks a change in the way the policy rate is transmitted. Prior to 2015, a 1 percentage point increase in the policy rate was followed by a roughly 1 percentage point increase in the non-performing loan (NPL) ratio a year later. The nominal effect in 2015 is only slightly negative; only the real rate forecasts higher NPLs, and the higher the real rate, the higher the capital ratios, as government security interest income boosts capital ratios. The change coincides with a rise in investments from about 30% to over 50% of assets in every commercial bank group. The data-driven break search fixes the break point at 2016, and the break result passes the bootstrap and control tests, although the coefficients are only significant at the 5–10% level in a regime analysis of an exploratory nature. Financial stability policy in sovereign-dominated banking systems should follow the real, not nominal, policy rate and the concentration of sovereigns.

KEYWORDS: Monetary Policy, Bank Risk-taking, Financial Stability, Sovereign-bank Nexus, Non-performing Loans, Pakistan, Emerging Markets

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Corresponding Author
Azhar Hussain
✉ azharyash7074@gmail.com

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Introduction

Since Central bankers have been forced to accept that interest rates have an influence not only on the amount of lending by banks but on the amount of risk that they will take since the global financial crisis. These were called by Borio and Zhu (Borio & Zhu, 2012) the “risk-taking channel” of monetary policy: lower rates increase asset values,

lower margins and drive banks to seek yield, and higher rates have the opposite effect. The bulk of the evidence for this channel is from the United States and the euro area, where credit markets are deep, and banks are competitive with private borrowers.

The emerging markets are different in some aspects which can affect the channel sign and size. They are apt to hold substantial amounts of government debt in their banks, their private credit markets are shallow, and inflation and exchange-rate shocks push their central banks to make large and abrupt rate changes. All of these are demonstrated in Pakistan. Credit availability from the private sector is also low in comparison to that of other countries in the region; banks have the highest share of government paper in their assets, and the SBP has conducted two separate tightening cycles in the last decade, including the largest in its history (2021-2023).

This paper contains three questions:

1. Does monetary tightening/loosening in Pakistan alter the credit risk banks are exposed to and how much?
2. How does the policy rate impact the risk mix of the banking sector, specifically the mix of private bank loans to the rest of the economy and exposure to the government?
3. What are the implications of these patterns for financial stability and for financial and macroprudential policy in emerging markets?

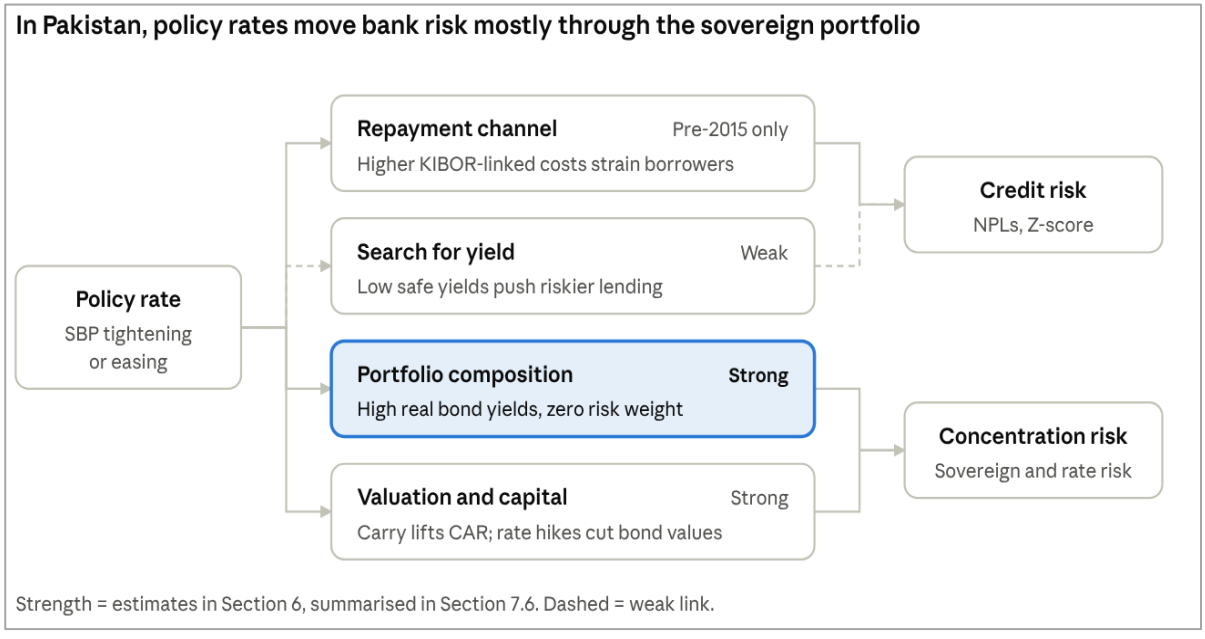
The paper has three contributions. First, it compiles a new annual panel of Pakistan's bank groups from the official SBP compendiums for 2006-2025 and provides it for replication. Second, it offers the first estimates for Pakistan that span the record highs and the rapid easing of the policy rate in 2019–2025 and reveals that the relationship between the policy rate and credit risk flipped sign around 2015. Third, it rephrases the channel of risk taking for a banking system in which the government dominates the system; the question now becomes not "safe versus risky borrowers," but instead, "private credit versus government paper.

Literature Review

Theory of the Risk-taking Channel

The literature has pinpointed a number of channels through which policy rates affect bank risk appetite. Lending standards are tightened when rates fall in the valuation channel because values of the collateral and assets are increased, and the resulting increase in measured default probabilities leads to tighter lending standards (Borio & Zhu, 2012). In the search-for-yield channel, managers with a nominal return objective turn to riskier securities if yields on safe securities decrease (Rajan, 2005). The leverage channel involves lower funding costs, which allow intermediaries to increase their balance sheets during economic downturn. The opposite sign is also allowed by theory. Dell'Ariccia et al. (2014) demonstrate that lower rates increase the value of a bank's franchise, making it more attractive to the bank as well as increasing the bank's incentive to monitor borrowers, especially if the bank is well capitalised. The impact of easing raises or lowers risk-taking will depend on leverage, market structure and the option set of the bank. This ambivalence is key to the case for emerging markets, where the primary competing asset to private lending is a zero-risk-weight government bond with a higher yield. The four channels and the level of evidence for each channel in Pakistan are summarised in figure 1 below.

Figure 1



Transmission channels from the policy rate to bank risk. 4 channels, 2 risk outcomes (Figure 1). The four channels discussed in the literature, rated by the strength of the Pakistani evidence in Section 6. Two run to credit risk and two to concentration risk; the strongest runs through banks' holdings of government paper.

Evidence from Advanced Economies

Using Spain's credit register, Jiménez, Ongena, Peydró and Saurina (Jiménez et al., 2014) have discovered that lower overnight rates increase the amount that weakly capitalised banks lend to ex-ante riskier firms. Maddaloni and Peydró (Maddaloni & Peydró, 2011) demonstrate that cutting short-term rates eased credit conditions in the euro area and the USA prior to 2008. Altunbas, Gambacorta, and Marques-Ibanez (Altunbas et al., 2014) have found that exceptionally low default rates over a long period of time increased banks' expected default frequency in Europe and the U.S. Using US loan-level data, Dell'Ariccia et al. (2017) confirm that riskier lending follows easing, and that this effect is less pronounced for banks with thin capital.

Evidence from Emerging Markets

The picture is less clear for the emerging economies. Chen, Wu, Jeon and Wang (Chen et al., 2017) examine banks in 29 emerging economies and conclude that expansionary policy increases risk taking, but does so in smaller magnitudes in economies where banks are larger, more liquid, and where there is less competition. Bruno and Shin (Bruno & Shin, 2015) and Rey (Rey, 2013) point out that global liquidity and the US policy cycle are other factors that influence the risk of emerging-market banks, which may outweigh domestic rates.

Another strand is on the sovereign-bank nexus. If a government's spending is large and financed by borrowing domestically, the banks will have to hold government debt, and high policy rates will be profitable and lead to repression of private credit (International Monetary Fund, 2022). In these systems, where credit risk is measured, the level of concentration risk can increase, and the level of credit risk may decrease, causing traditional soundness measures to overestimate resilience.

Evidence from Pakistan

The most direct test for Pakistan is from Shabbir, Iqbal and Rana (Shabbir et al., 2016) from the Monetary Policy Department of SBP. They calculate the infection (NPL) ratio and the Z-scores of banks and find that a tighter policy rate leads to higher infection ratios and lower Z-scores for banks, thereby amplifying their insolvency risk, using quarterly data for 35 commercial banks from 2002Q4 to 2014Q2, and employing a fixed-effects model with an instrumental variable.

They also experience a genuine search-for-yield period, when the banks lent at very low risk premia to corporates during the easing phase of 2001-2004, and when the loans turned sour when the rate increased after 2004. The five largest banks, with roughly 53% of assets, took the least risk in easing, while the small, highly liquid and highly capitalised banks took the most. The repayment effect has been confirmed later. In their study of 22 listed banks between 2009 and 2021, Shahid, Badar, Iftikhar and Shah (Shahid et al., 2024) conclude that policy-rate changes have significant effects on bank credit risk and profitability. Since then, policy literature has turned its focus to the sovereign.

According to Article IV of the IMF report for Pakistan 2024 (International Monetary Fund, 2024), the share of government securities in the hands of Pakistan's banks is the highest in comparison with their total assets, which is supported by SBP open market operations. It refers to a "tripartite" relationship between the government, banks and the central bank which stifles private credit growth and reduces the impact of the policy rate on private credit.

Gap Addressed

The evidence from Pakistan on the risk-taking channel is from 2002-2014 when government securities constituted a considerably smaller portion of bank assets and a credit boom was feasible. The literature on the sovereign nexus, conversely, gives a description of the balance sheet but not a connection with the monetary cycle. This paper brings the two together for the decade 2016-2026, which is a period of record rates and very quick rate easing and rate tightening again. It poses the question: Does the search-for-yield behaviour observed in 2001-2004 still exist when the sovereign owns the banks?

Institutional Background

The Conduct of Monetary Policy

The interest-rate corridor in which the SBP sets the policy rate is ±100 basis points, with an open market operations policy rate of 12% and floor and ceiling rates of 11% and 13%, respectively. It has a target of maintaining medium-term inflation at 5–7%. Changes in the SBP Act in 2022 had given the bank more autonomy and eliminated the possibility of the government borrowing directly from the bank, with the deficit having to be financed by commercial banks. Table 1 shows that there are four different monetary phases in the past decade. Both were due primarily to external-sector and inflation shocks, rather than to domestic credit conditions.

Table 1

SBP Monetary Policy Phases, 2017–2026

Phase	Period	Policy rate	Main driver
Renewed tightening	Apr 2026 – present	10.5% → 12.0%	Middle East conflict, energy and wheat prices; CPI 10.3% in Sep 2026
Rapid easing	Jun 2024 – Dec 2025	22.0% → 10.5%	Disinflation; CPI 5.6% in Dec 2025

Phase	Period	Policy rate	Main driver
Record tightening	Sep 2021 – Jun 2023	7.0% → 22.0%	Balance-of-payments crisis, IMF programme, CPI peak above 35%
COVID easing	Mar – Jun 2020	13.25% → 7.0%	Pandemic demand shock
First tightening	Nov 2017 – Jul 2019	5.75% → 13.25%	Current-account deficit, currency depreciation

Sources: SBP Monetary Policy Statements (State Bank of Pakistan, 2026c; Business Recorder, 2026; State Bank of Pakistan, 2026d).

The paper is only concerned with the latest stage. The SBP kept the rate unchanged at 10.5% for January and March 2026, but increased it by 100 bps to 11.5% in April 2026 (State Bank of Pakistan, 2026d) and by another 50 bps to 12% on 26 October 2026, due to the persistence of the energy shock and the need to maintain a positive real rate on a forward-looking basis (State Bank of Pakistan, 2026c).

Structure of the Banking System

The financial sector accounts for around 80% of the assets held by banks, and financial depth (financial assets/GDP) increased to 67.1% in 2025 (State Bank of Pakistan, 2026a). Islamic banking has also been expanding rapidly, increasing from 20% of system assets in 2012 to approximately 23% in 2025 (bne IntelliNews, 2026b). Lending is very localized.

The percentage of rated borrowers in banks' corporate and commercial loans is approximately 62% (State Bank of Pakistan, 2026a), and earlier estimates suggested that large borrowers represented less than 2% of borrowers and approximately 87% of loans (PRIME Institute, n.d.). When rates drop, this concentration restricts banks' ability to go down the credit quality spectrum

The Sovereign-bank Nexus

Pakistani banking is extremely vulnerable to the state. In December 2023, the exposure to government securities stood at 60.6% of bank assets, and in 2025, it was 64.6% (State Bank of Pakistan, 2024; State Bank of Pakistan, 2026a). According to its own review by SBP, banks are increasingly becoming financiers of the government instead of firms and households.

This is supported by two policy features. Domestic sovereign debt, under Basel rules, has a zero risk weight, meaning that it does not require any regulatory capital. SBP's big open market operations provide liquidity from which banks pass it on to the treasury auctions. The government made a brief attempt to establish the links between the bank tax rates and advances-to-deposits ratio (ADR) with the aim of promoting lending, thereby adding to the credit during 2024 but establishing a high base for lending and a contraction in 2025.

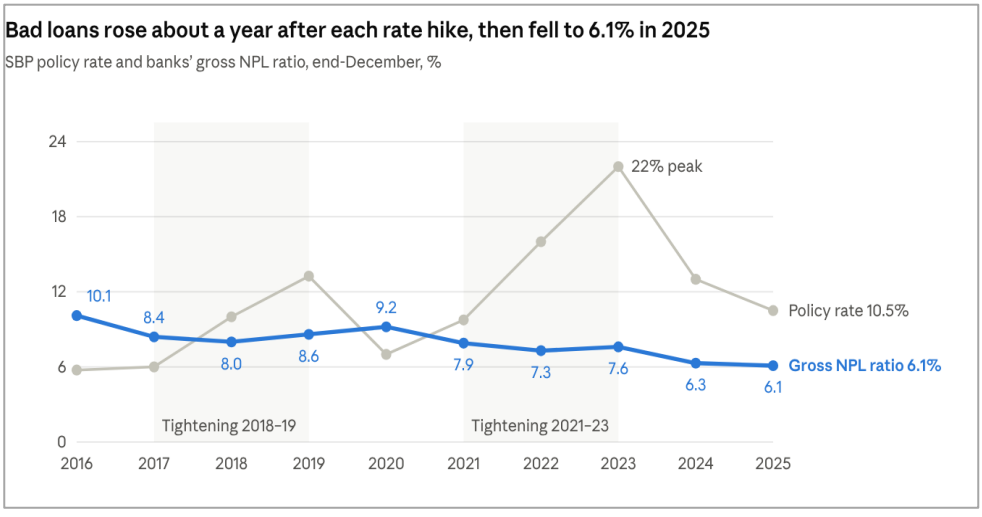
Stylised Facts

Fact 1: NPLs Rise after Tightening, with a Lag

When the money supply is tightened, 4.1 Fact 1 is true: NPLs increase with a lag. The gross NPL ratio fell from 10.1% in 2016 to 8.0% in 2018, then rose to 8.6% in 2019 and 9.2% in 2020, one to two years after the 2018–19 tightening (Pakistan & Gulf Economist, n.d.). It fell to 7.3% in 2022 after the low-rate period, then edged up to 7.6% in 2023 as the 22% rate bit (State Bank of Pakistan, 2024). With easing, it fell to 6.3% in 2024 and 6.1% in

2025 (State Bank of Pakistan, 2026a). The changes in rates are small in comparison to the size of the changes, as is tested formally in Section 6. The two series are plotted in figure 2.

Figure 2



SBP Monetary Policy Statements; SBP FSR 2023 and 2025; Pakistan & Gulf Economist · end-December 2016–2025 (Figure 2). The NPL ratio peaks after each shaded tightening phase, but its swings (about 1–2 points) are small next to rate moves of 7–15 points.

Fact 2: Capital Buffers Grew through the Tightening

Capital also earned a grade of "strengthened" every year from 2021 through 2025, including the record rate year. Net interest margins on government securities widened, and capital was augmented by retained earnings. The unweighted CAR, on the other hand, changed significantly less than the risk-weighted CAR, because the increase in the capital base was mostly due to the rise in assets for sovereign paper, which has no risk weighting.

Table 2

Capital and Asset Quality of the Banking System, 2021–2025 (%)

Indicator (%, end-December)	2021	2022	2023	2024	2025
Capital adequacy ratio (CAR)	16.7	17.0	19.7	20.6	20.8
Tier 1 capital to risk-weighted assets	13.5	14.2	16.0	16.4	16.8
Capital to total assets	6.3	5.9	5.9	6.3	6.5
Gross NPLs to gross loans	7.9	7.3	7.6	6.3	6.1

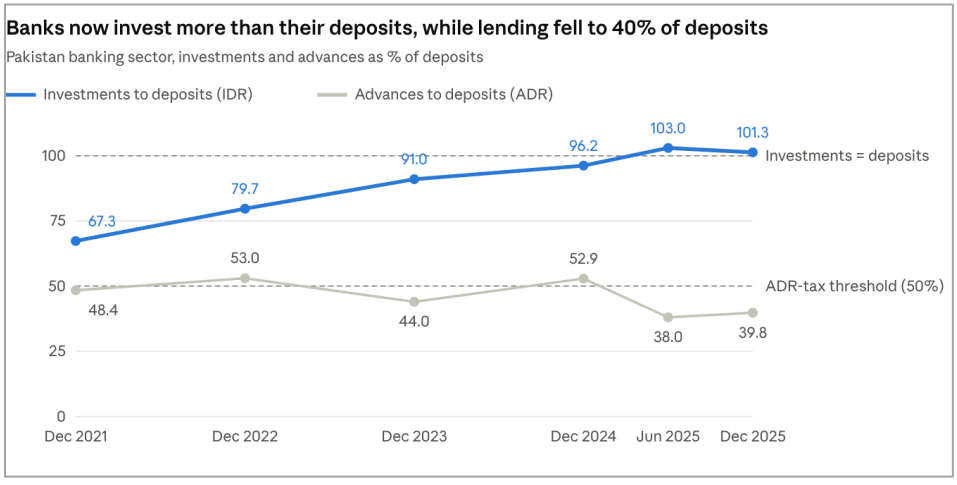
Sources: (State Bank of Pakistan, 2026a; State Bank of Pakistan, 2024; State Bank of Pakistan, 2026b). Regulatory minimum CAR is 11.5%.

Fact 3: Banks Shifted from Private Credit to the Sovereign

The largest movement in bank risk is in portfolio composition. Gross advances shrank by 15.2% in the first half of 2025, the ADR dropped to 35.3% from 55.5% in December 2024 (State Bank of Pakistan, 2025), and investments increased to 62.9% of total assets from 55.5% in December 2024. The investment amounted to more than total deposits, reaching 103% in June 2025 (Express Tribune, 2025). Recovery was just 39.8% of the ADR by December 2025 as investments rose 30.1% year-on-year to Rs 37.9 trillion (ProPakistani, 2026) (Figure 3). This is important

for interpretation. The increase in NPL ratio to 7.4% in June 2025 was not due to the stock of NPLs increasing, but was rather due to the loan book shrinking (State Bank of Pakistan, 2025). In Pakistan, ratio-based risk measures, therefore, accompany the denominator.

Figure 3



Arif Habib Limited calculations from SBP data, via Business Recorder, Express Tribune, Profit and ProPakistani. Dec 2021–Dec 202 Figure 3. Investments overtook total deposits in mid-2025, while lending fell well below the 50% threshold that the ADR-linked tax was designed to enforce. The brief 2024 rise in ADR reflects that tax rather than a lasting shift in bank behaviour.

Fact 4: Real Rates Swung from Deeply Negative to Strongly Positive

At 22%, the policy rate was much lower than the 30% year-on-year CPI inflation at end-2023, or about 8 percentage points below the inflation rate. By end-2025, with inflation at 5.6% and the rate at 10.5%, the real rate was about +5 percentage points (Business Recorder, 2026). The real rate dropped below 2 points after the September 2026 inflation rate escalated to 10.3%, which the SBP mentioned as justification for increasing the rate to 12% (State Bank of Pakistan, 2026c). Real, not nominal, rates are the true price that matters for borrowers' ability to pay back, and for banks' decision to lend versus bond.

Data and Empirical Methodology

Data

Estimates are based on an annual panel of banks in Pakistan, which includes the four bank groups: public-sector commercial banks (PSCBs, 5 banks), local private banks (LPBs, 20–25 banks), foreign banks (FBs, 4–7 banks) and specialized banks (SBs, 3–4 banks). The panel is compiled from four editions of SBP's Quarterly Compendium: Statistics of the Banking System (December 2011, 2016, 2021 and 2025) (State Bank of Pakistan, n.d.). Several soundness indicators and balance sheets are reported by group for each edition, with observations spanning 2006-2016, 2019-2021 and 2023-2025: 17 years per group.

These editions do not include 2017, 2018 and 2022. If there is an overlap in editions, the revised edition is chosen. The three commercial groups, which accounted for 99% of banking assets in December 2025, are in the main sample for 51 group-years. Specialized banks are included as a robustness check, since their balance sheets differ from the norm, with advances/deposits ranging from 180-580% and negative capital prior to 2010.

Table 3

Variables

Variable	Definition	Source
NPL ratio	Gross NPLs ÷ gross advances, %	SBP compendiums (State Bank of Pakistan, n.d.)
Advances-to-deposits ratio (ADR)	Net advances ÷ deposits, %	SBP compendiums (State Bank of Pakistan, n.d.)
Investment share	Net investments ÷ total assets, %. Government securities make up 85–91% of bank investments	SBP compendiums (State Bank of Pakistan, n.d.)
Capital adequacy ratio (CAR)	Regulatory capital ÷ risk-weighted assets, %	SBP compendiums (State Bank of Pakistan, n.d.)
Policy rate, t−1	SBP policy rate at the previous end-December (discount rate before May 2015)	SBP
Real policy rate, t−1	Policy rate minus CPI inflation, both for the previous year	SBP; World Bank (World Bank, n.d.); SBP FSR 2025 for 2022–2025
GDP growth	Real GDP growth, calendar year, %	World Bank (World Bank, n.d.)

The investment share is unavailable for 2023, because the December 2025 compendium reports group balance sheets only for 2024 and 2025.

Table 4

Summary Statistics, Commercial Bank Groups, 2006–2025

Variable	Obs.	Mean	SD	Min	Max
NPL ratio (%)	51	9.7	5.7	0.1	22.9
ADR (%)	51	50.6	13.6	22.2	80.1
Investment share (%)	48	40.3	15.2	9.6	70.8
CAR (%)	51	20.4	8.0	11.8	45.7
Policy rate, t−1 (%)	51	11.7	3.7	6.5	22.0
Real policy rate, t−1 (%)	51	0.0	3.4	−8.8	4.9
GDP growth (%)	51	3.3	2.1	−1.3	6.6

Specification

In line with the literature on risk taking (Altunbas et al., 2014; Delis & Kouretas, 2011), a regression of each risk measure is performed on the lagged policy stance and output growth, allowing for group fixed effects:

$$Risk_{i,t} = \alpha_i + \beta \cdot MP_{t-1} + \gamma \cdot GDP_t + \varepsilon_{i,t} \quad (1)$$

MP is the nominal or the real policy rate, and indices i and t refer to bank groups and years, respectively. A dynamic version includes the lagged dependent variable, which is available only for the group-years where the previous year is known (42 group-years). The baseline is extended by the addition of a regime interaction to test whether there was a change in transmission as banks moved into government debt. The baseline is extended with an interaction between the regimes to test if there was a change in transmission as banks shifted to government debt.

$$Risk_{i,t} = \alpha_i + \beta \cdot MP_{t-1} + \theta \cdot (MP_{t-1} \times Post_t) + \delta \cdot Post_t + \gamma \cdot GDP_t + \varepsilon_{i,t} \quad (2)$$

The effect of the policy rate before 2015 is represented by β, while the effect of the policy rate after 2015 is represented by β + θ. The 2015 date has been arrived at for two institutional changes:

(i) In May 2015, the SBP revoked its interest-rate corridor policy and introduced a policy rate as the new operational target
(ii) Increase in the investment share above 45% for all commercial groups from 2015.

This was because the full-sample model revealed no average effect, so the regime specification was added. Since it was not determined in advance, the regime results will be seen as explorative. To reduce the likelihood that the break date was selected to match the data, Section 6.3 does not assume a break date; rather, the break date is estimated by least-squares methodology, and the results are presented for each break year between 2013 and 2019.

Estimation and Inference

The estimation of all models is done using fixed-effects least squares. Clustering by group is not possible for three groups, and standard errors are calculated as per Driscoll and Kraay (Driscoll & Kraay, 1998) (using a Bartlett kernel with one lag). These are fairly robust to heteroskedasticity and to serial correlation as well as correlation across groups within the same year. To use t-distribution, the number of degrees of freedom is T − 1.

System GMM (Blundell & Bond, 1998) is not used because it needs a large number of cross-sectional units. In the dynamic models, the Nickell bias in the lagged dependent variable is of order 1/T ~ 6% here. To complement, the system-wide NPL ratio of all banks in 2006–2025 is regressed on its lag, the lagged policy rate and the lagged GDP growth, with Newey–West standard errors (Newey & West, 1987) and 19 observations.

All specifications estimated are listed in Tables 5–9. The data and estimation software are provided as replication files.

Empirical Results

Full-sample Estimates: no Stable Average Effect

The lagged policy rate does not have a statistically significant impact on any of the three risk measures over 2006-2025 as a whole (Table 5). The same result is obtained from the real policy rate: The coefficient for the NPL ratio is 0.17 (SE 0.22), that of the ADR is −0.32 (0.66), and that of the investment share is −0.12 (1.13).

Table 5

Policy Rate and Bank Risk, Commercial Bank Groups, 2006–2025

	(1) NPL ratio	(2) NPL ratio, dynamic	(3) ADR	(4) Investment share	(5) Investment share, dynamic
Policy rate, t−1	−0.18 (0.21)	−0.07 (0.09)	0.11 (0.75)	0.76 (0.92)	1.09 (0.65)
Dependent variable, t−1		0.79*** (0.10)			1.04*** (0.08)
GDP growth	−0.27 (0.38)	−0.46 (0.31)	0.33 (1.57)	1.53 (2.11)	0.92 (0.82)
Observations	51	42	51	48	39
Within R^2	0.03	0.73	0.00	0.04	0.85

Notes: group fixed effects included. Driscoll–Kraay standard errors in parentheses. ***, ** and * denote significance at 1%, 5% and 10%.

The flat average hides a change in how policy is transmitted, which the regime estimates reveal.

A Regime Change Around 2015

As for the impact of a 1 percentage point increase in policy rate, an increase of approximately 1 point in the NPL ratio is recorded a year after a pre-2015 increase, which then turns negative in 2015 (Table 6).

Table 6

Regime-dependent Effects, Commercial Bank Groups

		NPL ratio (real rate)	Investment share	ADR
Rate, t–1: before 2015 (β)	0.98* (0.54)	–0.31 (0.27)	1.09 (1.74)	–1.48 (1.73)
Rate, t–1: 2015 onward (β + θ)	–0.36** (0.15)	0.30** (0.13)	0.42 (0.29)	0.67** (0.26)
GDP growth	–0.28 (0.26)	–0.19 (0.37)	1.24 (0.80)	0.09 (0.80)
Observations	51	51	48	51
Within R^2	0.47	0.29	0.57	0.41

Notes: group fixed effects and a post-2015 dummy added. The standard errors for β + θ are calculated using the Driscoll–Kraay covariance matrix. The significance is as in Table 5.

Here are three standout results: First, the pre-2015 coefficient is similar to that found by Shabbir et al. (2016) for the period 2002–2014, which showed that higher borrowing costs (in terms of KIBOR) led to an increase in defaults the following year.

The second, after 2015, the NPL ratio is not predicted by the nominal rate but rather the real rate: a 1-point increase in the real rate results in an NPL ratio 0.30 points higher. The big increases in nominal rates in 2019 and 2022-2023 were accompanied by high inflation, meaning that real debt of borrowers decreased. Third, the bulk of the portfolio change is not a year-to-year reaction but a level change. In post-2015 regime, the investment-share coefficient is also positive, but the coefficient is not precisely known (0.42, SE 0.29). With specialized banks included, it is 1.23 (SE 0.32, $p < 0.01$). The positive post-2015 ADR coefficient is likely due to the ADR-related tax incentivizing banks to lend in the high-rate years 2022 and 2024 and should be interpreted with caution.

Table 7

Bank Balance Sheets before and after 2015, Group Averages (%)

Group	NPL ratio	ADR	Investment share	CAR
Public-sector commercial banks	16.5 → 14.3	59.7 → 41.8	28.2 → 51.7	15.5 → 19.6
Local private banks	10.3 → 6.7	60.2 → 46.0	32.9 → 49.7	13.6 → 17.1
Foreign banks	7.0 → 3.1	54.4 → 38.9	30.7 → 57.0	23.9 → 33.4

Notes: averages over observed years, 2006–2014 → 2015–2025. Source: SBP compendiums (State Bank of Pakistan, n.d.).

All commercial groups saw their investment proportions rise by 17–26 points and their lending ratios decrease by 14–18 points over the two periods. This is the rebalancing of the balance sheet that undermined the link between the policy rate and the private sector's riskiness.

Robustness

The change of sign is for the break year selected for the period between 2013 and 2016, and in the system-wide series (Table 8).

Table 8

Robustness of the NPL regime result

Specification	Rate effect before break	Rate effect after break
Break in 2013	1.37** (0.52)	–0.44** (0.15)
Break in 2014	1.06* (0.56)	–0.39** (0.14)
Break in 2015 (baseline)	0.98* (0.54)	–0.36** (0.15)
Break in 2016	0.87* (0.50)	–0.31** (0.14)
Break in 2019	0.54 (0.36)	–0.19* (0.10)
All four groups, incl. specialized banks (break 2015)	0.36 (0.30)	–0.53*** (0.14)

Note: dependent variable is the NPL ratio; commercial groups, unless specified. Standard errors of the estimates in parentheses, for Driscoll–Kraay.

The pattern is similar for the system-wide time series. The short-run effect of the lagged policy rate on NPL ratio is 0.36 (SE 0.05, $p < 0.01$) prior to 2015 (19 observations) with a persistence coefficient of 0.66. That suggests a long-run impact of approximately 1.1 points. The negative effect is removed by the post-2015 interaction term –0.49 (SE 0.05). In the absence of the regime split, the policy rate is not significant (–0.04, SE 0.10). Three additional checks address the worry that the regime result is a break-date choice and of small samples and omitted variables (Table 9).

Table 9

Further Robustness Checks for the NPL Regime Result

Check	Rate effect before 2015	Rate effect from 2015
Baseline (Table 6)	0.98* (0.54)	–0.36** (0.15)
Adding a linear time trend	0.93* (0.46)	–0.48* (0.23)
Adding CPI inflation	0.99* (0.52)	–0.31** (0.13)
Adding lagged CAR (42 obs.)	0.72 (0.51)	–0.41* (0.22)
Block bootstrap over years, 90% interval	–0.10 to 2.29	–1.63 to 0.07
Block bootstrap: share of draws with expected sign	92% positive	94% negative

Notes: commercial groups are commercial groups other than Driscoll–Kraay. 96% of the draws have a pre-2015 effect greater than the post-2015 effect; the pre-2015 effect is larger in 96% of those draws.

First, a "least squares" search over break years 2009-2021 indicates that the break year is around 2016, near the institutional break date. The fit is almost as good for 2013 and 2017–2019; the 2017–2018 data gap prevents finer dating. The F-statistic for adding the break at 2016 is 20.9, which is significantly higher than the conventional critical values for an unknown break date, but just suggestive here, with the assumption of independent errors. Second, most block bootstrap estimates have the correct sign, but both 90% intervals contain zero. Third, patterns remain the same with time trends such as inflation or lagged capital, but the significance is reduced if lagged capital is nine observations.

There are two checks, and they support a stronger claim. However, the change in NPLs and the investment share does not seem to have any significant impact, as seen in first-difference models where the changes in NPLs and the investment share are regressed upon the change in policy rate, of which the coefficient on the change in NPLs is 0.02 (SE 0.07) while that on the change in investment share is 0.05 (SE 0.07). A two-year lag in policy rates is also not significant. The evidence therefore relates to the movement of the level of risk over a number of years and not to a response to each rate change as it occurs.

The direction of the change is the same for all break dates, controls, resampling and data sources, but the significance of the individual coefficients is only at the 5-10% level, and the regime analysis is exploratory. The results should be interpreted as a sign of some change in transmission which has a stable sign but with an uncertain size.

Profitability and Capital

When policy rates are increased, banks' capital ratios rise: a 1-point increase in the lagged policy rate corresponds to a 0.76-point increase in banks' capital ratios during the entire period, and a 0.73-point increase from 2015 (Table 10). This is the capital channel and valuation. Banks receive high nominal yields on government securities that have a zero risk weight, and carry income in addition to capital, but do not add to risk-weighted assets.

Table 10

Policy Rate, Profitability and Capital, Commercial Bank Groups

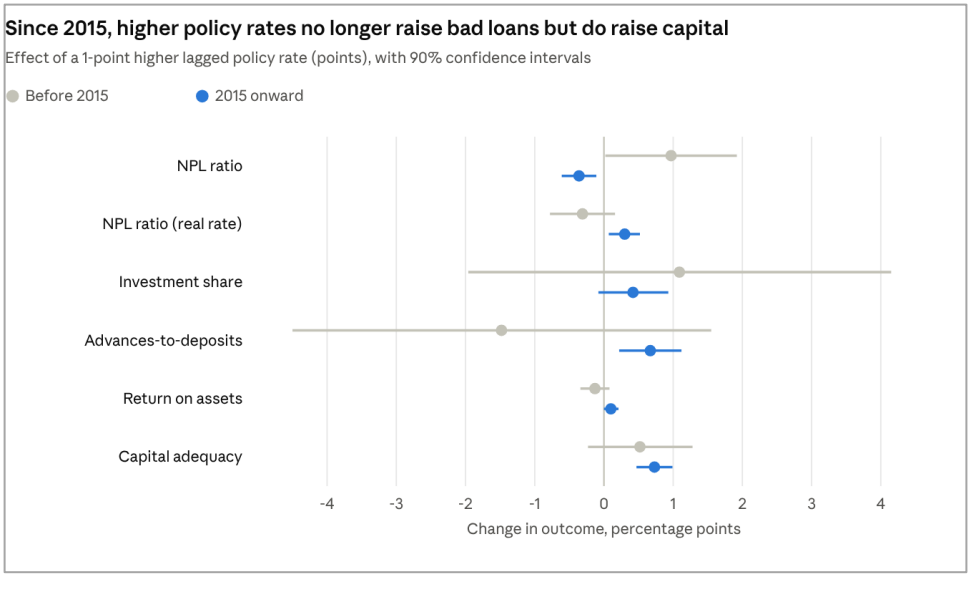
	Return on assets	Capital adequacy ratio
Full sample: policy rate, t–1	0.08* (0.04)	0.76*** (0.18)
Full sample with linear time trend: policy rate, t–1	0.04 (0.04)	0.44*** (0.13)
Regime model: rate effect before 2015	–0.13 (0.12)	0.52 (0.43)
Regime model: rate effect from 2015	0.10 (0.06)	0.73*** (0.15)
Observations	51	51

Notes: group fixed effects and GDP growth included, along with a post-2015 dummy in the regime model. The return on assets is not after tax. Standard errors in parentheses are for Driscoll–Kraay. Significance as in Table 5.

The capital result also withstands the gradual "phasing-in" of Basel III requirements, beginning in 2013. The evidence for higher rates increasing profits is slight, given the profitability result. Both measures are not significantly affected by the real policy rate: the coefficient for the return on assets is –0.02 (SE 0.06) and for the capital adequacy –0.54 (SE 0.27). Carry income is only possible when nominal yields are positive, not real yields.

When combined with 6.2, this provides a consistent picture since 2015. A higher nominal rate does not generate higher bad loans; it does increase measured capital by earning income on government paper. Risk-weighted solvency ratios are thus better the more banks concentrate on sovereign debt. The regime estimates for all six outcomes are summarised in figure 4.

Figure 4



Author's estimates from SBP Quarterly Compendium data, commercial bank groups 2006–2025 (Tables 6 and 10) and Figure 4. Regime estimates for six outcomes. Grey: effect before 2015; blue: effect from 2015. Intervals crossing zero are not significant at the 10% level.

Interpretation Across Monetary Cycles

The estimates are consistent with the monetary cycles of Pakistan, as during the tightening phase, the banks got bad loans from the private sector, and during the period of raised government-debt holdings and capital, the banks were mainly the lenders to the government (Table 11).

Table 11

Monetary Cycles and Bank Responses

Cycle	Policy rate	NPL ratio, all banks	Main bank response
2008–2011 tightening	10% → 15% (2008); 12–14% to 2011	7.6% (2007) → 15.7% (2011)	Defaults doubled, concentrated in leveraged sectors such as textiles
2018–2019 tightening	5.75% → 13.25%	8.0% (2018) → 9.2% (2020)	Modest rise, partly due to the pandemic
2020–2021 easing	13.25% → 7%	9.2% → 7.9%	Refinance schemes and loan deferrals; little sign of riskier lending
2021–2023 record tightening	7% → 22%	7.9% → 7.6%	Negative real rates; after-tax profits nearly doubled; government exposure above 60% of assets
2024–2025 easing	22% → 10.5%	7.6% → 6.1%	Investment share rose to about 62% of assets while advances fell 6% in 2025
2026 tightening	10.5% → 12%	Not yet observed	Revaluation losses on fixed-rate bonds; fiscal risk

Sources: SBP compendiums (State Bank of Pakistan, n.d.); Pakistan & Gulf Economist (Pakistan & Gulf Economist, n.d.); SBP FSR 2023 (State Bank of Pakistan, 2024); VIS Credit Rating (VIS Credit Rating Company, 2025); SBP FSR 2025 (State Bank of Pakistan, 2026a).

Prior to 2015, the repayment channel was in full force. The tightening of 2008 was followed by a doubling of the NPL ratio, where the highest proportion of NPLs belonged to the textile sector, which had the highest dependence on loans and was also priced off KIBOR (State Bank of Pakistan, n.d.).

Following 2015, there were two changes. There was nominal tightening in 2022-2023 with inflation levels in excess of 30%, which pushed real rates into negative territory and the real debt burden of borrowers down, only for NPLs to change marginally even with an inflation rate of 22%. Banks were increasingly putting their money into the safest papers, namely those of the government, which had a rating of zero.

After-tax profits increased from Rs 336 billion in 2022 to Rs 642 billion in 2023 (VIS Credit Rating Company, 2025) due to high nominal yields and a rise in capital ratios (Section 6.4). Despite the drop in rates, the investment share continued to increase in 2024–2025, as real rates became very positive and state financing requirements remained. The answer to the question of whether the 2026 tightening increases the NPLs in 2027 is based on the real rate and not the nominal rate.

Table 12

Summary of Channels

Channel	Prediction	Evidence in Pakistan, 2006–2025	Strength
Repayment (borrower)	Tightening raises NPLs with a lag	+0.98 points of NPL ratio per 1 point of policy rate before 2015; no positive nominal effect after (Table 6)	Strong before 2015; after 2015 only through the real rate
Search for yield	Easing raises risky lending	Not testable with group data; lending stays with large rated firms	Weak or untested
Portfolio composition	High rates shift assets to sovereign debt	Investment share up 17–26 points in every group after 2015; year-to-year rate effect positive but imprecise (Tables 6–7)	Strong in levels, weak year to year
Valuation / capital	Rates change margins and capital	CAR up from 16.7% to 20.8% (2021–2025) on sovereign carry income	Strong, but flattered by zero risk weights

Implications for Financial Stability and Policy

The primary concern regarding monetary policy risk to financial stability in Pakistan does not relate to a credit boom but a credit regime where the balance sheet is safe from private default, and vulnerable to the State. This risk should be specifically addressed in policy.

For the Central Bank's Role in the Money Sector

1. **Maintain moderate positive real rates:** It is the rates of return that drive the policy, meaning deeply negative real rates (2023) reduce the savings flow and the currency, while very high positive real rates (2025) anchor the sovereign carry trade. A forward-looking real rate in the range of 2-4 points, as suggested by the SBP in October 2026, is the right level for disinflationary and crowding-out considerations.
2. **Track the flow of funds on bank balance sheets as part of transmission:** The amount of sovereign exposure, ADR and IDR should be included in MPC statements, in addition to exposure in private credit, as indicators of whether rate changes impact the real economy.
3. **Minimize stop-start driving:** Shocks to repayments are larger if they are 7–15 percentage points from the norm within 2 years. A bigger reserve buffer (SBP reserves stood at $21.6 billion as of end-October 2026 (State Bank of Pakistan, 2026e)) and clear forward guidance can help decrease the need for sudden interventions.

For Macroprudential and Supervisory Policy

1. **Price sovereign concentration:** Implement a concentration surcharge or Pillar 2 add-on on banks that have a government exposure above a threshold of assets, similar to the 2017 Basel Committee discussion of sovereign exposures (Basel Committee on Banking Supervision, 2017).
2. **When the sell-off is phased, it is not disorderly:** The leverage ratio also should be reported with CAR. The unweighted leverage ratio (capital to total assets of around 6.5%) should be given the same weight in public communication, as zero risk weights are advantageous for CAR.
3. **Stress test interest rate risk in the banking book:** Easing stress exposure is a loss stress exposure during the tightening period, as in 2026; joint rate and sovereign shocks should be covered in the stress tests that should be performed by supervisors.

4. **Substitute hard-to-sustain tax breaks for long-lasting credit facilities:** The tax levied on ADR resulted in an initial spike in lending followed by a decline. Credit bureaus and secured-transactions registries and platforms like SBP's SMEConnect portal tackle the root cause of the banks' aversion to small borrowers.

For Fiscal Policy

Ironically, the nexus is a monetary one. So long as the government keeps borrowing the majority of its deficits from domestic banks, the role of money will remain with the sovereign portfolio and not private credit. This linkage would be relaxed through sustained fiscal consolidation and the further development of the non-bank government debt market, including retail access to government debt via the InvestPak platform of the SBP. Appendix B provides a comparison of banking system in Pakistan with other countries' banking systems, such as Egypt, Sri Lanka, Bangladesh and India.

Conclusion

This paper takes a different approach by using a new sample of bank groups in Pakistan from 2006 to 2025 and documents the shifting nature of the relationship between monetary policy and bank credit risk starting from 2015. Tighter policy drove NPL ratios up about one-for-one with a one-year lag prior to that. The nominal policy rate has been of no value to NPLs since then – it's the real rate that's important. Instead, the primary reaction of banks to high rates has been to buy more government debt - now more than half of all commercial bank groups' assets are government debt. The search-for-yield channel that worked in advanced economies is not very supportive, as lending is focused on large, rated firms and high-yield, risk-free government debt is always available. The headline soundness indicators are also impressive, with CAR in 2025 at 20.8% and NPLs at 6.1%. However, keep in mind that those numbers are in part due to the regulatory treatment of sovereign debt. Sovereign concentration, interest-rate risk in the banking book and their fiscal origins, therefore, should be the financial-stability agenda for Pakistan and for similar emerging markets.

Limitations

Each of the three commercial bank groups has three observations a year; there are 17 observations per year for each of the groups, there are some gaps between years (2017, 2018 and 2022), so inferences are based on time-series variation, and the effect of the pre-2015 period is significant only at the 10% level. The differences within the groups are not visible in the group averages. The regime split was specified after the full-sample model failed to find an effect, and thus is exploratory; the reassurance that a least-squares search puts the break in 2016 (near the institutional date) applies to breaks between 2013 and 2016. Estimates represent conditional associations, rather than causal associations, as policy rates are affected by inflation and external shocks, which may also have an impact on banks.

Future Research

The data from banks on a yearly basis would enable system GMM estimation in many banks and a direct test of the search-for-yield channel. The compendiums for 2017, 2018 and 2022-2023 would fill in gaps in this panel. The quarterly series from SBP, which goes back to the NPL peak around 16.7% in 2011 (CEIC Data, n.d.) would provide local projections of NPLs and sovereign holdings after a rate change (Jordà, 2005). A comparison between conventional and Islamic banks would reveal whether there is a difference between the two channels on a business model level.

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Appendix A. Data

Construction

Bank-group indicators are end-December values from the SBP's *Quarterly Compendium: Statistics of the Banking System*, December 2011 (2006–2008), December 2016 (2009–2016), December 2021 (2019–2021) and December 2025 (2023–2025) editions (State Bank of Pakistan, n.d.). Placing multiple editions in the same year results in the later, audited value being used. The ratio of nonperforming loans (NPL), the asset/debt ratio (ADR), the asset/capital ratio (CAR) and the return on assets before tax (ROA) are directly obtained from the financial soundness indicator tables in the compendiums. The investment share is the ratio between the net investments and the total assets presented in the group-wise key-variables tables. The SBP rate applicable at end-December is referred to as the policy rate, which is the discount (reverse repo) rate in effect prior to May 2015 from the SBP Statistical Bulletin and the SBP policy rate thereafter. Data for CPI inflation is the calendar-year average for 2005-2021 as published by the World Bank (World Bank, n.d.) and for SBP Financial Stability Review 2025 for 2022-2025; data for Real GDP growth is from the World Bank (World Bank, n.d.).

Table A1

NPL Ratio and Investment Share by Bank Group (%)

Year	NPL PSCB	NPL LPB	NPL FB	Inv. share PSCB	Inv. share LPB	Inv. share FB
2006	9.0	5.2	1.0	21.5	18.9	17.2
2007	8.4	6.5	1.6	28.6	24.4	15.3
2008	16.3	8.7	2.9	19.6	20.1	9.6
2009	16.9	11.1	6.7	24.2	28.0	21.7
2010	22.9	12.5	9.5	28.1	31.3	34.2
2011	21.1	13.8	10.4	30.7	39.4	44.4
2012	17.3	13.2	13.4	32.0	44.3	34.7
2013	18.7	11.4	10.1	32.2	43.6	45.8
2014	17.8	10.4	7.6	36.5	46.0	53.3
2015	18.3	9.3	7.8	46.1	49.5	66.4
2016	15.9	8.1	8.3	44.3	48.0	70.8
2019	13.2	6.9	2.9	44.9	39.9	40.1
2020	14.7	7.0	3.3	49.1	47.5	47.0
2021	14.6	5.9	2.0	50.0	47.5	68.9
2023	12.0	6.4	0.1	n.a.	n.a.	n.a.
2024	13.0	5.0	0.1	64.4	53.7	46.2
2025	12.5	4.7	0.1	63.2	61.6	59.3

Table A2

ADR, CAR and Return on Assets by Bank Group (%)

Year	ADR PSCB	ADR LPB	ADR FB	CAR PSCB	CAR LPB	CAR FB	ROA PSCB	ROA LPB	ROA FB
2006	64.6	74.5	80.1	15.2	12.7	15.0	4.0	3.1	3.2
2007	60.0	70.1	75.2	16.1	11.8	14.6	3.5	2.0	1.5
2008	68.4	75.1	68.9	13.4	11.9	21.8	0.6	1.3	0.0
2009	65.2	66.6	56.1	15.1	13.9	23.0	1.5	1.3	–0.3
2010	58.0	61.3	42.0	14.7	13.6	23.8	1.8	1.5	0.9
2011	55.2	52.0	39.6	16.5	14.4	31.3	2.0	2.3	2.3
2012	60.7	48.9	37.4	16.7	14.9	30.7	1.5	2.1	0.4

Year	ADR PSCB	ADR LPB	ADR FB	CAR PSCB	CAR LPB	CAR FB	ROA PSCB	ROA LPB	ROA FB
2013	54.5	47.1	36.8	15.4	14.4	30.2	0.7	1.8	1.2
2014	51.1	46.0	53.7	16.8	15.2	25.0	1.5	2.3	2.4
2015	44.1	45.6	35.4	17.1	15.7	24.4	2.0	2.5	4.2
2016	43.1	46.7	22.2	16.5	15.4	22.5	2.0	2.1	2.6
2019	48.9	51.9	37.2	15.6	16.4	29.0	0.9	1.6	3.7
2020	43.0	45.0	26.4	18.9	17.8	30.9	1.3	1.9	3.8
2021	39.7	48.4	25.0	18.2	15.6	29.7	1.3	1.7	1.9
2023	41.1	40.8	68.9	23.0	17.8	42.3	1.5	3.5	6.3
2024	40.1	51.7	49.8	24.6	18.7	43.0	1.1	3.0	4.7
2025	34.6	37.5	46.4	23.3	19.2	45.7	2.2	2.7	5.6

Table A3

Macroeconomic Variables

Year	Policy rate, end-December (%)	CPI inflation (%)	Real GDP growth (%)
2005	9.00	9.1	
2006	9.50	7.9	6.0
2007	10.00	7.6	4.4
2008	15.00	20.3	2.1
2009	12.50	13.7	3.5
2010	14.00	12.9	1.5
2011	12.00	11.9	2.7
2012	9.50	9.7	3.0
2013	10.00	7.7	4.4
2014	9.50	7.2	4.1
2015	6.50	2.5	4.2
2016	5.75	3.8	6.6
2017	6.00	4.1	4.4
2018	10.00	5.1	6.2
2019	13.25	10.6	2.5
2020	7.00	9.7	–1.3
2021	9.75	9.5	6.5
2022	16.00	19.9	4.8
2023	22.00	30.8	–0.4
2024	13.00	12.6	3.0
2025	10.50	3.5	3.7

Notes: 2005 values are used only as lags for the 2006 observations.

Appendix B

Lessons for other Emerging Markets

In the case of Pakistan, the traditional risk-taking channel can be overpowered in emerging markets with high domestic debt loads and zero-risk-weight treatment for sovereign debt, so long as sovereign-carry incentives are high. Conditions are similar in Sri Lanka, Bangladesh and certain parts of Sub-Saharan Africa and Egypt. In these systems, the NPL and CAR are not necessarily enough to tell whether a system is stable or not; the concentration risk and the risk of interest rate should be dealt with equally.

Pakistan is one of the few countries in the region where the banking sector is heavily tilted towards sovereigns and with low NPLs. The same is true for Egypt, where the sovereign-carry profile is present, and for Bangladesh and Sri Lanka, where the failure mode is the private losses on credit (Table B1).

Table B1

Bank Soundness and Sovereign Exposure in five Emerging Markets

Country	Gross NPL ratio (latest)	Bank sovereign exposure	Private credit	Dominant risk
Pakistan	6.1% (Dec 2025)	About 62% of assets in government securities (2025)	Advances fell 6% in 2025; credit about 12% of GDP (2023)	Sovereign concentration
Egypt	1.9% (Mar 2026)	About 32% of assets in securities and T-bills (Mar 2026)	Private share of bank lending fell to 40.5%	Sovereign concentration
Sri Lanka	9.4% Stage 3 (Mar 2026)	Loans rose to 55.9% of assets (2025)	Loans grew 21.4% in 2025 after easing	Credit, after a sovereign default
Bangladesh	32.8% (Jun 2026)	Lower; losses sit in loans	Credit about 40% of GDP	Credit quality and governance
India	1.8% (Mar 2026)	Lower; statutory liquidity holdings	Credit about 50% of GDP; growth 14.5% in FY26	Low; well-capitalised (CAR 17.7%)

Data sources: Pakistan as in Section 4, Egypt (Daily News Egypt, 2026; bne IntelliNews, 2026a), Sri Lanka (Central Bank of Sri Lanka, 2026b; Central Bank of Sri Lanka, 2026a), Bangladesh (Dhaka Tribune, 2026), India (Business Standard, 2026), and private credit as a share of GDP from World Bank data (United Nations Development Programme Pakistan, n.d.).

It is indicative of levels as there are some variations in definitions of loans between countries (Sri Lanka uses IFRS 9 Stage 3 loans). Two lessons follow. First, Pakistan's exposure is extraordinary, even in comparison to other emerging and developing economies: The World Bank estimates that the average bank's exposure to government debt is around 16% of its assets, while the IMF considers Pakistan's exposure to be the highest in the world (International Monetary Fund, 2024) (United Nations Development Programme Pakistan, n.d.). Second, low NPLs do not equate to health. The low level of bad loans in Egypt and Pakistan is partly due to the fact that they lend very little to the private sector, while the ratio of bad loans in Bangladesh is 32.8%. Emerging markets' financial stability policy should be vigilant on both margins.