Financial Stability Report

June 2024

Reserve Bank of India

Financial Stability Report

Issue No. 29

Reserve Bank of India

June 2024

The publication can also be accessed through Internet at **https://www.rbi.org.in**

Feedback of this report may be mailed to **cgmfsd@rbi.org.in**

Published by Financial Stability Department, Reserve Bank of India, Mumbai 400 001 and designed and printed at Jayant Printery LLP, 352/54, Girgaum Road, Murlidhar Temple Compound, Near Thakurdwar Post Office, Mumbai - 400 002.

Foreword

The world has traversed through multiple high impact shocks over the past four years. The overall international outlook is still shrouded by uncertainty. The balance of risks for global financial stability, however, has improved since the last issue of the Financial Stability Report (FSR) in December 2023. The risks of a hard landing for the global economy have abated, even though progress in disinflation has been slow and world trade continues to face fragmentation and realignment of supply chains. Financial markets have been adjusting to these shifts, including pivots in monetary policy stances of certain central banks.

In this environment, the global financial system faces major risks which include alarming levels of public debt; stretched asset valuations; increasing economic and financial fragmentation; frequent geopolitical conflicts; and risks associated with financial technologies and climate change.

Amidst these headwinds, the Indian economy is exhibiting strength and resilience, with strong macroeconomic fundamentals and buffers. Economic activity is expanding at a steady pace, with the financial system being stronger and more vibrant than what it was before the onset of the recent period of crises. Our approach of balancing growth and stability, with willingness to take proactive and prudent actions to prevent accumulation of risks, is promoting long-term resilience and stability of the financial system. It is vital that we consolidate these gains and nurture a financial system that is future ready and supports the needs of India's growing economy. Furthermore, as India's contribution to global growth rises, our financial system must also modernise and deepen as it prepares to go more global.

This issue of the FSR highlights the strengthening of balance sheets of financial institutions with low levels of impairments, robust earnings and strong buffers that render the financial system resilient to shocks. The results of stress tests demonstrate that capital levels of banks and non-banking financial companies (NBFCs) will remain above the regulatory minimum even under severe stress scenarios.

Even in this stable environment, we are watchful of the emerging risks, including those from cyber hazards, climate change and global spillovers. The highest priority must be assigned to governance – strong governance is at the core of resilience of stakeholders in the financial system.

The regulators, including the Reserve Bank, remain committed to promote innovation, financial inclusion, efficient payment and settlement systems, and a robust financial system. New technologies offer gains in efficiency and customer experience, but they can also bring with them sudden and widespread disruptions to the financial system. This requires that all stakeholders not only invest adequately to take full advantage of technological advancements, but also take steps to safeguard the security and soundness of their systems.

Efforts must be made to develop an ecosystem that puts the interests of the customer at the forefront. Ultimately, preserving the trust of the customer is the cornerstone of safeguarding systemic stability.

Today, the matrix of financial stability is perhaps at its best, but the real challenge is to maintain it and improve upon it further. The regulators, on their part, remain committed to these goals. We are focused on having in place an ecosystem that is adaptive and proactive in safeguarding the stability of the financial system.

Shaktikanta Das
Governor

June 27, 2024

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Chapter I

List of Select Abbreviations

AA	Adjudicating Authority
ADL	Autoregressive Distributed Lag
AEs	Advanced Economies
AFA	Authorisation for Assignment
AFS	Available for Sale
AI	Artificial Intelligence
AID	All Inclusive Direction
AIFIs	All-India Financial Institutions
AIFs	Alternative Investment Funds
AMC	Asset Management Companies
AMFI	Association of Mutual Funds in India
AML	Anti Money Laundering
APIs	Application Programming Interfaces
APY	Atal Pension Yojana
ASP	Annuity Service Provider
AUM	Assets Under Management
BBPS	Bharat Bill Payment System
BCBS	Basel Committee on Banking Supervision
BE	Budget Estimates
BIFR	Board for Industrial and Financial Reconstruction
BIS	Bank for International Settlements
BSI	Banking Stability Indicator
C-D	Credit-Deposit
CAD	Current Account Deficit
CAGR	Compounded Annual Growth Rate
CAS	Consolidated Account Statement
CASA	Current Account and Savings Account
CASP	Crypto Asset Service Providers
CBOE	Chicago Board Options Exchange
CCB	Capital Conservation Buffer
CCIL	Clearing Corporation of India Limited
CCPs	Central Counterparties
CCs	Clearing Corporations
CD	Certificate of Deposit
CDSL	Central Depository Services Limited
CET1	Common Equity Tier 1
CFT	Combating the Financing of Terrorism
CFTC	Commodity Futures Trading Commission
CIC	Core Investment Companies
CIRP	Corporate Insolvency Resolution Process
CMs	Clearing Members
CoC	Committee of Creditors
COTE	Capital Outlay in Total Expenditure
CP	Commercial Paper
CPI	Consumer Price Index
CRAR	Capital to Risk-Weighted Assets Ratio
CRAs	Credit Rating Agencies
CRE	Commercial Real Estate
CRR	Cash Reserve Ratio
CSA	Climate Scenario Analysis
DeFi	Decentralised Finance
DGA	Duration Gap Analysis
DGCI&S	Directorate General of Commercial Intelligence & Statistics
DICGC	Deposit Insurance and Credit Guarantee Corporation
DIF	Deposit Insurance Fund
DIIs	Domestic Institutional Investors
DMA	Direct Market Access

DLT	Distributed Ledger Technology
DSR	Debt Service Ratio
EAR	Earnings At Risk
EBPT	Earnings Before Profit and Tax
ECB	External Commercial Borrowings
EMDEs	Emerging Market and Developing Economies
EMEs	Emerging Market Economies
ESG	Environmental, Social, and Governance
ESRB	European Systemic Risk Board
ETP	Exchange Traded Products
EXIM Bank	Export Import Bank of India
F&O	Futures and Options
FAR	Fully Accessible Route
FATF	Financial Action Task Force
FBIL	Financial Benchmark India Pvt Ltd
FBs	Foreign Banks
FCI	Financial Conditions Index
FDI	Foreign Direct Investment
FDIC	Federal Deposit Insurance Corporation
FIs	Financial Institutions
FinTech	Financial Technology
FIPs	Financial Information Providers
FIT21	Financial Innovation and Technology for the 21st Century Act
FME	Fund Management Entity
FPI	Foreign Portfolio Investment
FRBs	Foreign Reinsurance Branches
FSB	Financial Stability Board
FSDC-SC	Sub Committee of the Financial Stability and Development Council
FSR	Financial Stability Report
FSSI	Financial System Stress Indicator
FX	Foreign Exchange
FY	Financial Year
GARCH	Generalised AutoRegressive Conditional Heteroskedasticity
GDP	Gross Domestic Product
GFC	Global Financial Crisis
GFD	Gross Fiscal Deficit
GNDI	Gross National Disposable Income
GNPA	Gross Non-Performing Asset
GPR	Geopolitical Risk
GSCs	Global Stablecoin Arrangements
GSDP	Gross State Domestic Product
GSL	Government Securities Lending
G-SIB	Global Systemically Important Bank
HFCs	Housing Finance Companies
HFT	Held for Trading
HPI	House Price Index
HQLAs	High Quality Liquid Assets
HTM	Held-to-Maturity
IBBI	Insolvency and Bankruptcy Board of India
IBC	Insolvency and Bankruptcy Code
IBU	IFSC Banking Units
ICCL	Indian Clearing Corporation Limited
ICR	Interest Coverage Ratio
IFRS	International Financial Reporting Standards
IFSC	International Financial Services Centre
IFSCA	International Financial Services Centres Authority
IGNOAPS	Indira Gandhi National Old Age Pension Scheme
IIBX	India International Bullion Exchange
IIIOs	IFSC Insurance Intermediary Offices
IIOs	IFSCA Insurance Offices

IMF	International Monetary Fund
InvITs	Infrastructure Investment Trusts
IOSCO	International Organization of Securities Commissions
IoT	Internet of Things
IRB	Internal Rating Based
IRDAI	Insurance Regulatory and Development Authority of India
ISSB	International Sustainability Standards Board
IT	Information Technology
KFS	Key Facts Statement
KYC	Know Your Customer
LABs	Local Area Banks
LBs	Large Borrowers
LCR	Liquidity Coverage Ratio
LEF	Large Exposure Framework
LMTs	Liquidity Management Tools
LT	Long-term
MD	Modified Duration
MDG	Modified Duration Gap
MF	Mutual Fund
MII	Market Infrastructure Institutions
ML	Machine Learning
MMF	Money Market Funds
MOVE	Merrill Lynch Option Volatility Estimate
MRC	Minimum Required Corpus
MSME	Micro, Small and Medium Enterprises
MTM	Mark-To-Market
MVE	Market Value of Equity
NABARD	National Bank for Agriculture and Rural Development
NaBFID	National Bank for Financing Infrastructure and Development
NAVs	Net Asset Values
NBFC	Non-Banking Financial Company
NBFC-ICCs	NBFC - Investment and Credit Companies
NBFC-IFCs	NBFC - Infrastructure Finance Companies
NBFIs	Non-Banking Financial Intermediaries
NCCD	Non-Centrally Cleared Derivatives
NCD	Non-Convertible Debentures
NCL	National Clearing Limited
NCLT	National Company Law Tribunal
NDB	National Development Banks
NDCF	Net Distributable Cash Flow
NDFs	Non-Deliverable Forwards
NDTL	Net Demand & Time Liabilities
NFCs	Non-financial Corporates
NGFS	Network for Greening the Financial System
NHB	National Housing Bank
NII	Net Interest Income
NIM	Net Interest Margin
NNPA	Net Non Performing Assets
NOI	Net Operating Income
NPA	Non-Performing Asset
NPS	National Pension System
NSDL	National Securities Depository Limited
NSE	National Stock Exchange
NSFR	Net Stable Funding Ratio
NSO	National Statistical Office
NSUCBs	Non-Scheduled Urban Cooperative Banks
NTC	New to Credit
OE	Operating Expense
OEF	Open-Ended Fund

OIS	Overnight Indexed Swap
OOI	Other Operating Income
ORBIO	Offices of the Reserve Bank of India Ombudsman
OSS	Off-Site Surveillance
OTC	Over-the-Counter
P/E	Price-to-Earnings
PA	Provisional Accounts
PAT	Profit After Tax
PCR	Provisioning Coverage Ratio
PD	Probability of Default
PFE	Potential Future Exposure
PFCE	Private Final Consumption Expenditure
PFRDA	Pension Fund Regulatory and Development Authority
PoP	Points of Presence
PPP	Purchasing Power Parity
PSBs	Public Sector Banks
PSUs	Public Sector Undertakings
PVBs	Private Sector Banks
RECO	Revenue Expenditure to Capital Outlay
REER	Real Effective Exchange Rate
REITs	Real Estate Investment Trusts
REs	Regulated Entities
RMS	Risk management systems
RoA	Return on Asset
RoE	Return on Equity
RPs	Resolution Professionals
RRBs	Regional Rural Banks
RSA	Rate-Sensitive Assets
RSL	Rate-Sensitive Liabilities
RTP	Remote Trading Participant
RWA	Risk-Weighted Assets
SaaS	Software as a Service
SCBs	Scheduled Commercial Banks
SCC	Stakeholder Consultation Committee
SD	Standard Deviation
SDLs	State Development Loans
SEBI	Securities and Exchange Board of India
SEC	Securities and Exchange Commission
SFBs	Small Finance Banks
SGF	Settlement Guarantee Fund
SGX	Singapore Exchange
SIPs	Systematic Investment Plans
SLR	Statutory Liquidity Ratio
SMAs	Special Mention Accounts
SRI	Sustainable and Responsible Investment
SROs	Self-Regulatory Organisations
SRS	Systemic Risk Survey
SUCBs	Scheduled Urban Cooperative Banks
T-Bills	Treasury Bills
TGA	Traditional Gap Analysis
UAEGD	UAE Good Delivery
UCB	Urban Cooperative Bank
VAR	Vector Auto Regression
WACR	Weighted-Average Call Rate
WALR	Weighted-Average Lending Rate

Overview

The Financial Stability Report (FSR) is a half-yearly publication, with contributions from all financial sector regulators. It presents the collective assessment of the Sub Committee of the Financial Stability and Development Council on current and emerging risks to the stability of the Indian financial system.

Global Macrofinancial Risks

The global economy and the financial system are exhibiting resilience amidst heightened risks and uncertainties. While near-term prospects are improving, pitstops in the last mile of disinflation, high public debt, stretched asset valuations, economic fragmentation, geopolitical tensions, climate disasters and cyber threats present downside risks. Emerging market economies (EMEs) remain vulnerable to external shocks and spillovers.

Domestic Macrofinancial Risks

Strong macroeconomic fundamentals and a sound and stable financial system have supported the sustained expansion of the Indian economy. Moderating inflation, a strong external position and ongoing fiscal consolidation are anchoring business and consumer confidence. Domestic financial conditions are buttressed by healthy balance sheets across financial institutions, marked by strong capital buffers, improving asset quality, adequate provisioning and robust earnings.

Financial Institutions: Soundness and Resilience

Scheduled commercial banks (SCBs) have been boosted by rising profitability and declining non-performing assets. Return on assets (RoA) and return on equity (RoE) are close to decadal highs at 1.3 per cent and 13.8 per cent, respectively, while gross non-performing assets (GNPA) ratio and net non-performing assets (NNPA) ratios fell to multi-year lows of 2.8 per cent and 0.6 per cent, respectively. This has helped SCBs to maintain strong capital buffers: their capital to risk-weighted assets ratio (CRAR) and the common equity tier 1 (CET1) ratio at 16.8 per cent and 13.9 per cent, respectively, stood well above the regulatory minimum in March 2024. Macro stress test for credit risk, which should not be interpreted as forecasts and are based on scenarios and stringent conservative assessments under hypothetical shocks, demonstrate that SCBs have adequate capital buffers relative to the regulatory minimum even under adverse stress scenarios.

At the system level, the CRAR of urban co-operative banks (UCBs) inched up to 17.5 per cent in March 2024 while that of non-banking financial companies (NBFCs) declined marginally to 26.6 per cent, both remaining well in excess of the prescribed regulatory minimum. The consolidated solvency ratio of the insurance sector remains above the minimum threshold limit of 150 per cent. Stress tests on mutual funds and clearing corporations attest to the resilience of these segments of the financial sector. Network analysis indicates that the total outstanding bilateral exposures between financial institutions are expanding, with SCBs holding the largest share.

Regulatory Initiatives and Other Developments in the Financial Sector

Globally, regulatory efforts remain focused on promoting financial stability, consistent implementation of global standards and their refinement. Recent initiatives have been aimed at safeguarding the banking system from interconnectedness with the non-banking financial institutions, addressing risks associated with

ongoing digitalisation of finance, improving climate-related risk assessments and strengthening resilience to cyber risks.

Domestic regulatory initiatives continue to work towards strengthening the safety and resilience of the financial system. Regulations are based on the principle of proportionality even as regulators harness the benefits of technology for strengthening customer service, improving governance and risk management at financial institutions and limiting procyclical activities while fostering efficiency.

Assessment of Systemic Risk

In the most recent systemic risk survey (SRS), carried out in May 2024, all major risk groups to domestic financial stability were categorised as 'medium'. Respondents expressed optimism about the soundness of the domestic financial system. Survey participants felt that risks from global spillovers have receded, with around one-third showing higher confidence in the Indian financial system. The main near-term risks identified by respondents were geopolitical risks, tightening of global financial conditions, and capital outflows.

Chapter I

Macrofinancial Risks

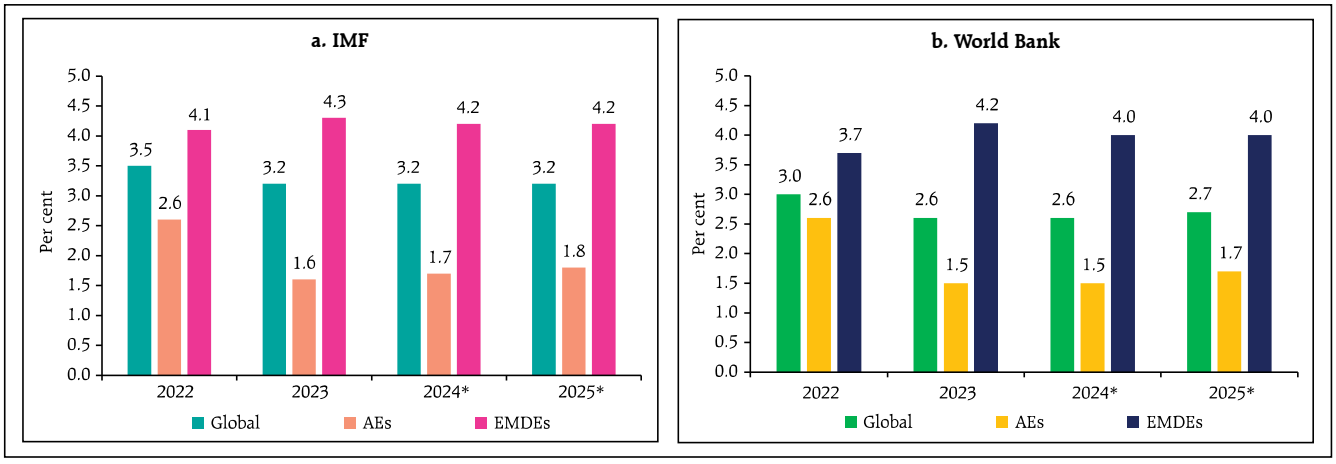
The global financial system remains resilient and financial conditions stable despite an uncertain and challenging backdrop marked by last mile disinflation process, elevated public debt, geopolitical tensions and economic fragmentation. The Indian economy and the financial system, on the other hand, strengthened by solid macroeconomic fundamentals and healthy balance sheets of financial institutions, are exhibiting robust growth and greater resilience.

Introduction

1.1 Since the December 2023 issue of the Financial Stability Report (FSR), the global financial system has shown remarkable resilience, weathering the halting progress in the last mile of disinflation, financial stability risks stirred up by higher for longer stance of monetary policy and bouts of volatility unsettling financial markets on incoming data. As market expectations about the future course of monetary policy re-aligned with policy guidance, financial conditions have stabilised and risks of a hard landing have receded. Nonetheless, financial stability risks remain significant in the context of diverging economic conditions across geographies, stretched asset valuations amidst flux in volatility fear gauges, high levels of global debt and commercial real estate strains. Prolonged geopolitical tensions and potential shocks to logistics and supply chains remain a clear and present threat with spillovers to commodity prices, the ongoing disinflation and eventually to the global economic outlook.

1.2 Against this backdrop, the International Monetary Fund (IMF) has projected[1] global growth to remain steady at 3.2 per cent in 2024 as in 2023, 0.3 percentage points higher than in its October 2023 World Economic Outlook update (Chart 1.1 a). The World Bank, on the other hand, projects global growth to be lower at 2.6 per cent in 2024 (Chart 1.1 b).

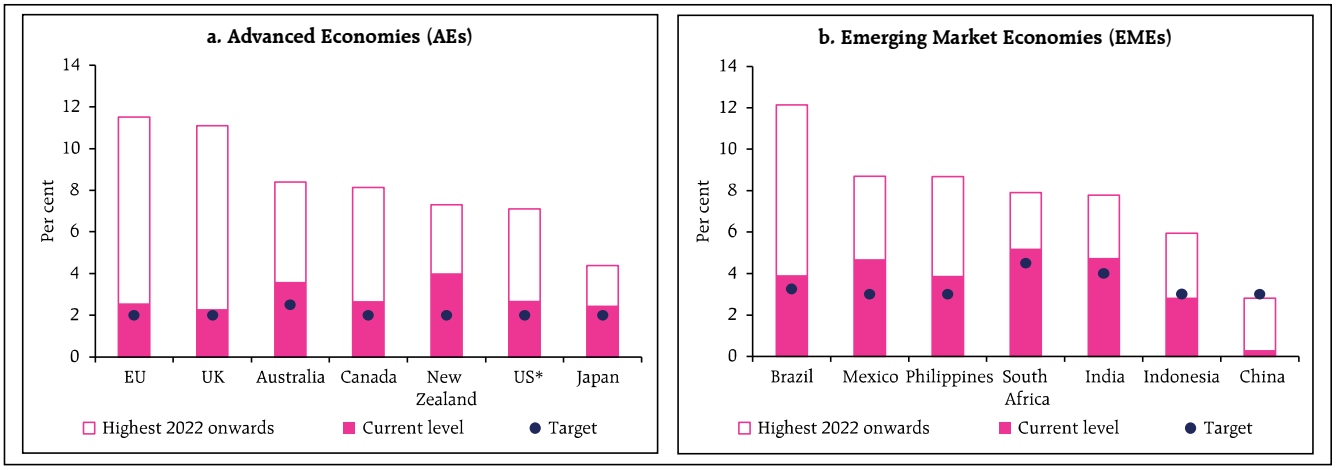
Chart 1.1: Global Growth Forecast



Note: * Forecasts.
Sources: IMF & World Bank.

[1] International Monetary Fund (2024), "World Economic Outlook - Steady but Slow: Resilience amid Divergence", April.

Chart 1.2: Global Headline Inflation



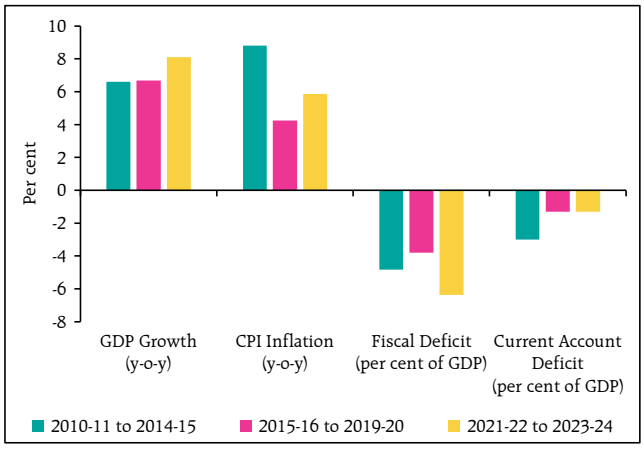
Note: (1) * Personal Consumption Expenditures Price Index for the U.S., and Consumer Price Index for all other countries.
(2) Latest available data as on June 14, 2024.
Source: Bloomberg.

1.3 The goal of bringing inflation down to targets remains the key focus of monetary policy authorities the world over, although headwinds are being encountered from sticky services inflation, elections across half the world's population, and the recent firming up of commodity prices, besides persisting geopolitical tensions (Chart 1.2 a and b).

1.4 In this uncertain international economic and financial environment, the Indian economy is exhibiting resilience and remains the fastest growing major economy. Moreover, India's contribution to global growth is rising and currently stands at 18.5 per cent in 2023-24[2].

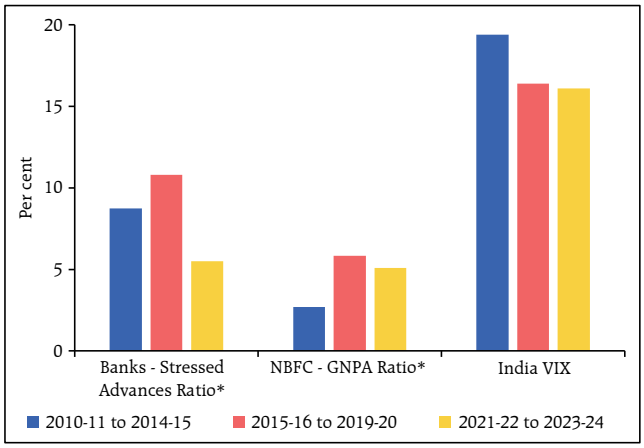
1.5 Real GDP growth is on a rising trajectory, supported by macroeconomic and financial stability. Inflation is moderating, *albeit* at an uneven pace, fiscal consolidation is underway and the external sector position is improving in spite of global spillovers. The domestic financial system is well buffered with strong capital and liquidity ratios, declining levels of asset impairment and rising profitability (Charts 1.3, 1.4, 1.5 a, b and c).

Chart 1.3: Macroeconomic Fundamentals



Note: FY 2020-21 (pandemic) not included.
Source: RBI.

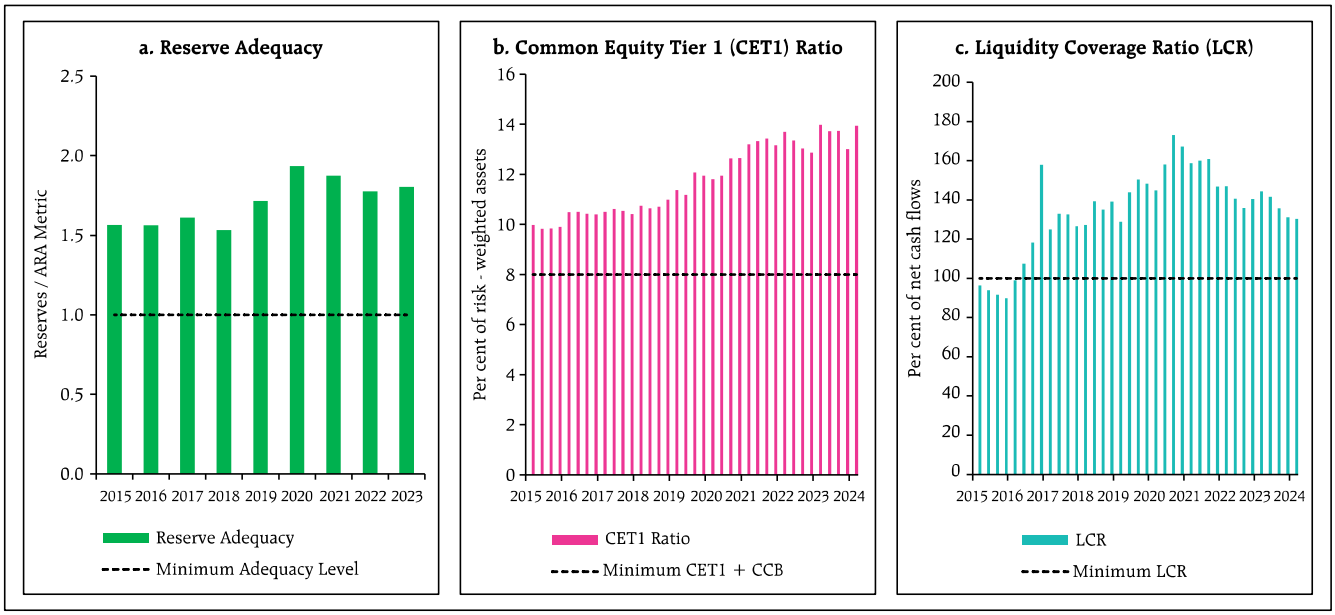
Chart 1.4: Financial System Soundness



Note: (1) * Average ratio computed based on end-March figures of respective financial year.
(2) FY 2020-21 (pandemic) not included.
(3) Stressed advances include gross non-performing assets and restructured standard advances.
Sources: RBI supervisory returns and Bloomberg.

[2] India's contribution to world GDP growth is calculated using the IMF World Economic Outlook database wherein GDP growth rate of countries is weighted by their share in world GDP based on purchasing power parity (PPP).

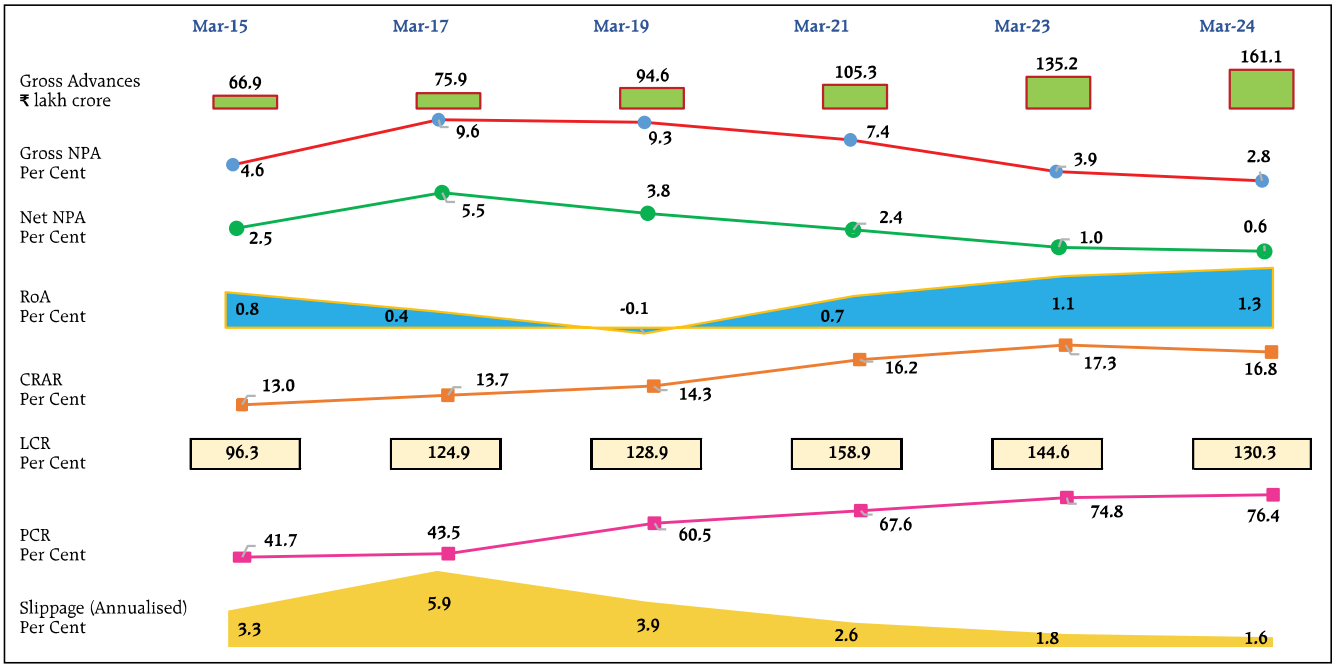
Chart 1.5: Reserve Adequacy and Banking System Buffers



Note: Reserve Adequacy is based on the IMF's Assessing Reserve Adequacy (ARA) metric. CCB- Capital conservation buffer.
Sources: IMF and RBI.

1.6 India's financial system is bank dominated and, therefore, sound health of the banking system is a *sine qua non* for preserving financial stability. Banks' balance sheets are consistently improving, with multi-year low non-performing asset (NPA) ratios, higher provisioning, stronger capital positions and robust earnings (Chart 1.6). In turn, these developments are catalysing a broad-based and sustained credit expansion.

Chart 1.6: Banking Sector Soundness Indicators



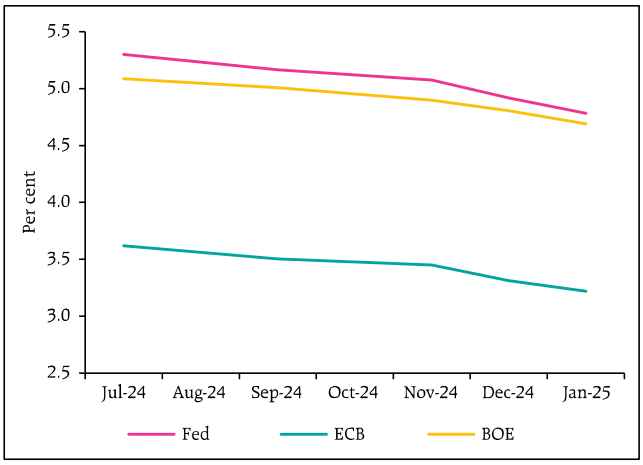
Note: As on June 14, 2024.
Source: RBI supervisory returns and staff calculations.

I.1 Global Backdrop

I.1.1. Macrofinancial Development and Outlook

1.7 A key feature of the evolving global economic outlook has been the recent alignment between market expectations and policy stances. The resilience of growth has allayed fears of hard landing and pushed out expectations of early interest rate cuts in response to central banks' discomfort about inflation remaining elevated relative to targets persistently; more recently, policy paths are increasingly expected to diverge as macroeconomic conditions move disparately in different regions of the world (Chart 1.7).

Chart 1.7: Market Expectations of Policy Rates

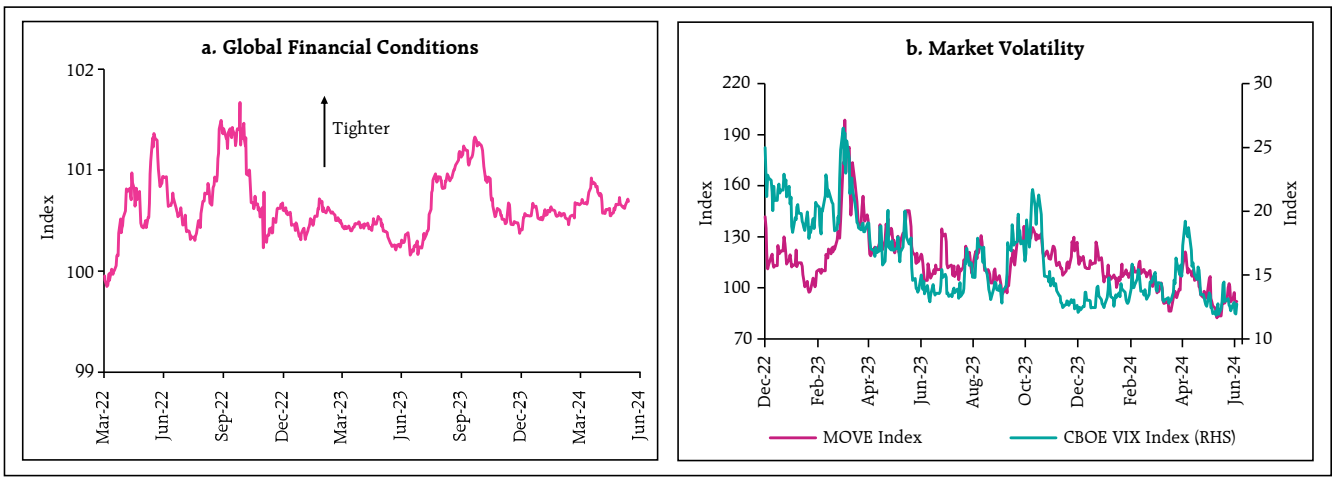


Note: Derived from overnight index swap (OIS) curve. As on June 14, 2024.
Source: Bloomberg.

1.8 Financial conditions remain stable, with equity markets scaling new highs and credit spreads narrowing. Volatility has largely remained subdued but intermittent reversals have signalled unease in investor perceptions around potential flux (Chart 1.8 a and b).

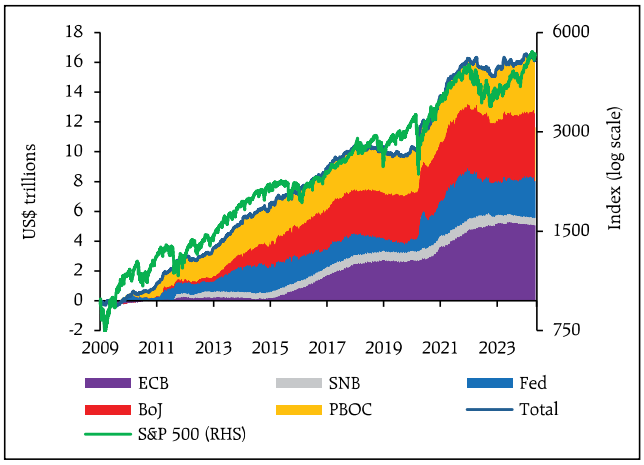
1.9 The pace of balance sheet reduction of AE central banks has been measured so far even as they reassess banks' liquidity requirements in the context of ongoing quantitative tightening and fiscal developments (Chart 1.9).

Chart 1.8: Financial Conditions and Volatility



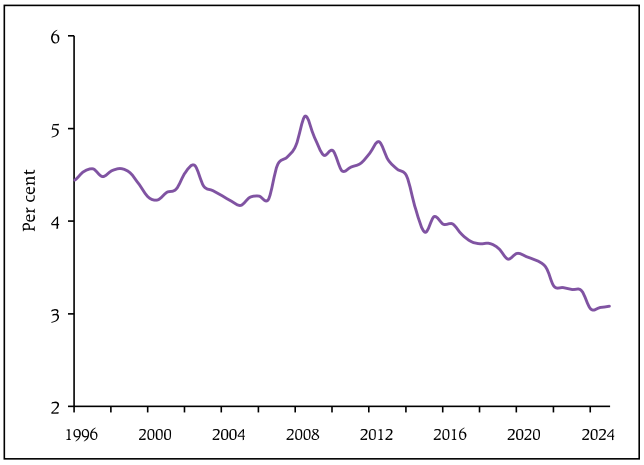
Note: (1) Financial Conditions Index (FCI) is a composite index of individual country FCIs, based on policy rate, riskless long-term bond yield, corporate credit spread, equity price variable and trade-weighted exchange rate.
(2) CBOE - Chicago Board Options Exchange; MOVE - Merrill Lynch Option Volatility Estimate.
Sources: Goldman Sachs, Bloomberg.

Chart 1.9: Central Bank Reserves and Equity Prices



Note: Cumulative change in central bank reserves since 2009.
Sources: National central banks, S&P Global, Satori Insights.

Chart 1.10: Five-year-ahead Global Growth Projections (Real GDP)



Note: Date shows when forecast was made. Latest forecast is for 2029.
Source: IMF.

1.10 According to the IMF, the medium-term outlook[3] is characterised by weak productivity and retreat in globalisation and global growth is expected to decline by more than a percentage point by the end of 2020s compared to the pre-pandemic average (Chart 1.10). Risks from geo-economic fragmentation and elevated debt call for closer global coordination of policy actions in order to secure and preserve macroeconomic and financial stability.

I.1.2. Global Macrofinancial Risks

1.11 While several near-term risks have receded, the global financial system continues to face heightened uncertainty surrounding the outer-term outlook for both financial markets and financial institutions. These shadows are cast by elevated levels of public debt, stretched asset valuations, stress in the commercial real estate (CRE) sector, risks in private credit and cyber risk in addition to the persistence of geopolitical risks.

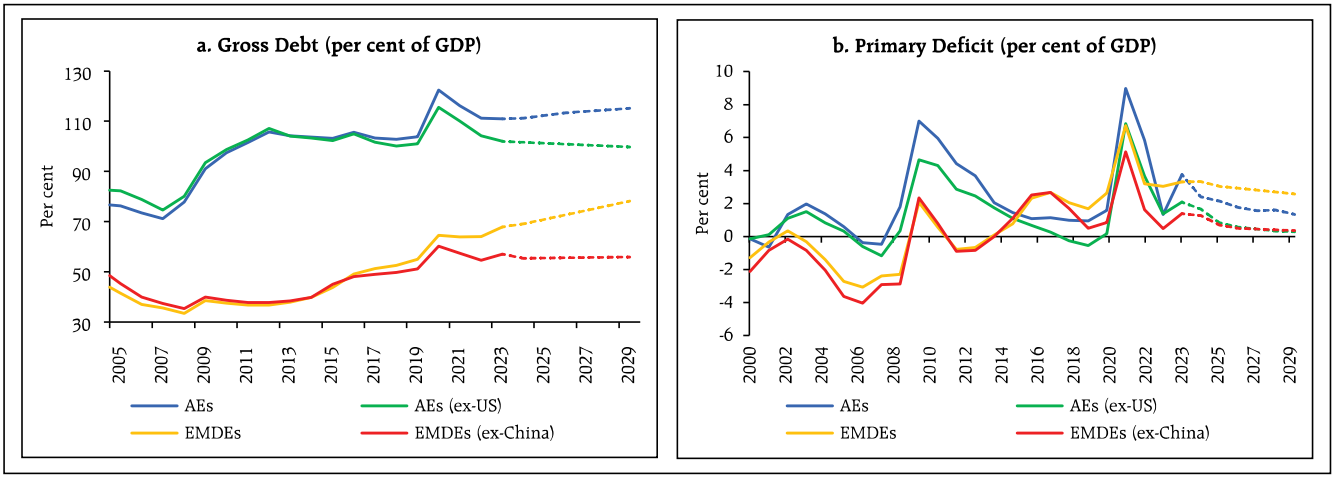
A. Elevated Public Debt

1.12 The frenetic expansion of global public debt in recent years has accentuated concerns about its sustainability. These worries are exacerbated by elevated interest rates and rollover risks for many overburdened economies. Global public debt has increased to 93.2 per cent of GDP by end-2023[4] - nine percentage points above its pre-pandemic level – bloated by pandemic-era expansionary fiscal policies, post-pandemic supportive measures such as tax breaks and subsidies. The rollback of supportive measures has also been slow. Worryingly, the two largest economies in the world, *viz.*, the U.S. and China, are leading the increase in global debt (Chart 1.11 a and b).

[3] International Monetary Fund (2024), "World Economic Outlook - Steady but Slow: Resilience amid Divergence", April.

[4] International Monetary Fund (2024), "Fiscal Monitor: Fiscal Policy in the Great Election Year", April.

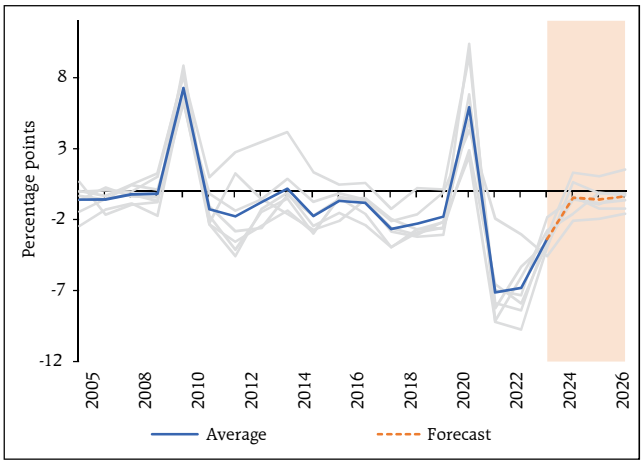
Chart 1.11: Global Public Debt



Note: Dotted lines represent forecasts.
Source: IMF.

1.13 The narrowing of the interest rate – economic growth rate differential against the backdrop of elevated interest rates and slowing growth is undermining debt sustainability (Chart 1.12). With several countries holding national elections in 2024, any related surge in government spending and widening of fiscal deficits may exacerbate the debt overhang, alongside costs associated with geopolitical tensions and green transition.

Chart 1.12: Interest Rate-Growth Rate Differential (G7 countries)

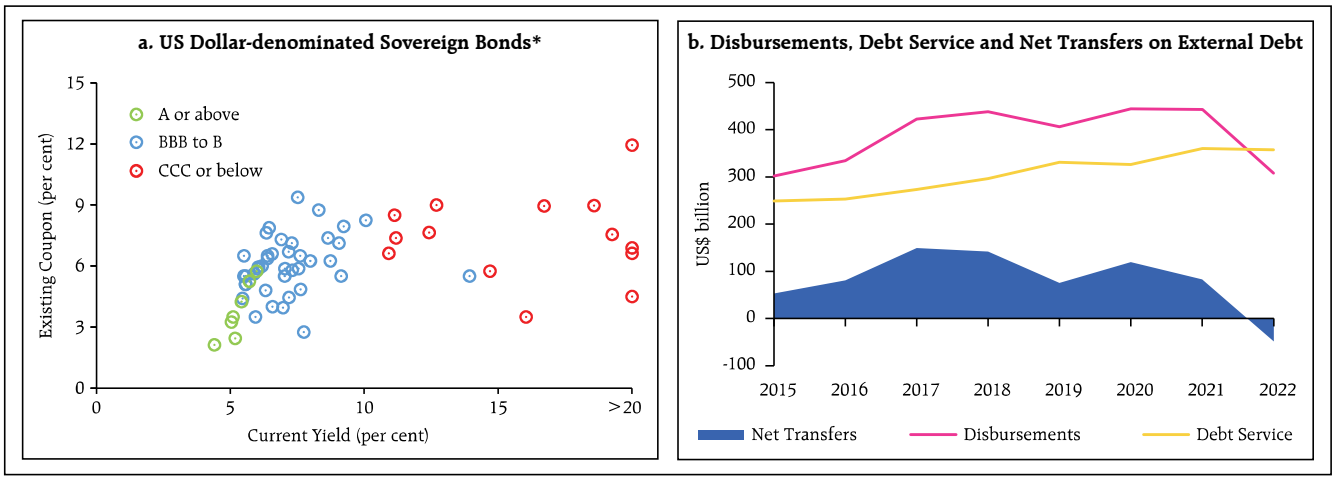


Note: (1) Forecast is based on real interest rates that are derived by deducting consumer price inflation from nominal 10-year government yields; Nominal yield forecasts are based on analyst estimates provided by Bloomberg while CPI and GDP growth forecasts are based on IMF estimates.
(2) Shaded region represents forecast.
Sources: IMF and Bloomberg.

1.14 The threat of a looming debt crisis cannot be overemphasised. Fiscal consolidation took a backseat in 2023 as global fiscal deficit increased to 5.5 per cent of GDP on an average – a rise of 1.6 percentage points from the previous year. At the same time, high debt levels and narrowing interest-growth differentials have pushed debt-stabilising primary deficit lower by 2 percentage points of GDP on an average in advanced and emerging market economies[5]. Alongside mounting public debt, private debt also remains elevated. At US$ 251.4 trillion, global debt stood at 239.9 per cent of GDP, with public debt at US$ 97.7 trillion and private

[5] International Monetary Fund (2024), "Fiscal Monitor: Fiscal Policy in the Great Election Year", April.

Chart 1.13: Debt Dynamics



Note: (1) * Each data point is an emerging market sovereign in the JP Morgan EMBIG Index. Rates pertain to the latest bond issuance by respective sovereign. Data as on May 31, 2024.

(2) Disbursements, debt service and net transfers on external public and publicly guaranteed debt of developing countries, based on a sample of 108 developing countries for which data are available. Net transfers correspond to disbursements minus debt service (principal and interest).

Sources: Bloomberg and UNCTAD

debt at US$ 153.7 trillion as at end-2023[6]. We are in a debt supercycle with significant long-term structural imbalances[7], which makes the financial system susceptible to frequent disruptions and overall macroeconomic instability.

1.15 The sharp rise in global public debt, especially among the two largest economies, poses significant spillover risks to EMEs, where low income and low-rated countries are particularly vulnerable. Surging interest rates have caused 18 sovereign defaults in 10 developing countries in the last three years alone, surpassing the total for the preceding two decades and interest payments have quadrupled in the past decade[8]. Meanwhile, according to the IMF, nine low-income countries are presently in debt distress, and an additional 25 countries are at high risk of debt distress[9]. These economies face higher refinancing costs and elevated interest rates forcing them to make difficult choices in terms of servicing debt or making investments in health, education and infrastructure (Chart 1.13 a and b).

1.16 Coexistence of high debt levels and elevated interest rates can feed a vicious cycle of financial instability through impairment of government and private-sector balance sheets. For emerging and low-income countries, this poses challenges to their developmental prospects and their fight against hunger and disease, portending social unrest and conflict-related welfare losses. Global institutions and lenders need to consider measures to enable such borrowers to calibrate fiscal consolidation by considering country-specific circumstances.

[6] Public debt and GDP are taken from IMF fiscal monitor and world economic outlook databases and private debt is sourced from the global debt monitor of the Institute of International Finance.

[7] Mian, Atif (2024), "Breaking the Debt Supercycle", Finance and Development, IMF, March.

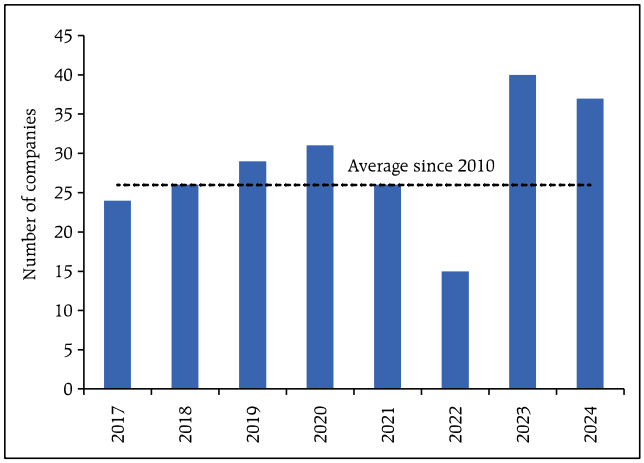
[8] World Bank (2023), "International Debt Report", December.

[9] IMF-World Bank Debt Sustainability Framework for Low Income Countries (risk ratings as on April 30, 2024).

B. Stretched Asset Valuations

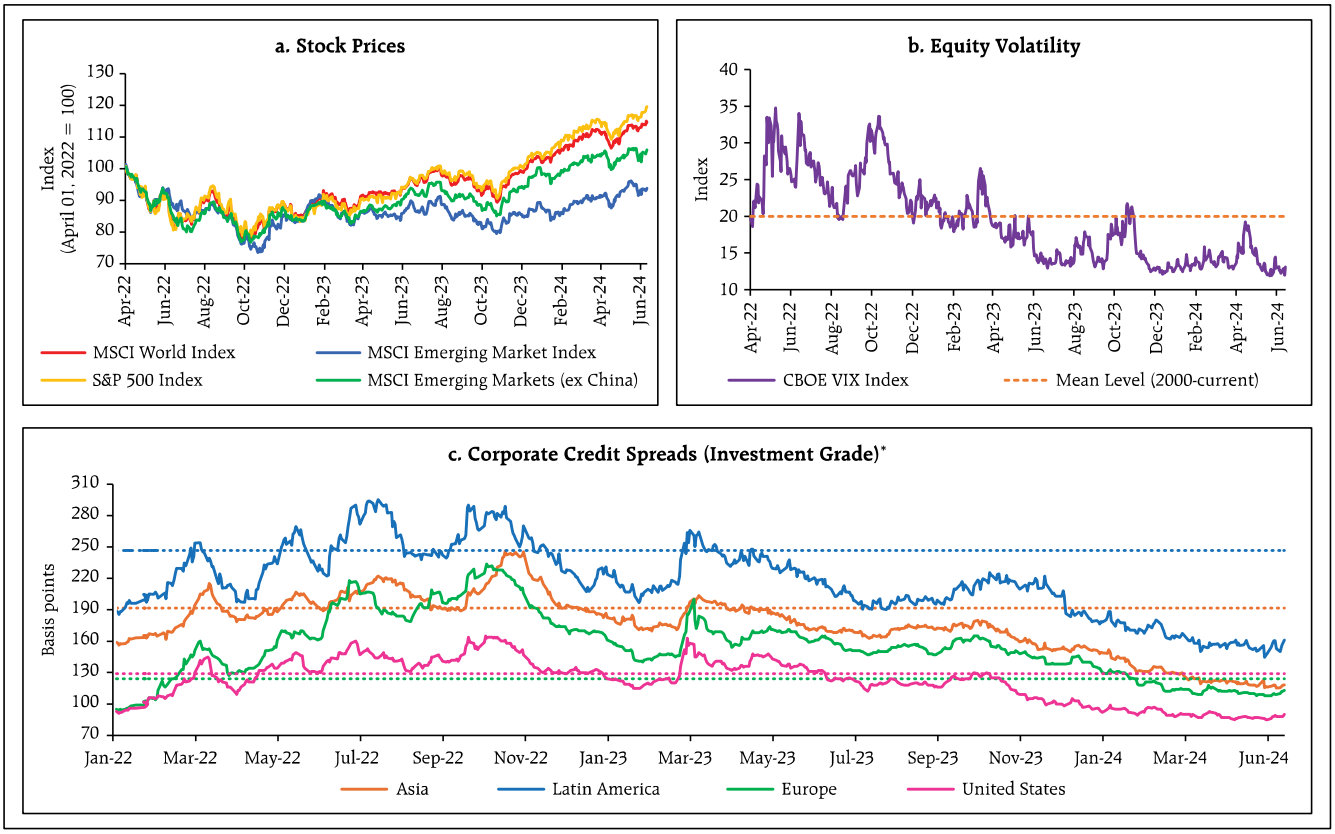
1.17 Since the December 2023 FSR, financial markets have remained buoyant and generally risk-on. Equity markets and bond yields have rallied, volatility has declined and corporate bond spreads have narrowed (Chart 1.14 a, b and c). A sharp increase in prices of relatively riskier assets has followed in the wake of the exceptionally rapid monetary tightening. While stocks have been supported by strong earnings, with price-to-earnings (P/E) ratios close to historical averages, the narrowing of corporate spreads have coincided with rising episodes of corporate defaults (Chart 1.15). The average correlation among equities, bonds, credit and commodity indices is higher than the historical 90th percentile[10] in both AEs and EMEs. The latest monetary policy cycle has witnessed a departure from past patterns when monetary tightening was associated with risk-off

Chart 1.15 Corporate Defaults (January-March)



Source: S&P Global Ratings Credit Research & Insights

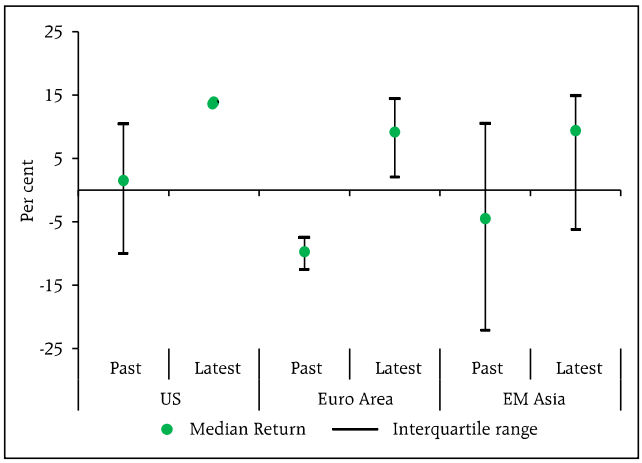
Chart 1.14 Asset Valuations



Note: * Dotted Lines indicate median value from 2005 to current date.
Sources: Bloomberg and JP Morgan.

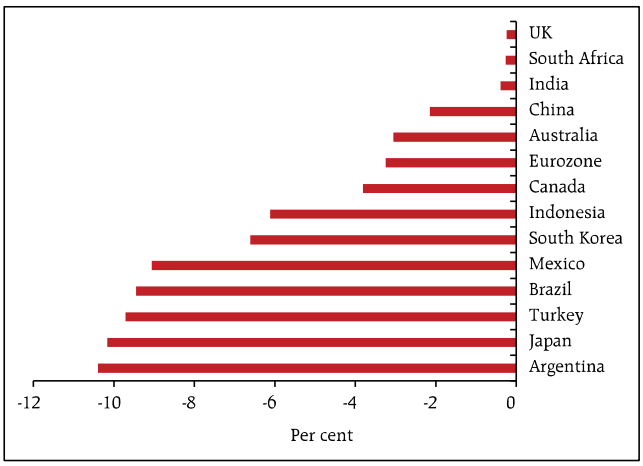
[10] International Monetary Fund (2024), "Global Financial Stability Report: The Last Mile: Financial Vulnerabilities and Risks", April.

Chart 1.16: Real Equity Returns in Post-tightening Plateaus



Note: Euro Area = France, Germany, Switzerland and Netherlands; EM Asia = China, India, Indonesia, South Korea. Monthly Data from January 1980 onwards; varying sample lengths across countries reflect data availability. Real equity returns between the latest hike in a tightening cycle and the first- rate cut following it (or the end of time series if no such change)
Sources: BIS, FRED and Bloomberg.

Chart 1.17: Change in Major Currencies against USD (2024 YTD)



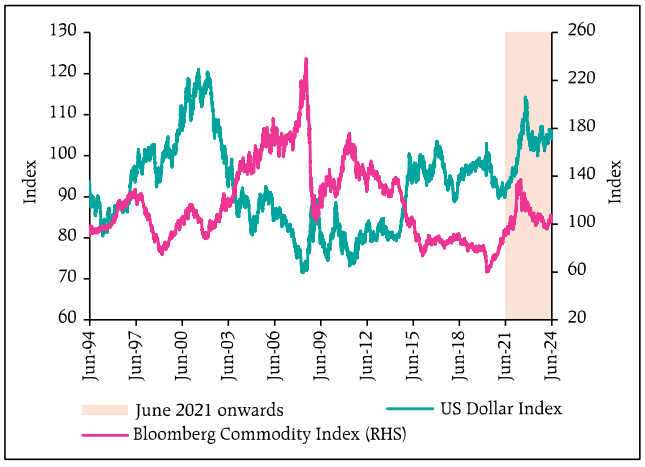
Note: As on June 14, 2024.
Source: Bloomberg

sentiment and decline in prices of riskier assets (Chart 1.16). To the extent valuations are stretched, sudden shocks could precipitate stress that spreads contagiously across financial market segments through correlated sell-offs and band-wagon effects. Moreover, the growing importance of the role of non-bank institutions in financial intermediation and higher and hidden leverage could amplify stress even further in the face of large shocks, leading to materialisation of debt vulnerabilities and rise in credit losses.

1.18 Stretched asset valuations have been co-terminous with a strong US dollar (USD) as market expectations have gravitated towards prospects of higher interest rates in the US than in other economies. Moreover, the unrelenting strength of the USD is being bolstered by currencies such as Japanese Yen dropping to historic lows and sustained downward pressures on other currencies (Chart 1.17).

1.19 Besides interest rate differentials and currency depreciations, risks to the global economy, especially the EMEs, are being transmitted through multiple channels. First, commodity prices and the USD are moving in tandem in a break from their historical inverse behaviour[11] (Chart 1.18). This can compound inflationary pressures for EMEs, especially commodity importers, dampening

Chart 1.18 Commodity Prices and the US Dollar



Source: Bloomberg

[11] Rees, Daniel (2023), "Commodity prices and the US dollar", BIS Working Papers No 1083, March.

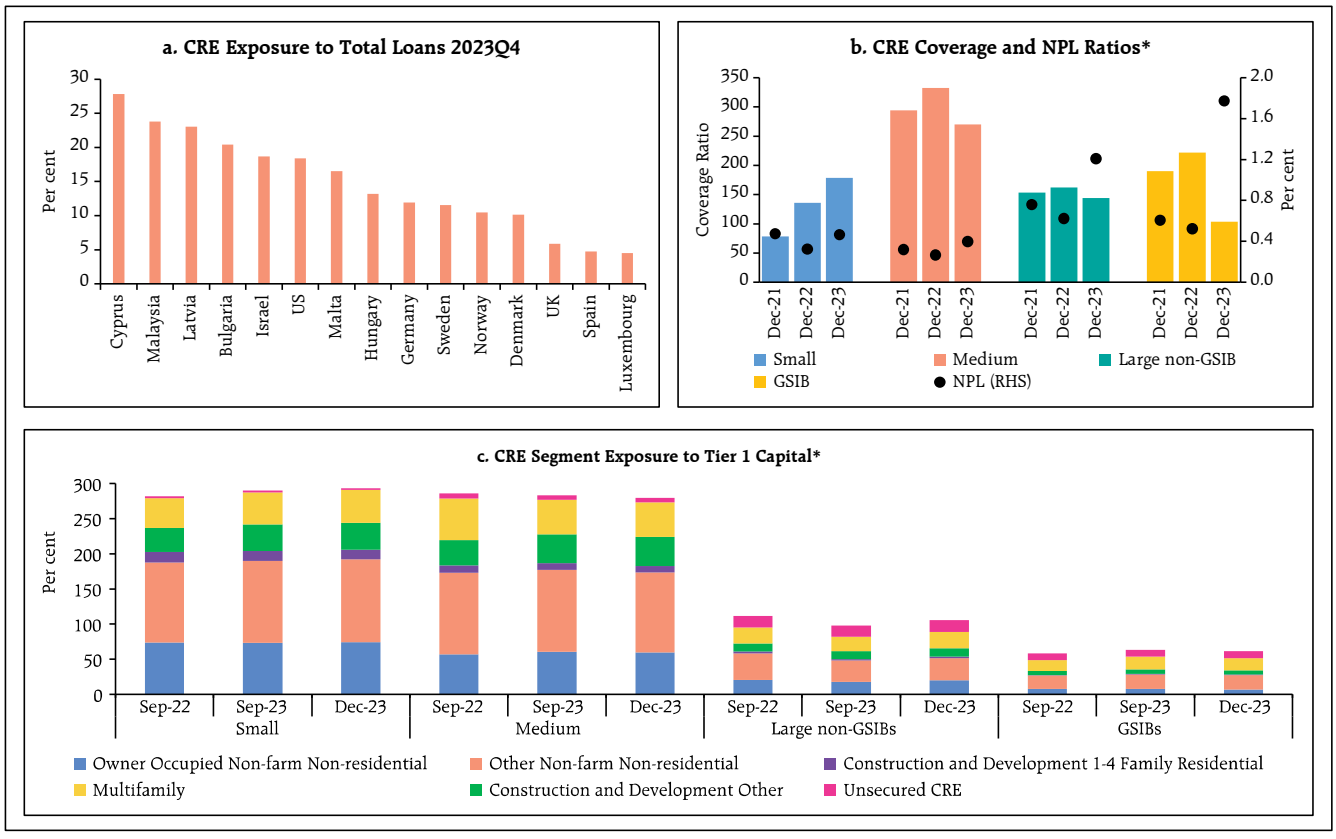
consumer spending, investment and economic growth. Second, the strong USD can increase debt service costs and prompt rating downgrades, limiting their access to global capital markets. Third, capital flows could become even more volatile.

C. Stress in the Commercial Real Estate Sector

1.20 Commercial real estate (CRE) prices have declined sharply across countries. According to the IMF, CRE prices fell by 12 per cent globally in real terms over the past year[12] with the sector also remaining vulnerable to higher vacancy rates and rising financing costs. CRE loans account for a substantial share of all bank loans in many countries and banks exhibit high sensitivity to expected and unexpected CRE losses, as reflected in relatively high CRE coverage ratios[13] (Chart 1.19 a and b). Importantly, CRE exposures are concentrated in small and medium sized banks while large and global systemically important banks (GSIBs) have little exposure (Chart 1.19 c).

1.21 Increasingly, bank profitability and market valuations are interacting in multiple ways[14].

Chart 1.19: CRE Exposures



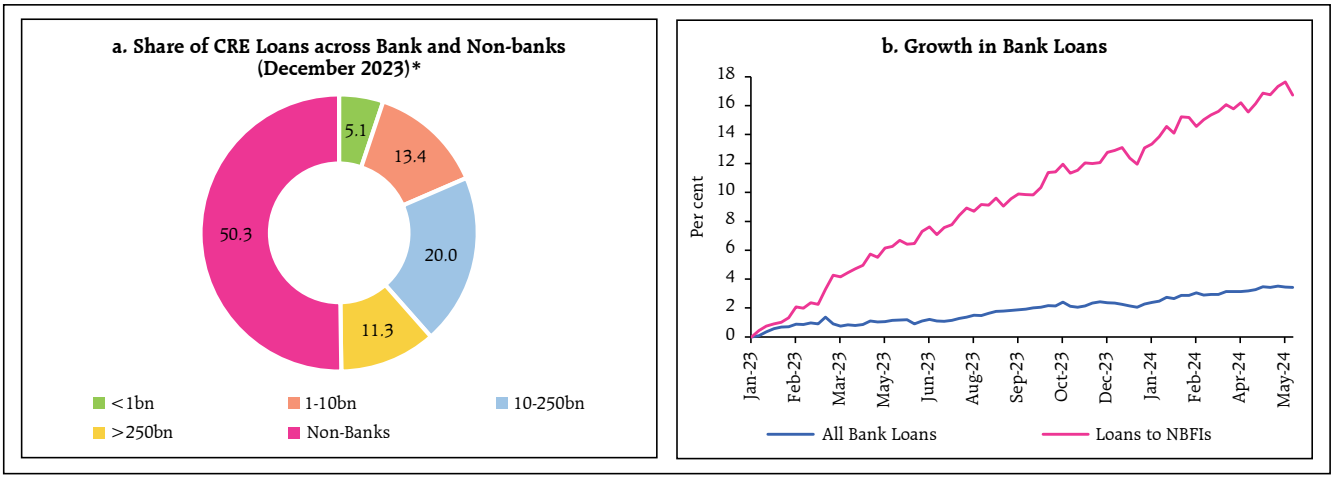
Note: * Data based on select US banks. 'Small' refers to banks with less than US$ 10 billion in total assets, 'Medium' corresponds to banks with assets between US$ 10 billion and US$ 100 billion, 'Large non-GSIB' corresponds to large banks with assets above US$ 100 billion not classified as a GSIB and 'GSIB' corresponds to large banks classified as GSIBs; NPL = non-performing loans.
Source: IMF.

[12] International Monetary Fund (2024), "Global Financial Stability Report: The Last Mile: Financial Vulnerabilities and Risks", April

[13] CRE coverage ratio is the ratio of loan-loss reserves to cover future losses to non-performing loans.

[14] J Caparusso, U Lewrick and N Tarashev (2023), "Profitability, valuation and resilience of global banks - a tight link", BIS Working Paper, No 1144, November.

Chart 1.20 NBFIs – CRE Exposure and Interlinkages with Banks in US



Note: * Banks categorised based on asset size.
Sources: Federal Reserve and FDIC.

Short sellers have been targeting banks with large CRE exposure, as evident from the sharp fall in stock prices of a few banks that declared losses on their CRE portfolios. The resulting erosion of investor confidence makes it difficult for these banks to access funding markets which, in turn, undermines their resilience, especially if CRE prices decline further or outlier banks announce large losses. Another source of contagion stems from large exposure of non-bank financial institutions (NBFIs) to the CRE sector and their interlinkages with the banking system with potential knock-on effects on the broader banking system (Chart 1.20 a and b).

D. Geopolitical Risks

1.22 The recent flaring of military conflicts and their disruptive persistence has heightened the focus on risks to the global economy from geopolitical tensions, especially from their transmission through trade, inflation and confidence channels. Potential threats to financial stability stem from volatility imparted to capital flows and asset prices, dampening of investor sentiment, unsettled financial markets and strains on balance sheets of financial institutions through deterioration in asset quality and profitability[15].

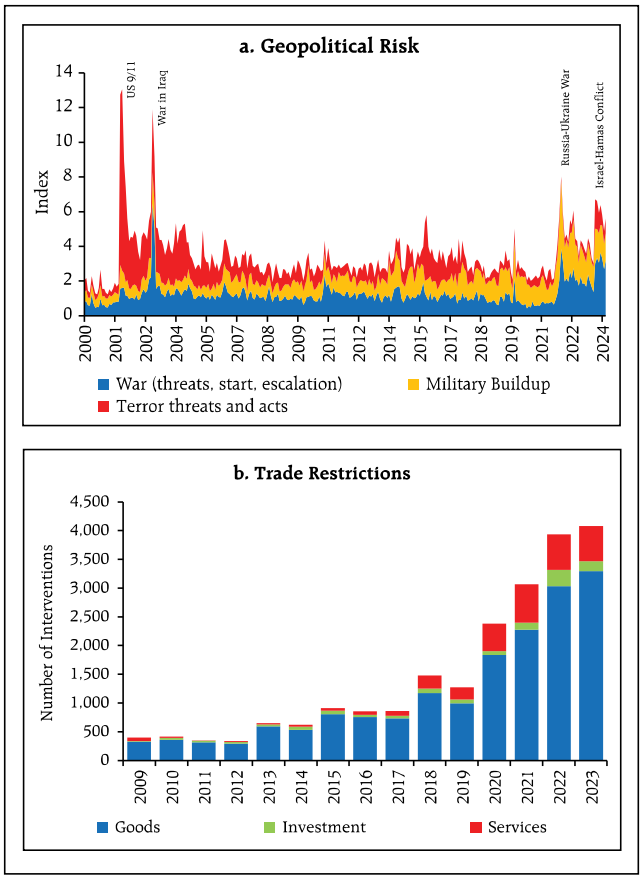
1.23 The geopolitical risk index (GPRI)[16] - constructed by counting the number of newspaper articles related to adverse geopolitical events as a share of the total number of newspaper articles at a monthly frequency - has spiked alongside sharp increases in trade restrictions and financial sanctions, reversing the gains from several decades of global economic integration. Inevitably, these developments portend strains to the international monetary system, undermining the efficiency of the global payment system (Chart 1.21 a and b).

1.24 Episodes of geopolitical tensions have generally been associated with spikes in crude oil prices and disruptions in supply conditions, which

[15] European Central Bank (2024), "Financial Stability Review", May.

[16] Caldara, Dario. and Iacoviello, Matteo (2022), "Measuring Geopolitical Risk", American Economic Review, Vol. 112, No 4, April, pp. 1194 1225.

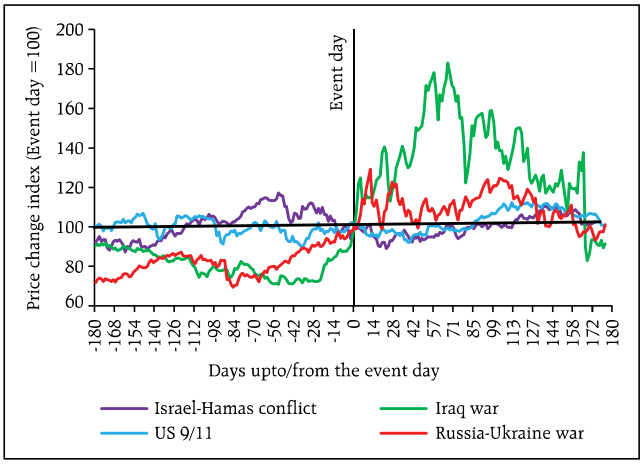
Chart 1.21 Geopolitical Risk and Trade Restrictions



Source: Caldara, Dario and Iacoviello, Matteo "Measuring Geopolitical Risk", American Economic Review, 112.4 (2022):1194-1225, Global Trade Alert (data accessed on May 21, 2024).

could interact with other channels and amplify stress on the real economy and the financial system (Chart 1.22).

Chart 1.22 Geopolitical Events and Crude Oil

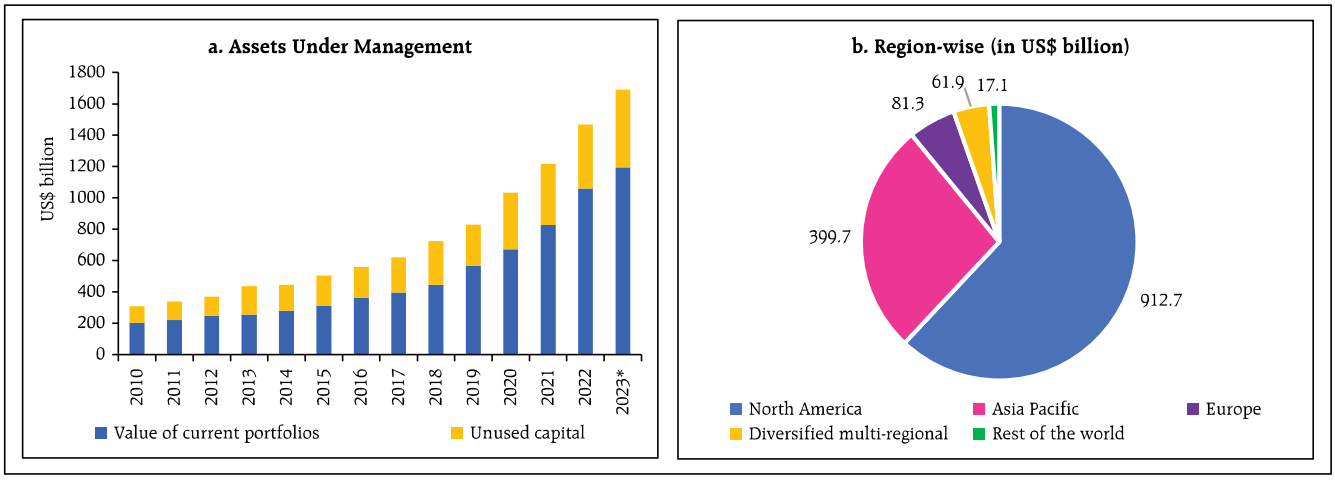


Source: Bloomberg.

E. Risks stemming from Private Credit

1.25 Private credit, which is essentially provided by non-bank lenders to corporates on a bilateral basis, has grown four-fold over the last ten years, emerging as a major source of corporate financing among middle-market firms that have low or negative earnings, high leverage, and lack of high-quality collateral (Chart 1.23 a and b). Private credit offers flexibility, quick execution and greater confidentiality. From a lender's perspective, returns on these investments, though riskier, are consistently superior during prolonged period of low interest rates, attracting investors to these types of investments.

Chart 1.23 Size of Private Credit Market



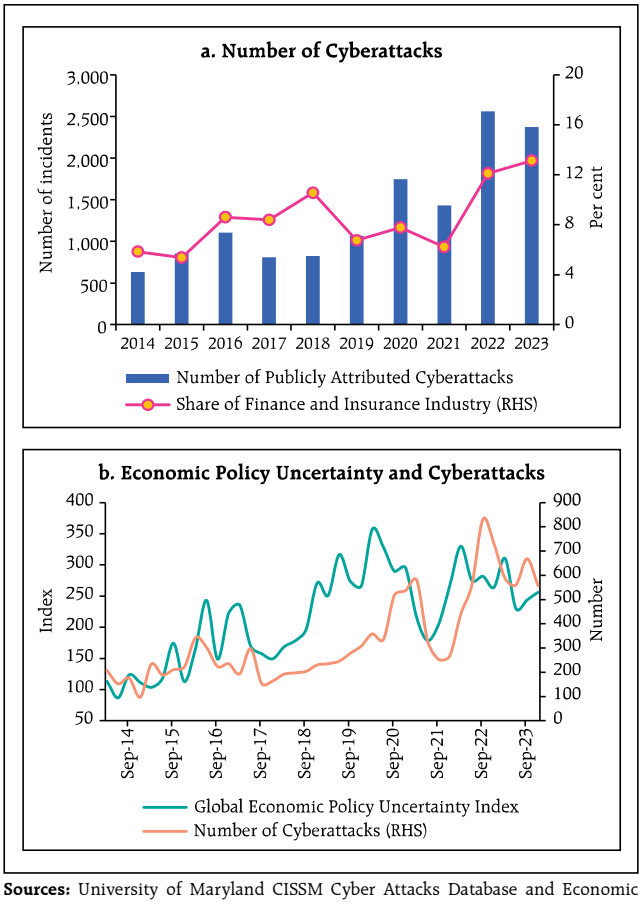
Note: *Data upto June 2023.
Sources: Bloomberg News and Preqin.

1.26 Private credit is not constrained by financing from banks that are subject to prudential regulation and supervisory oversight, or finance raised in capital markets subject to market discipline and price discovery. The rapid growth of private credit, increasing interconnectedness with banks and NBFIs and opacity can create vulnerabilities that could become systemic. The key dimensions through which these risks could be propagated are[17]: 1) riskier borrowers than counterparts in traditional lending spaces who could generate outsized losses; 2) investors, particularly insurance companies and pension funds, who could experience large capital losses with systemic implications; 3) private credit structures are becoming complex, adding multiple layers of leverage; 4) liquidity risks amplified by growing retail presence and higher redemption rights; and 5) interconnectedness with other segments of financial system. Banks are increasingly accessing private credit market in ways that allow them to manage regulatory costs and generate fee-based income whereas insurers and pension funds are increasing their exposure to less-liquid investments. Meanwhile, private equity (PE) firms are increasing their ownership stakes in life insurance companies and banks are originating their own private credit deals using minority stakes in private debt funds and business development companies. Data gaps also pose a challenge in monitoring of developments. Finally, private credit is yet to be tested in a credit cycle downturn and sharp losses could lead to a loss of confidence in the asset class as a whole.

F. Cyber Risk

1.27 With increasing digitalisation of financial services, the recurring intensity of cyberattacks has dominated financial stability concerns. The disruptions range from security bypasses and information disclosure to denial of services. The number of publicly reported cyberattacks has been rising globally at an alarming pace, with the share of attacks in the financial domain increasing at a rapid pace (Chart 1.24 a). Ransomware crypto payments, business email compromises and cost of data breaches surged to a new high during 2023. The financial sector has reported over 20,000 cyber intrusions and digital attacks, which resulted in losses amounting to US$ 20 billion over the last 20 years[18]. Furthermore, cyberattacks are found to swell during periods of political and economic uncertainty such as geopolitical tensions, with disruptive consequences (Chart 1.24 b).

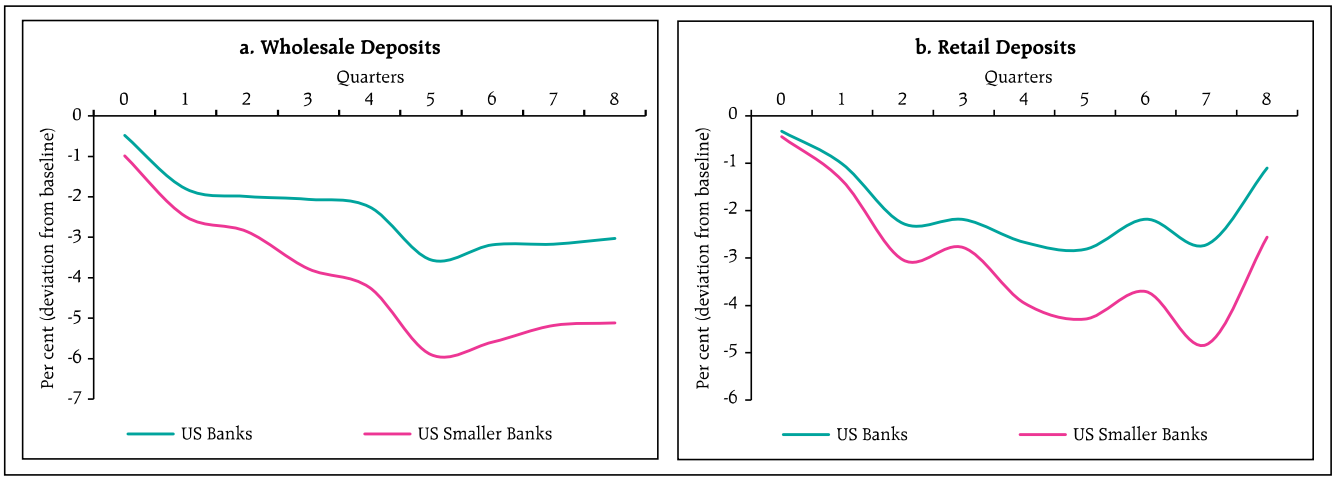
Chart 1.24: Global Cyberattacks



Sources: University of Maryland CISSM Cyber Attacks Database and Economic Policy Uncertainty.

[17] International Monetary Fund (2024). "Global Financial Stability Report: The Last Mile: Financial Vulnerabilities and Risks", April.
[18] Natalucci, Fabio, Qureshi, Mahvash S., Suntheim, Felix (2024), "Rising Cyber Threats Pose Serious Concerns for Financial Stability", IMF Blog, April 9.

Chart 1.25: Impact of Cyberattacks on US Bank Deposits (2014-22)



Note: (1) The lines represent estimates of the cumulative response of banks' domestic deposits to the occurrence of cyberattacks in a given quarter.
(2) Banks with total deposits below the two-thirds percentile are classified as small.
Source: IMF.

1.28 In extreme cases, spillovers from cyberattacks can cause "cyber runs" in terms of affecting the efficiency of payment systems and bank deposit flows, with smaller banks being particularly vulnerable (Chart 1.25 a and b).

1.29 Automated programming interfaces (APIs) that have facilitated the rise of Fintech and open banking have supported new revenue streams as well as improved customer experience, but they are becoming preferred cyber abuse targets. Cyber incidents can have systemic impact if financial market infrastructure is disrupted. In the recent past, multiple incidents involving payment and settlement systems have led to significant disruptions in interbank transactions and payment failures[19]. Dependence of financial institutions on artificial intelligence (AI) and third-party information technology (IT) also have associated risks that could intensify in tightly interconnected institutions. In face of these challenges, regular vulnerability checks at all levels remain a prerequisite. As disruptions from cyberattacks spread instantaneously across related products and connected parties, countermeasures require real-time monitoring and response capabilities using automated algorithms for identifying anomalous events, with collective action and sharing of critical intelligence measures becoming vital.

I.2 Domestic Macrofinancial Risks

1.30 In this uncertain global economic environment, the Indian economy is poised to sustain resilient growth anchored by macroeconomic and financial stability, and a rising contribution to global growth as the fastest growing major economy of the world. Furthermore, unlike other jurisdictions, India's economic performance is underpinned by domestic demand. Sizeable foreign exchange reserves, high capital and liquidity buffers in the banking system and stronger and cleaner balance sheets of banks, non-banks and corporates provide bulwarks against global shocks.

[19] In 2020, a software error disrupted the payment and settlement operation of the European Central Bank's TARGET2 system for approximately 11 hours, leading to a complete failure of all payment transactions in the system. In December 2023, a cyberattack disrupted the national payment system in Lesotho, preventing local banks from conducting interbank transactions in the country (Source: IMF).

I.2.1 Domestic Growth and Inflation

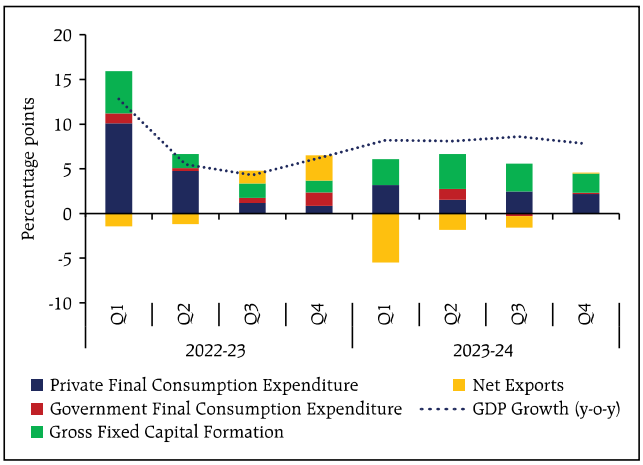
1.31 Real GDP rose by 8.2 per cent in 2023-24[20], up from 7.0 per cent in the previous year, despite muted private and government final consumption and external demand conditions acting as a drag (Chart 1.26). For 2024-25, the India Meteorological Department (IMD) has projected the south-west monsoon season rainfall in the country at 106 per cent of the long-period average (LPA) in 2024. World trade volume is also expected to recover as per the IMF's assessment, potentially easing the constraint from net exports. The Monetary Policy Committee (MPC) has projected real GDP to grow by 7.2 per cent during 2024-25[21].

1.32 There are several positives in the near-term economic outlook. First, domestic demand conditions are strengthening, and business optimism is at its highest among major economies of the world. Second, the government's sustained focus on capital expenditure should crowd-in more private investment through multiplier effects. Third, firms are utilising high profits to augment investible resources while bringing down leverage. Fourth, real estate activity is gathering pace which, alongside public investment on infrastructure, is driving a construction activity cycle. Fifth, exports of services are rising, and their prospects remain bright. Finally, credit growth is deepening, supported by healthier bank balance sheets.

1.33 Downside risks to this outlook stem from global slowdown and spillovers, geopolitical risks and their impact on supply conditions and commodity prices, slack in the rural economy and uncertainties related to weather conditions.

1.34 Headline consumer price index (CPI) inflation is descending to the medium-term target

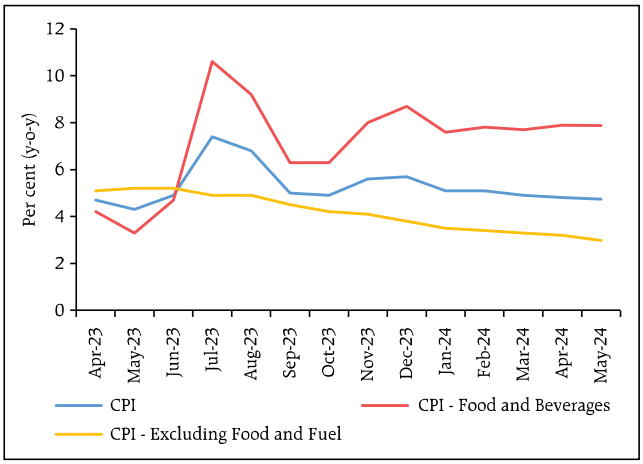
Chart 1.26: Contribution to GDP Growth



Sources: NSO and RBI staff estimates.

of 4 per cent. It eased to 4.7 per cent in May 2024 from 5.7 per cent in December 2023 but its near-term trajectory remains vulnerable to volatile food prices. Food inflation edged up to 7.9 per cent in May 2024 from 7.6 per cent in January 2024; however, the projection of a above normal south-west monsoon in 2024 augurs well for the upcoming *kharif* season and can ease pressures on food prices. In contrast, core inflation (*i.e.*, CPI excluding food and fuel) is witnessing a sustained decline - it eased to 3.0 per cent in May 2024, its lowest level in the current CPI series (Chart 1.27). Commodity

Chart 1.27: Consumer Price Inflation



Sources: National Statistics Office and RBI staff calculations.

[20] Provisional estimates released by the National Statistical Office (NSO) on May 31, 2024.

[21] RBI (2024), Monetary Policy Statement, June 07.

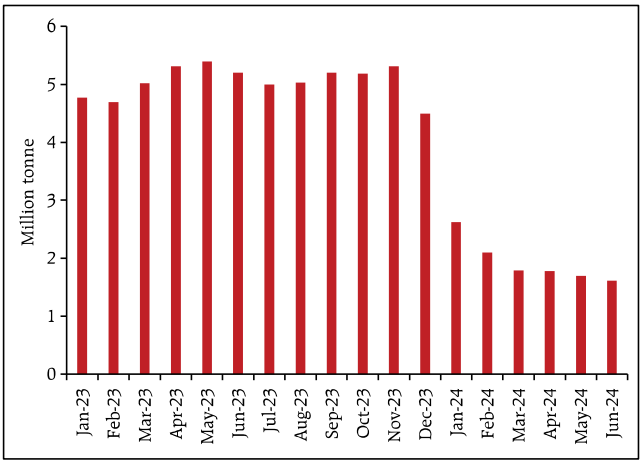
prices volatility emanating from frequent bouts of geopolitical conflicts alongside the incidence of climate shocks poses risks to the inflation outlook.

I.2.2 External Sector

1.35 The resilience of the external sector has supported India's overall macroeconomic stability. The merchandise trade deficit narrowed to US$ 238.3 billion in 2023-24 from US$ 264.9 billion in the previous year. Both exports and imports recorded positive growth (y-o-y) during the January-March 2024 quarter, which was a turnaround from declines during April-December 2023. Movements in merchandise trade have been largely influenced by the global demand slowdown, with adverse price effects even as volumes registered expansion across major export categories.

1.36 Going forward, the outlook for merchandise trade would be conditioned by the strength of global demand, movements in commodity prices and freight costs, supply chain pressures, especially in major trading routes. Traffic on the Suez Canal – which is crucial for India's trade with European and North African markets – has more than halved since the Red Sea crisis, forcing rerouting of ships via Cape of Good Hope and increase in transit times as well as concentration of ships on certain critical ports (Chart 1.28).

Chart 1.28: Suez Canal Transit Trade Volumes (Monthly Average)



Note: Up to June 11, 2024.
Source: IMF Port Watch.

1.37 The moderation in trade deficit alongside sustained buoyancy in services exports and remittances have led to current account surplus of 0.6 per cent of GDP at current market prices in Q4:2023-24 (Chart 1.29 a, b, c and d).

1.38 In an uncertain global economic and financial environment, India remains an attractive investment destination. During 2023-24, net inflows of foreign portfolio investments (FPI)

Chart 1.29: Trade Deficit, Service Exports and Private Transfers *(Contd.)*

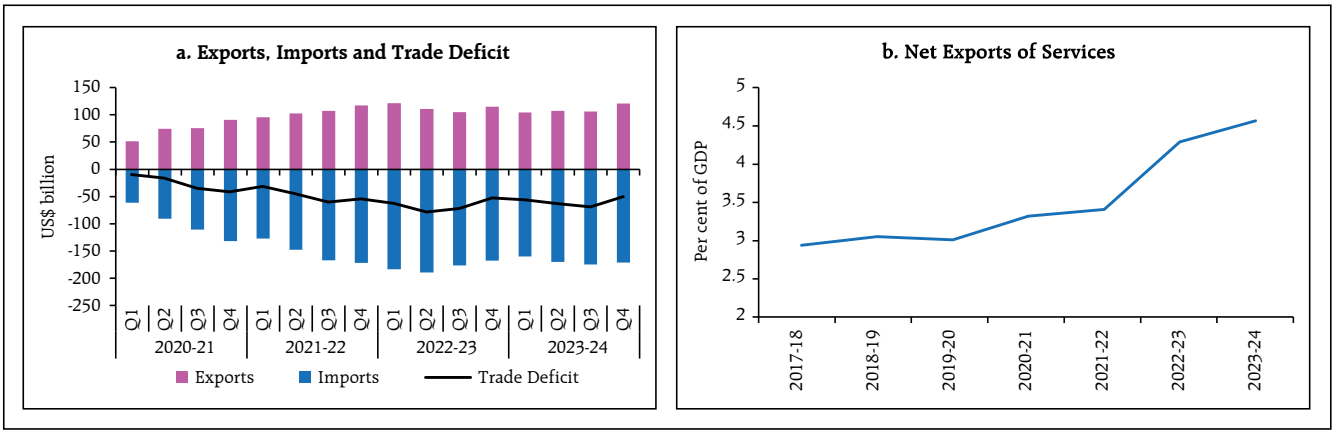
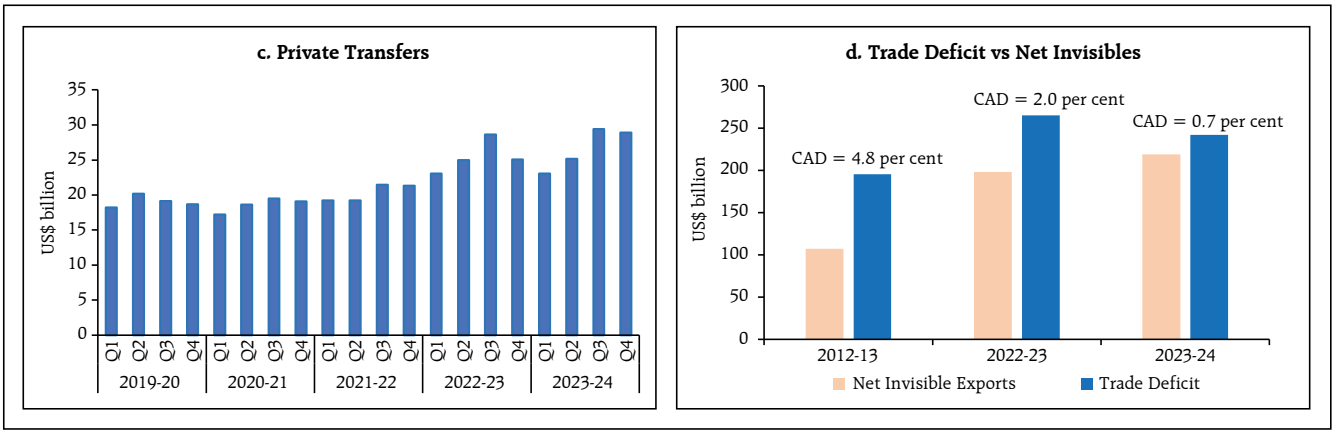


Chart 1.29: Trade Deficit, Service Exports and Private Transfers *(Concld.)*



Sources: Directorate General of Commercial Intelligence & Statistics (DGCI&S) and RBI.

to India, both debt and equity, recorded a sharp turnaround, reaching its second-highest level ever at US$ 44.6 billion (BoP basis). During the current fiscal year so far (up to June 12, 2024), FPI flows were negative at (-) US$ 3.9 billion. External commercial borrowings (ECB) flows (net of principal repayments and intercompany borrowings) turned positive in 2023-24 from net outflows in the previous year. Also, both rupee-denominated and foreign currency denominated non-resident deposit schemes recorded inflows throughout 2023-24. Foreign direct investment (FDI) flows moderated, partly due to a rise in repatriations from India (Table 1.1).

Table 1.1: Capital Flows

(US$ billion)

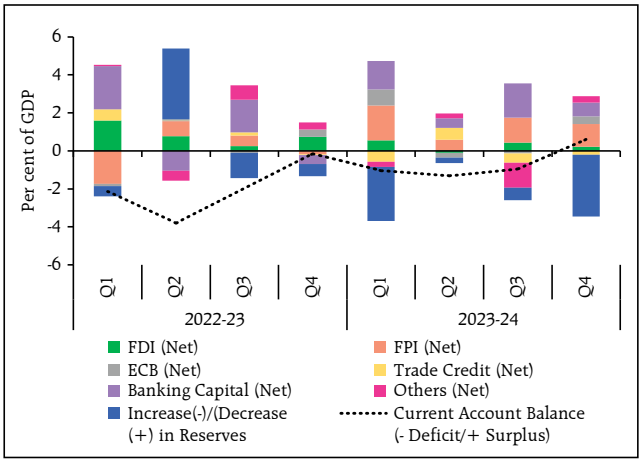
Component	Financial year so far			Financial Year	
	Period	2024-25	2023-24	2023-24	2022-23
FDI (net)	April	4.0	2.8	9.8	28.0
FPI (net)	April-June	-3.9	9.0	44.6	-4.8
ECB (net)	April	-0.1	1.9	3.8	-4.1
Non-resident Deposits (net)	April	1.1	-0.2	14.7	9.0

Note: Data on FPI for financial year so far (June 12, 2024) and corresponding previous year period have been sourced from NSDL, whereas data for full year is based on BoP.

Sources: RBI and NSDL.

1.39 There has been a rise in both international liabilities and assets and, as a corollary, the build-up of foreign exchange reserves has strong interlinkages with net capital flows to India. In an increasing global interest rate cycle, the servicing cost of debt liabilities and investment income outflows have been rising. Overall, capital flows are expected to remain strong, supported by macroeconomic stability and the positive economic outlook (Chart 1.30). The inclusion of Indian

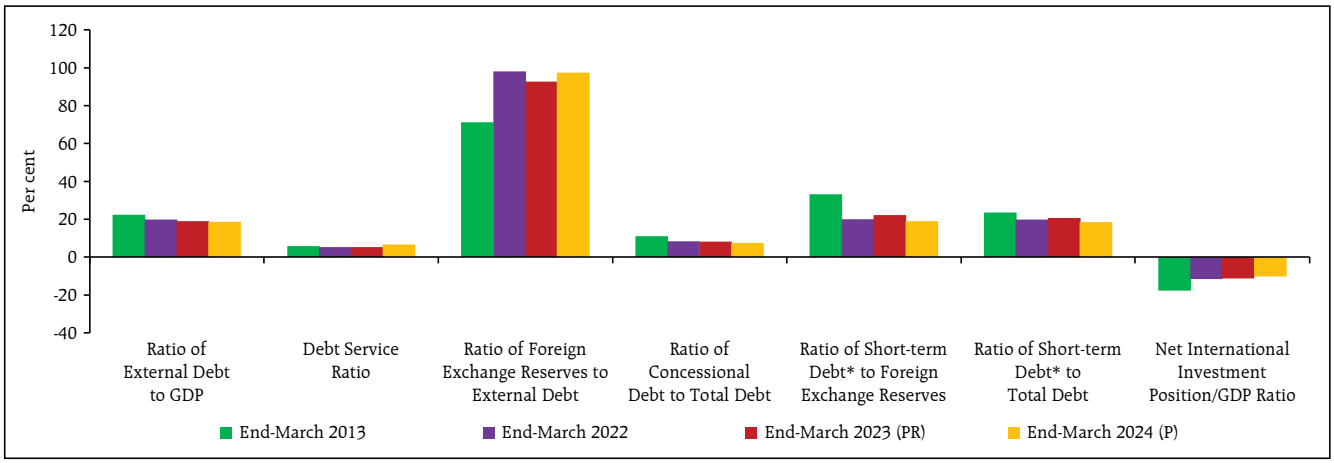
Chart 1.30: Balance of Payments



Note: 'Others' includes external assistance, rupee debt service, other capital and errors and omissions.

Source: RBI.

Chart 1.31 External Vulnerability Indicators



Note: * Original Maturity; P: Provisional; PR: Partially Revised.
Sources: RBI and Ministry of Finance.

government securities in the JP Morgan Global Bond Index - Emerging Markets from June 2024 and in the Bloomberg Emerging Market Local Currency Government Index from January 2025 also augurs well for the outlook for debt capital flows to India.

1.40 External vulnerability indicators continue to show improvement: foreign exchange reserves of US$ 652.9 billion as on June 14, 2024 is sufficient to cover over ten months of projected imports for 2024-25; external debt moderated to 18.7 per cent of GDP in March 2024; and the share of short-term debt (with original maturity of up to one year) in total external debt declined to 18.5 per cent in March 2024 (Chart 1.31).

I.2.3 Foreign Exchange Market

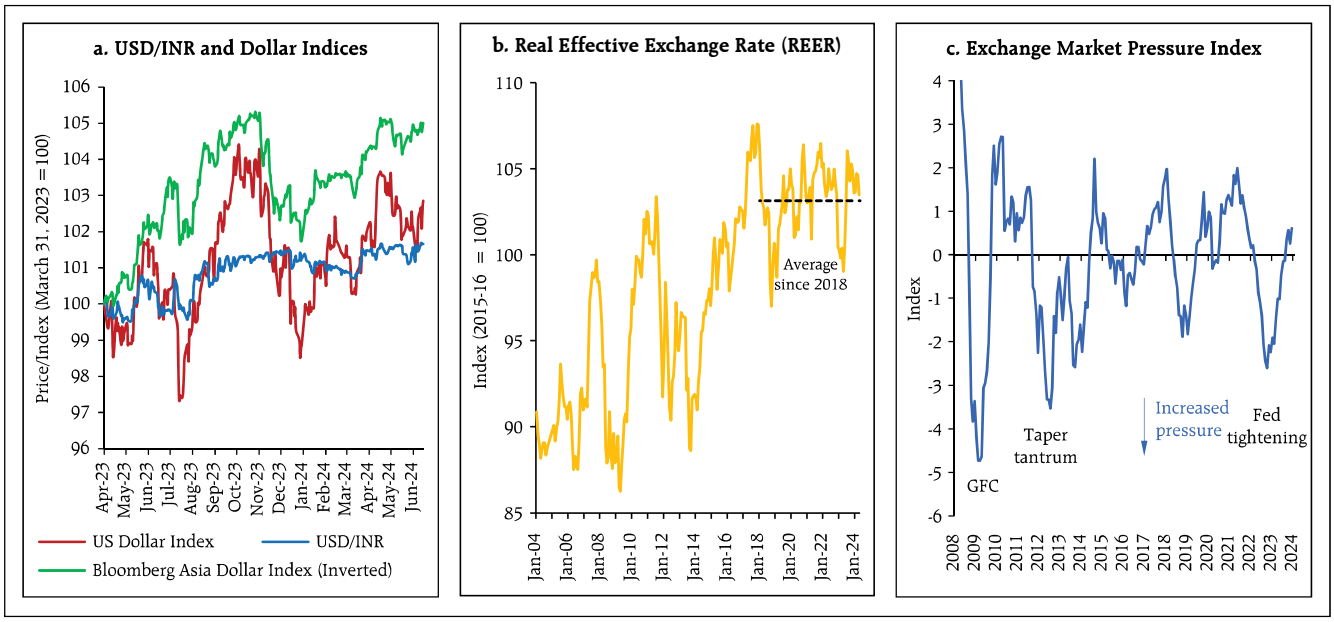
1.41 The domestic foreign exchange market has remained relatively stable lending support to overall macroeconomic stability in a period of strengthening of the USD against other currencies and bouts of volatility in international foreign exchange markets. The stability of the Indian rupee (INR) is reflected in a variety of indicators ranging from movement in real effective exchange rates, the exchange market pressure (EMP) index[22] as well as volatility indicators such as implied volatility derived from option prices and onshore-offshore spreads (Chart 1.32 a, b, c and 1.33 a, b).

[22] EMP index is used to measure external pressures on the currency and is constructed as a weighted average of exchange rate movements and changes in forex reserves.

$$EMP_t = \frac{1}{\sigma_{\Delta e_t}}\Delta e_t + \frac{1}{\sigma_{\Delta r_t}}\Delta r_t$$

where Δe_t is the y-o-y percentage change in exchange rate relative to the U.S. dollar at time t, and Δr_t is the y-o-y percentage change of foreign exchange reserves at time t as a fraction of the monetary base (M_3) at time t-1. $\sigma_{\Delta e_t}$ and $\sigma_{\Delta r_t}$ are the historical standard deviations of the two variables respectively. For more details, see Appendix 3.1 of IMF World Economic Outlook April 2007.

Chart 1.32: Exchange Rate Indicators

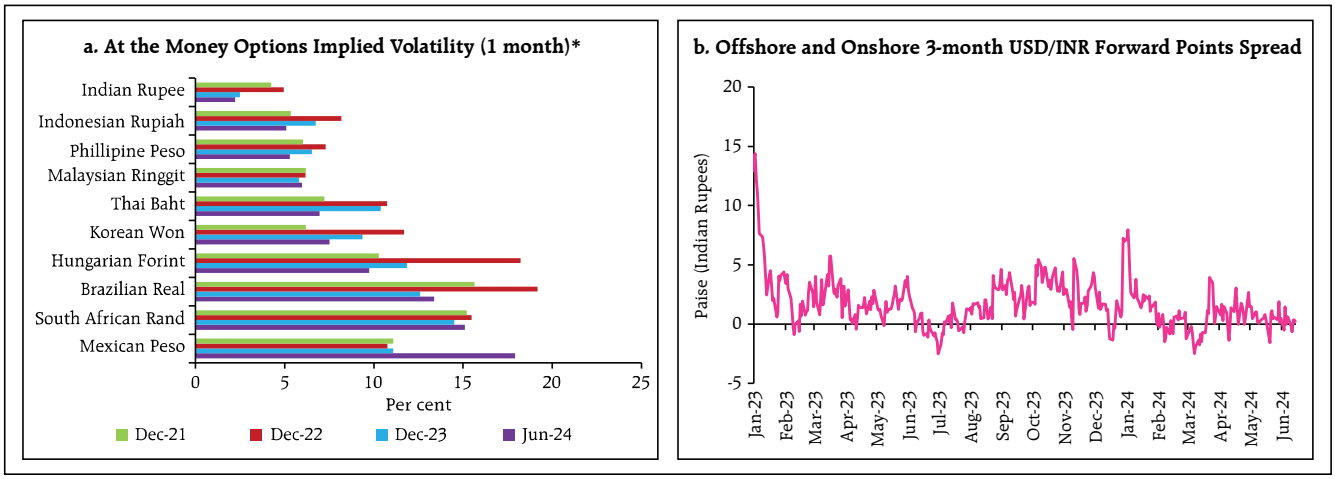


Note: (1) Bloomberg Asia Dollar Index (Inverted) aims to replicate the performance of USD against 9 Asian currencies.
(2) Trade weighted REER index is based on 40 currency basket (monthly average).
(3) The EMP index uses standardised changes in exchange rates and forex reserves to measure the net pressure on an exchange rate. Negative numbers indicate increased depreciation pressure.
Sources: Bloomberg, RBI and staff calculations.

I.2.4 Corporate Sector

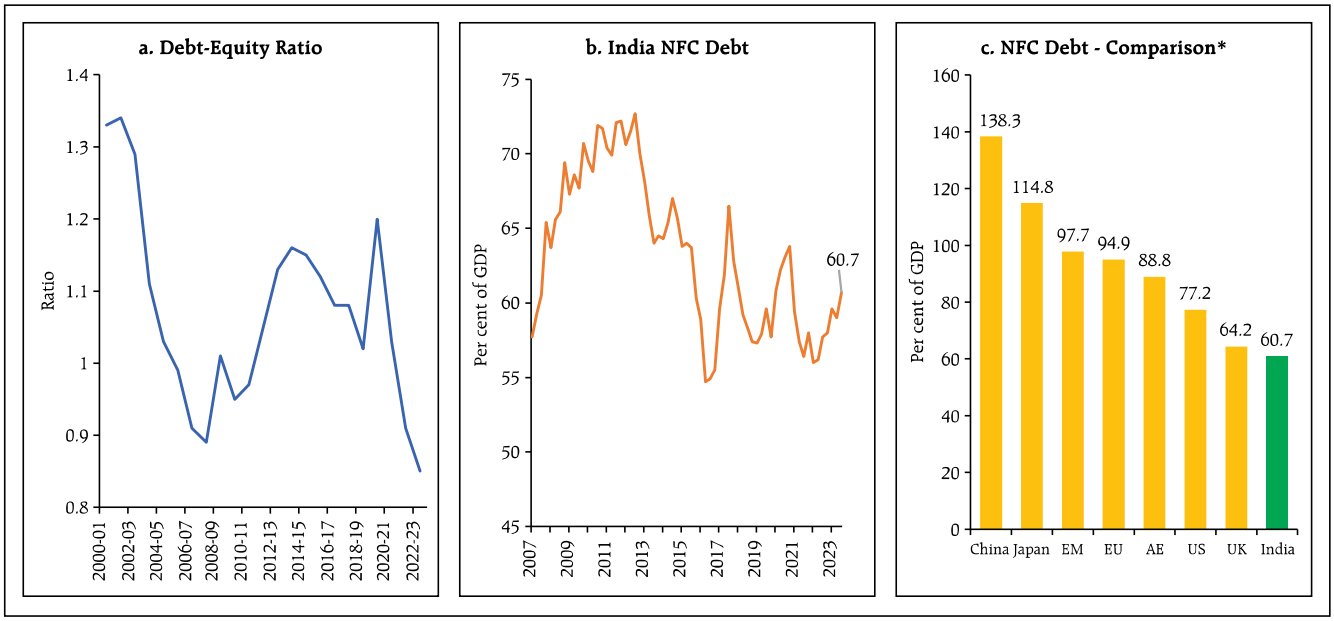
1.42 Corporate sector resilience has been bolstered by strengthening balance sheets and steady earnings. Increased capitalisation of profits has augmented equity of non-financial corporates (NFCs) and supported deleveraging. This is reflected in declining debt-to-equity and NFC debt-to-GDP ratios relative to AE and EME peers (Chart 1.34 a, b and c).

Chart 1.33: Implied Volatility and Onshore-Offshore Spread



Note: * As on June 14, 2024.
Source: Bloomberg.

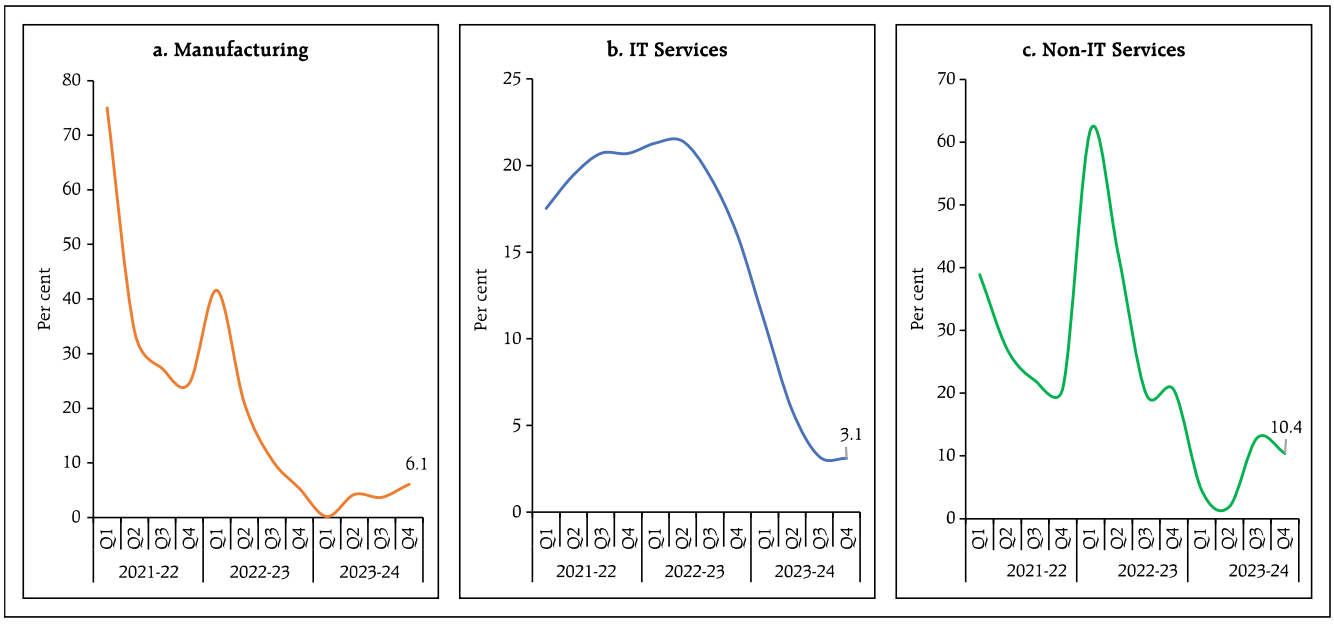
Chart 1.34: Non-Financial Corporates – Debt-Equity and Debt-to-GDP Ratios



Note: * Data as on December 2023.
Sources: CMIE and BIS.

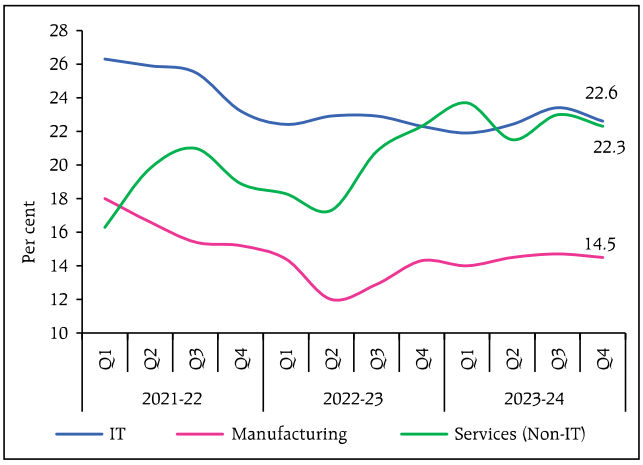
1.43 Among listed private corporates, sales growth diverged across manufacturing firms, information technology (IT) firms and non-IT services firms, and operating profit margins moderated across the major sectors during Q4:2023-24, with sales of manufacturing companies increasing (y-o-y) by 6.1 per cent and those of IT firms moderating to 3.1 per cent in Q4:2022-23 (Chart 1.35 a, b, c and 1.36).

Chart 1.35: Nominal Sales Growth



Note: Results are based on 2,823 listed private non-financial companies for Q4: 2023-24.
Source: Capitaline and RBI staff calculations.

Chart 1.36: Operating Profit Margin - Listed Private Non-Financial Companies

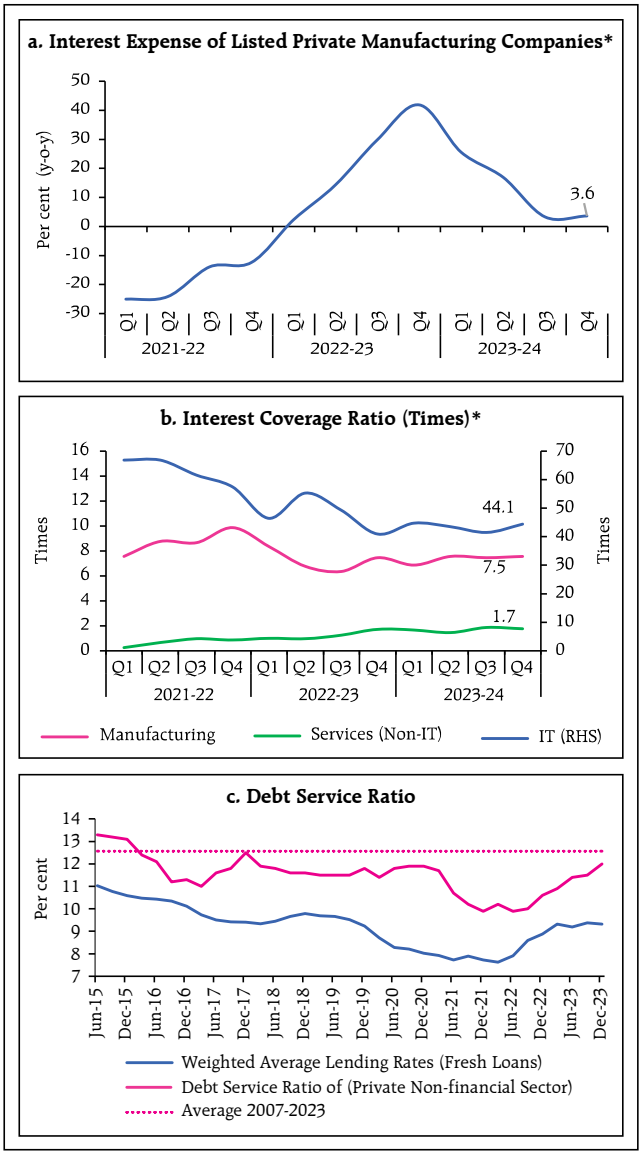


Note: Results are based on 2,823 listed private non-financial companies for Q4:2023-24.
Source: Capitaline and RBI staff calculations.

1.44 Despite the rise in interest rates, NFCs are exhibiting stability in key financial indicators. Their interest expenses have increased modestly, but lower leverage has contributed to a stable interest coverage ratio (ICR)[23]. Moreover, their debt service ratio[24] remains below its mean level (between 2007 and 2023), despite 169 bps increase in weighted average lending rates on fresh rupee loans between March 2022 and December 2023 (Chart 1.37 a, b and c).

1.45 Overall, the debt share of NFCs with ICR below unity, a key indicator of a firm's financial vulnerability, continued to decline (Table 1.2 and 1.3).

Chart: 1.37: Corporate Vulnerability Indicators



Note: * Results are based on 1,669 listed private manufacturing companies and 2,823 listed private non-financial companies for Q4:2023-24.
Sources: BIS, Capitaline and RBI staff calculations.

Table 1.2: Debt Share* of Firms Below/ Above ICR Threshold Values

Items	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
No. of Companies	3,238	3,231	3,205	3,163	3,103	2,963	2,990	3,073
ICR <=1 (per cent)	35.5	34.2	34.1	37.6	34.7	32.6	21.0	18.0
1 < ICR <= 4 (per cent)	34.8	34.3	27.6	25.2	31.5	15.2	27.9	33.3
ICR > 4 (per cent)	29.6	31.5	38.3	37.2	33.8	52.2	51.2	48.7

Note: * Debt includes total liabilities less total equity.
Sources: Capitaline and RBI staff calculations.

[23] Interest coverage ratio (ICR) is defined as the ratio of gross profit (EBIT) to interest expenses.

[24] The debt service ratio (DSR) is defined as the ratio of interest payments plus amortisations to income. As such, the DSR provides a flow-to-flow comparison – the flow of debt service payments divided by the flow of income and as such reflects the share of income used to service debt.

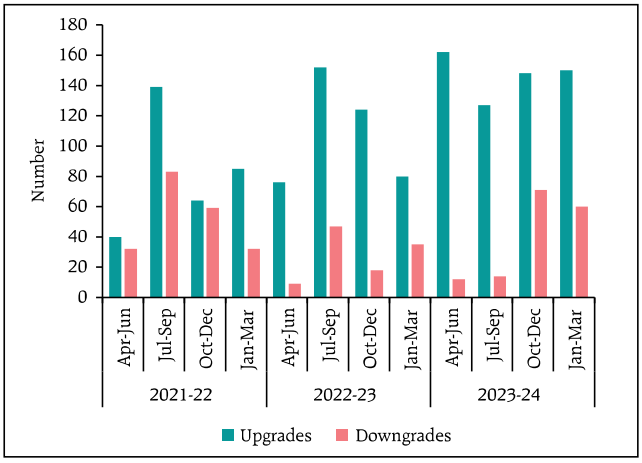
Table 1.3: Sectoral Share in Sales of Companies with ICR<=1

(per cent)

Year	Manufacturing	IT	Non-IT services	Aggregate
2020-21	6.8	3.0	44.1	10.5
2021-22	5.5	1.6	36.5	9.3
2022-23	3.5	1.3	22.5	5.5
2023-24	2.8	2.0	12.2	4.0

Source: Capitaline and RBI staff calculations.

Chart 1.38: Trend in Credit Rating Actions



Sources: CRISIL, ICRA and CARE.

1.46 The healthy credit profile of listed companies is also reflected in the rating actions of major credit rating agencies (CRAs). While credit upgrades have remained high in 2023-24 across three major credit rating agencies (ICRA, CRISIL and CARE), downgrades have also edged up moderately in H2:2023-24 (Chart 1.38).

I.2.5 Government Finance

1.47 Fiscal consolidation, buoyant tax collections and improvement in the quality of spending have been the distinguishing features of the Union Government's fiscal position. As per the provisional accounts (PA), the gross fiscal deficit (GFD) was 5.6 per cent of GDP in 2023-24 as against the budget estimates (BE) of 5.9 per cent. Gross tax collections posted double digit growth, driven up by direct tax collections. On the expenditure side, the strategy remained geared towards growth-inducing capital expenditure; growth in revenue expenditure remained muted at 1.2 per cent (Table 1.4).

Table 1.4: Fiscal Indicators – Central Government

Fiscal Indicators	Amount (₹ crore)		Growth Rate (per cent)	
	2023-24(PA)	2024-25(BE)	2023-24(PA)	2024-25(BE)
1. Gross Tax Revenue	34,64,792	38,30,796	13.4	10.6
Direct Tax Revenue	19,56,645	21,98,830	17.9	12.4
Indirect Tax Revenue	15,08,147	16,31,966	8.2	8.2
2. Tax Revenue (Net)	23,26,524	26,01,574	10.9	11.8
3. Total Non-Debt Receipts	27,88,872	30,80,275	13.6	10.4
3. Total Expenditure	44,42,542	47,65,768	5.9	7.3
Revenue Expenditure	34,94,036	36,54,657	1.2	4.6
Capital Expenditure	9,48,506	11,11,111	28.2	17.1
4. Fiscal Deficit	16,53,670	16,85,494	-4.8	1.9
5. Revenue Deficit	7,65,624	6,53,383	-28.4	-14.7
6. Primary Deficit	5,89,799	4,95,054	-27.1	-16.1

Note: PA: Provisional Accounts; BE: Budget Estimate.
Sources: Union Budget Documents and Controller General of Accounts (CGA).

Table 1.5: Central Government Finances - Key Deficit Indicators

(per cent of GDP)

Item	2020-21	2021-22	2022-23	2023-24 (PA)	2024-25 (BE)
Revenue Deficit	7.3	4.4	4.0	2.6	2.0
Gross Fiscal Deficit	9.2	6.7	6.4	5.6	5.1
Primary Deficit	5.7	3.3	3.0	2.0	1.5

Note: PA: Provisional Accounts; BE: Budget Estimate.
Sources: Union Budget Documents and CGA.

1.48 All major deficit indicators of the Union Government are projected to show further improvement (Table 1.5). The GFD is pegged at 5.1 per cent of GDP in 2024-25 (BE), 46 basis points lower than in 2023-24 (PA). Ongoing improvement in the quality of fiscal adjustment is also reflected in the declining revenue expenditure to capital outlay (RECO) ratio (Chart 1.39 a). Alongside, the share of borrowings directed towards growth-inducing capital outlay has increased from 47.6 per cent in 2023-24 (PA) to 55.7 per cent in 2024-25 (BE). Consequently, the central government's debt is projected to fall to 57.1 per cent of GDP in 2024-25 (BE) from 58.4 per cent of GDP a year ago, further consolidating public finances (Chart 1.39 b).

1.49 The states' combined GFD-GSDP ratio for 2024-25 is budgeted at 3.0 per cent, unchanged from the level in 2023-24 (PA) (Table 1.6). The increase in their capital expenditure has improved the quality of spending, as reflected in the RECO ratio and the

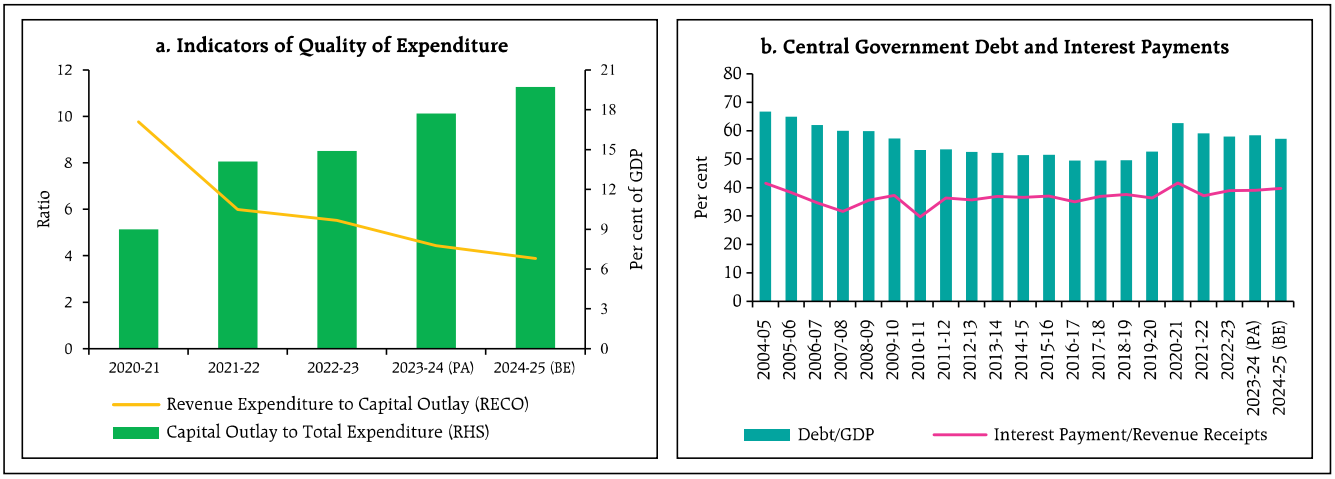
Table 1.6: State Government Finances: Key Deficit Indicators

(per cent of GSDP)

Item	2022-23	2023-24(PA)	2024-25 (BE)
Revenue Deficit	0.2	0.2	0.2
Gross Fiscal Deficit	2.7	3.0	3.0
Primary Deficit	1.0	1.4	1.3

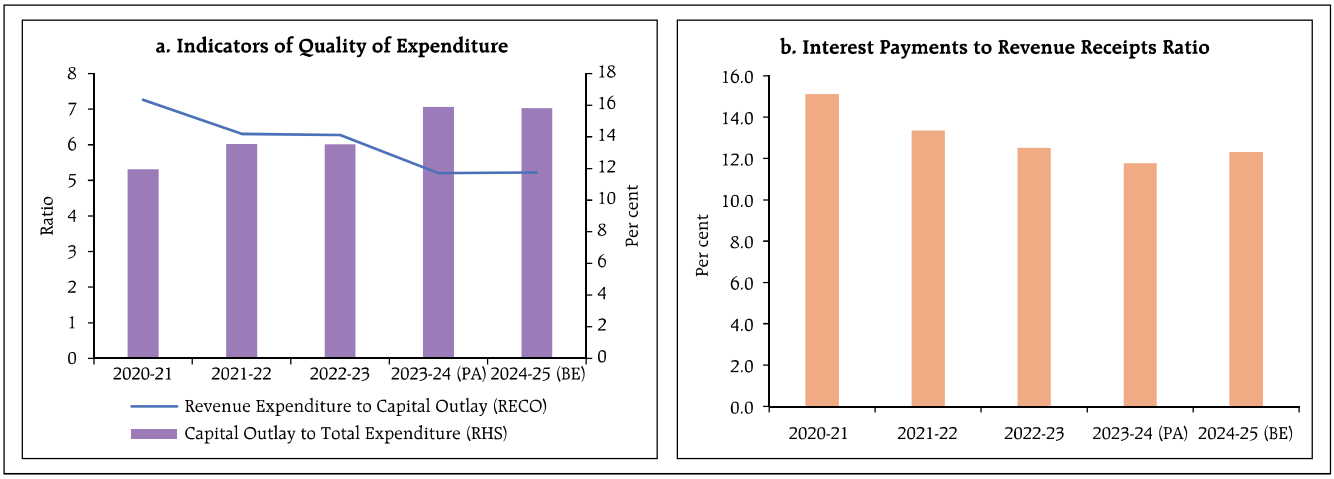
Note: (1) Data for 2022-23 and 2023-24 (PA) pertain to 31 States/ UTs and for 2024-25 (BE) pertain to 27 States/UTs. Data for 2023-24 (PA) and 2024-25 (BE) is taken as a per cent of GSDP.
(2) PA: Provisional Accounts; BE: Budget Estimate.
Source: Budget documents of the States; and Comptroller and Auditor General of India.

Chart 1.39: Key Fiscal Performance Indicators - Central Government



Note: PA: Provisional Accounts BE: Budget Estimate.
Sources: Union Budget Documents and CGA.

Chart 1.40: Key Fiscal Performance Indicators - State Governments



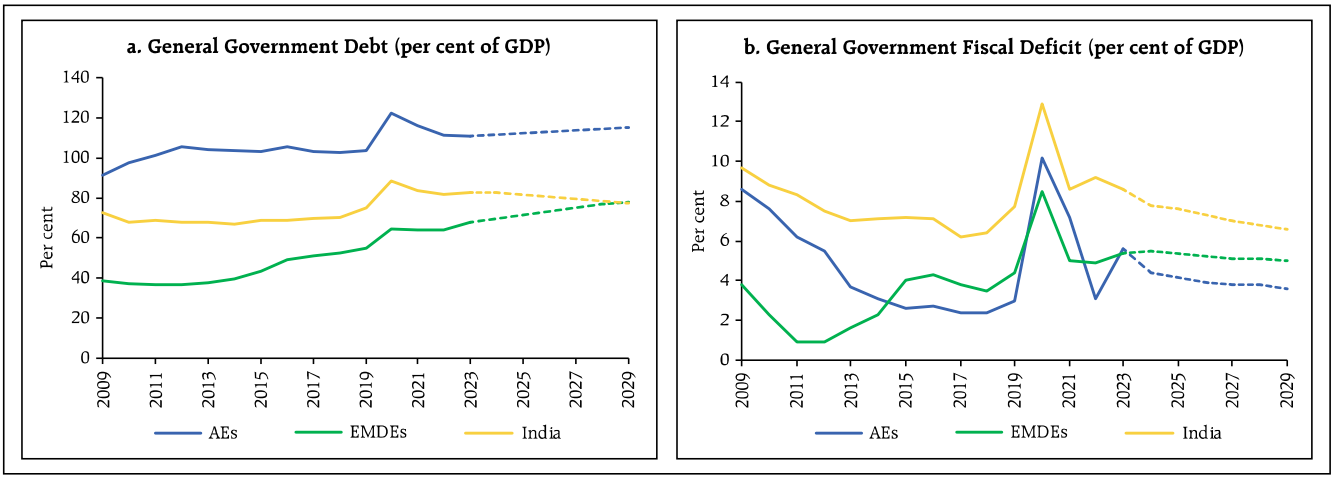
Note: Data for 2023-24 (PA) pertains to 31 States/UTs and for 2024-25 (BE) pertains to 27 States/UTs.
Source: Budget documents of the States; and Comptroller and Auditor General of India.

share of capital outlay in total expenditure (COTE) (Chart 1.40 a). Alongside, states' debt-to-GDP ratio declined to 27.6 per cent by March 2024 from the pandemic high of 31.0 per cent of GDP in March 2021. The ratio of interest payments to revenue receipts has also moderated (Chart 1.40 b).

1.50 Although India's general government debt and deficit are higher than peer EMDEs, they are projected to continue to decline over the medium-term (Chart 1.41 a and b).

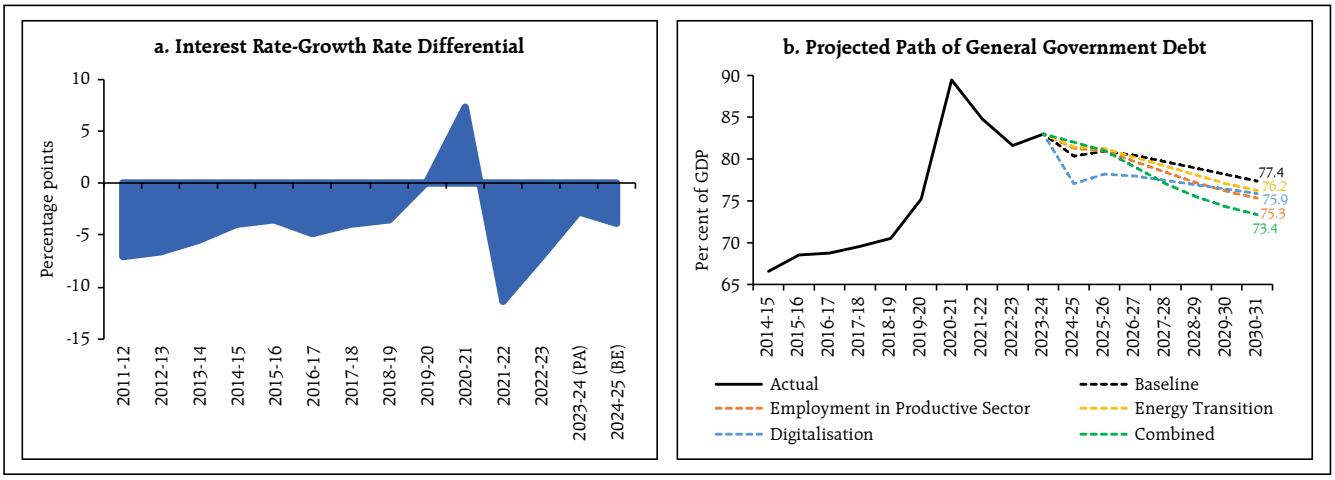
1.51 Debt dynamics exhibit sustainability due to robust economic growth and lower primary deficits as a direct consequence of fiscal consolidation. The interest rate-growth rate differential (r-g) remains favourable, which augurs well for debt sustainability (Chart 1.42 a). Growth-inducing expenditures such as spending on social and physical infrastructure, climate mitigation, digitalisation and skilling the labour force can further improve productivity, outweigh short-run costs, yield long-term growth

Chart 1.41: India, AEs and EMDEs – Debt and Deficit



Note: Charts present weighted average position. Dotted lines represent forecasts.
Source: IMF.

Chart 1.42: Debt Indicators



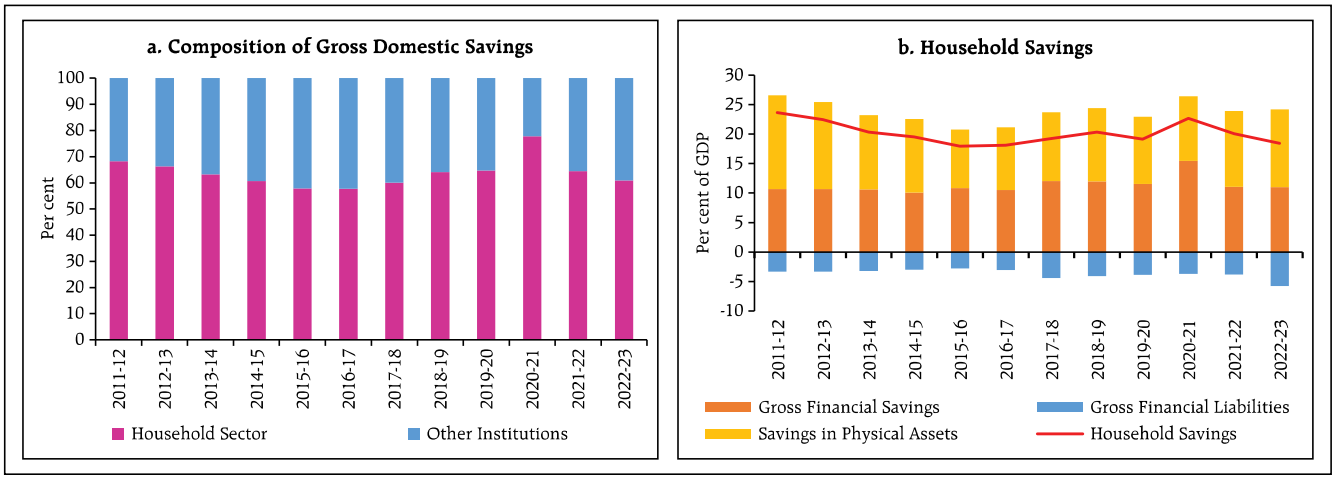
Sources: Union Budget Documents and RBI staff calculations.

dividends and lead to a substantial decline in the debt-to-GDP ratio in the medium-term[25] (Chart 1.42 b).

I.2.6 Household Finance

1.52 India's gross savings rate stood at 29.7 per cent of gross national disposable income (GNDI) in 2022-23, with households being the primary savers and forming 60.9 per cent of aggregate savings (10-year average for 2013-2022 stood at 63.7 per cent). For the household sector, savings in physical assets has been the dominant and rising component. The share of net financial savings in total household savings has been declining: it stood at 28.5 per cent in 2022-23, from an average of 39.8 per cent during 2013-2022. Combined with the rise in financial liabilities, net financial savings also declined to 5.3 per cent of GDP during 2022-23 from an average of 8.0 per cent during 2013-2022 (Chart 1.43 and 1.44).

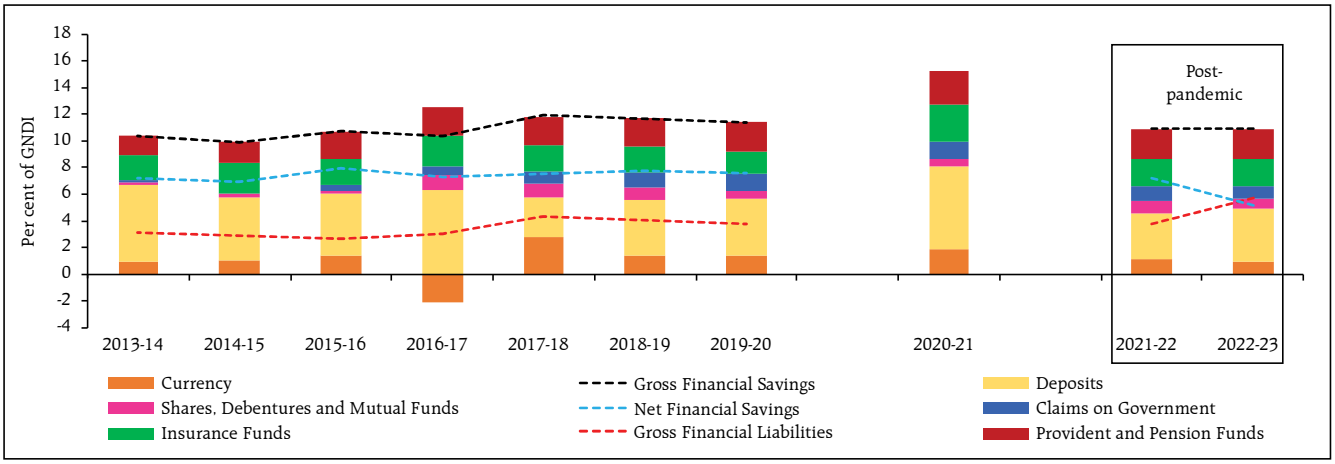
Chart 1.43: Gross Savings and Household Savings



Source: National Statistical Office, MoSPI.

[25] Patra, M.D, Behera, S.R, Behera, H.K, Banerjee, S, Padhi, I, Sood, S (2024), "The Shape of Growth Compatible Fiscal Consolidation", RBI Bulletin, February.

Chart 1.44: Household Financial Savings



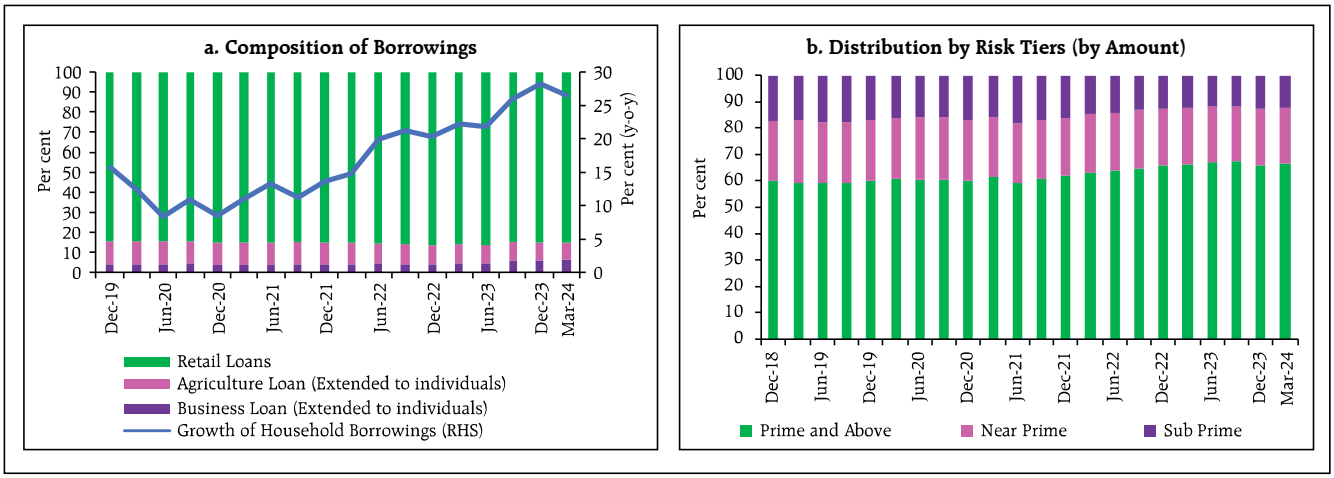
Source: National Statistical Office, MoSPI.

1.53 The sharp rise in household financial savings during the pandemic (51.7 per cent of total household savings in 2020-21) has been drawn down subsequently, as in many other economies, and shifted towards physical assets. Alongside, households are also diversifying their financial savings, allocating more to non-banks and capital markets.

1.54 Financial liabilities of households have risen in the post-pandemic period, as reflected in the surge in retail loan growth for financing both consumption and investment. Alongside, agricultural and business loans have also grown. Notably, more than two-thirds of borrowers are of prime and above credit quality (Chart 1.45 a and b).

1.55 At 40.1 per cent of GDP[26], the stock of household debt in India is relatively low when compared to other EMEs, but in relation to GDP per capita, it is comparatively high (Chart 1.46 a and

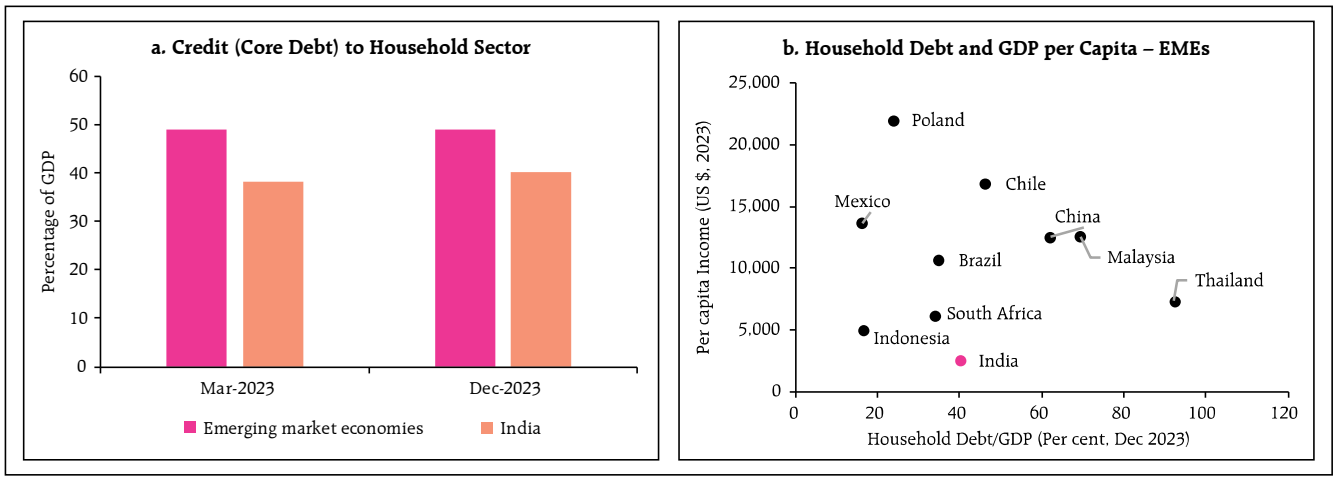
Chart 1.45: Household Borrowings from Financial Institutions



Note: Financial institutions include banks and non-banks, excluding insurance companies.
Source: TransUnion CIBIL.

[26] The five-year average between 2015-19 stood at around 33 per cent.

Chart 1.46: Household Debt



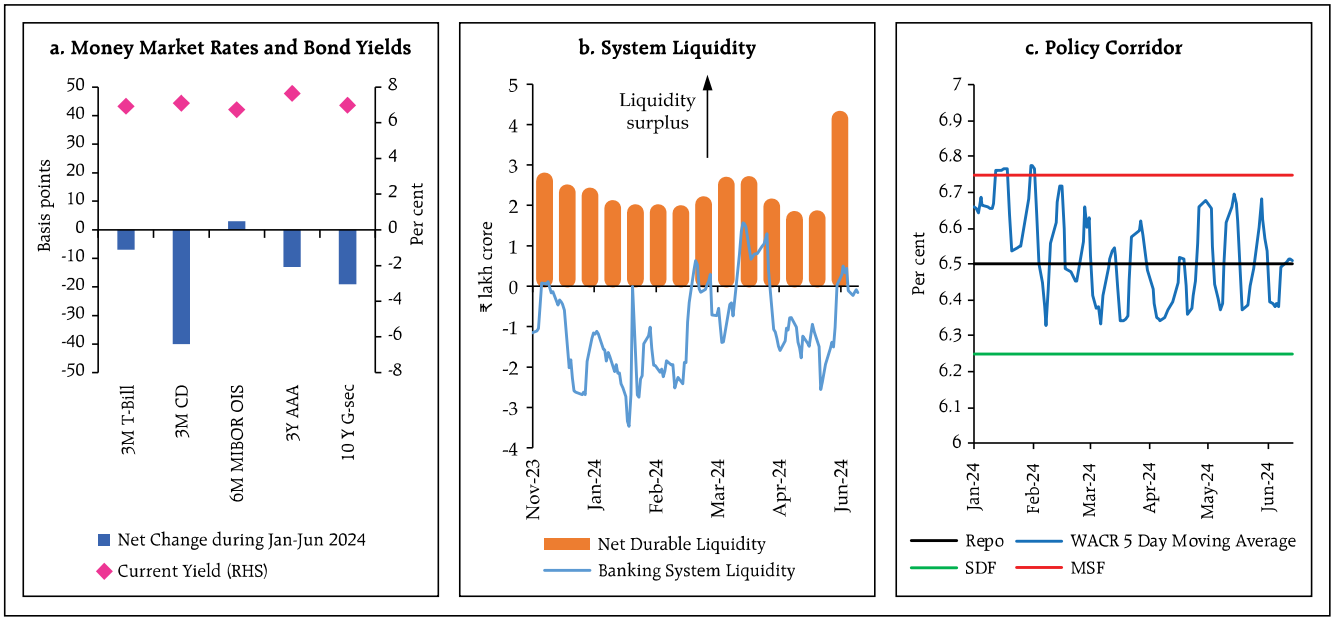
Source: BIS.

b). With overall household savings declining to 18.4 per cent of GDP in FY:2022-23 from an average of 20.0 per cent of GDP over 2013-2022, and coupled with an increasing trend in financial liabilities, household debt warrants close monitoring from a financial stability perspective.

I.2.7 Money and Capital Markets

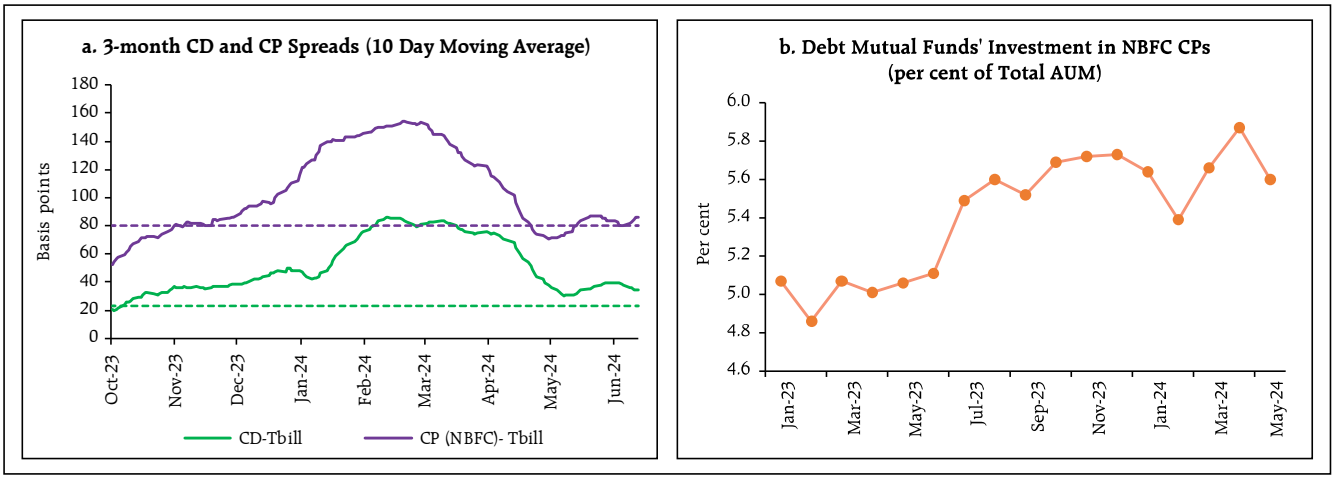
1.56 Domestic financial conditions have generally eased since the December FSR, in line with the movements in system liquidity. This is reflected in the easing of money market rates and government securities yields (Chart 1.47 a and b). The weighted average call rate (WACR) generally remained within the policy corridor (Chart 1.47 c).

Chart 1.47: Money Market Rates and System Liquidity



Note: (1) * As of June 14, 2024.
(2) 'Durable liquidity' adjusts the banking system liquidity for government cash balances.
Source: Bloomberg.

Chart 1.48: Money Market Spreads and Mutual Fund Investments



Note: Dotted lines indicate average spread from January 01, 2021 to June 14, 2024.
Sources: Bloomberg and SEBI.

1.57 Money market spreads narrowed after spiking during January-March 2024, reflecting movements in system liquidity and mutual fund investment patterns. The widening of commercial paper (CP) spreads and subsequent narrowing was primarily driven by mutual fund investments, the main investors in the CP market with an average share of 82 per cent between June 2020 – December 2023[27]. Movements in certificate of deposit (CD) spreads were driven by evolving shifts in banking system liquidity (Chart 1.48 a and b).

1.58 Among the autonomous drivers of system liquidity, the large changes in government cash balances have been the dominant driver in the recent period as reflected in a high negative correlation (Table 1.7 and Chart 1.49).

1.59 The sovereign yield curve has bull flattened (*i.e.*, long-terms rates fell faster than short-term

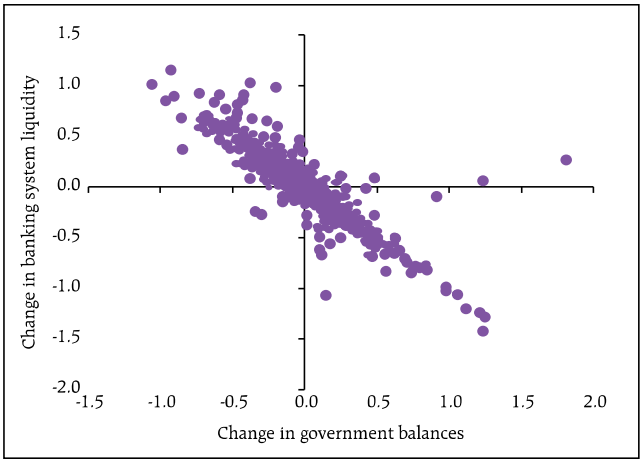
Table 1.7: Autonomous Drivers of Banking System Liquidity

(Amount in ₹ crore)

Year	2023-24	2024-25*
Autonomous Drivers of Liquidity	**26,577**	**-2,95,569**
1. Currency in Circulation	-1,32,749	-76,120
2. GoI Cash Balances	-2,20,848	-2,14,198
3. Net Forex Activity of RBI	3,39,528	-4,901
4. Excess Reserves	40,646	-350

Note: (1) * Updated till June 09, 2024.
(2) Positive figure denotes increase in banking system liquidity and negative figure denotes decrease in banking system liquidity.
Source: RBI.

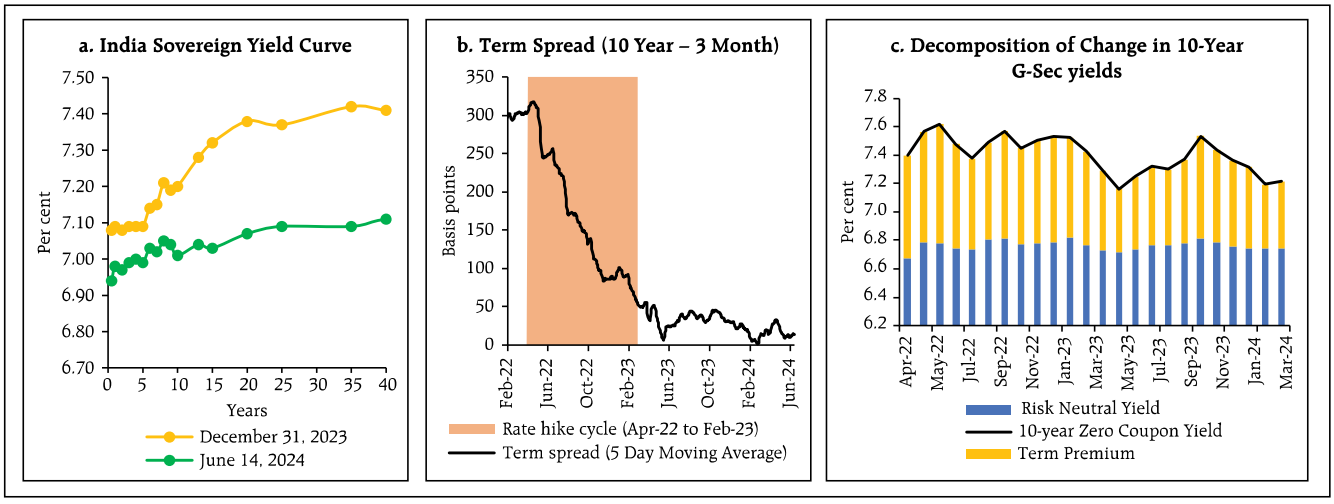
Chart 1.49: Daily Change in Government Balance and Banking System Liquidity



Note: All figures in ₹ lakh crore. Data from April 2020 to June 2024.
Source: RBI and staff calculations.

[27] Anshul, Priyanka P, Srijashree S, Dipak R C and Sangeeta D (2024), "Drivers of Commercial Paper Rate Spread - An Empirical Assessment", RBI Working Paper Series No. 02, March. Mutual funds share in CP market increased to 83.4 per cent as at end-May 2024.

Chart 1.50: Sovereign Yield Curve and Term Spread

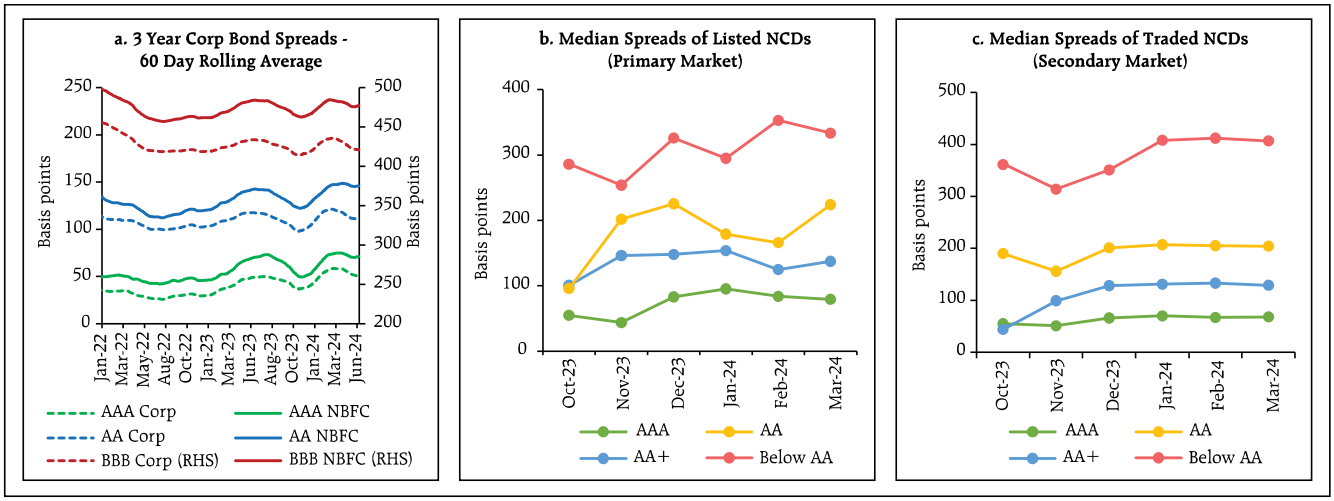


Note: The decomposition into risk neutral yield and term premium is based on Adrian, Crump, and Moench (2013)[28].
Sources: FBIL, Refinitiv and IMF.

rates), supported by improving fiscal dynamics, anchoring of inflation expectations and positive sentiments in response to inclusion of Indian government securities in global bond indices[29]. As a result, the average term spread in the G-sec market (10-year minus 91-day Treasury Bills) narrowed to just 16 bps during January-May 2024 from 35 bps during July-December 2023. Changes in term premiums have been the dominant factor in movements in long-term bond yields, with short-term rates remaining stable (Chart 1.50 a, b and c).

1.60 Between October 2023 and March 2024, corporate bond spreads and those of listed non-convertible debentures (NCDs) over the yield of 3-year benchmark government securities widened marginally across institutions and rating categories (Chart 1.51 a, b and c).

Chart 1.51: Corporate Bond Spreads



Sources: Bloomberg, NSDL, CDSL, NSE & BSE.

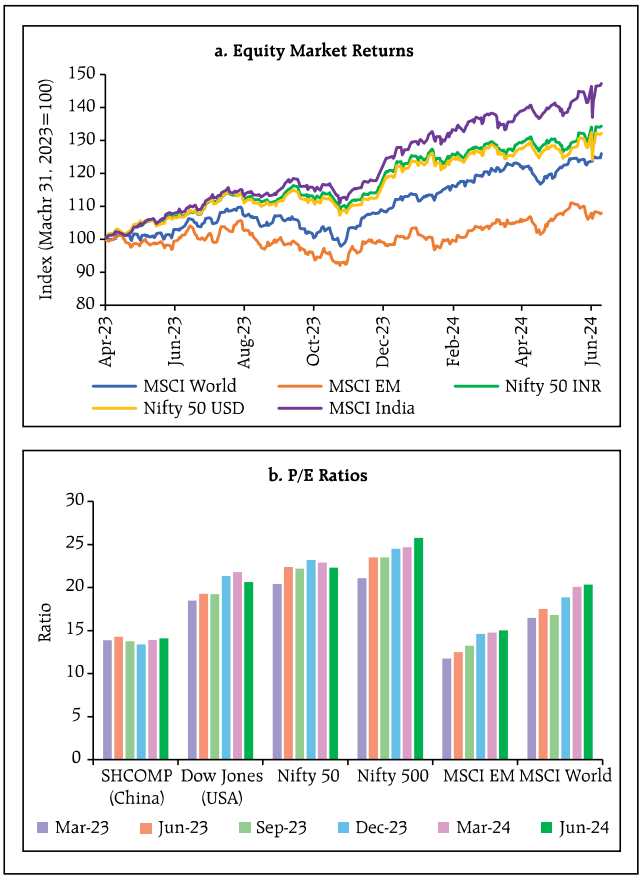
[28] Adrian, Tobias, Crump, Richard K., and Moench, Emanuel (2013), "Pricing the Term Structure with Linear Regressions", Journal of Financial Economics, Volume 110, Issue no. 1, Pages 110 –138.

[29] Indian government securities were included in the JP Morgan Global Bond Index - Emerging Markets and Bloomberg Emerging Market Local Currency Government Bond Index.

1.61 NBFCs, public sector undertakings (PSUs) and body corporates were the major issuers of corporate bonds, together accounting for nearly three fourths of total issuances. Private placement was the preferred mode of raising funds. Among the investing entities, banks and body corporates held nearly 60 per cent of the total issuances (Chart 1.52 a, b and c).

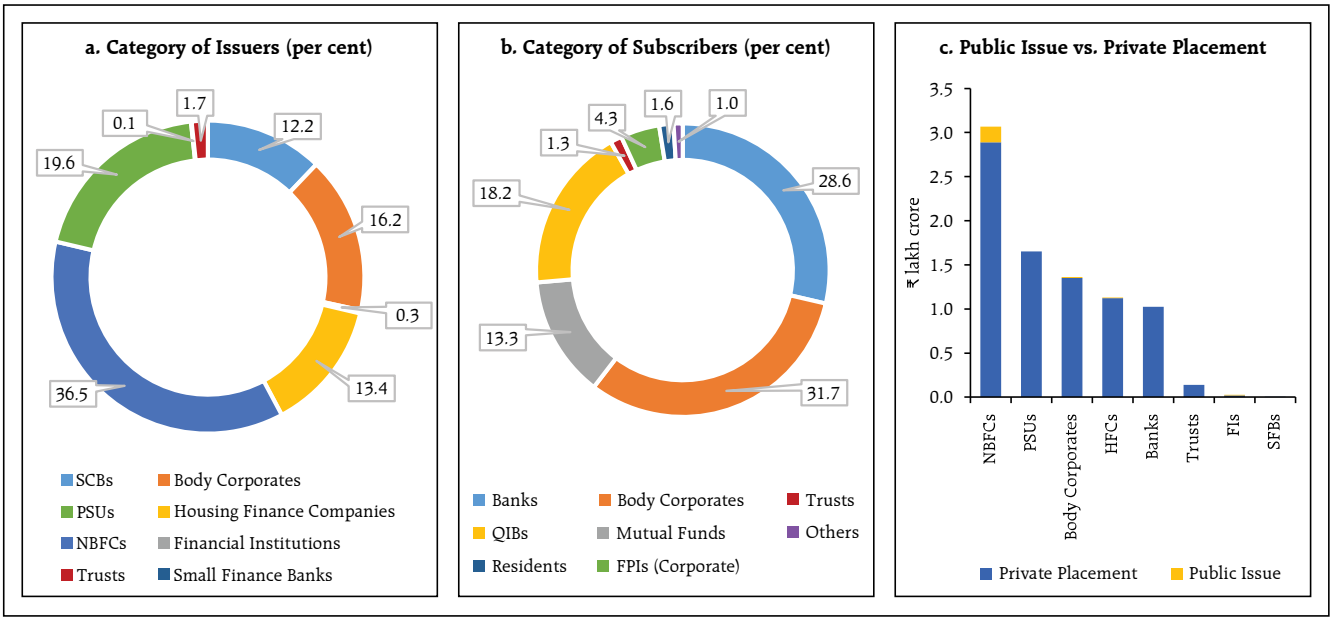
1.62 Supported by strong macroeconomic fundamentals, healthy corporate balance sheets, robust earnings outlook, stable financial conditions and sustained inflows into domestic mutual funds, the Indian equity market has been consistently outperforming its EME peers. During 2023-24, the Nifty 50 index yielded 28.6 per cent returns in local currency (26.8 per cent in USD terms). Contemporaneously, the MSCI India index posted a return of 35.5 per cent, higher than the MSCI-Emerging Markets index return of 23.2 per cent. Price-to-earnings (P/E) ratios also rose sharply (Chart 1.53 a and b).

Chart 1.53: Equity Market Performance and P/E Ratios



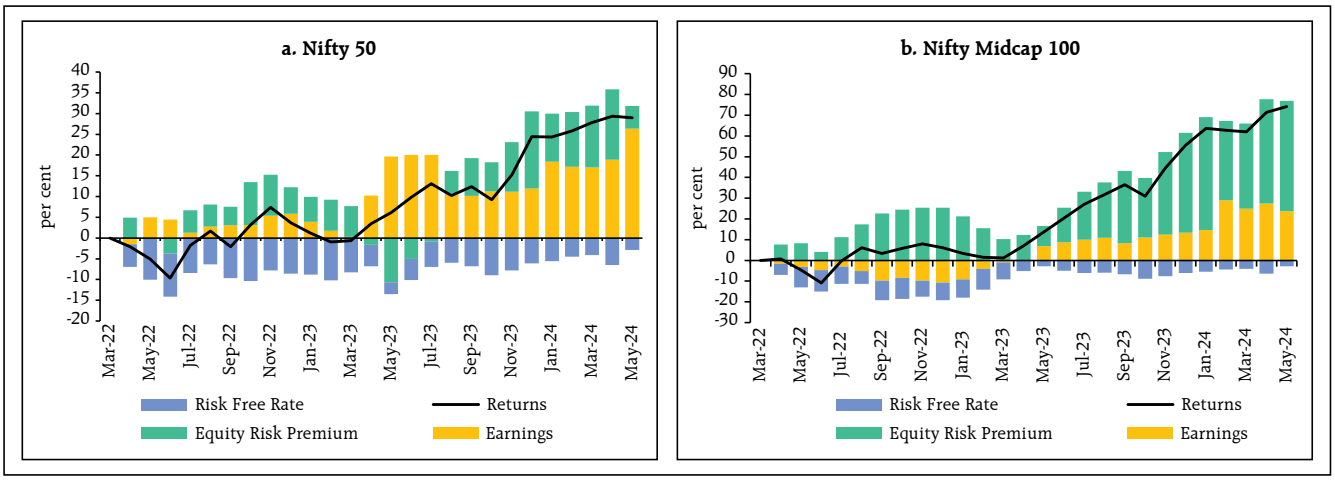
Note: Trailing P/E Ratios
Sources: Refinitiv, NSE and MSCI.

Chart 1.52: Corporate Bond Issuance and Subscription from April 2023 to March 2024



Note: (1) QIBs stands for Qualified Institutional Buyers.
(2) 'Others' include Alternative Investment Funds (AIFs), clearing members (CMs), NBFCs, Insurance Funds, Pension Funds, FPIs (Individuals), foreign nationals, HUFs, NRIs, among others.
Sources: NSDL and CDSL.

Chart 1.54: Decomposition of Cumulative Nifty Returns



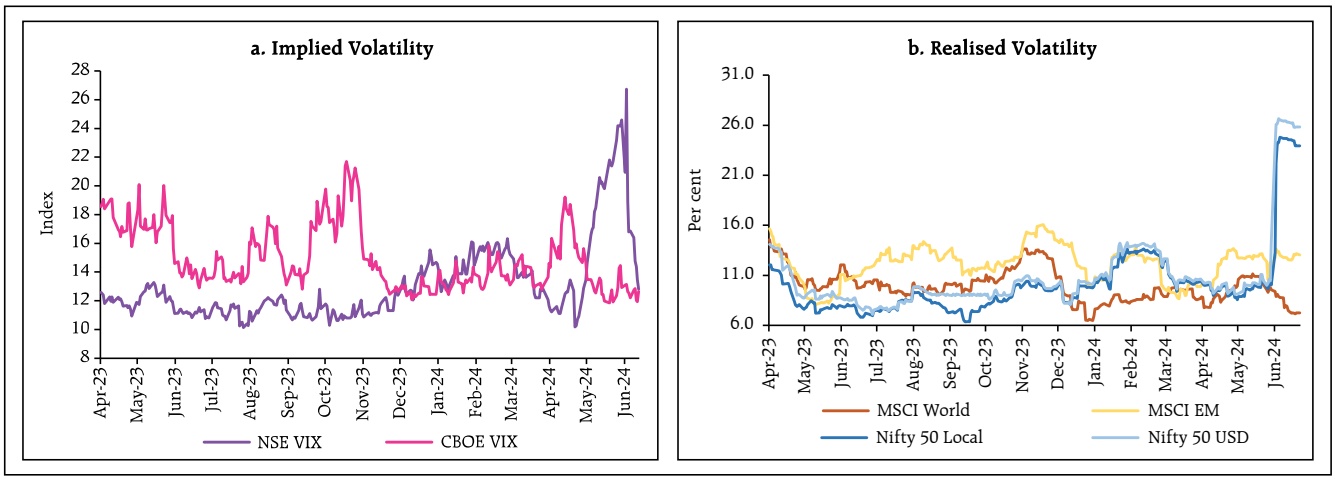
Sources: Bloomberg and RBI Staff Calculations.

1.63 A standard discounted cash flow model suggests that the rise in the overall Nifty 50 index since March 2022 appears to have been driven mainly by improved earnings projections and to a lesser extent by investors' risk appetite (declining equity risk premium). Extending the model to analyse the returns on midcap index shows that investors' higher risk appetite is the major driver of returns when compared to improved earnings projections (Chart 1.54 a and b).

1.64 Equity market volatility has mostly remained lower than that of global indices in terms of both implied volatility based on option prices and realised volatility, except in June 2024 when it spiked in response to general election results (Chart 1.55 a and b).

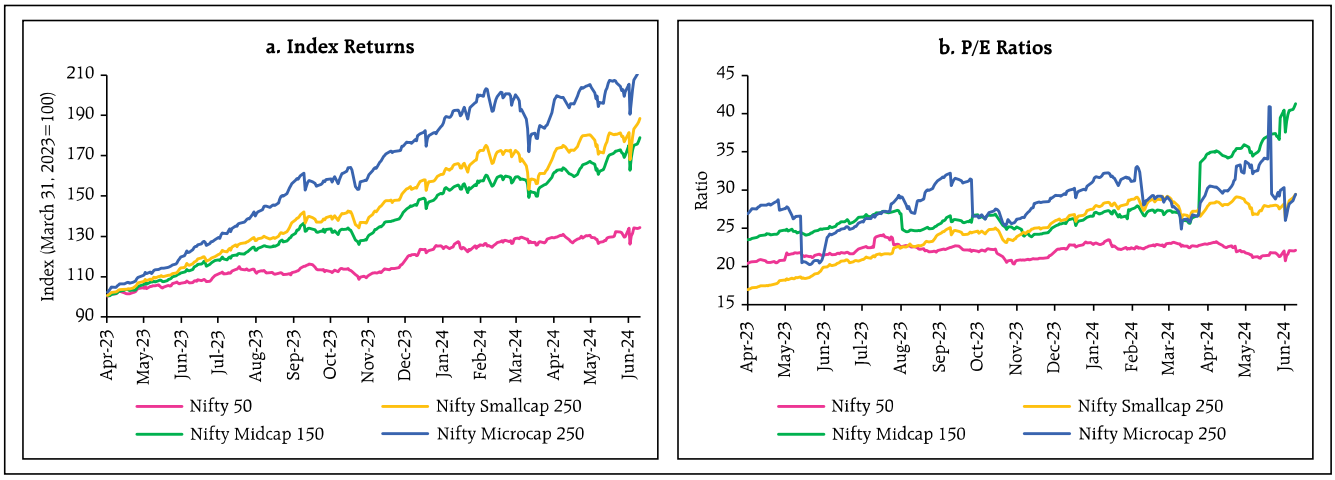
1.65 Midcap, smallcap and microcap stocks have logged higher returns than Nifty 50 stocks during 2023-24. Consequently, their P/E ratios have also risen sharply (Chart 1.56 a and b and Table 1.8).

Chart 1.55: Equity Market Volatility



Note: NSE VIX is a volatility index based on the NIFTY Index Option prices and Chicago Board Options Exchange's (CBOE) Volatility Index is a popular measure of the stock market's expectation of volatility based on S&P 500 index option prices.
Sources: Refinitiv and NSE.

Chart 1.56: Performance of Nifty Benchmark Indices



Source: NSE.

Table 1.8: Returns of Nifty Benchmark Indices

(per cent)

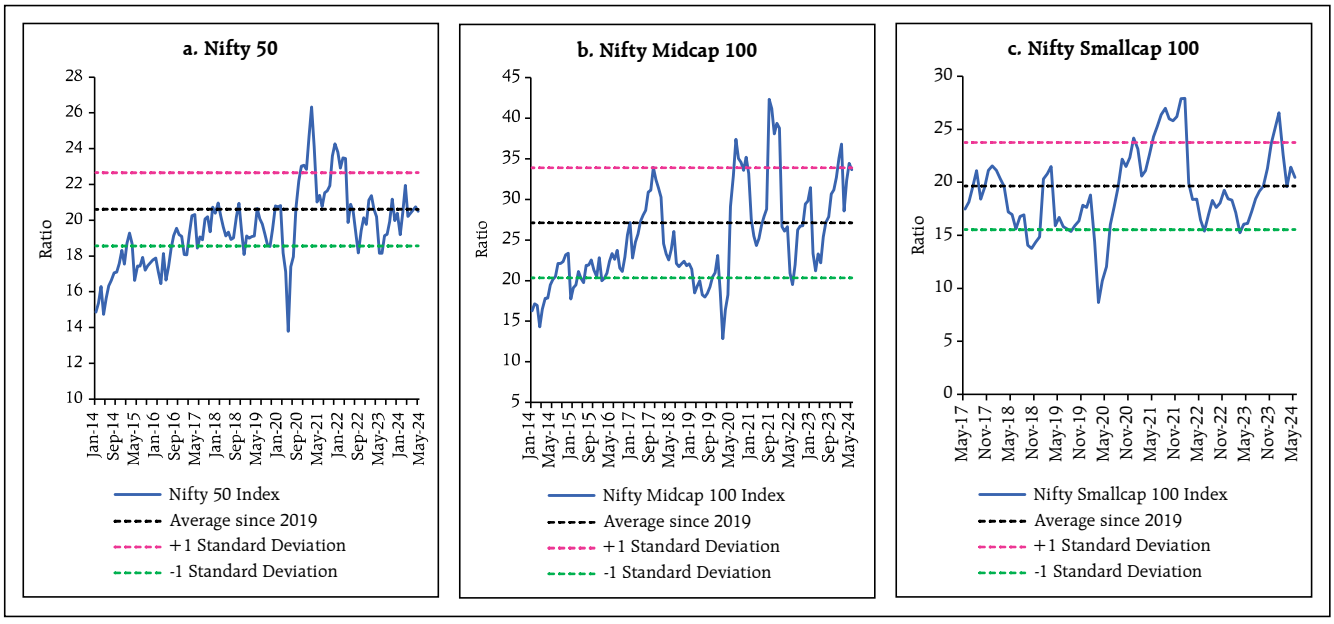
CAGR	Nifty 50	Nifty Midcap 150	Nifty Smallcap 250	Nifty Microcap 250
1-year	29	56	63	85
2-years	13	26	23	37
3-years	15	25	28	42

Note: CAGR w.r.t. March 31, 2024.
Source: NSE.

1.66 Analysis of a longer time series of 12-month forward P/E ratios shows that while Nifty 50 and Nifty smallcap 100 are trading close to their historical averages since 2019, Nifty midcap 100 is trading one standard deviation above its historical average (Chart 1.57 a, b and c).

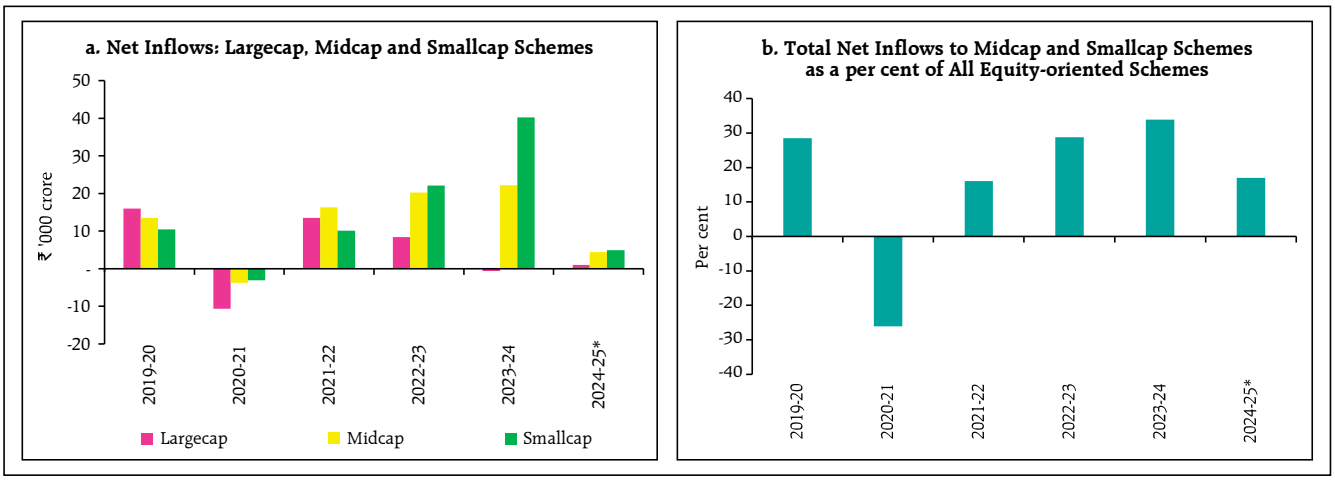
1.67 The rise in prices and valuations of these stocks was driven by a sharp increase in net inflows to midcap and smallcap mutual fund (MF) schemes. Smallcap MF schemes saw net inflows of ₹ 40,189 crore during 2023-24, even as largecap schemes witnessed net outflows. In 2024-25 so far, all three schemes received net inflows (Chart 1.58 a and b).

Chart 1.57: 12-month Forward P/E Ratios



Sources: Bloomberg and RBI Staff Calculations.

Chart 1.58: Annual Trends in Net Inflows to Different Schemes of Mutual Funds



Note: * For April-May 2024.
Source: SEBI.

1.68 The rapid rate at which midcap and smallcap stocks have been rising over the past year and the increase in inflows to MF schemes targeted at these segments have elicited concerns about froth in some pockets of the market. The Association of Mutual Funds in India (AMFI), in consultation with the Securities and Exchange Board of India (SEBI), mandated all Asset Management Companies (AMCs) to disclose risk parameters, *viz.*, time taken to liquidate 25 per cent and 50 per cent of the portfolio, asset and liability side concentration, standard deviation, portfolio beta, portfolio trailing P/E ratio and portfolio turnover ratio of these schemes. As per the disclosure for May 2024, the number of days to liquidate 25 per cent of the portfolio for the top 5 schemes ranged from 4 to 13 days in midcap schemes and 12 to 36 days in smallcap schemes (Table 1.9).

1.69 The equity derivatives segment has been witnessing growing participation from retail investors in recent years. It has gone up by 42.8 per cent from 65.0 lakh during 2022-23 to 95.7 lakh during 2023-24. While trading volumes in derivatives segment has seen exponential growth over the years in notional terms, the trading

Table 1.9: Summary of Risk Parameters of Midcap and Smallcap MF Schemes

		Midcap Schemes				Smallcap Schemes			
		February 2024	March 2024	April 2024	May 2024	February 2024	March 2024	April 2024	May 2024
No. of days to liquidate 25 per cent of portfolio- Range for top 5 schemes w.r.t. AUM		4 to 17	4 to 15	4 to 14	4 to 13	11 to 30	10 to 29	11 to 27	12 to 36
Concentration-Assets side (AUM held in per cent)*	**Largecap**	13.5	14.2	14.1	14.0	6.9	7.1	6.8	6.9
	Midcap	65.0	65.5	67.9	68.1	11.5	11.4	12.0	11.9
	Smallcap	14.2	13.7	14.9	14.8	72.7	72.6	76.4	76.4
	Cash	3.8	3.7	3.1	3.0	6.0	5.8	5.6	5.5

Note: *Largecap, Midcap and Smallcap are as per AMFI classification.
Source: SEBI.

Table 1.10: Derivatives to Cash Ratio

FY	Derivatives to Cash (notional) Ratio	Derivatives to Cash (premium) Ratio
2021-22	98	2.03
2022-23	269	2.82
2023-24	405	2.24

Source: SEBI.

volumes when measured by the premium turnover, has witnessed a linear growth pattern. The ratio of premium turnover to cash market has remained steady over the last 3 years (Table 1.10).

1.70 Globally due to the existence of dark pools, Alternative Trading Systems, and Systematic Internalisers (SI), not all trades get transacted on stock exchanges. In India, these trading facilities are not permitted. Therefore, it may not be appropriate to compare the derivatives to cash market turnover ratio in India with that of global peers.

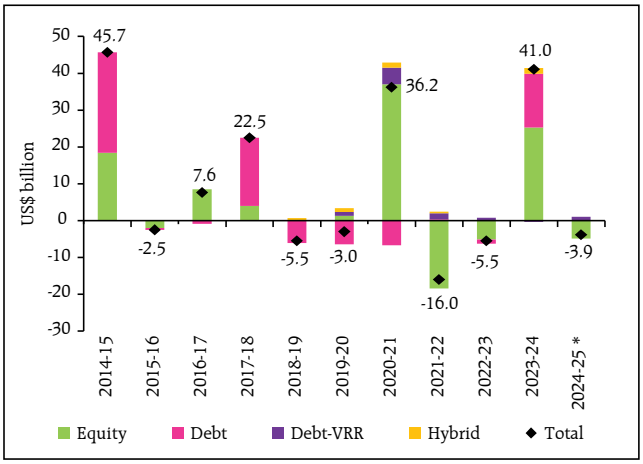
1.71 Equity derivatives market can improve price discovery and enhance market liquidity in underlying cash markets. It, however, is also associated with higher risks. Since derivatives are more complex than the underlying, investor protection is a key regulatory imperative. A SEBI research published in January 2023 showed that 89 per cent of individual participants in Equity Futures and Options (F&O) lost money in the segment during Fiscal Year 2018-19 and Fiscal Year 2021-22. As part of enhanced customer disclosure, *inter alia*, brokerages are now also required to disclose this statistic to their clients before they initiate any trade. Moreover, to mitigate risks the regulator follows a conservative approach in the areas of margining, setting of open interest limits, and in the management of clearing and settlement risks. The risk architecture is also unique in India with clearing corporations required to ensure margins are maintained at an individual participant level, and not just at a clearing member level.

1.72 Nevertheless, the rapid rise in F&O volumes in recent years could pose several challenges: retail investors could be impacted by sudden movements in markets without proper risk management and this could have knock-on effects on cash market; rise in popularity of shorter-duration options in indices with few stocks and high volatility could amplify leverage; and preference among investors to reduce holding period and shift from one instrument to another searching for immediate expiries could intensify volatility. Therefore, it is imperative to closely monitor risks emerging from this segment and initiate appropriate and proactive policy response. Accordingly, the SEBI has instituted an Expert Working Group, under the Secondary Markets Advisory Committee, to review F&O markets from both an investor protection and overall systemic risk management perspective.

1.73 The SEBI is also in the process of reviewing the corpus of the Settlement Guarantee Fund (SGF), stress testing methodologies and scenarios for computation of core SGF to build a more resilient settlement system to meet contingencies arising due to failure to honour obligations by any member of a stock exchange.

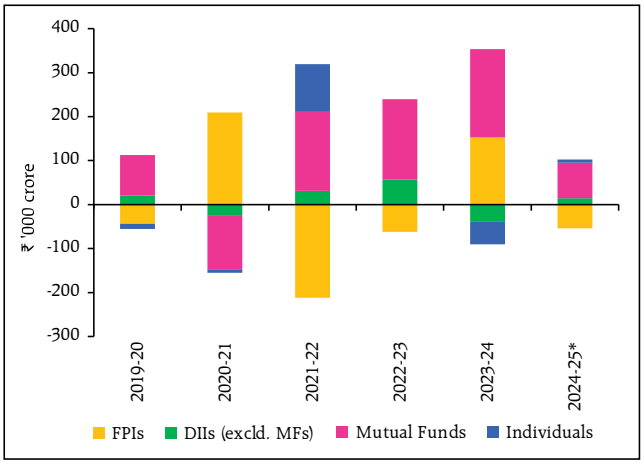
1.74 FPI inflows to Indian capital markets rose sharply during 2023-24. After being net sellers to the tune of US$ 5.5 billion (equity- US$ 5.1 billion, debt- US$ 0.4 billion) in 2022-23, foreign portfolio investors made second highest recorded net investments of US$ 41.0 billion in 2023-24 in equity (US$ 25.3 billion), debt (US$ 14.2 billion) and hybrid (US$ 1.5 billion) segments. FPI flows, however, turned negative with net outflows of US$ 3.9 billion in the current financial year so far (up to June 12, 2024). On the other hand, domestic investors remain bullish on Indian equities and provide support to the market even during periods of sharp FPI outflows (Chart 1.60 and 1.61). Despite strong FPI flows to India, persistent geopolitical conflicts have emerged as a new source of risk (Box 1.1).

Chart 1.59: Trend in Net FPI Investments



Note: * Up to June 12, 2024.
Source: NSDL.

Chart 1.60: Trends in Net Investments - FPIs, DIIs and Individual Investors



Note: * Up to June 12, 2024.
Sources: NSE, BSE and SEBI.

Box 1.1: Geopolitical Uncertainties: Effect on Portfolio Flows and Exchange Rate Volatility

Geopolitical tensions threaten financial stability through the financial channel (IMF, 2023), leading to increased asset price volatility and prompting investors to seek safer havens (Table 1).

An analysis for the period January 2010 – March 2024 suggests that net FPI inflows to Indian equities have remained lower during months of high geopolitical uncertainty, as measured by the geopolitical risk (GPR) index (Caldara and Iacoviello, 2022) than during other months (Table 2).

In fact, the distribution of FPI flows during high and low geopolitical risk periods exhibits a fat left tail, indicating a higher likelihood of outflows from Indian equity markets (Chart 1).

The effect of geopolitical uncertainties can be estimated by using a quantile regression framework (Patra *et al.*, 2022) as follows:

$VIX_t = \theta_0 + \theta_1 GPR_t + \eta_t$ (Instrument equation)

$\sigma_t^2 = \beta_0 + \beta_1 \widehat{VIX_t} + \gamma X_t + \eta_t$ (two-stage approach where $\widehat{VIX_t}$ is instrumented by GPR_t)

where σ_t^2 is the estimated stochastic volatility[30] of FPI flows, GPR_t is the geopolitical index, X_t are other controls (for pull and push factors driving FPI flows such as: GDP growth; inflation (proxied by GDP deflator); and interest rate differentials (difference between 3-month treasury yields in India and the US). The model is estimated on quarterly data from Q1: 2006-07 till Q3:2023-24.

Table 1: Immediate Impact of Geopolitical Incidents

Early peak period of Geopolitical Incidents	Cumulative FPI Equity flows (US$ million)	Return on Sensex (per cent)
Russian-Ukraine conflict (February 24, 2022 – March 9, 2022)	-6,969.7	-4.5
Hamas-Israel conflict (October 7, 2023 – October 12, 2023)	-247.2	0.6
Iran-Israel conflict (April 12, 2024 – April 18, 2024)	-2,229.1	-3.4

Note: (1) Dates in parentheses correspond to immediate periods of FPI outflows following a geopolitical incident.
(2) Negative sign indicates FPI outflows.
Source: Bloomberg and RBI Staff calculations.

(Contd.)

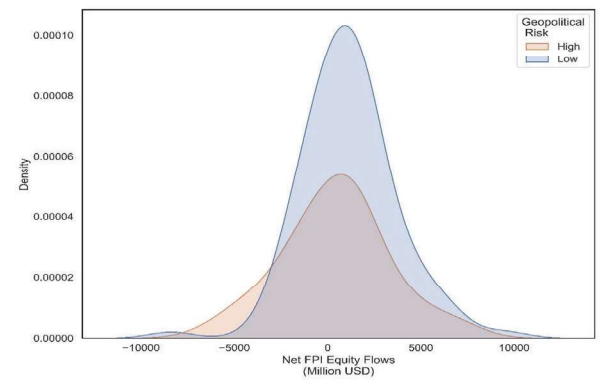
[30] Stochastic volatility is estimated using random walk model for mean process and unobserved volatility component. The model is estimated using the Bayesian technique suggested by Kastner and Frühwirth-Schnatter (2014).

Table 2: FPI flows and Level of Geopolitical Risk

Geopolitical Risk Index	Average monthly FPI flows (net) into Indian equity market (US$ million)
Low	1,126.7
High	409.5

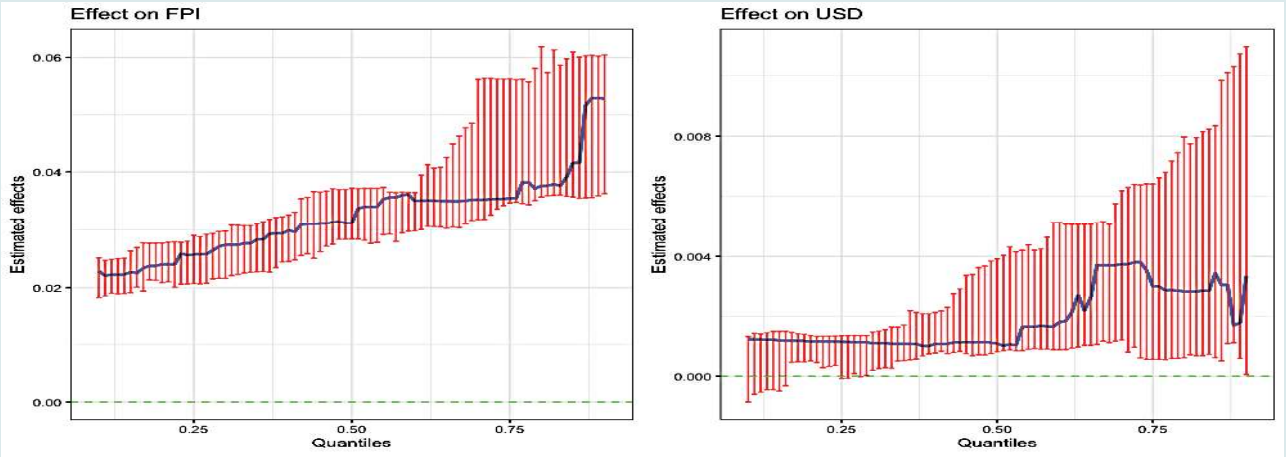
Note: GPR index is normalised to a value of 100 (average) in the 2000-09 decade, so that a reading of 200, for instance, indicates that newspaper mentions of rising geopolitical risk in that month were twice as frequent as they were during the 2000s. Therefore, we classify GPR values above 100 as 'high' and those less than or equal to 100 as 'low'.
Source: NSDL and Statista Database.

Chart 1: Probability Distribution – Equity FPI Flows



Note: This Kernel density estimation (KDE) plot for FPI flows for high and low geopolitical risk periods uses bandwidth parameter value of 1.2.
Source: NSDL and Authors' calculations

Chart 2: Effect of Geopolitical uncertainties on FPI and Exchange Rate Volatility



Note: The blue lines are point estimates and red bars are the 95 per cent confidence band.

The effect of geopolitical risks on FPI inflows is significant across all quantiles, amplifying exchange rate volatility in periods when it is already high. The findings underline the risk-return trade-off in portfolio adjustments by foreign investors in response to geopolitical risks – investors balance their risk appetite between risk-adjusted and risk-free returns (Chart 2).

In sum, geopolitical uncertainties increase volatility in FPI flows and exchange rates in the Indian context.

Reference:

1. Caldara, Dario and Matteo Iacoviello (2022), 'Measuring Geopolitical Risk', American Economic Review, April, 112(4), pp.1194-1225.
2. Caldara, Dario, Sarah Conlisk, Matteo Iacoviello, and Maddie Penn (2023), 'Do Geopolitical Risks Raise or Lower Inflation?', Federal Reserve Board.
3. International Monetary Fund (2023), 'Global Financial Stability Report', April.
4. Kastner, G. and S.Fruhwirth-Schnatter, S. (2014), 'Ancillarity-sufficiency interweaving strategy (ASIS) for boosting MCMC estimation of stochastic volatility models', Computational Statistics and Data Analysis, Vol. 76, 408–423
5. Patra, Michael, Harendra Kumar Behera and Silu Muduli (2022), 'Capital Flows at Risk: India's Experience', Reserve Bank of India Bulletin, June 2022.

Table 1.11: AUMs of the Domestic Mutual Fund Industry

(in ₹ crore)

As on	B30 AUM			T30 AUM			Industry AUM		
	Equity	Non-Equity	Total	Equity	Non-Equity	Total	Equity	Non-Equity	Total
Mar 31, 2023	4,28,396	2,81,797	7,10,193	11,93,975	20,37,863	32,31,838	16,22,371	23,19,660	39,42,031
Sep 30, 2023	5,37,789	3,22,668	8,60,457	14,89,083	23,08,214	37,97,298	20,26,873	26,30,882	46,57,755
Mar 31, 2024	6,66,594	3,48,394	10,14,988	18,30,140	24,95,067	43,25,207	24,96,734	28,43,461	53,40,195
Apr 30, 2024	7,00,607	3,66,884	10,67,490	19,28,312	27,30,096	46,58,408	26,28,919	30,96,980	57,25,898
May 30, 2024	7,23,024	3,76,944	10,99,967	19,78,071	28,13,122	47,91,193	27,01,094	31,90,066	58,91,161

Note: T30 refers to the top 30 geographical locations in India and B30 refers to the locations beyond the top 30 cities.
Source: SEBI.

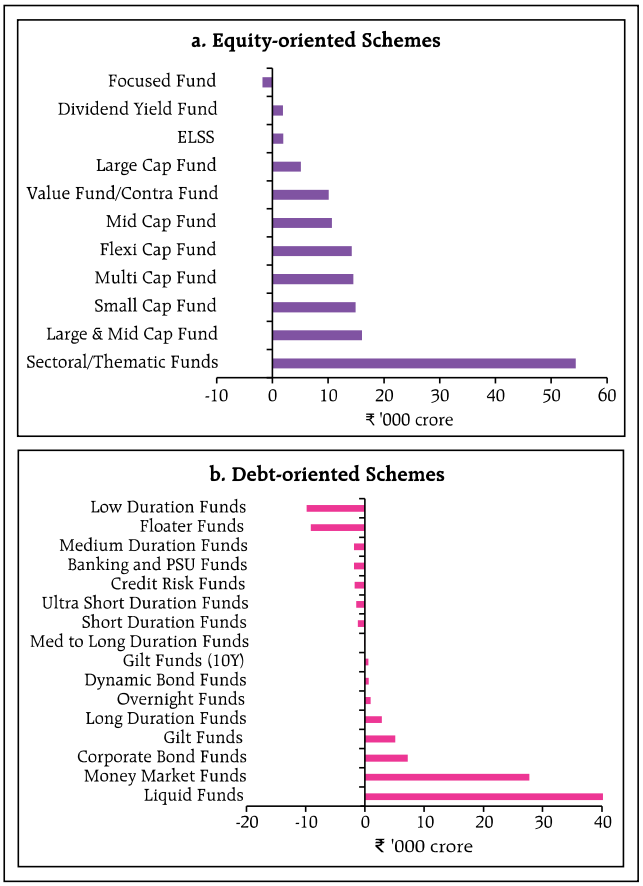
I.2.8 Mutual Funds

1.75 Bolstered by increasing participation of households, the assets under management (AUM) of the mutual fund (MF) industry grew by 35.5 per cent during 2023-24. This sharp growth has been primarily driven by inflows into equity-oriented schemes (Table 1.11).

1.76 Disaggregated analysis of flows into different schemes shows that within open-ended equity schemes, cumulative inflows during December 2023 to May 2024 into sectoral / thematic funds has more than tripled over inflows during April to November 2023 on the back of sector specific stocks. On the other hand, the AUM of debt schemes grew at a slower pace (Chart 1.61 a and b).

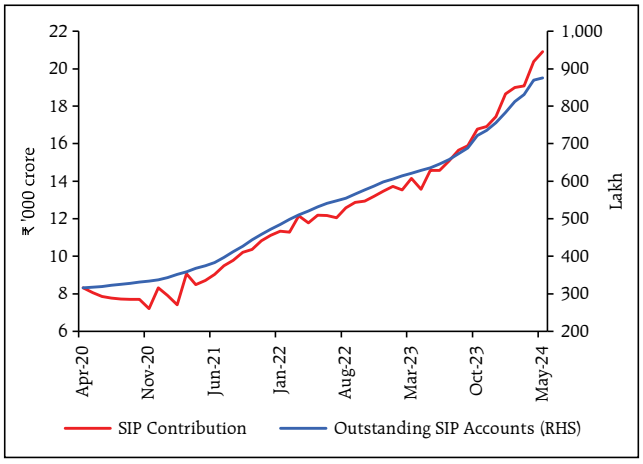
1.77 MFs' systematic investment plans (SIPs) have played a key role in the financialisation of savings. The number of outstanding SIP accounts as well as gross SIP contributions are consistently rising. The investments made through SIPs formed

Chart 1.61: Net Inflows in Open-ended Schemes (Dec-23 to May-24)



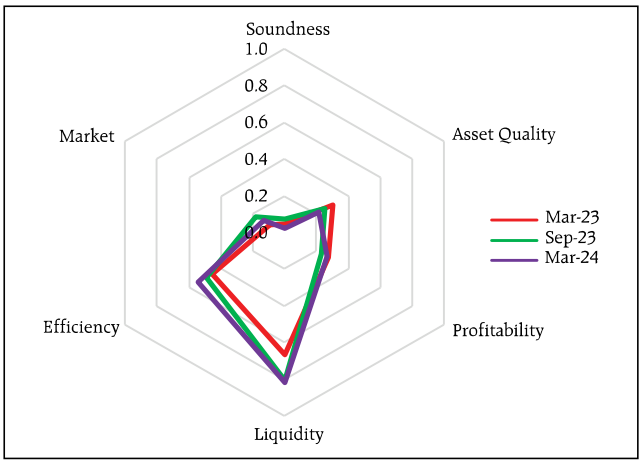
Source: AMFI.

Chart 1.62: Trends in Monthly SIP Contribution and Outstanding SIP Accounts



Source: SEBI.

Chart 1.63: Banking Stability Indicator



Note: Away from the centre indicates increase in risk.
Source: RBI supervisory returns and staff calculations.

19.6 per cent of the total AUM of the domestic mutual fund industry (Chart 1.62).

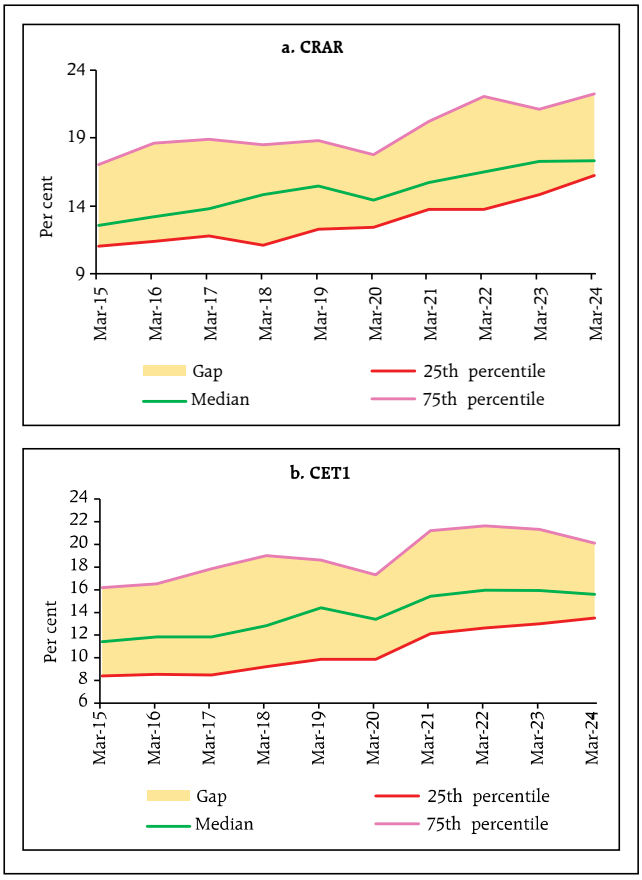
I.2.9 Banking Stability Indicator

1.78 The banking stability indicator (BSI) provides a comprehensive assessment of the health of the domestic banking system. The BSI shows that overall stability of the banking system improved on the back of stronger capital levels, higher earnings, and decline in the stock of NPAs, including restructured assets (Chart 1.63). Profitability indicators (*viz.*, RoA, RoE and NIM) remained strong in March 2024 despite a marginal decline relative to the September 2023 position. Efficiency indicators weakened because of increase in staff costs and the cost-to-income ratio. Liquidity coverage ratio (LCR) fell marginally, although the banking system has substantial liquidity buffers relative to the regulatory minimum.

I.2.10 Banking System

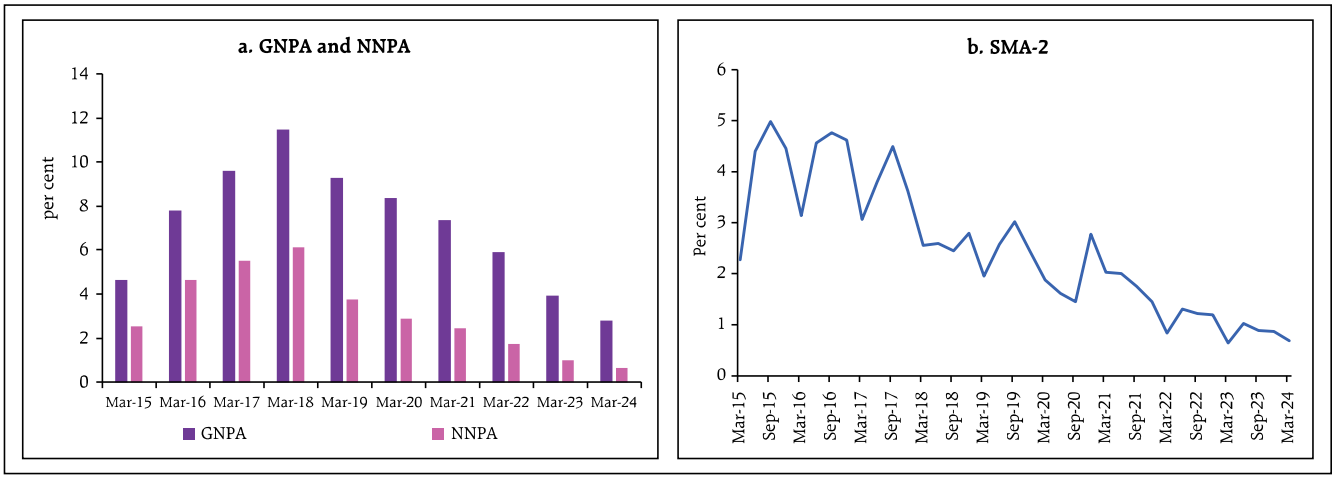
1.79 Capitalising on robust macroeconomic fundamentals and strong consumer and business confidence, Indian banks improved their asset quality, shored up earnings and augmented capital buffers. Their capital to risk-weighted asset ratio (CRAR) and common equity tier 1 (CET1) ratio stayed well above the regulatory minimum, despite increase in risk weights on certain segments of consumer credit by banks as well as on bank credit to NBFCs in November 2023 (Chart 1.64 a and b).

Chart 1.64: Banking System Capital



Source: RBI supervisory returns.

Chart 1.65: Asset Quality Indicators

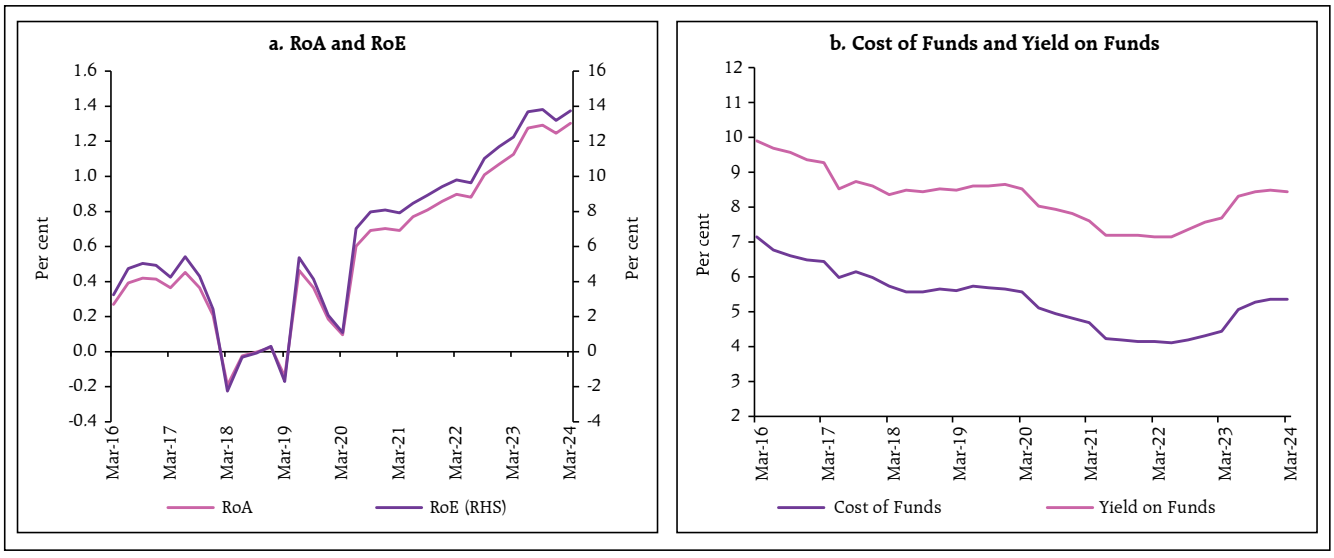


Source: RBI supervisory returns.

Asset quality improved further, with the gross non-performing assets (GNPA) ratio and net non-performing assets (NNPA) ratio falling to multi-year lows of 2.8 per cent and 0.6 per cent, respectively. The special mention accounts – 2 (SMA-2) ratio, which is a leading indicator of asset quality, is also showing relatively low levels of future impairment (Chart 1.65 a and b).

1.80 Amidst a lengthy monetary tightening cycle, banking sector profitability has also been bolstered by high net interest margins (NIMs) and strong credit demand. The return on assets (RoA) and return on equity (RoE) remained strong at 1.3 per cent and 13.8 per cent, respectively, in March 2024[31] (Chart 1.66 a and b).

Chart 1.66: Banking System Profitability and Market Valuation Indicators



Sources: RBI supervisory returns and NSE.

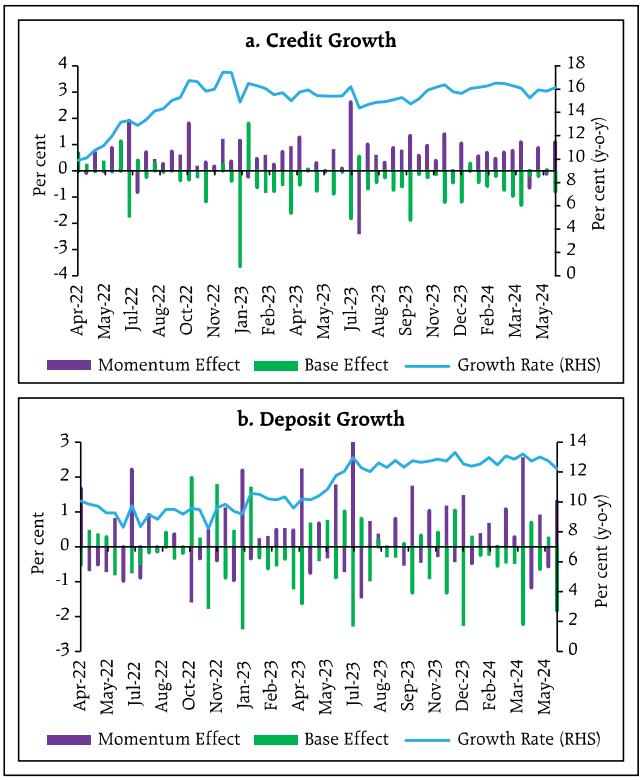
[31] As a standard accounting practice, these ratios are calculated with flow data in the numerator and average stock data in the denominator. The September 2023 figures of RoA, RoE and NIM published in the December 2023 edition of FSR were calculated using 'point in time' data as supervisory data on average assets, capital and reserves was not available for the combined entity (an HFC merged with a bank). In this edition, we revert to the standard accounting practice of using average stock data in the denominator.

1.81 With strong loan demand, credit grew at a robust pace driven by momentum even as favourable base effect is waning (Chart 1.67 a and b).

1.82 The growing gap between credit and deposit growth is reflected in a rising credit-deposit (C-D) ratio, which has been on the ascent since September 2021 to peak at 78.8 per cent in December 2023 before moderating to 76.8 per cent at end-March 2024. The C-D ratio of private sector banks (PVBs) has been particularly high - over three fourths of the banks with C-D ratios above 75 per cent are PVBs (Chart 1.68 a and b).

1.83 With credit growing at a brisk pace and outpacing nominal GDP growth for seven consecutive quarters, the credit-GDP gap (*i.e.* the difference between the credit-GDP ratio and its long-term trend) has sharply narrowed to

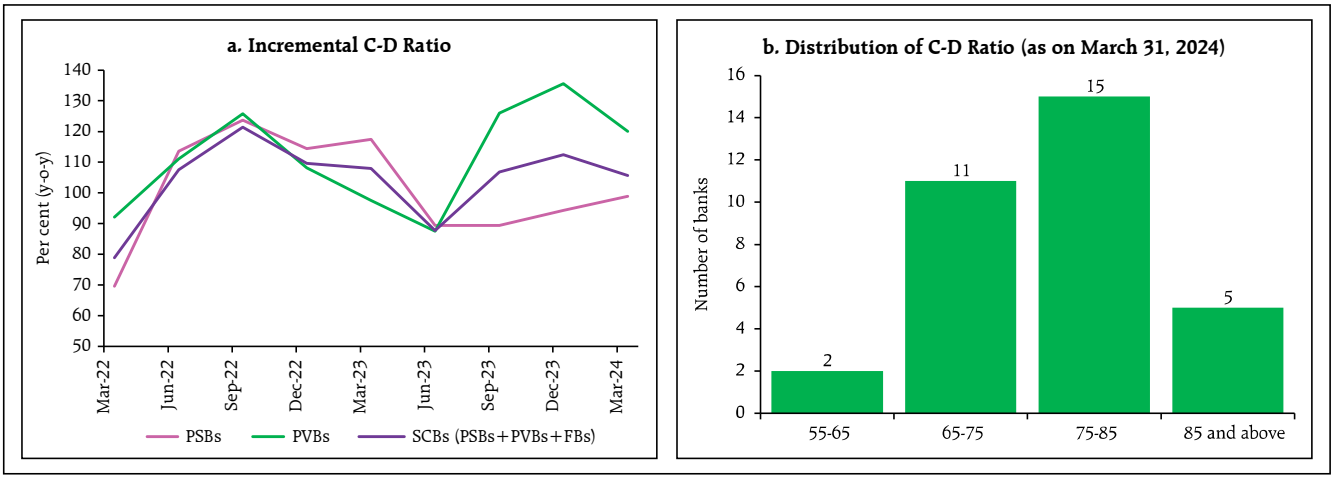
Chart 1.67: Credit and Deposit Growth



Note: (1) Data does not include the impact of reverse merger of an HFC with a bank.
(2) Momentum effect is calculated as [ln c_t - ln c_{t-1}]*100 where c is outstanding credit. Base effect is calculated as [ln c_{t-12} - ln c_{t-13}]*100. For more details, see Box I.1 of the Monetary Policy Report, September 2014.

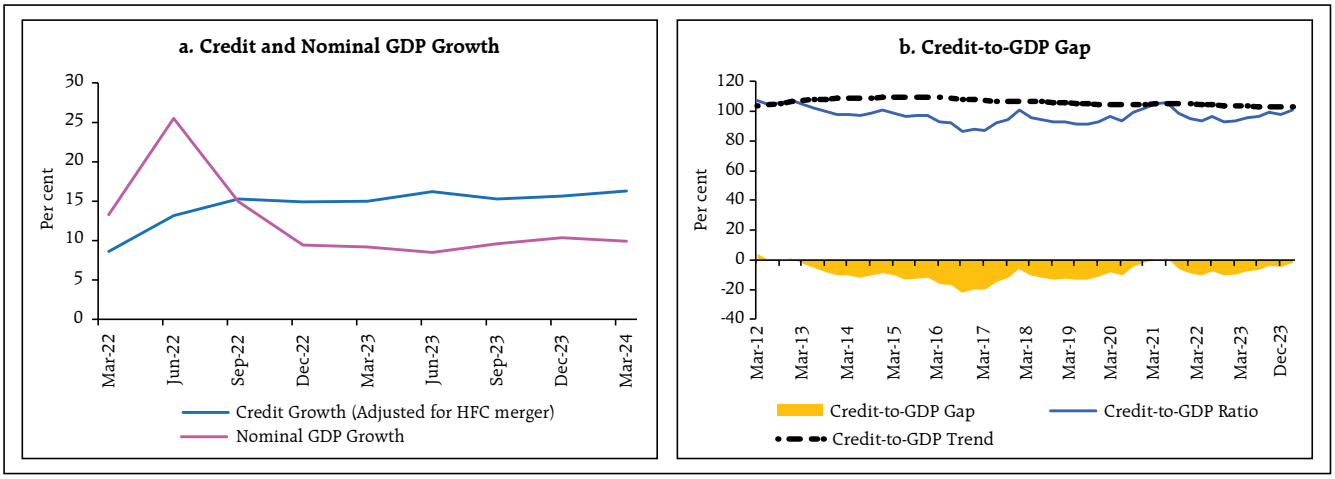
Source: RBI and staff calculations.

Chart 1.68: Credit Deposit (C-D) Ratio



Source: RBI supervisory returns (sample of 33 PSBs and PVBs) and staff calculations.

Chart 1.69: GDP Growth and Credit-to-GDP Gap



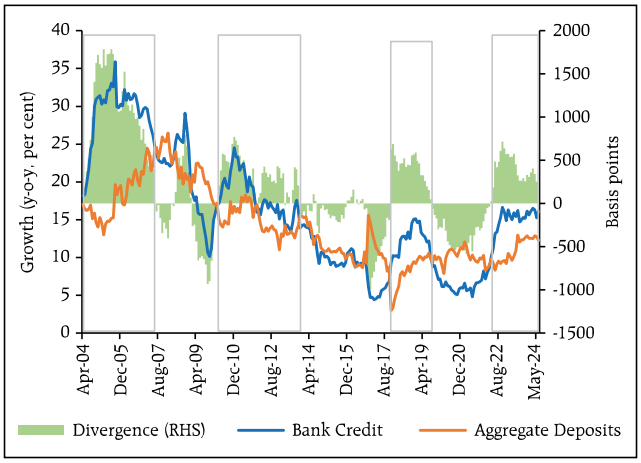
Notes: Credit-GDP gap has been estimated with one sided Hodrick-Prescott Filter and Lambda = 400,000.
Sources: BIS, RBI and Staff Calculations.

(-) 2.1 per cent in Q3:2023-24 from (-) 7.4 per cent Q3:2022-23 (Chart 1.69 a and b).

1.84 Despite the divergence in credit and deposit growth, elevated C-D ratio and narrowing credit-GDP gap, credit growth at 16.1 per cent as on May 31, 2024 (net of merger of an HFC with a bank) remains sustainable and within the range of 16-18 per cent beyond which it may lead to higher impairments[32].

1.85 There have been episodes of credit and deposit growth divergence persisting for 2 to 4 years (Chart 1.70). A decomposition of seasonally adjusted aggregate deposits (deflated by CPI) into their trend and cyclical components using turning point analysis shows that the average duration of these cycles is 41 months[33]. Moreover, in this cycle, the merger of a large HFC with a bank

Chart 1.70: Credit and Deposit Growth – Long Term Dynamics



Sources: RBI and staff calculations.

[32] RBI (2022), "Report on Currency and Finance", April.

[33] RBI (2019), "Bank Deposits: Underlying Dynamics", RBI Bulletin, May. (updated using the latest data)

Table 1.12: Credit and Deposit – Divergence and Convergence

Identifying Period				Credit Growth			Deposit Growth		
Start Month	End Month	Number of Months	Average Growth Gap: Credit Deposit (bps)	Peak of Credit Growth during that period (y-o-y; per cent)	Credit Growth after 12 months after end month (y-o-y; per cent)	Change in Credit Growth (bps)	Deposit Growth in the month when credit growth peaked (y-o-y; per cent)	Deposit Growth after 12 months after end month (y-o-y; per cent)	Change in Deposit Growth (bps)
Apr-04	Jun-07	39	1071	36	26	-961	20	22	232
Apr-10	Oct-13	43	332	24	11	-1382	17	11	-555
Nov-17	Aug-19	22	432	15	6	-958	9	11	173
Apr-22	May-24	26	408	17			13		

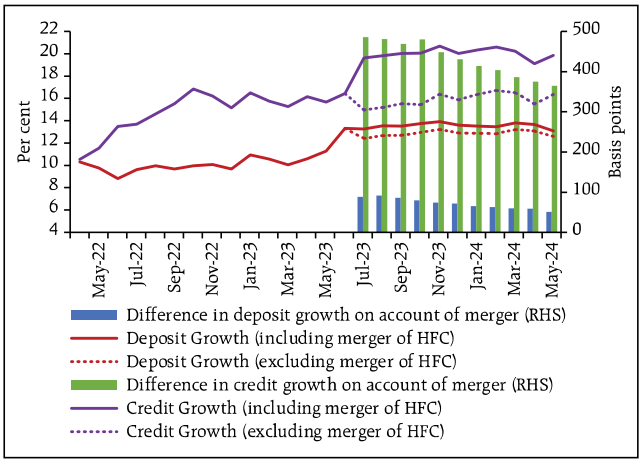
Source: RBI and staff calculations.

has exacerbated the credit and deposit growth divergence[34] (Chart 1.71). In addition, Granger causality shows that credit growth precedes deposit growth[35]. Convergence has been mostly achieved through a sharp fall in credit growth (Table 1.12).

1.86 In the current cycle, the C-D ratio is close to its peak after adjusting for reserve requirements {*viz.*, cash reserve ratio (CRR) and statutory liquidity ratio (SLR)} (Chart 1.72 and Table 1.13).

1.87 The LCR of banks declined from 135.7 per cent to 130.3 per cent between September 2023 and March 2024. Notably, the LCR of PVBs stood at

Chart 1.71: Credit and Deposit Growth (including and excluding HFC Merger Impact)



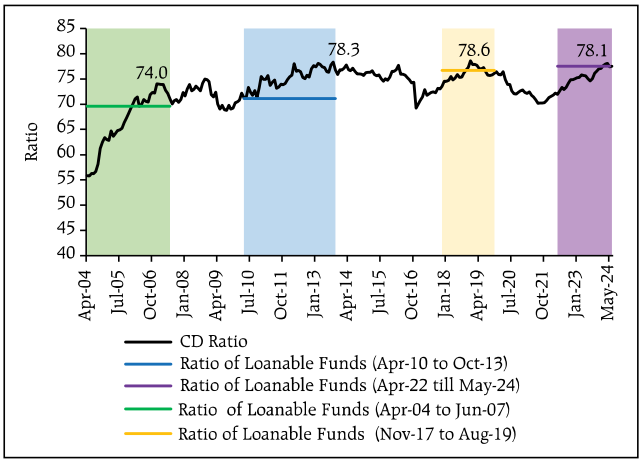
Sources: RBI and staff calculations.

Table 1.13: C-D Ratio and Ratio of Loanable Funds

Start Month	End Month	Peak C-D Ratio	Average Ratio of Loanable Funds during the Period
Apr-04	Jun-07	74.0	69.6
Apr-10	Oct-13	78.3	71.1
Nov-17	Aug-19	78.6	76.7
Apr-22	May-24	78.1	77.5

Source: RBI and staff calculations.

Chart 1.72: C-D Ratios Across Past High Credit Growth Cycles

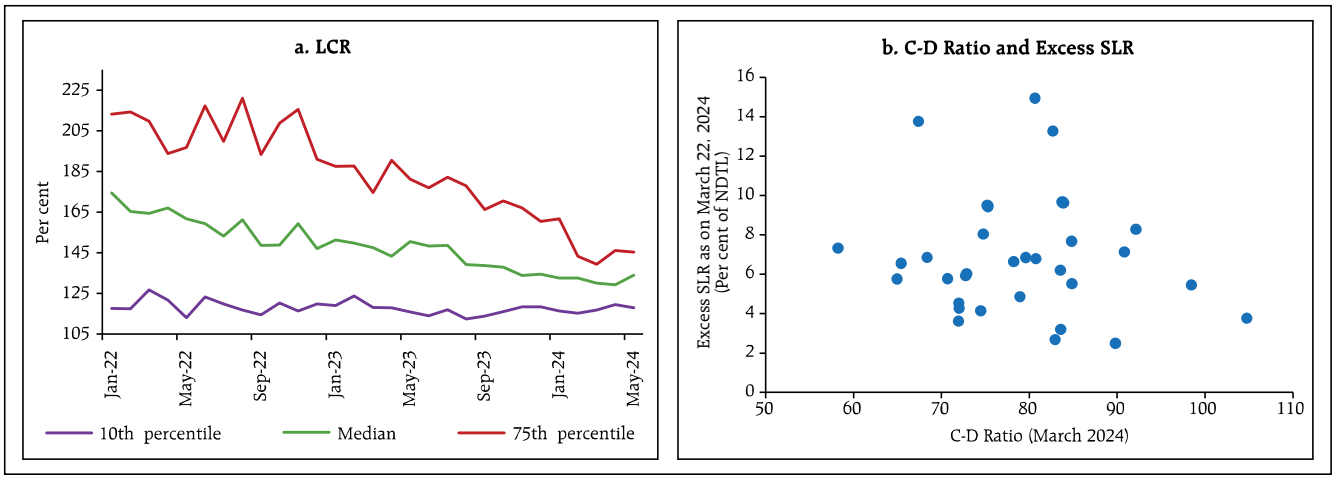


Sources: RBI and staff calculations.

[34] The merged HFC had a low deposit base and was primarily dependent on market borrowings as source of funds; consequently, the merger did not significantly impact the deposit base while it increased the loans and advances of the banking system.

[35] McLeay M, Radia A, Thomas R (2014), "Money creation in the modern economy", Quarterly Bulletin 2014 Q1, Bank of England.

Chart 1.73: LCR, C-D Ratio and Excess SLR



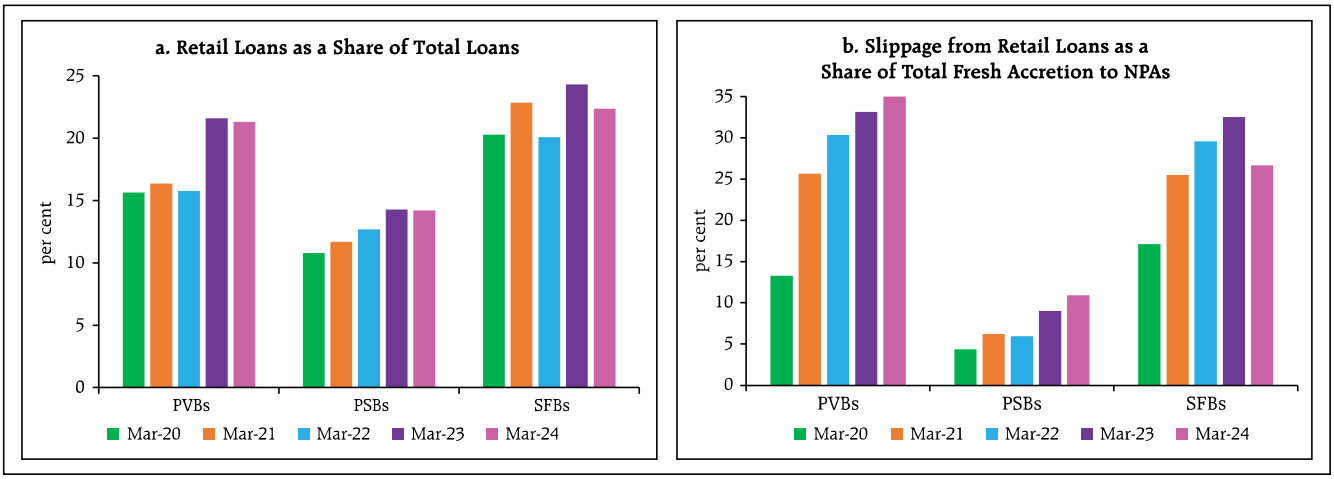
Source: RBI supervisory returns.

126.9 per cent in March 2024 after dipping to 118.8 in Q3:2023-24. Also, banks' C-D ratio is found to be negatively correlated to their excess SLR holdings (Chart 1.73 a and b).

1.88 The share of retail and service sectors in total bank credit has been rising for over two decades. During April 2022 and March 2024, bank lending to the retail sector grew at a CAGR of 25.2 per cent and lending to services - which includes bank lending to NBFCs - grew at 22.4 per cent, far exceeding overall credit growth of 16.4 per cent. Accordingly, regulatory measures were taken by the RBI to curb high loan growth in certain retail segments. As a result, sequential growth (q-o-q) in retail lending fell from 4.4 per cent in Q1:2023-24 to 2.9 per cent in Q4:2023-24.

1.89 The underlying asset quality of retail loans has improved: the GNPA ratio in this category declined from a high of 2.1 per cent in June 2022 to 1.2 per cent in March 2024. The SMA (1+2) ratio, which is a leading indicator of incipient stress, has also declined from 3.0 per cent to 2.6 per cent over this period. Importantly, asset quality of unsecured retail lending is also showing improvement, with GNPA ratio at 1.5 per cent and SMA (1+2) ratio at 2.1 per cent compared to 1.6 per cent and 2.3 per cent, respectively, a year ago. Nonetheless, in respect of PVBs, the share of slippage from retail loans (excluding housing loans) in overall fresh accretion to NPAs is increasing. It formed 40.0 per cent of fresh accretion to NPAs in 2023-24, even as the share of these loans in total advances is 21.3 per cent (Chart 1.74 a and b).

Chart 1.74: Retail Share – Total Loans and Fresh Accretion to NPAs

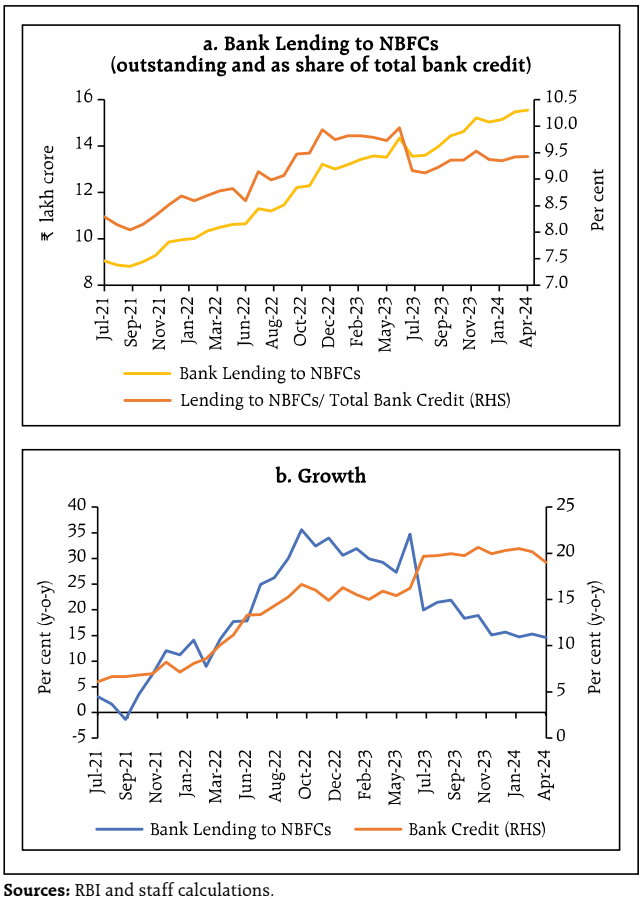


Note: Retail loans exclude housing loans.
Source: RBI supervisory returns and staff calculations.

1.90 Growth in bank lending to NBFCs was another area of concern, which prompted the Reserve Bank to take regulatory measures in November 2023 as interlinkages could be a potential source of systemic risk. Measures taken in November 2023 are coming to fruition - as bank lending to NBFCs has also declined to 9.4 per cent of total bank credit as of end-April 2024, down from its peak of 10.0 per cent in June 2023. Moreover, growth (y-o-y) in bank lending to NBFCs has also moderated from 18.9 per cent in November 2023 to 14.6 per cent in April 2024 (Chart 1.75 a and b).

1.91 Banks held 64.6 per cent of their investments in the held-to-maturity (HTM) category[36], which is not subject to mark-to-market valuation; however, elevated interest rates continued to affect the fair value of banks' investments portfolio. Unrealised losses[37] on securities held within the HTM portfolio, showed a reduction in March 2024 compared to September 2023. The impact on their CET1

Chart 1.75: Bank Lending to NBFCs



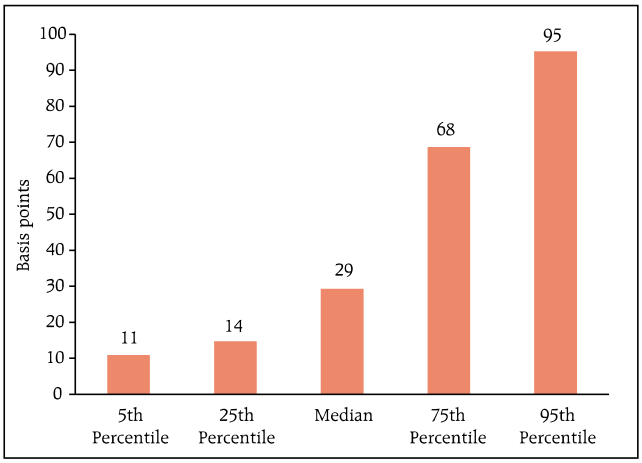
Sources: RBI and staff calculations.

[36] Bank's investments under HTM category is limited to 25 per cent of total investments. However, it can exceed 25 per cent if (i) the excess comprises of SLR securities and (ii) total SLR in HTM does not exceed a certain percentage (currently 23 per cent) of net demand and time liabilities (NDTL). These limits have been removed with effect from April 01, 2024.

[37] Includes the impact of recap bonds.

ratio also remains limited. The median impact of unrealised losses on the CET1 ratio of select banks stands at 29 basis points, with 5 per cent of banks recording a substantial impact of 95 basis points or more (Chart 1.76).

Chart 1.76: Impact of Unrealised HTM Losses on CET1 Ratio of Select Banks



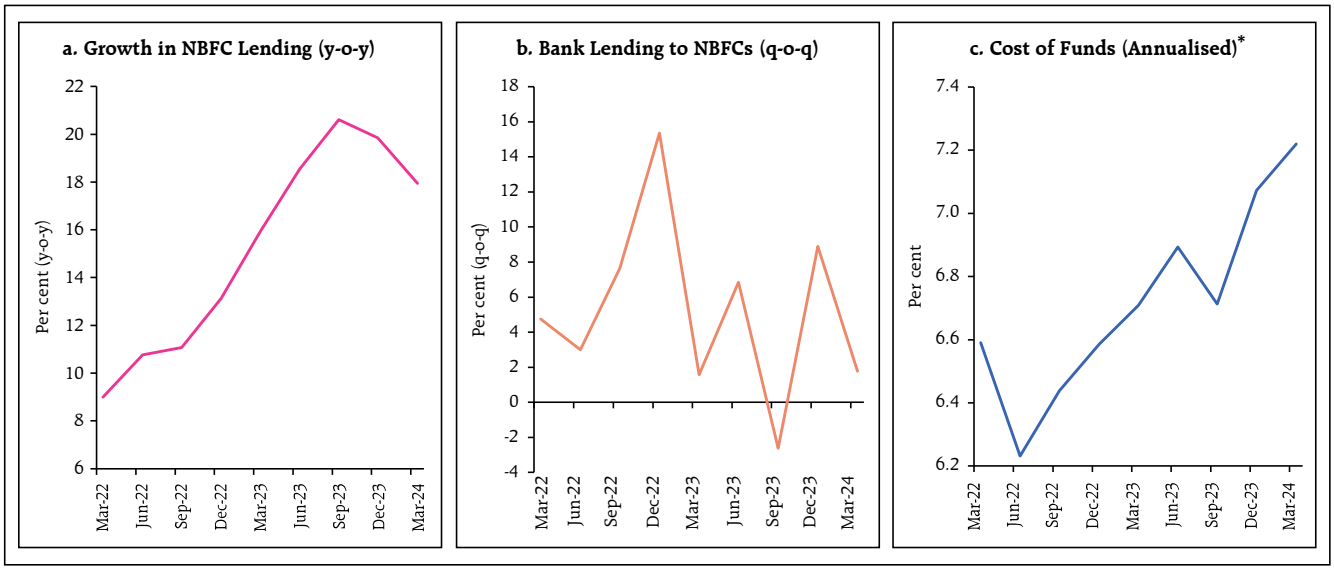
Note: 29 banks having unrealised HTM losses.
Sources: RBI supervisory returns and staff calculations.

I.2.11 Non-Banking Financial Companies (NBFCs)[38]

1.92 The pace of growth of advances by NBFCs moderated during H2:2023-24, reflecting the impact of regulatory prescription of higher risk weights on NBFC lending to certain categories of consumer credit and bank lending to NBFCs. On an incremental basis, bank lending to NBFCs declined in H2:2023-24 even as the latter's overall cost of funds increased (Chart 1.77 a, b and c).

1.93 Overall, the NBFC sector maintained large capital buffers boosted by improving asset quality and robust earnings. Despite a 79 bps decline during H2:2023-24, the capital ratio of NBFCs (CRAR of 26.6 per cent) remains well above the regulatory minimum of 15 per cent. Their NIMs have remained in the range of 4.2-4.8 per cent since mid-2022,

Chart 1.77: NBFC Lending, Bank Lending to NBFCs and Cost of Funds[39]



Note: *Based on the sample of select NBFCs.
Source: RBI supervisory returns.

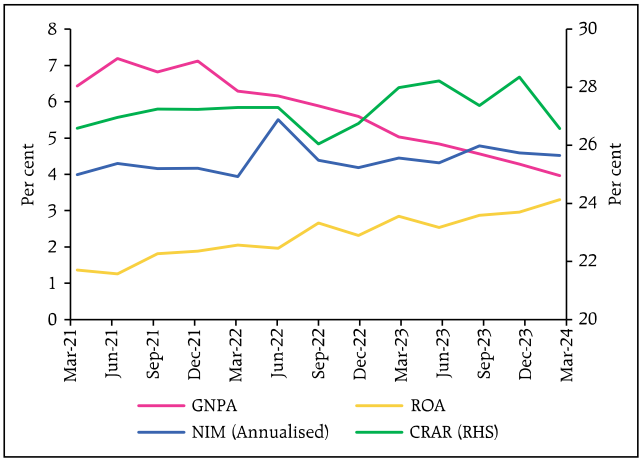
[38] The analyses done in this section are based on NBFCs in upper layer, middle layer and base layer (meeting certain threshold asset size criteria) but excludes HFCs. The analyses includes seven NBFCs under resolution. Data available as on June 10, 2024, which are provisional.

[39] Cost of funds = Annualised Interest Expense and Other Financing Cost/ (Average Total Borrowing + Average Public Deposit).

which is well above the pre-pandemic trend, notwithstanding a fall of 27 bps to 4.5 per cent in March 2024. Their profitability improved further with the RoA at 3.3 per cent during Q4:2023-24. The asset quality of NBFCs continued to improve and the GNPA ratio reached a new low of 4.0 per cent[40] (Chart 1.78).

1.94 Retail lending by NBFCs recorded some moderation in growth (half year-on-half year) to 14.8 per cent in March 2024 from 16.6 per cent in March 2023. The share of unsecured loans[41] extended by the NBFC sector fell from 32.2 per cent of total loans to 22.9 per cent over this period (Chart 1.79 a and b).

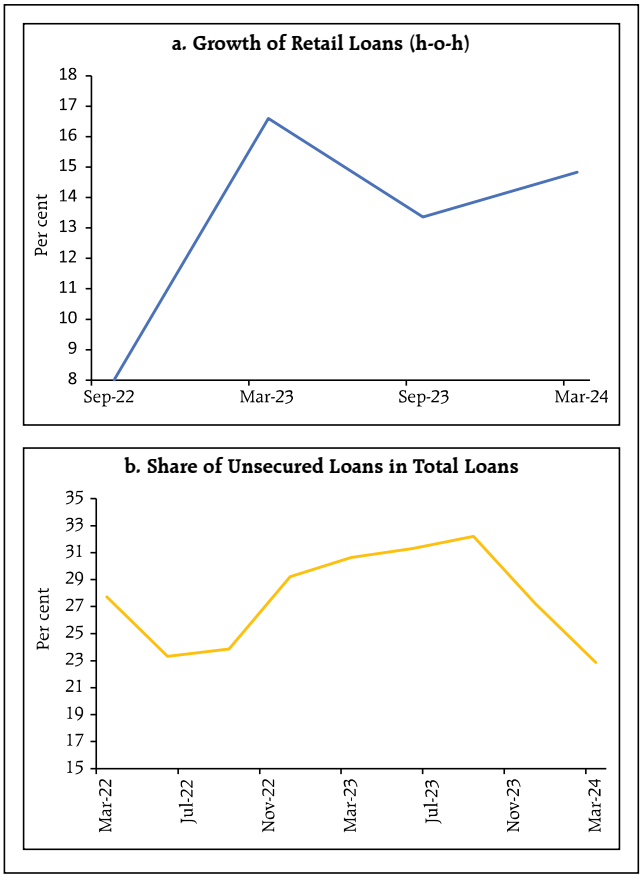
Chart 1.78: NBFCs - Financial Indicators



Source: RBI supervisory returns.

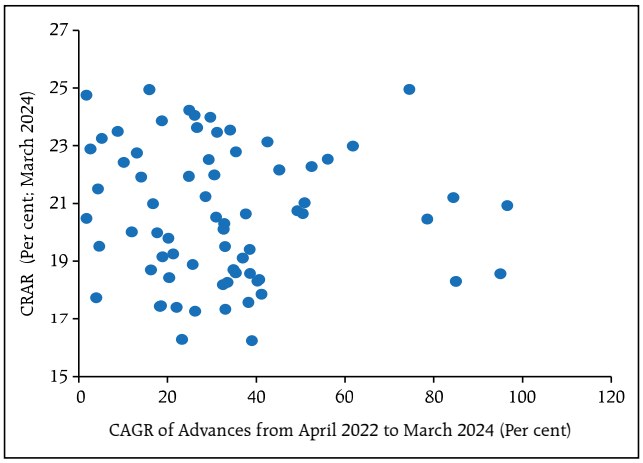
1.95 A few NBFCs with low capital buffers are growing at a rapid pace, warranting close monitoring from a systemic stability perspective as they could morph into a tail risk (Chart 1.80).

Chart 1.79: Retail Loans and Share of Unsecured Loans



Note: Based on the sample of select NBFCs.
Source: RBI supervisory returns.

Chart 1.80: Capital Adequacy and Credit Growth

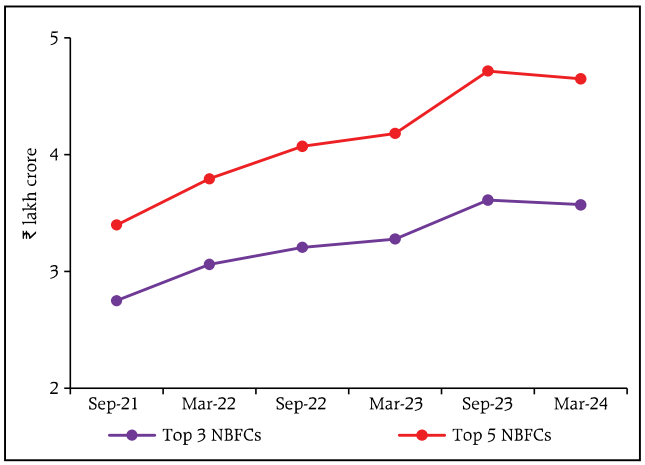


Note: Based on the sample of select NBFCs.
Source: RBI supervisory returns.

[40] The GNPA ratio will fall to 2.6 per cent if seven NBFCs under resolution are excluded.

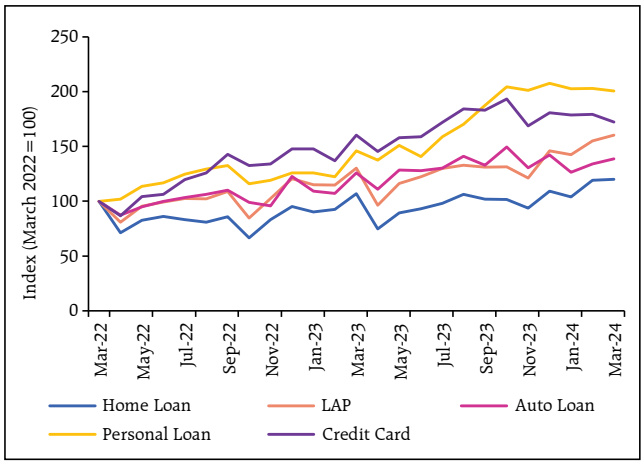
[41] Share of unsecured loans is computed as a percentage of unsecured loans to gross loans and advances.

Chart 1.81: Solvency Losses of Banks due to Hypothetical Failure of NBFCs



Source: RBI supervisory returns and staff calculations.

Chart 1.82: Inquiry Volumes by Product Category



Note: LAP stands for Loan against property.
Source: TransUnion CIBIL.

1.96 During H2:2023-24, there was an improvement in the resilience of banks to potential contagion shocks from the NBFC sector, measured in terms of solvency losses due to hypothetical failure of a few large NBFCs (Chart 1.81).

I.2.12 Consumer Credit

1.97 Consumer credit – a major driver of banking business over the last decade – remained robust during H2:2023-24. Credit inquiry volumes differed across product categories: while inquiries for housing loans and loans against property categories rose, volumes in auto loans, credit card and personal loan categories moderated (Chart 1.82).

1.98 Even as inquiry volumes remain robust, the impact of increase in risk weights on certain segments of consumer credit pulled down the rate of growth in overall consumer credit, especially personal loans and credit cards (Table 1.14).

Table 1.14: Growth in Outstanding Balances by Product Type

(y-o-y; per cent)

	March 2023	March 2024
Home Loans	17.6	14.7
LAPs	23.1	23.9
Auto Loans	27.0	23.1
Personal Loans	31.0	23.6
Credit Cards	34.9	30.0

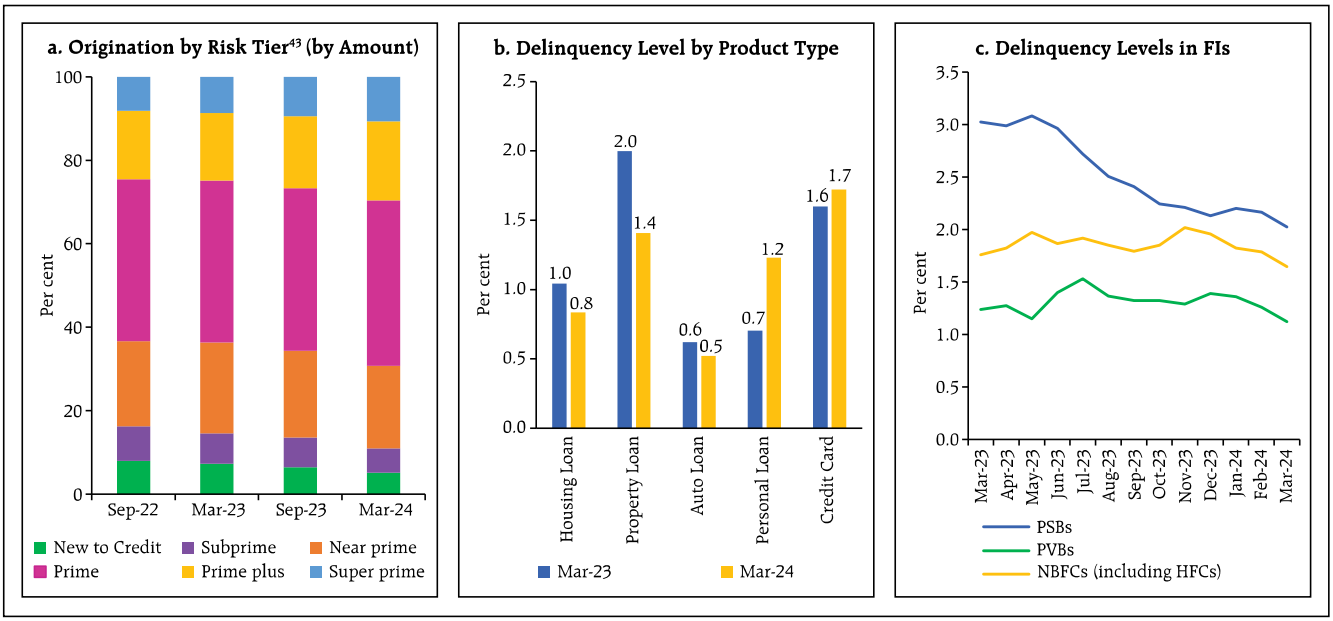
Source: TransUnion CIBIL.

1.99 Overall asset quality of outstanding credit showed an improvement, except personal loans. Credit card asset quality broadly remained the same. Delinquency levels remain low across product categories, with the share of low-rated borrowers[42] in incremental credit continuing to decline (Chart 1.83 a and b). Delinquency levels have diminished across financial institutions (Chart 1.83 c).

1.100 In the consumer credit segment, there are a few concerns that require close monitoring. First, delinquency levels among borrowers with

[42] Below prime and new to credit (NTC) borrowers.

Chart 1.83: Consumer Credit – Asset Quality

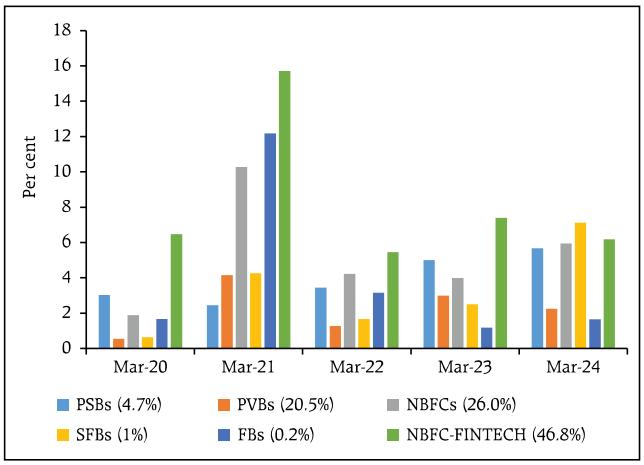


Note: (1) Delinquency based on 90 days past due balances.
(2) Methodology for computing delinquency has been modified and accordingly previous data has been revised.
Source: TransUnion CIBIL.

personal loans below ₹50,000[44] remain high. In particular, NBFC-Fintech lenders, which have the highest share in sanctioned and outstanding amounts, also have the second highest delinquency levels, only below that of small finance banks (Chart 1.84).

1.101 Second, vintage delinquency[45], which is a measure of slippage, remains relatively high in personal loans at 8.2 per cent. Third, little more than a half of the borrowers in this segment have three live loans at the time of origination and more than one-third of the borrowers have availed more than three loans in the last six months.

Chart 1.84: Delinquency Levels - Personal Loans (Below ₹50,000)



Note: The number in the parentheses indicate a cohort's share in outstanding amount for personal loans below ₹50,000 as on March 31, 2024.
Source: TransUnion CIBIL.

I.2.13 Housing Sector

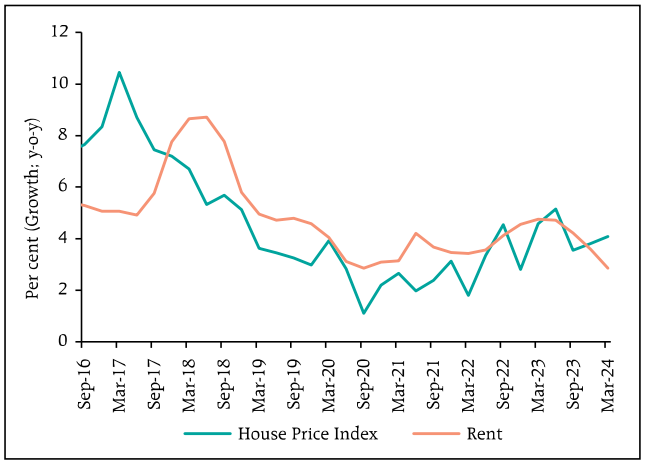
1.102 The all-India House Price Index (HPI) rose by 4.1 per cent (y-o-y) in Q4:2023-24 as against 3.8 per cent in the previous quarter and 4.6 per cent a year ago. On a sequential basis, the all-India HPI increased by 0.9 per cent in Q4:2023-24, with expansion witnessed in eight out of ten major cities (Chart 1.85).

[43] The segregation of risk tiers based on CIBIL scores is as follows-Super Prime:791-900; Prime Plus: 771-790, Prime:731-770; Near Prime:681-730 and Sub Prime: 300-680.

[44] These loans form 0.4 per cent of total outstanding retail loans of financial institutions.

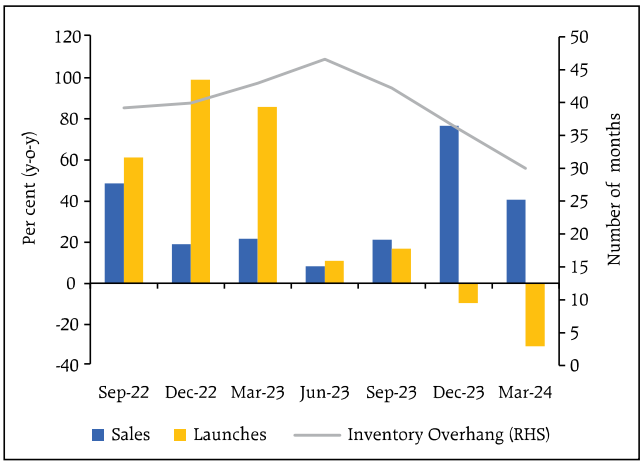
[45] Vintage delinquency is defined as the percentage of accounts that have anytime become delinquent (90+ dpd) within twelve months of origination and is a commonly used industry metric to assess the efficiency of the loan underwriting process.

Chart 1.85: House Prices and Rent



Sources: RBI and MoSPI.

Chart 1.86: House Sales, Launches and Unsold Inventory

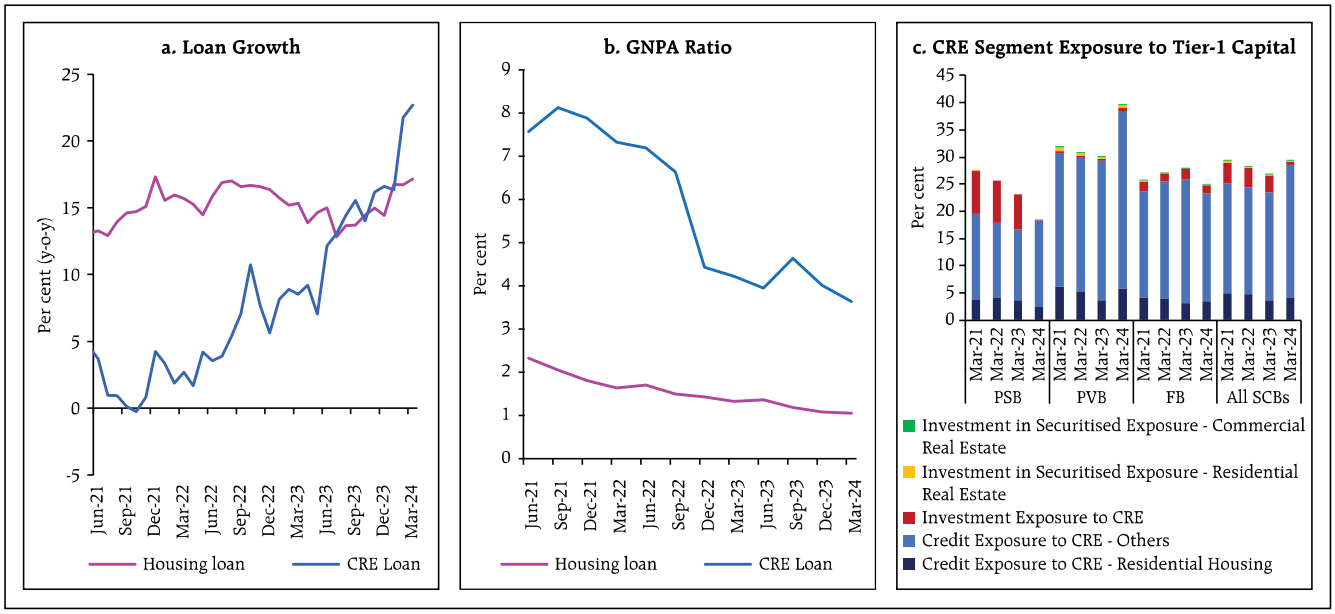


Source: PropTiger Datalabs.

1.103 The city-wise behaviour of house prices varied widely, underscoring the importance of idiosyncratic local factors. After witnessing a moderate pace of growth in Q1:2023-24, residential real estate sales increased in subsequent quarters. During 2023-24, housing sales maintained a strong performance for the second consecutive year in the latest monetary policy tightening cycle. Consequently, unsold inventory overhang declined; growth (y-o-y) in new launches also declined in Q4:2023-24, reflecting a high base (Chart 1.86).

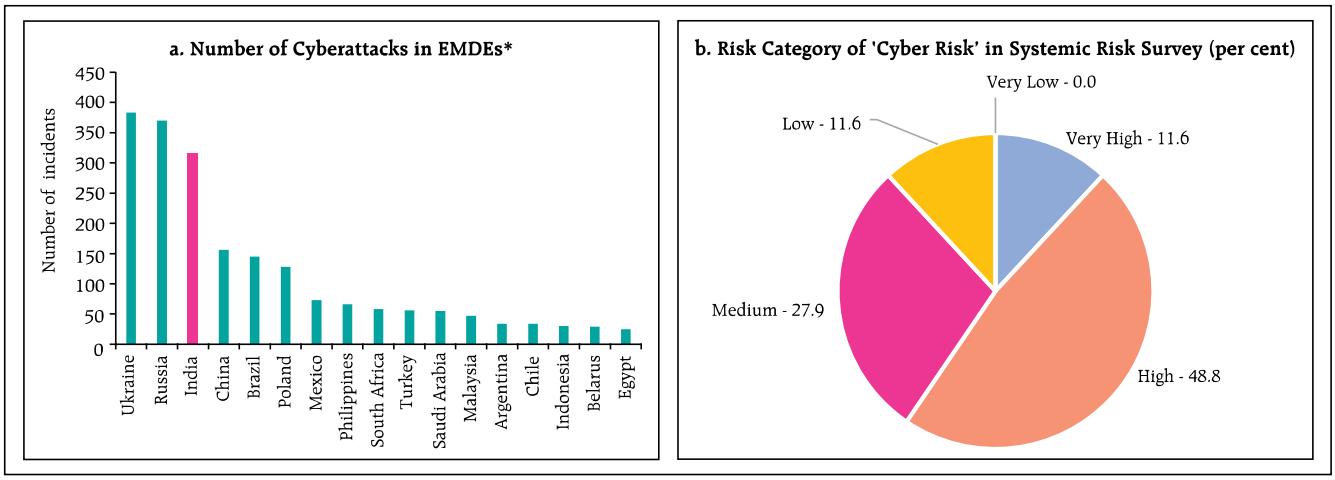
1.104 Housing loan growth remained steady. CRE loans accelerated further on a low base, although they form only 2.7 per cent of the banking system's gross advances. Despite hardening of mortgage rates, delinquencies in the residential and CRE loans moderated. India does not suffer the stress in the CRE sector witnessed in other economies, and such exposures form a relatively smaller share of Tier-I capital of Indian banks (Chart 1.87 a, b and c).

Chart 1.87: Residential and CRE Loans



Note: Loan data does not include the impact of reverse merger of a non-bank with a bank.
Sources: DBIE and supervisory returns.

Chart 1.88: Cyber Risk



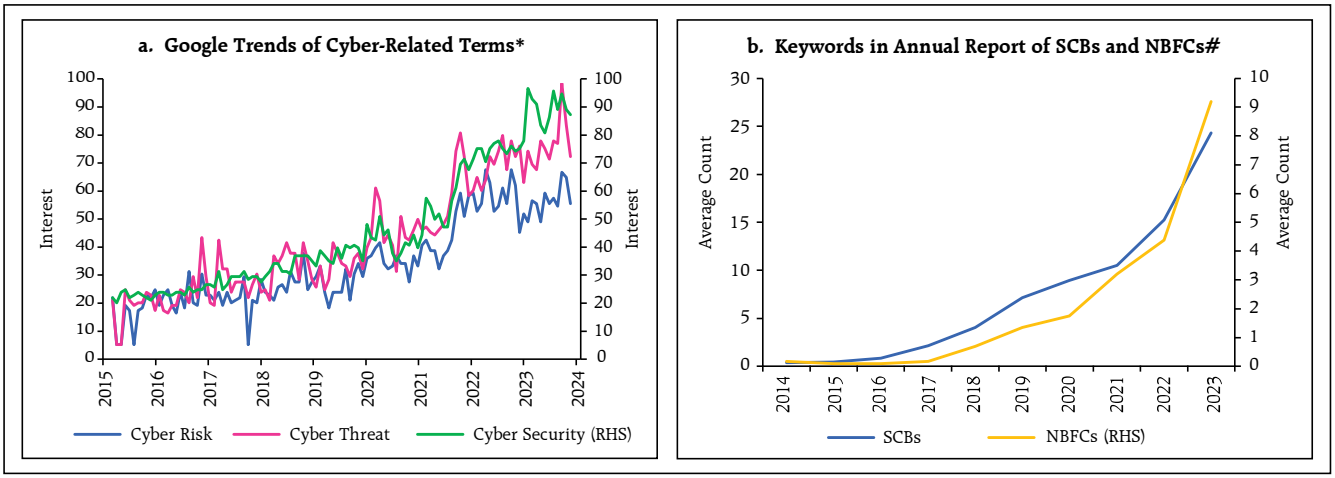
Note: * Based on publicly attributed cyberattacks between 2014 and 2023.
Source: University of Maryland CISSM Cyber Attacks Database and Systemic Risk Survey, May 2024.

I.2.14 Cyber Risk

1.105 With rapid adoption of digital infrastructure and rising internet penetration, cyber risk is emerging as a key financial system vulnerability. The number of publicly attributed cyberattacks have risen in India (Chart 1.88 a and b). Cyber risk is identified as a key source of systemic vulnerability in the RBI's systemic risk survey (SRS) and was placed under the 'high risk' category in eight out of ten previous half-yearly surveys.

1.106 In response to the rising threat of cyber risks, efforts on spreading awareness related to cyber security are also gaining momentum (Chart 1.89 a). Alongside, banks and other financial institutions are beefing up their cyber security frameworks, cyber security audits and other information system management aspects to mitigate cyber risks. This is also reflected in the surge in cyber-related mentions in the annual reports of financial institutions (Chart 1.89 b).

Chart 1.89: Cyber Risk Awareness in India



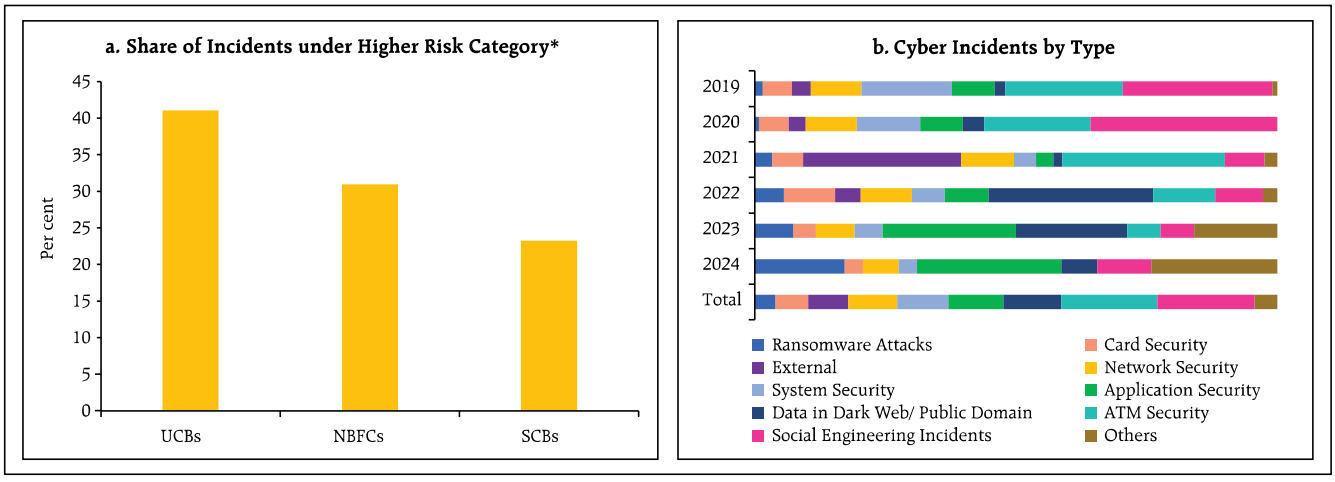
Note: (1) * Interest represents search interest relative to the highest point on the chart. Data accessed on June 14, 2024.
(2) # Average number of occurrences of keywords related to cybersecurity ('cybersecurity', 'cyberattack', 'cyber risk', 'cyber threat', 'data loss', 'data theft') in annual reports of 33 select SCBs and 15 upper-layer NBFCs.
Sources: Google Trends and ProwessIQ.

1.107 Analysis of cyber incidents[46] reported by regulated entities (REs)[47] to the Reserve Bank shows that 69 per cent of incidents were reported by SCBs, 19 per cent by UCBs and 12 per cent by NBFCs. UCBs had the highest share of incidents (41 per cent) in higher risk categories amongst all REs (Chart 1.90 a). Among the types of cyber incidents reported, social engineering incidents constituted the largest share. Incidents relating to data leakage, application security and ransomware attacks are rapidly rising. Most of these incidents involve threat actors leaking REs' data such as card data, customers' KYC details, and KYC documents on the dark web, social media or public platforms for sale (Chart 1.90 b).

1.108 Another source of risk emerges from dependence on common IT service providers among REs. These include, but not limited to, cloud service providers, payment switch providers and data centre providers. A major cyber incident in these IT service providers may propagate and adversely impact multiple REs simultaneously, threatening systemic stability. To monitor and mitigate this risk, the Reserve Bank had issued directions[48] on outsourcing of IT services, which stipulate that REs should report cyber incidents within six hours of detection by third-party service providers.

1.109 Rising threat of cyber risk and increasing adoption of financial services by customers through digital channels makes it imperative for REs to ensure robustness and high security in their IT systems and controls to ensure operational resilience. Information systems and infrastructure should be able to support business functions seamlessly and ensure availability across all service delivery channels. This has been a critical part of the increased supervisory focus of the Reserve Bank and supervisory actions have been taken on REs where significant lacunae have been observed, especially in terms of downtime (leading to customer service disruption) of digital financial services.

Chart 1.90: Categories of Cyber Incidents



Note: (1) * Based on impact, the incidents are categorised into lowest risk or other than lowest risk (referred to as higher risk category).
Source: RBI supervisory returns.

[46] 'Cyber incident' shall mean a cyber event that adversely affects the cyber security of an information asset whether resulting from malicious activity or otherwise.

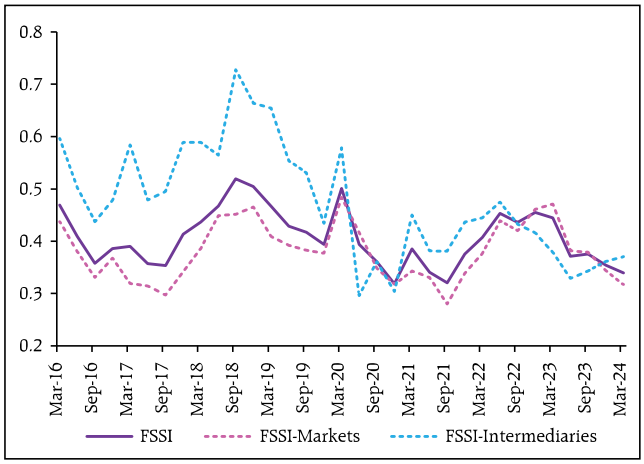
[47] Incidents reported by REs (SCBs, UCBs and NBFCs) from January 2019 to March 2024.

[48] RBI master direction No. DoS.CO.CSITEG/SEC.1/31.01.015/2023-24 on "Outsourcing of Information Technology Services" dated April 10, 2023.

I.2.15 Financial System Stress Indicator

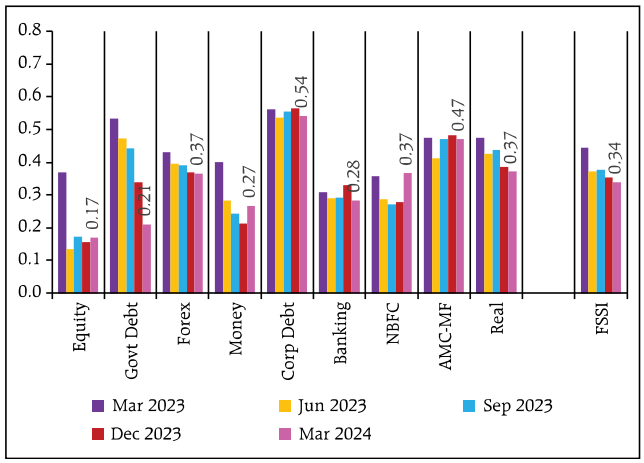
1.110 The financial system stress indicator (FSSI), a comprehensive indicator of the aggregate stress levels in the Indian financial system, indicated gradual easing of stress during H2:2023-24. The decline in stress indicators has been broad-based, except for the NBFC and money market segments. The decline in government debt market stress was the primary contributor to the improvement in the overall FSSI, aided by fall in long term yields as well as volatility and higher net foreign portfolio debt inflows. Meanwhile, declining volatility and rangebound movement in the exchange rate reduced stress level in the foreign exchange market. Money market stress indicators inched up as tight liquidity in the banking system led to higher interest rates on money market instruments (*e.g.*, CPs and CDs). The banking system stress indicator remained subdued, supported by improving soundness. The real sector stress indicator moderated further on the back of sound macroeconomic fundamentals. Stress indicators for the NBFC sector rose as their capital ratios dipped and spreads on their borrowing costs increased (Chart 1.91 and 1.92).

Chart 1.91: FSSI and its Broad Components



Sources: DBIE, Bloomberg, RBI supervisory returns and staff calculations.

Chart 1.92: Components of FSSI



Sources: DBIE, Bloomberg, RBI supervisory returns and staff calculations.

I.2.16 Systemic Risk Survey

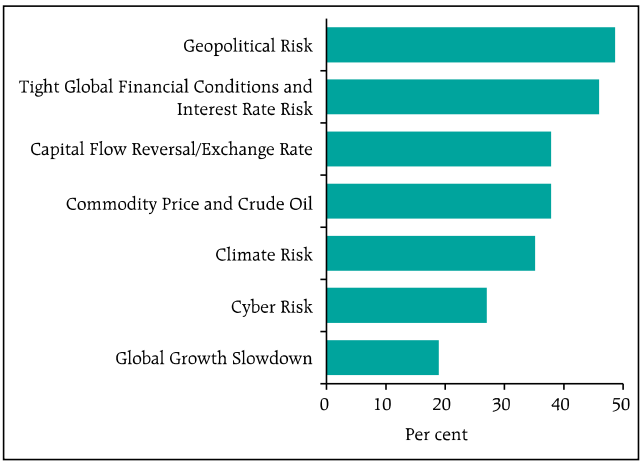
1.111 The latest systemic risk survey (SRS) conducted in May 2024 showed that external experts remain confident of stability in the domestic financial system, with all major risk groups in the 'medium' risk category. Respondents felt that risks from global spillovers and macroeconomic risk have receded. There were no changes in their assessment of risks emerging from financial markets and institutions from the previous survey round. Among drivers of financial market risk, foreign exchange rate risk and liquidity risk were gauged to have moderated while risk emanating from equity price volatility was perceived to have moved from the 'medium' to the 'high' risk category. Interest rate risk also inched up. Around one-third of respondents expressed an increase in confidence in the Indian financial system and around 20 per cent of them reported higher confidence in the stability of the global financial system from the previous survey round.

1.112 Underscoring the resilience and strength of the Indian banking sector, nearly 90 per cent of the respondents assessed better or similar prospects for

the Indian banking sector over a one-year horizon. Nearly 26 per cent of the survey participants expect asset quality to further improve. Almost 48 per cent of the respondents assessed that demand for credit would improve, supported by higher GDP growth, government spending, pickup in manufacturing sector activity and growing demand from real estate and infrastructure sectors.

1.113 The survey participants assessed geopolitical risks, tightening of global financial conditions and capital outflows and exchange rate pressures as major near-term risks (Chart 1.93). Nearly three-fourths of the panellists expected that the Indian economy will be impacted somewhat or to a limited extent in H2:2024 from 'higher for longer' policy rate stances of central banks. Half of the experts perceived that the increase in credit growth witnessed in the last two years is 'somewhat sustainable' and another 27 per cent assessed it to be 'largely sustainable'. Some of the respondents, however, expressed concerns over consumer loan quality, cost of funds and asset quality.

Chart 1.93: Potential Risks to Financial Stability



Source: Systemic Risk Survey, May 2024.

Summary and Outlook

1.114 The global financial system remains resilient, despite successive high impact shocks and the challenges stemming from uncertain growth prospects, high public debt and geopolitical conflicts. Near-term global macrofinancial risks have receded, helped by progress in lowering inflation and the ongoing economic recovery. The last mile of disinflation, however, remains complex and delay in aligning inflation to target could unmoor investor expectations, tighten financial conditions and worsen existing fragilities.

1.115 Amidst an uncertain and challenging global backdrop, the Indian economy is displaying steady growth and has been a significant contributor to global growth. Economic resilience and improved prospects are anchored by macroeconomic stability. Bolstered by a healthy banking system, the domestic financial system remains stable and supportive of real activity. Global spillovers remain a key near-term vulnerability. Overall, strong macroeconomic fundamentals and financial system soundness augur well for sustaining the growth momentum and withstanding global shocks.

Chapter II

Financial Institutions: Soundness and Resilience

India's financial sector consolidated further in terms of asset quality, capital position, profitability and resilience. Macro stress tests for credit risk reveal that all banks would be able to meet the regulatory minimum capital even under a severe stress scenario. Interconnectedness among financial sector entities continued to rise in terms of bilateral exposures.

Introduction

2.1 The Indian banking sector recorded sustained improvement in capital positions, asset quality and profitability amidst strong business expansion. Credit growth remains robust, mainly driven by personal loans and lending to the services sector. Accruals in term deposits rose with increased transmission of monetary policy. The regulatory prescription of higher risk weights for certain category of loans has had a sobering impact on such loans. Lending by non-banking financial companies (NBFCs) moderated in the second half of 2023-24, especially personal loans, and asset quality improved further. Bilateral exposures among entities in the Indian financial system continued to expand, commensurate with expansion in business.

2.2 This chapter presents stylised facts and analyses on latest trends in the domestic financial sector. Section II.1 outlines the performance of scheduled commercial banks (SCBs) in India through various parameters, *viz.* business mix; asset quality; concentration of large borrowers; capital adequacy; earnings and profitability. Macro stress tests and sensitivity analyses are also performed to evaluate the resilience of SCBs. Sections II.2 and II.3 examine the financial parameters of urban cooperative banks (UCBs) and NBFCs, respectively, including their resilience under various stress scenarios. Sections II.4, II.5 and II.6 examine the soundness and resilience of the insurance sector, mutual funds and clearing corporations, respectively. Section II.7 concludes the chapter with a detailed analysis of the network structure and connectivity of the Indian financial system, with contagion analysis under adverse scenarios.

II.1 Scheduled Commercial Banks (SCBs)[1] [2] [3]

2.3 Deposit mobilisation by SCBs gathered pace during 2023-24 with a large portion of new accretions in the form of term deposits. Interest rates became more attractive as banks stepped up efforts to mobilise funds to match the rapid rise in credit demand (Chart 2.1 a and 2.1 b). Growth in current account and savings account (CASA) accelerated across all bank groups (Chart 2.1 c).

[1] Analyses are mainly based on RBI's supervisory returns which cover only domestic operations of SCBs, except in the case of data on large borrowers, which are based on banks' global operations. For this exercise, SCBs include public sector banks, private sector banks and foreign banks. Private sector bank data for September 2023 onwards are inclusive of merger of a large housing finance company with a private bank and therefore, the data may not be comparable to past periods before the merger (applicable for all charts and tables).

[2] The analyses done in the chapter are based on the data available as of June 14, 2024, which are provisional.

[3] Personal loans refer to loans given to individuals and consist of (a) consumer credit (b) education loan (c) loans given for creating/enhancement of immovable assets (*e.g.* housing, *etc.*) and (d) loans given for investment in financial assets (shares, debentures, *etc.*)

2.4 Bank credit accelerated during H2:2023-24 among public sector banks (PSBs) and foreign banks (FBs), whereas it moderated in respect of private sector banks (PVBs) (Chart 2.1 d). The share of credit to the services sector and personal loans in the aggregate loan portfolio increased (Chart 2.1 e and f). Personal loans accounted for over half of PVBs' credit growth (Chart 2.1 g). The expansion in personal loans was broad-based (Chart 2.1 h), led by housing loans and followed by other personal loans (Chart 2.1 i).

Chart 2.1: Deposit and Credit Profile of SCBs *(Contd.)*

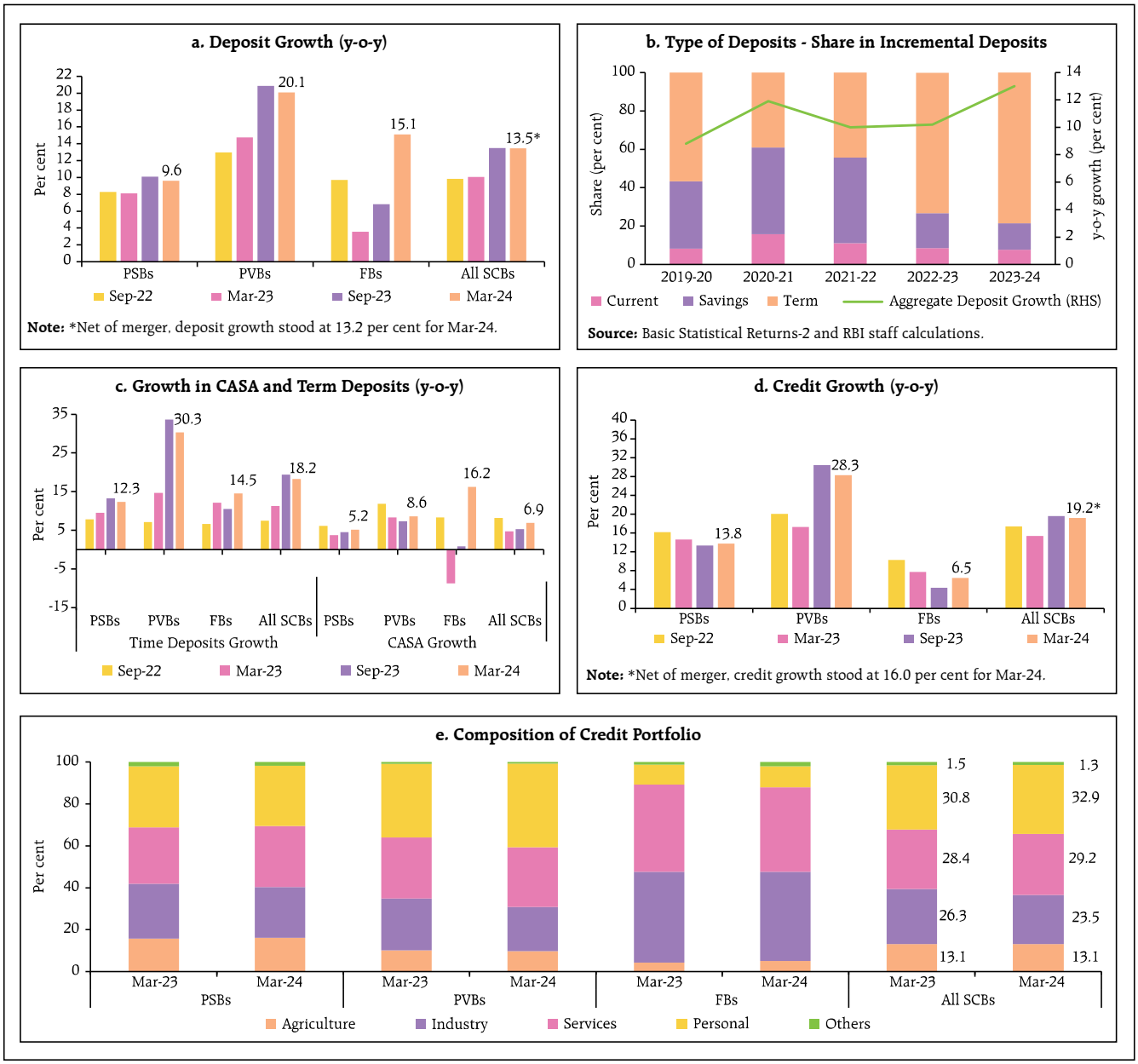


Chart 2.1: Deposit and Credit Profile of SCBs *(Concld.)*

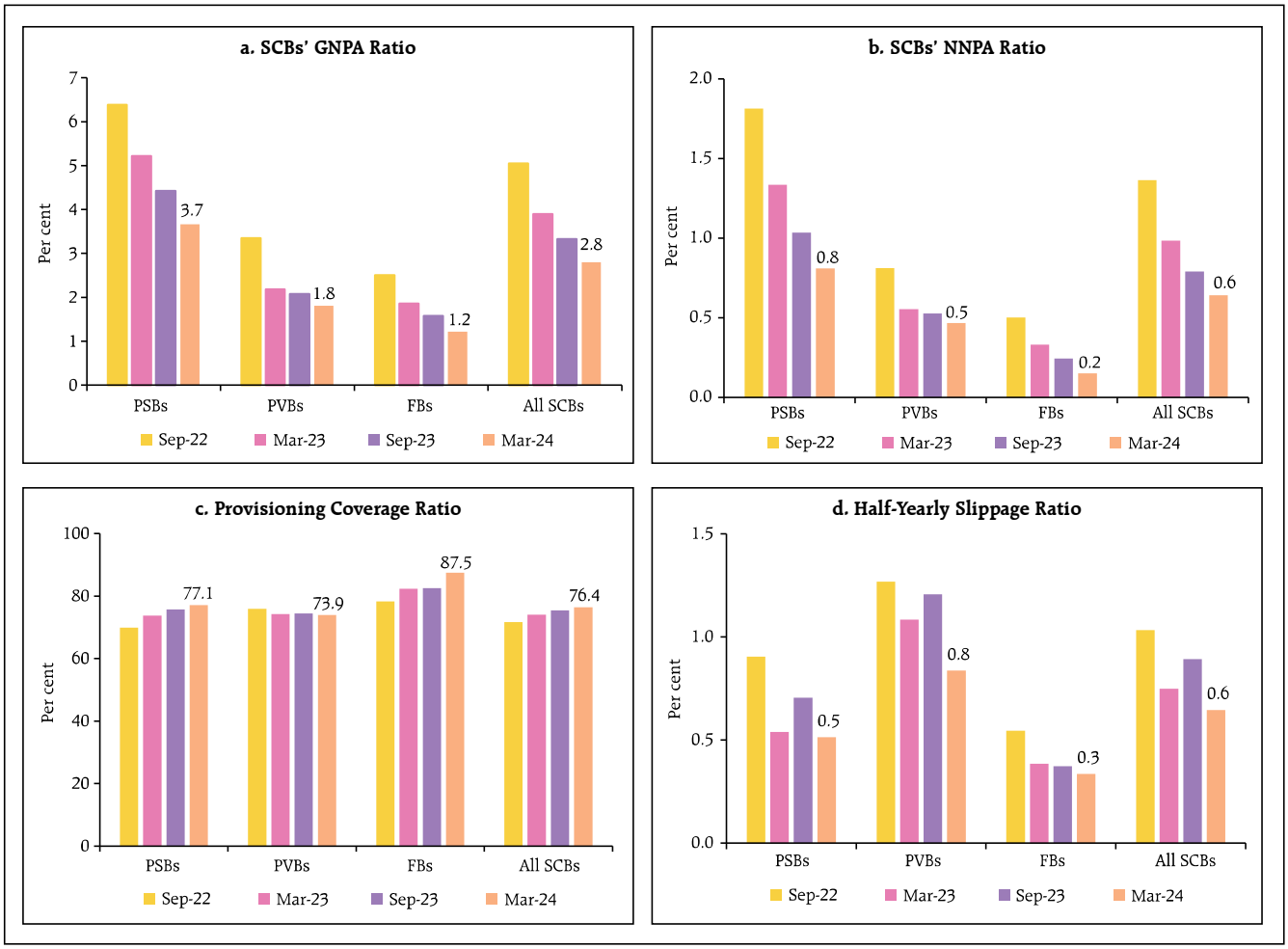
Note: Numbers given in parantheses are the percentage shares of the respective sub-sector's credit in total personal loans in March 2024. Vehicle/ auto loans and education loans for FBs have not been considered due to negligible amounts.

Note: Transfer of retail business of a foreign bank to a PVB in March 2023 has impacted the growth rates of PVBs and FBs. The spurt in housing loans of PVBs from September 2023 is attributable to the merger of a large housing finance company with a private bank.
Source: RBI supervisory returns and staff calculations.

II.1.1 Asset Quality

2.5 The asset quality of SCBs recorded sustained improvement and their GNPA ratio moderated to a 12-year low in March 2024 (Chart 2.2 a). Their NNPA ratio[4] too improved to a record low (Chart 2.2 b). Among bank groups, PSBs recorded a substantial reduction (76 bps) in their GNPA ratio during H2:2023-24. While the GNPA stock decreased across all bank groups, active and deep provisioning by PSBs and FBs resulted in an improved provisioning coverage ratio (PCR)[5] in March 2024 (Chart 2.2 c). The half-yearly slippage ratio (*viz.*, new NPA accretions as a share of standard advances) decreased across bank groups (Chart 2.2 d). Though the amount of write-offs declined during the year, the write-off ratio[6] remained almost at the same level as a year ago, due to reduction in GNPA stock (Chart 2.2 e). Overall, the sustained reduction in the GNPA ratio since March 2020 has been primarily due to a persistent fall in new NPA accretions and increased write-offs (Chart 2.2 f).

Chart 2.2: Select Asset Quality Indicators *(Contd.)*

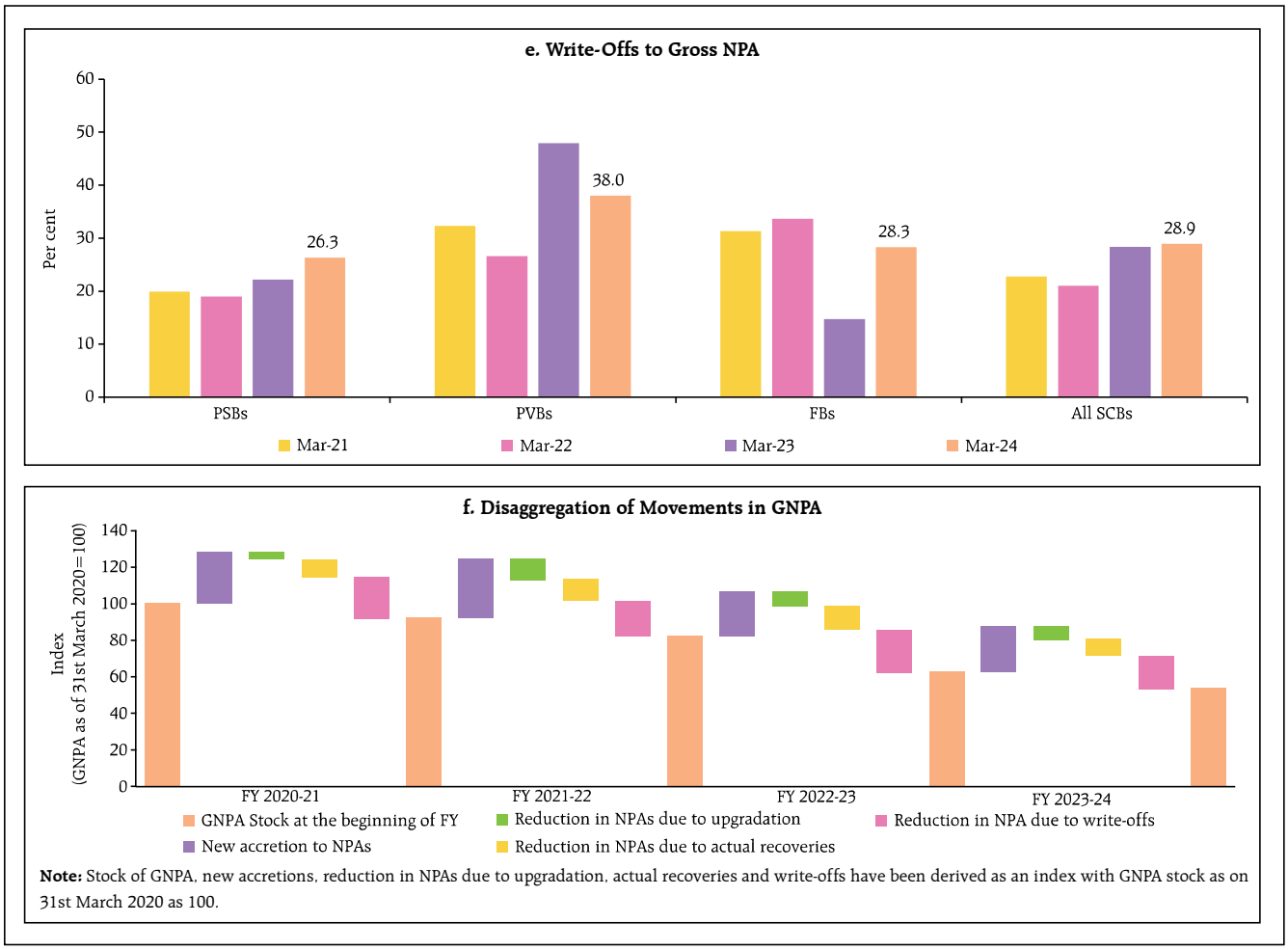


[4] NNPA ratio is the proportion of net non-performing assets in net loans and advances.

[5] PCR is the proportion of provisions (without write-offs) held for NPAs to GNPA.

[6] Ratio of write-offs (including technical/ prudential write-offs and compromise settlement) during the period to GNPA at the beginning of the period.

Chart 2.2: Select Asset Quality Indicators *(Concld.)*



Note: Stock of GNPA, new accretions, reduction in NPAs due to upgradation, actual recoveries and write-offs have been derived as an index with GNPA stock as on 31st March 2020 as 100.

Source: RBI supervisory returns and staff calculations.

II.1.2 Sectoral Asset Quality

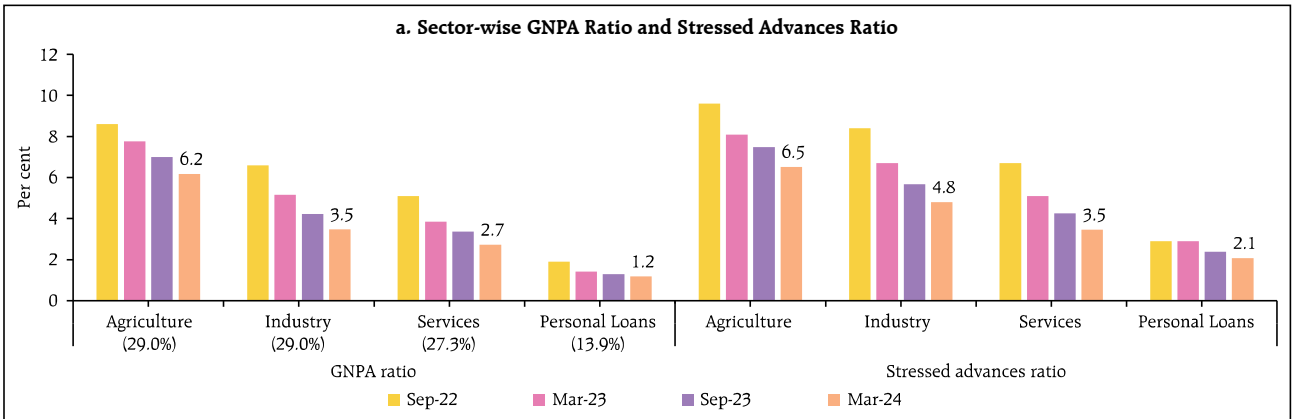
2.6 The improvement in SCBs' asset quality was broad-based (Chart 2.3 a). Among major sectors, the impairment ratio in agriculture remained the highest but it has recorded persistent improvement during H2:2023-24. The GNPA ratio in all categories of personal loans reduced across bank groups (Chart 2.3 b). Within the industrial sector, asset quality improved across all major sub-sectors barring the vehicles and transport equipment sector (3.0 per cent share in bank credit to industry) (Chart 2.3 c).

II.1.3 Credit Quality of Large Borrowers[7]

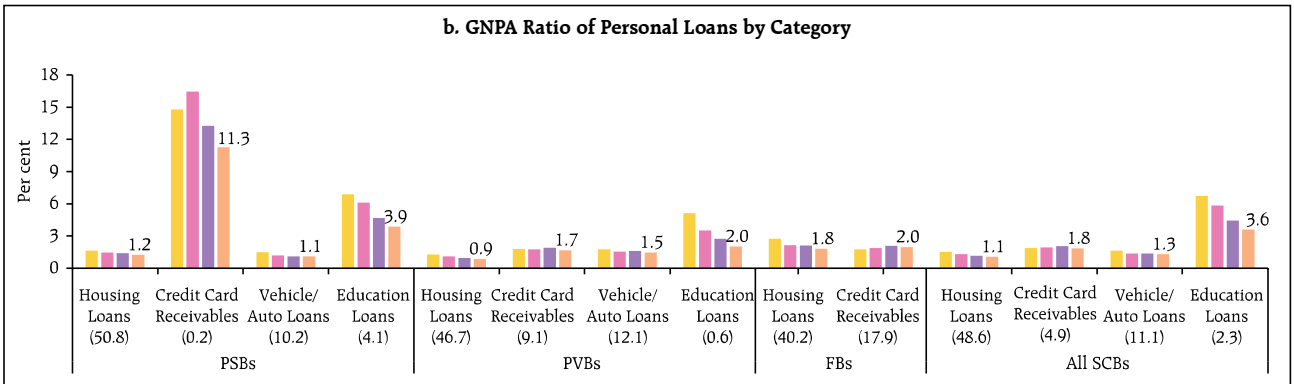
2.7 The share of large borrowers in gross advances of SCBs declined during 2023-24. The asset quality of the large borrower portfolio of banks improved, leading to a downtick in the share

[7] A large borrower is defined as one who has aggregate fund-based and non-fund-based exposure of ₹5 crore and above. This analysis is based on SCBs' global operations.

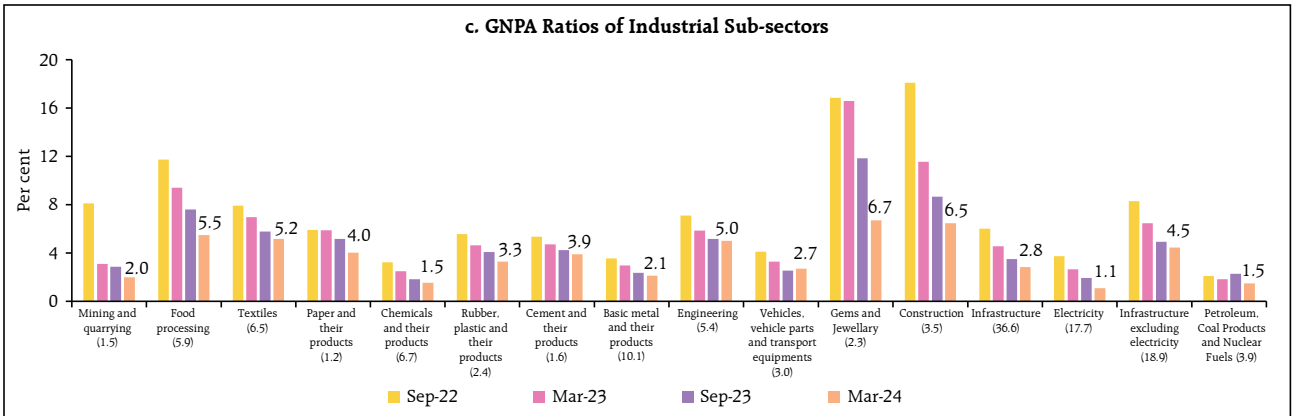
Chart 2.3: Sectoral Asset Quality Indicators



Note: Numbers given in parentheses are percentage shares of the respective sector's GNPA in total GNPA as of March-24.



Note: Numbers given in parentheses with the legend are the percentage shares of the respective sub-sector's credit in total credit to personal loans in March-24; residual share pertains to other personal loans. Vehicle/ auto loans and education loans for FBs have not been considered due to negligible amounts.

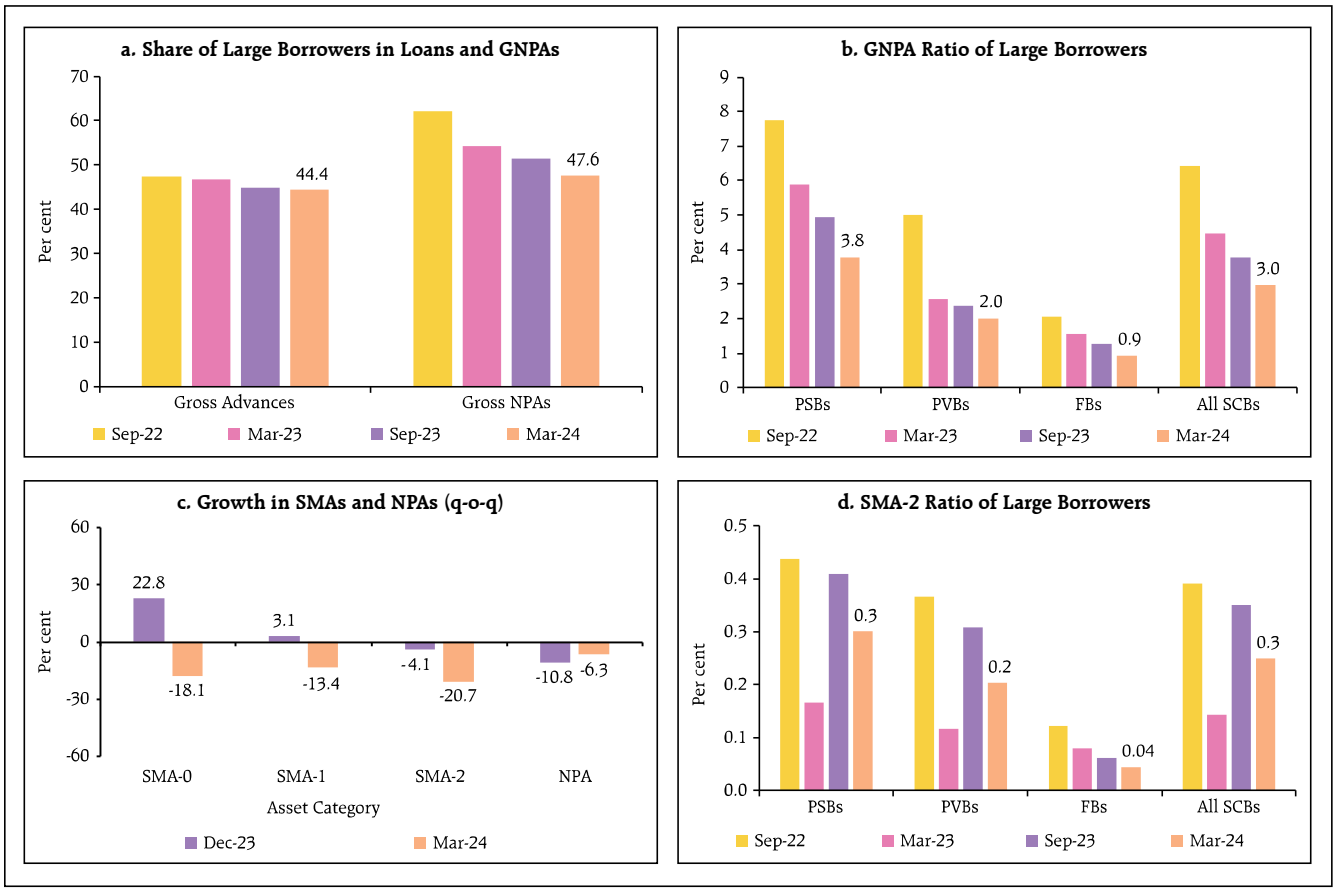


Note: Numbers given in parentheses with the legend are the shares of the respective sub-sector's credit in total credit to industry in March-24.

Source: RBI supervisory returns and staff calculations.

of large borrowers in total GNPAs of SCBs (Chart 2.4 a and b). SMA[8] loans in all maturity buckets declined sequentially (q-o-q) in March 2024 (Chart 2.4 c). The SMA-2 ratio for large borrowers, which had risen during H1:2023-24, declined during Q3 and Q4:2023-24 (Chart 2.4 d). The proportion of standard assets to total funded amount continued to rise for large borrower accounts (Chart 2.4 e). The share of the top 100 borrowers in the total funded amount moderated during 2023-24 after rising in the previous two years. As at end March 2024, only one of the top 100 borrower accounts was classified under the NPA category (Chart 2.4 f). In terms of value, investment grade advances (rated BBB and above) constituted 91.3 per cent of total externally rated funded advances to large borrowers (Chart 2.4 g).

Chart 2.4: Select Asset Quality Indicators of Large borrowers *(Contd.)*

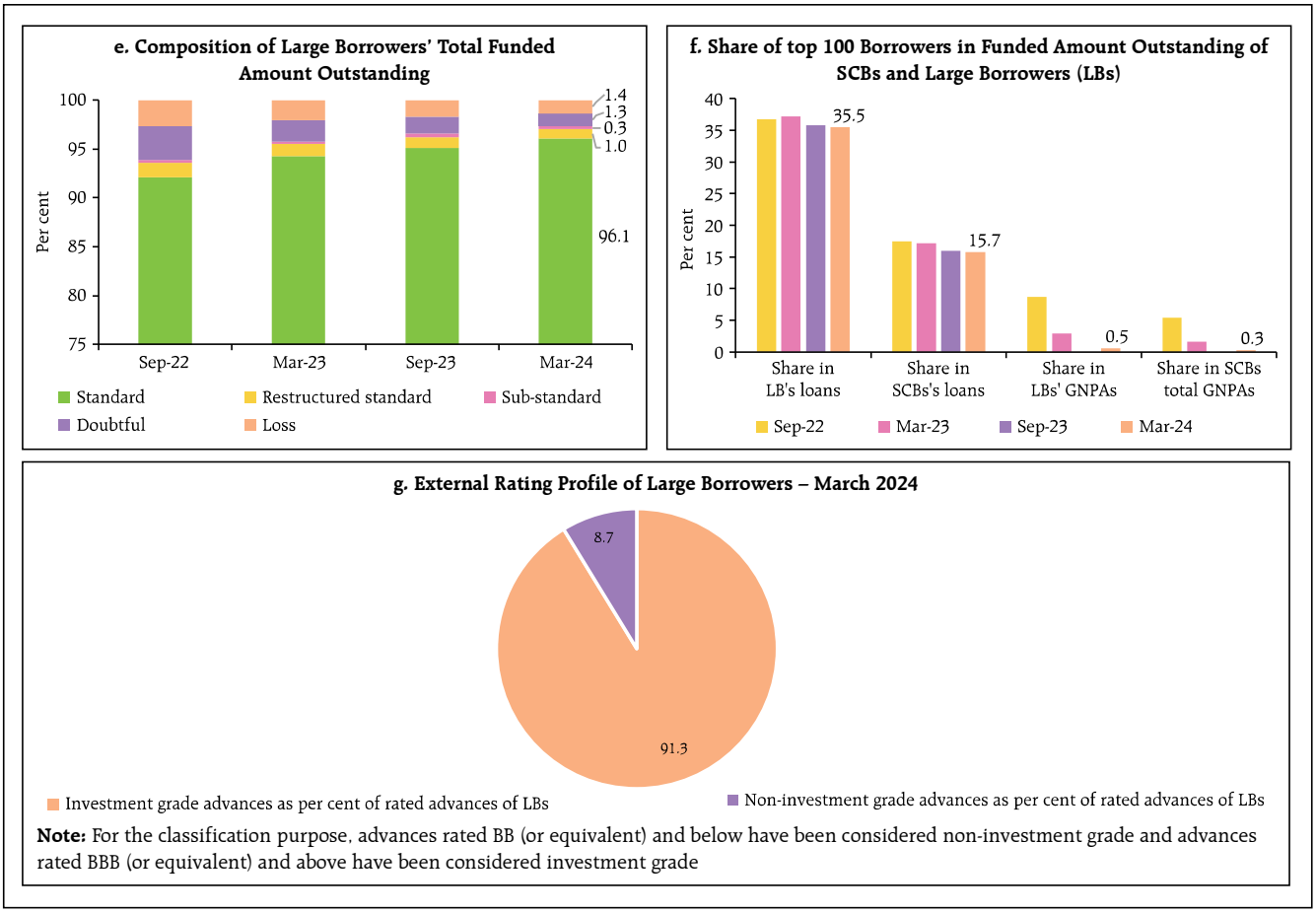


[8] Special mention account (SMA) is defined as:

a) For loans in the nature of revolving facilities like cash credit/ overdraft: if outstanding balance remains continuously in excess of the sanctioned limit or drawing power, whichever is lower, for a period of 31-60 days - SMA-1 ;61-90 days - SMA-2.

b) For loans other than revolving facilities: if principal or interest payment or any other amount wholly or partly overdue remains outstanding up to 30 days - SMA-0; 31-60 days - SMA-1; 61-90 days - SMA-2.

Chart 2.4: Select Asset Quality Indicators of Large borrowers *(Concld.)*



Note: For the classification purpose, advances rated BB (or equivalent) and below have been considered non-investment grade and advances rated BBB (or equivalent) and above have been considered investment grade

Source: RBI supervisory returns and staff calculations.

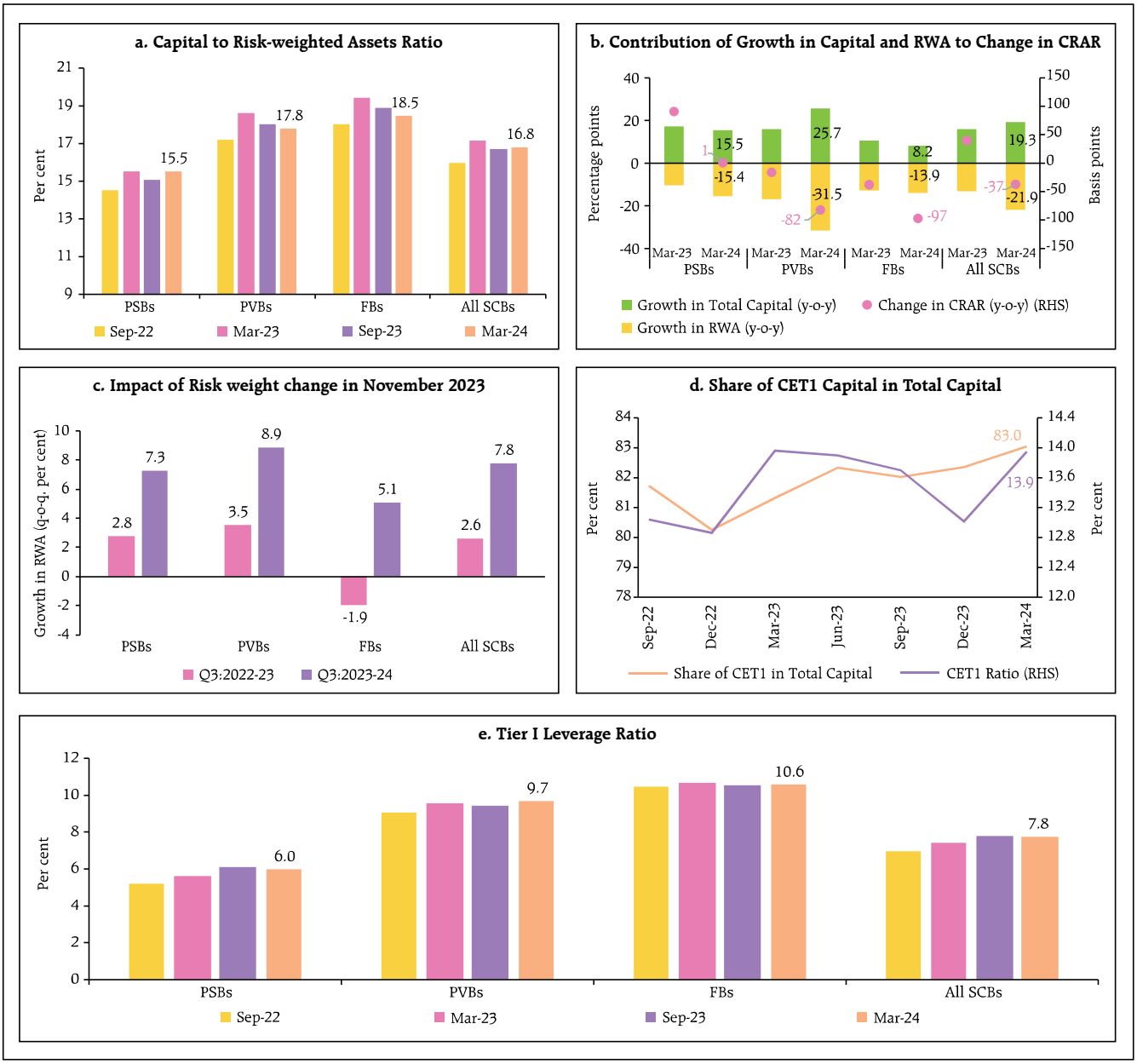
II.1.4 Capital Adequacy

2.8 During H2:2023-24, CRARs of PSBs increased but they declined for PVBs and FBs that had higher shares of certain categories of loans for which risk weights were increased under regulatory measures[9] (Chart 2.5 a). As growth in risk weighted assets (RWA) outpaced the growth in total capital for PVBs and FBs, the system level CRAR declined by 37 bps during 2023-24 (Chart 2.5 b). Due to revision in risk weights, all bank groups posted higher growth in RWA during October-December 2023 over a year ago (Chart 2.5 c). The common equity tier 1 (CET1) capital ratio inched closer to its record level of March 2023, as its share in total capital increased (Chart 2.5 d). The Tier I leverage ratio[10] remained close to its September 2023 level, with additional

[9] Regulatory measures towards consumer credit and bank credit to NBFCs (circular DOR.STR.REC.57/21.06.001/2023-24 dated November 16, 2023).

[10] Tier I leverage ratio is the ratio of Tier I capital to total exposure.

Chart 2.5: Capital Adequacy



Source: RBI supervisory returns and staff calculations.

Tier I capital accretion matching incremental total exposure during H2:2023-24 (Chart 2.5 e). Capital ratios are exhibiting mean reversion with an asymmetric speed of reversion towards trend (Box 2.1).

Box 2.1: Banking System Resilience Measured through the Speed of Convergence

SCBs in India are mandated to maintain a minimum CRAR of 9 per cent on an ongoing basis to ensure viability and smooth business functioning. Since 2009, the bank group level CRARs have remained much above the regulatory minimum: the lowest CRARs among PSBs, PVBs and FBs observed during this period are 11.2 per cent, 15.0 per cent and 14.3 per cent, respectively (Chart 1). Nevertheless, there were occasions when an individual bank's CRAR fell below 9 per cent.

In the event of banks' CRAR deviating from the trend, the speed of convergence towards the trend acts as a proxy for the banks' resilience. Resilience is measured by the coefficient (α_T) of 'Gap' in the following equation (O'Sullivan, *et al*; 2024):

$$\Delta CRAR_{i,t} = c + \alpha_T . Gap_{i,t-1} + \beta_T' X + \epsilon_t \quad t = 1, 2, \ldots, T \quad \ldots(1)$$

where 'Gap' denotes the deviation of CRAR from its long-term trend (CRAR minus long-term trend), i stands for bank groups (PSBs, PVBs and FBs), X is a set of control variables (*e.g.*, inflation rate; lending rate spread) and ϵ_t a normally distributed white noise error. The long-term trend is computed by using one-sided Hodrick-Prescott (HP) filter with 'lambda' equal to 1600. The coefficient (α_T) should be negative to ensure mean reversion, with higher values (in absolute terms) representing higher resilience.

Among bank groups, the maximum resilience is displayed by FBs. With improvements in asset quality and capital adequacy, PSBs displayed better convergence than PVBs, and also showed the highest resilience among bank groups in the latest quarter (Chart 2).

To ascertain whether the speed of convergence is asymmetric for higher and lower levels of CRAR, the following relationship for each bank group is estimated using quarterly data from Q1:2009 to Q1:2024:

$$\Delta CRAR_{i,t} = c + \alpha_{1T} . Gap^{+}_{i,t-1} + \alpha_{2T} . Gap^{-}_{i,t-1} + \beta_T' X + \epsilon_t \quad \ldots(2)$$
$$t = 1, 2, \ldots, T$$

where Gap^{+} = 'Gap' when it is positive, zero otherwise; and Gap^{-} = 'Gap' when it is negative, zero otherwise.

Chart 1: CRAR and its trend* - Bank group wise

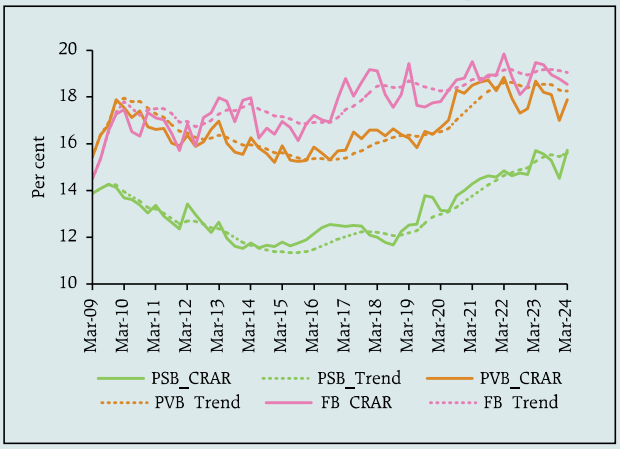
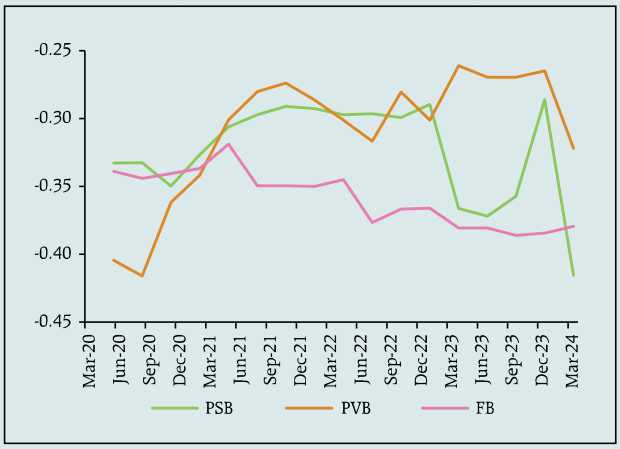


Chart 2: Speed of convergence - Bank group wise



* One-sided HP trend.

(Contd.)

Table 1: Estimated regression equations for ΔCRAR

	PSBs	PVBs	FBs
Constant	0.081 (0.104)	-1.448** (0.569)	-1.081 (0.670)
$Gap^{+}(-1)$	0.106 (0.207)	-0.157 (0.259)	-0.574* (0.332)
$Gap^{-}(-1)$	-0.955*** (0.340)	-0.499* (0.267)	-0.306 (0.281)
Lending spread		0.316** (0.119)	0.262* (0.140)
No. of Obs.	60	60	60
Adjusted R^2	0.085	0.086	0.116
DW statistic	1.872	2.015	1.975
F-statistic	3.725**	2.851**	3.570**

***, ** and * indicate significance at 1, 5 and 10 per cent levels, respectively.
Figures in parentheses are standard errors.
Lending spread = Weighted average lending rate minus RBI repo rate.

It is observed that PSBs and PVBs catch up with their long-term CRAR levels at a faster rate when the CRAR is below the long-term trend. The speed of mean reversion is higher and significant when the gap is negative *vis-à-vis* when it is positive (Table 1). FBs, however, have a different profit allocation behaviour as they are permitted to remit profits to their headquarters; hence the speed of mean reversion is higher and significant when the gap is positive.

Reference:

O'Sullivan, C, V Papavassiliou, R Wekesa Wafula and S Boubaker (2024). "New insights into liquidity resiliency", *Journal of International Financial Markets, Institutions and Money*, Vol 90, 101892.

II.1.5 Earnings and Profitability

2.9 Net interest income (NII) of SCBs increased during 2023-24 with a surge in trading income augmenting other operating income (OOI). As the need for additional provisions fell due to depleting stock of NPAs, profit after tax (PAT) rose by 32.5 per cent (y-o-y) in March 2024 in spite of a large increase in operating expenses. On the back of significant increase in NII and OOI, PVBs registered higher PAT growth *vis-à-vis* PSBs. A significant fall in OOI of FBs, however, led to moderation in their PAT despite a steep fall in provisioning (Chart 2.6 a).

2.10 Lagged effects of transmission of monetary policy rate increases and shifts in liquidity conditions led to nearly 100 bps rise in the cost of funds, as against 75 bps rise in the yield on assets

Chart 2.6: Select Performance Indicators of SCBs *(Contd.)*

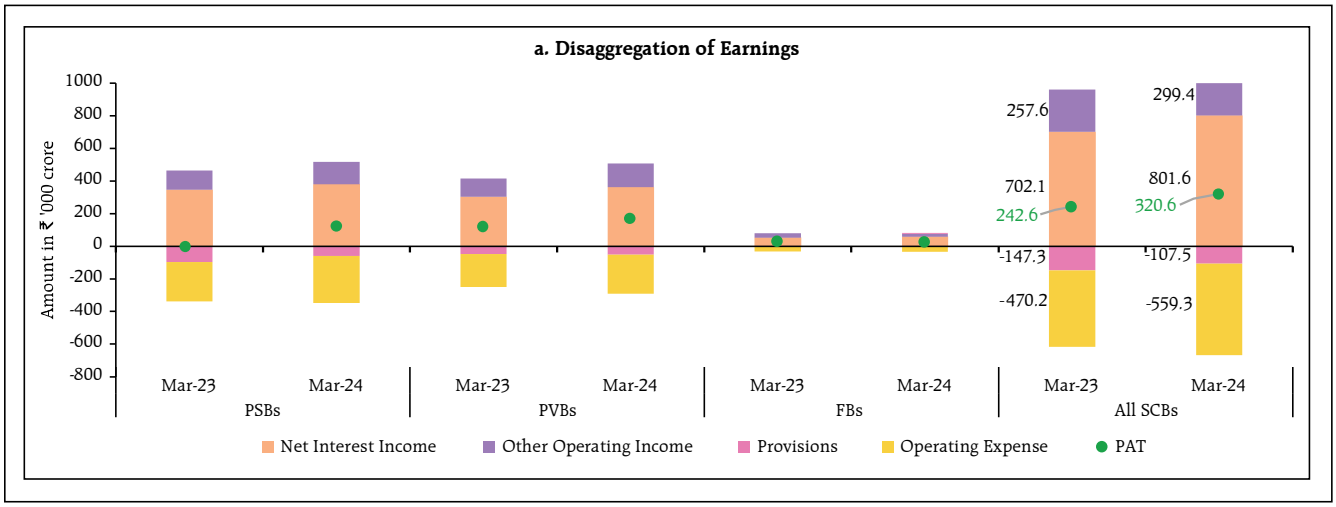
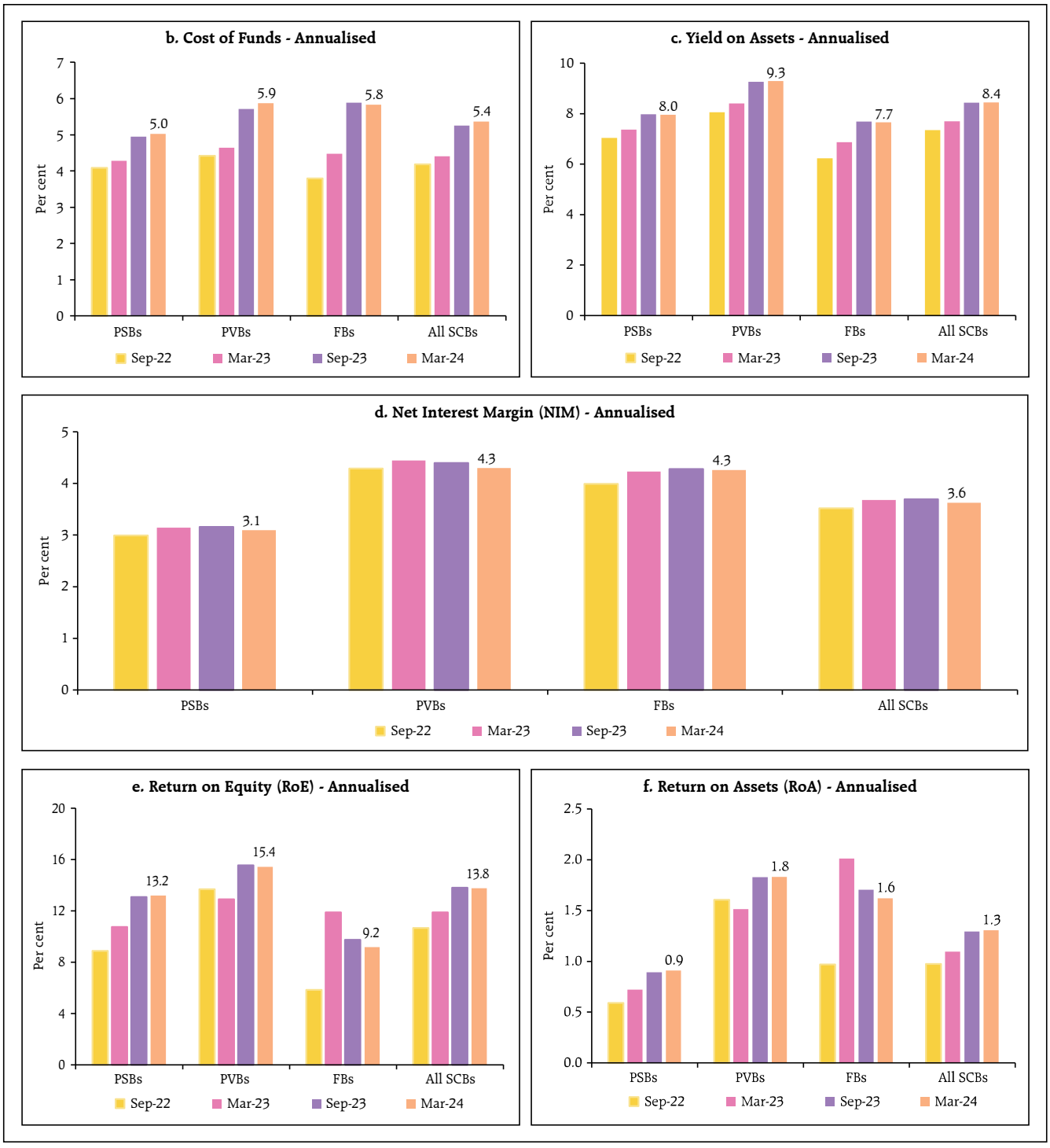


Chart 2.6: Select Performance Indicators of SCBs *(Concld.)*



Source: RBI supervisory returns and staff calculations.

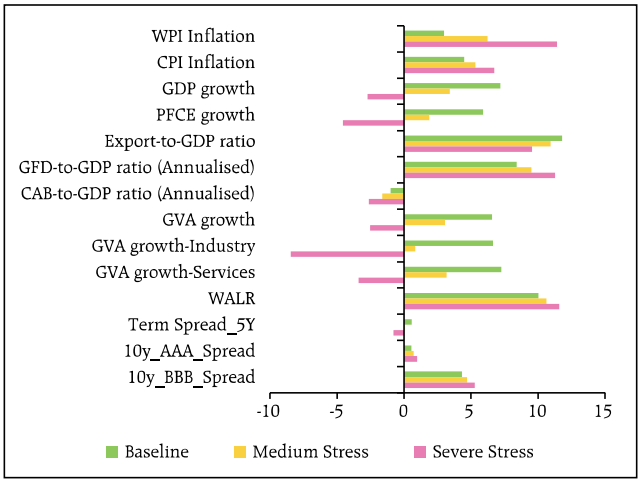
during 2023-24 (Chart 2.6 b & c). As a result, net interest margin (NIM) of SCBs shrunk marginally (Chart 2.6 d). Profitability of banks remained high as reflected in their RoE and RoA ratios (Chart 2.6 e and f).

II.1.6 Resilience – Macro Stress Tests

2.11 Macro stress tests are performed to assess the resilience of SCBs' balance sheets to unforeseen shocks emanating from the macroeconomic environment. These tests attempt to assess capital ratios over a one-year horizon under a baseline and two adverse[11] (medium and severe) scenarios. The baseline scenario is derived from the forecasted values of macroeconomic variables. The medium and severe adverse scenarios are arrived at by applying 0.25 to one standard deviation (SD) shocks and 1.25 to two SD shocks, respectively, to the macroeconomic variables, increasing the shocks sequentially by 25 basis points in each quarter (Chart 2.7). The adverse scenarios are stringent conservative assessments under hypothetical adverse economic conditions. The model outcomes should not be interpreted as forecasts.

Chart 2.7: Macro Scenario Assumptions for 2024-25
(average of four quarters)

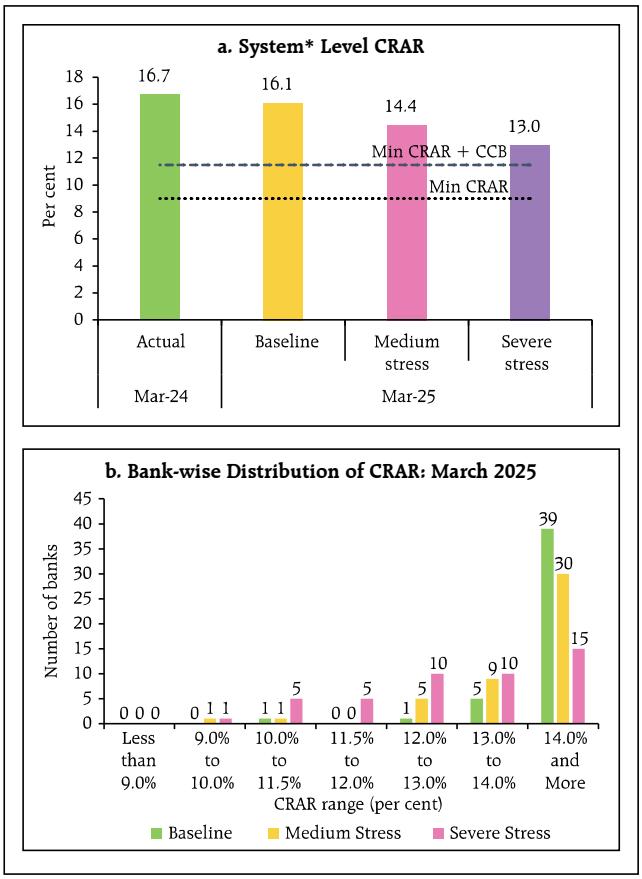
(per cent)



Source: RBI staff calculations.

2.12 Stress test results reveal that SCBs are well capitalised and capable of absorbing macroeconomic shocks even in the absence of any further capital infusion by stakeholders. Under the baseline scenario, the aggregate CRAR of 46 major banks is projected to slip from 16.7 per cent in March 2024 to 16.1 per cent by March 2025. It may go down to 14.4 per cent in the medium stress scenario and to 13.0 per cent under the severe stress scenario by March 2025, which is still above the minimum capital requirement (Chart 2.8 a). No SCB would breach the minimum capital requirement of 9 per cent over a year ahead horizon (Chart 2.8 b).

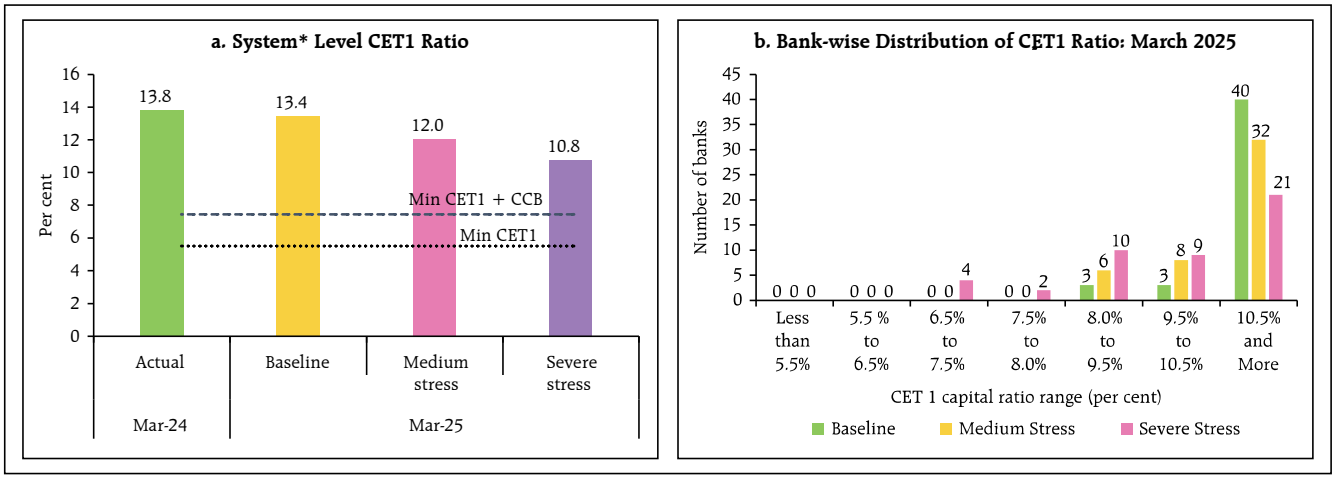
Chart 2.8: CRAR Projections



Note: (1) * For a system of 46 select banks.
(2) It does not consider any capital infusion by stakeholders.
Source: RBI supervisory returns and staff calculations.

[11] See Annex-2 for detailed methodology.

Chart 2.9: Projection of CET1 Ratio

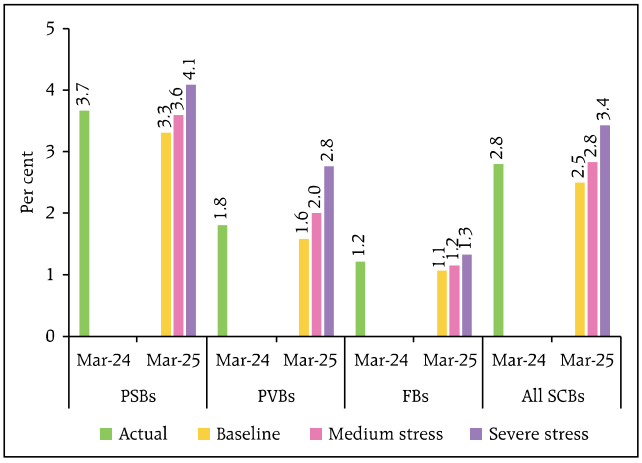


Note: (1) * For a system of 46 select banks.
(2) It does not consider any capital infusion by stakeholders.
Source: RBI supervisory returns and staff calculations.

2.13 The CET1 capital ratio of the select 46 SCBs may decline from 13.8 per cent in March 2024 to 13.4 per cent a year ahead under the baseline scenario (Chart 2.9 a). Even in a severely stressed macroeconomic environment, the aggregate CET1 capital ratio would deplete by 300 basis points only, which would not breach the minimum regulatory norms. All banks would be able to meet the minimum regulatory CET1 ratio of 5.5 per cent (Chart 2.9 b).

2.14 The GNPA ratio of all SCBs may improve to 2.5 per cent by March 2025 under the baseline scenario (Chart 2.10). However, if the macroeconomic environment worsens to a severe stress scenario, the ratio may rise to 3.4 per cent. Under the severe stress scenario, the GNPA ratios of PSBs may increase from 3.7 per cent in March 2024 to 4.1 per cent in March 2025, whereas it may go up from 1.8 per cent to 2.8 per cent for PVBs and from 1.2 per cent to 1.3 per cent for FBs.

Chart 2.10: Projection of SCBs' GNPA Ratios



Note: GNPAs are projected using two complementary econometric models-autoregressive distributed lag (ADL) and vector autoregression (VAR); the resulting GNPA ratios are averaged.
Source: RBI supervisory returns and staff calculations.

II.1.7 Sensitivity Analysis[12]

2.15 Under macro stress tests, the shocks are in terms of adverse macroeconomic conditions, while in sensitivity analyses, hypothetical shocks are applied to single factors like GNPA, interest rate, equity prices, deposits, and the like, one at a time. This sub-section presents the results of top-down[13] sensitivity analyses involving several single-factor

[12] Macro stress tests for GNPA ratios are applied at the system and major bank-group levels, whereas the sensitivity analyses are conducted at system and individual bank levels. The detailed methodology is given in Annex 2.

[13] Top-down stress tests are based on specific scenarios and on aggregate bank-wise data.

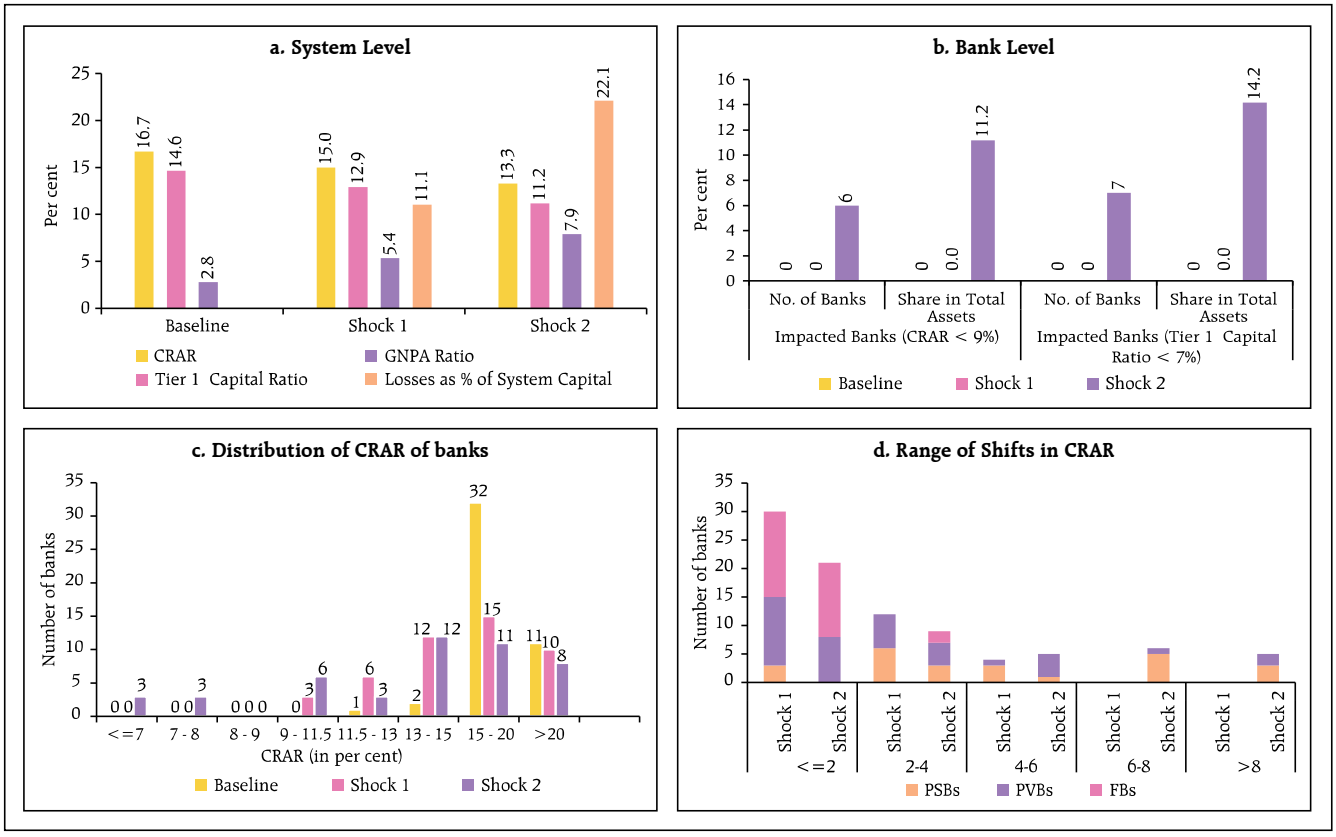
shocks to assess the vulnerabilities of SCBs to simulated credit, interest rate, equity and liquidity risks under various stress scenarios[14].

a. Credit Risk

2.16 Credit risk sensitivity has been analysed under two scenarios wherein the system level GNPA ratio is assumed to rise from its prevailing level by (i) one SD[15]; and (ii) two SDs in a quarter. Under a severe shock of two SDs, (a) the aggregate GNPA ratio of 46 select SCBs would move up from 2.8 per cent to 7.9 per cent; (b) the system-level CRAR would deplete by 340 bps from 16.7 per cent to 13.3 per cent; and (c) the Tier 1 capital ratio would go down from 14.6 per cent to 11.2 per cent, which would still remain well above the respective regulatory minimum levels. The system level capital impairment could be 22.1 per cent in this case (Chart 2.11 a). The reverse stress test shows that a shock of 5.1 SD would be required to bring down the system-level CRAR below the regulatory minimum of 9 per cent.

2.17 Bank-level stress tests indicate that under the severe shock scenario, six banks with a share of 11.2 per cent of SCBs' total assets may fail to maintain the regulatory minimum level of CRAR (Chart 2.11 b). In such a scenario, the CRAR would

Chart 2.11: Credit Risk - Shocks and Outcomes



Note: For a system of select 46 SCBs
Shock 1: 1 SD shock on GNPA ratio
Shock 2: 2 SD shock on GNPA ratio
Source: RBI supervisory returns and staff calculations.

[14] Single factor sensitivity analyses are conducted for a sample of 46 SCBs accounting for 98 per cent of the total assets of the banking sector. The shocks designed under various hypothetical scenarios are extreme but plausible.

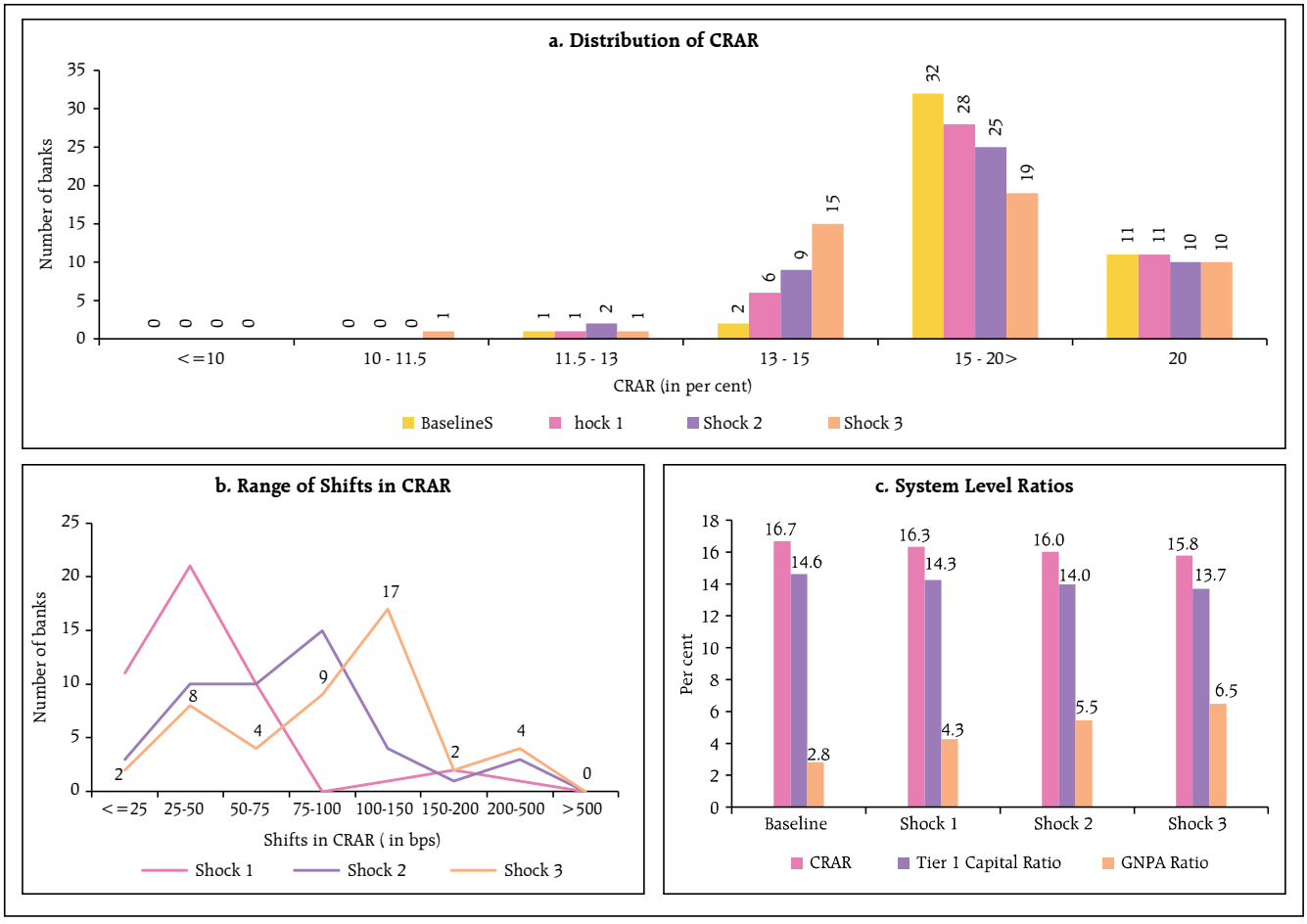
[15] The SD of the GNPA ratio is computed using quarterly data for the last 10 years.

fall below 7 per cent in case of three banks (Chart 2.11 c) and five banks would record a decline of over eight percentage points in the CRAR. In general, PVBs and FBs would face lower erosion in CRARs than PSBs under both scenarios (Chart 2.11 d).

b. Credit Concentration Risk

2.18 Stress tests on banks' credit concentration – considering top individual borrowers according to their standard exposures – show that in the extreme scenario of the top three individual borrowers of respective banks failing to repay[16], no bank would face a situation of a drop in CRAR below the regulatory minimum (Chart 2.12 a). Under this scenario, four banks would experience a fall of more than two percentage points in their CRARs (Chart 2.12 b) and the system level CRAR would fall by 90 bps (Chart 2.12 c).

Chart 2.12: Credit Concentration Risk: Individual Borrowers – Exposure



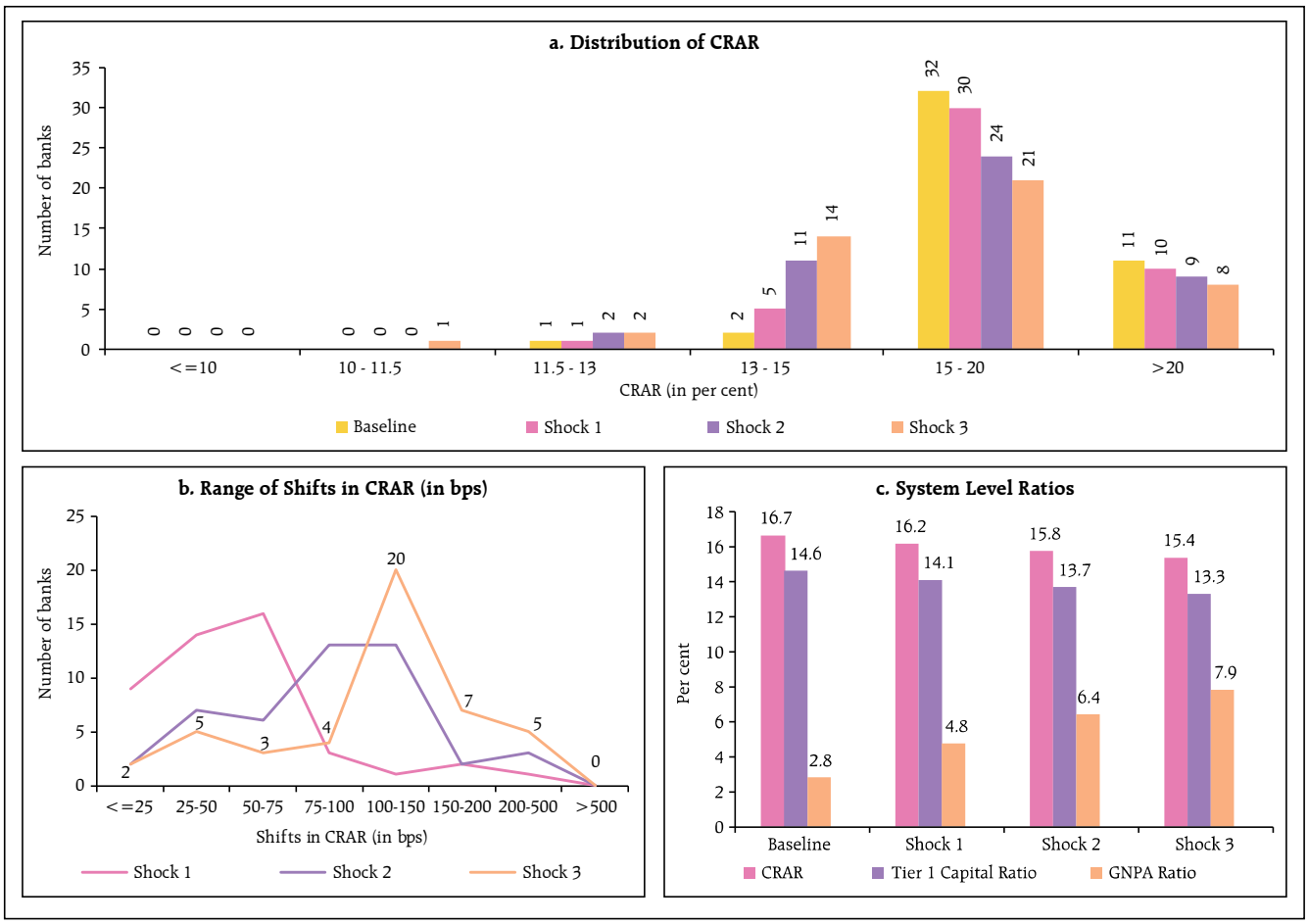
Note: For a system of select 46 SCBs
Shock 1: Topmost individual borrower fails to meet payment commitments
Shock 2: Top 2 individual borrowers fail to meet their payment commitments
Shock 3: Top 3 individual borrowers fail to meet their payment commitments.
Source: RBI supervisory returns and staff calculations.

[16] In the case of default, the borrower in the standard category is considered to move to the sub-standard category.

2.19 Under the extreme scenario of the top three group borrowers in the standard category failing to repay[17], the CRAR of all banks would still remain above 9 per cent (Chart 2.13 a). None of the banks would face a decline of more than five percentage points in their CRARs (Chart 2.13 b). Under this scenario, the system level CRAR would decline by 130 bps (Chart 2.13 c).

2.20 In the extreme scenario of the top three individual stressed borrowers of respective banks failing to repay[18], all banks would remain resilient, with their CRARs depleting by a mere 25 bps or lower (Chart 2.14 a and b). Under this scenario, the system level CRAR would decline by 30 bps (Chart 2.14 c).

Chart 2.13: Credit Concentration Risk: Group Borrowers – Exposure

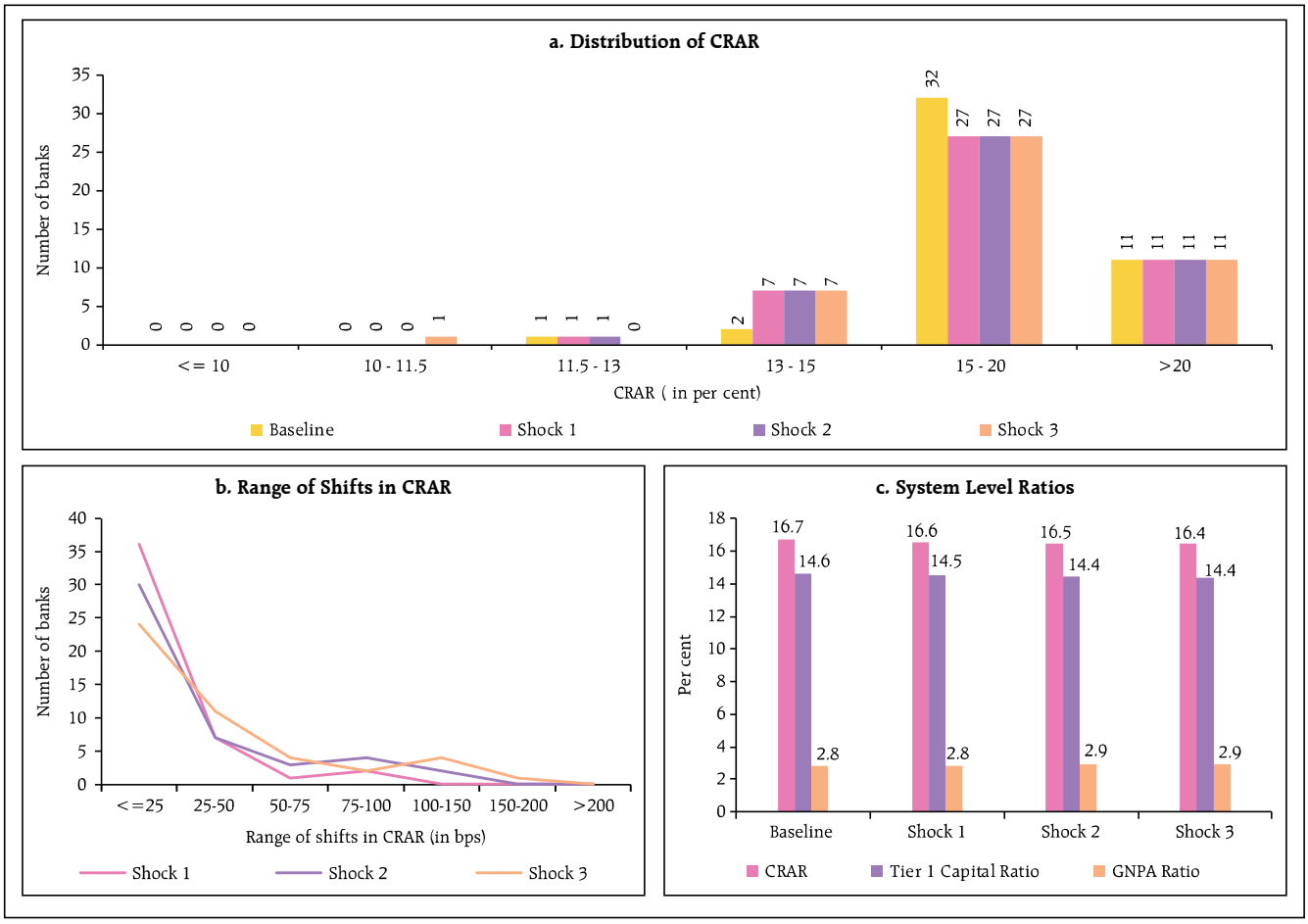


Note: For a system of select 46 SCBs
Shock 1: The top 1 group borrower fails to meet payment commitments
Shock 2: The top 2 group borrowers fail to meet payment commitments
Shock 3: The top 3 group borrowers fail to meet payment commitments.
Source: RBI supervisory returns and staff calculations.

[17] In the case of default, the group borrower in the standard category is considered to move to the sub-standard category.

[18] In case of failure, the borrower in sub-standard or restructured category is considered to move to the loss category.

Chart 2.14: Credit Concentration Risk: Individual Borrowers – Stressed Advances



Note: For a system of select 46 SCBs
Shock 1: Topmost stressed individual borrower fails to meet its payment commitments
Shock 2: Top 2 stressed individual borrowers fail to meet their payment commitments
Shock 3: Top 3 stressed individual borrowers fail to meet their payment commitments.
Source: RBI supervisory returns and staff calculations.

c. Sectoral Credit Risk

2.21 Shocks applied on the basis of volatility of industry sub-sector-wise GNPA ratios indicate varying magnitudes of rise in GNPAs. By and large, sectoral credit risk remains muted – a two SD shock to basic metals and energy sub-sectors would reduce the system-level CRAR by merely 15 bps and 13 bps, respectively, whereas the impact of such a shock on the rest of the sub-sectors would be negligible (Table 2.1).

Table 2.1: Decline in System Level CRAR - Sectoral Credit Risk

(basis points, in descending order for top 10 most sensitive sectors)

	1 SD	2 SD
Basic Metal and Metal Products (699 per cent)	8	15
Infrastructure - Energy (629 per cent)	7	13
Infrastructure - Transport (129 per cent)	3	6
All Engineering (158 per cent)	2	5
Textiles (101 per cent)	2	4
Construction (94 per cent)	1	2
Food Processing (47 per cent)	1	2
Vehicles, Vehicle Parts and Transport Equipments (278 per cent)	1	2
Chemicals (170 per cent)	1	2
Infrastructure - Communication (173 per cent)	1	2

Note: (1) For a system of select 46 SCBs.
(2) Numbers in parenthesis represent the growth in GNPA of that sub-sector due to 1 SD shock to the sub-sector's GNPA ratio.
Source: RBI supervisory returns and staff calculations.

d. Interest Rate Risk

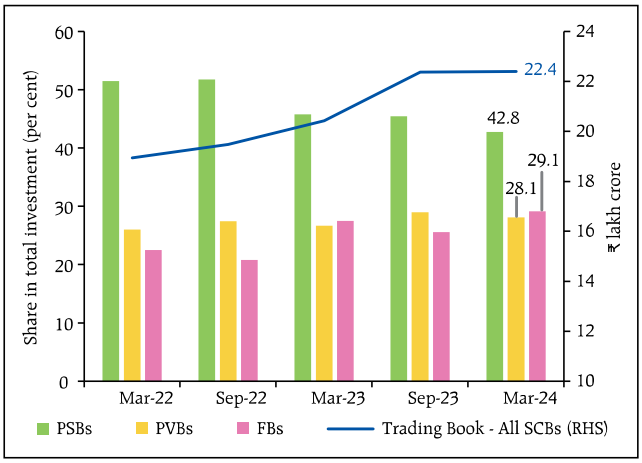
2.22 The market value of investments subject to fair value for the sample of SCBs under assessment was ₹22.4 lakh crore in March 2024 (Chart 2.15) of which, 89.3 per cent was categorised as 'available for sale (AFS)' and the remainder was classified as 'held for trading (HFT)'. PSBs' share in the trading book portfolio of SCBs has been tapering, whereas the corresponding share of FBs has been rising.

2.23 The AFS portfolio's sensitivity (PV01[19]) increased for PSBs and FBs since September 2023, while it declined for PVBs. PV01 increased for PSBs owing to a rise in duration, despite their AFS portfolio shrinking. For FBs, the reverse occurred as their portfolio size increased and their duration declined. Meanwhile, for PVBs, PV01 declined predominantly on account of decline in their portfolio size.

2.24 The PV01 of HFT portfolio of PVBs and FBs increased because of the substantial increase in market value of securities held in the HFT portfolio, as these banks progressively began designating their incremental securities acquired for trading as HFT securities prior to the new investment portfolio guidelines becoming applicable from April 1, 2024 (Table 2.2).

2.25 It is assessed that the impact of a parallel upward shift of 250 bps in the yield curve on the trading portfolio would reduce the system level CRAR and CET1 ratio by 92 and 93 bps, respectively (Table 2.3). At a disaggregated level, one foreign bank's CRAR will fall below the regulatory minimum in the event of such a major shock.

Chart 2.15: Trading Book Portfolio: Bank-group wise



Source: Individual bank submissions and staff calculations.

Table 2.2: PV01 of AFS and HFT Portfolios

(in ₹ crore)

	AFS Portfolio		HFT Portfolio	
	Sep-23	Mar-24	Sep-23	Mar-24
PSBs	227.2	231.4	4.6	4.4
PVBs	109.8	93.2	8.5	26.3
FBs	205.4	215.4	44.1	68.5

Source: Individual bank submissions and staff calculations.

Table 2.3: Interest Rate Risk – Bank-groups - Shocks and Impacts

(under shock of 250 basis points parallel upward shift of the INR yield curve)

	Public Sector Banks		Private Sector Banks		Foreign Banks		All SCBs	
	AFS	HFT	AFS	HFT	AFS	HFT	AFS	HFT
Modified Duration (year)	2.4	3.4	1.8	2.4	4.0	5.8	2.7	4.1
Share in total Investments (per cent)	26.5	0.3	25.0	6.3	77.3	17.2	31.4	4.0
Reduction in CRAR (bps)	74		37		530		92	
Reduction in CET1 (bps)	75		38		533		93	

Source: Individual bank submissions and staff calculations.

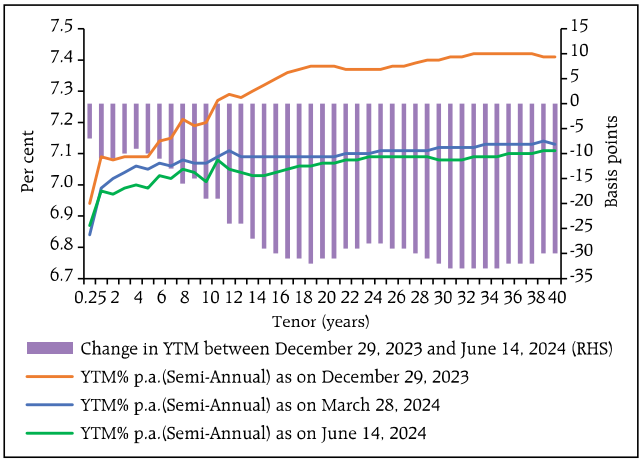
[19] PV01 is a measure of sensitivity of the absolute value of the portfolio to a one basis point change in the interest rate.

2.26 As of March 2024, yields have moved downwards across the curve as compared with their levels prevailing in December 2023. Also, since September 2023, the longer end of the yield curve has trended down due to increased buying of G-Secs by foreign portfolio investors under the fully accessible route (FAR) ahead of India's inclusion in global bond debt index, robust demand from long-term investors (insurance companies and pension funds) and positive sentiment generated by the adherence to the glide path of fiscal consolidation. The Government borrowing programme (gross and net) for 2024-25 is expected to be lower than in 2023-24 in the full Union Budget to be announced in July 2024 with the possibility of a marginal reduction in yields due to lower borrowing requirements (Chart 2.16).

2.27 Trading profits increased for all bank cohorts in Q4:2023-24 both on an annual (y-o-y) and on a sequential (q-o-q) basis. Securities trading earnings accounted for nearly a fifth of FBs' net operating income after a three-year period of negative/marginal share. PVBs' share of trading earnings in net operating income increased nearly threefold since December 2023. In absolute terms, trading profits for PSBs have more than doubled during Q4:2023-24 *vis-à-vis* the previous quarter (Table 2.4).

2.28 PSBs preferred to increase their holdings in state development loans (SDLs) while paring their allocations to G-Secs and other securities that are eligible for holding in the HTM category (Chart 2.17). PVBs increased their holding of G-Secs and SDLs in the HTM category, while reducing holdings of other securities.

Chart 2.16: Yield Curves and Shift in Yields across Tenors



Source: FBIL.

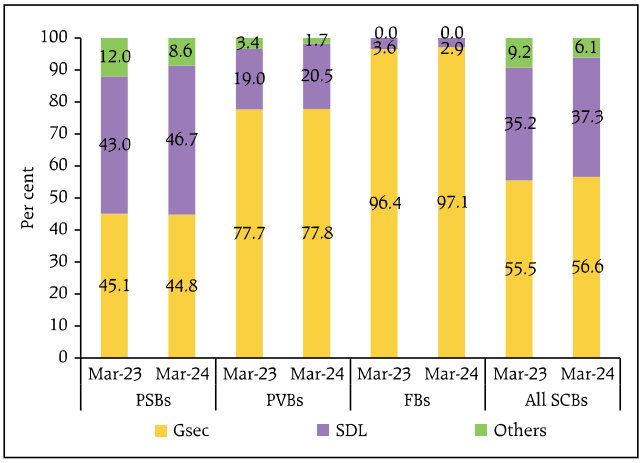
Table 2.4: OOI - Profit/ (Loss) on Securities Trading – All Banks

(in ₹ crore)

	Q4: 2022-23	Q1: 2023-24	Q2: 2023-24	Q3: 2023-24	Q4: 2023-24
PSBs	4084 (6.5)	6394 (10.2)	4047 (6.9)	3187 (6.4)	7565 (10.7)
PVBs	111 (0.2)	2042 (3.3)	872 (1.4)	3628 (5.4)	10421 (13.9)
FBs	-604 (-2.6)	215 (1.8)	-625 (-5.1)	-1864 (-19.6)	1532 (18.8)

Note: Figures in parentheses represent OOI-Profit/ (Loss) on Securities Trading as a percentage of Net Operating Income.
Source: RBI supervisory returns and staff calculations.

Chart 2.17: HTM Portfolio – Composition



Source: Individual bank submissions and staff calculations.

2.29 In March 2024, the notional loss in the HTM book of SCBs (PSBs and PVBs) declined by more than a half to ₹34,024 crore from ₹70,497 crore in September 2023, as the yield curve trended down in H2:2023-24 after a significant upward shift during 2022-23 and H1:2023-24.

2.30 The distribution of unrealised losses across investment categories showed a higher proportion of unrealised losses in other securities in the HTM book of PSBs. In contrast, PVBs had a larger percentage of unrealised losses in SDLs within their HTM book (Chart 2.18).

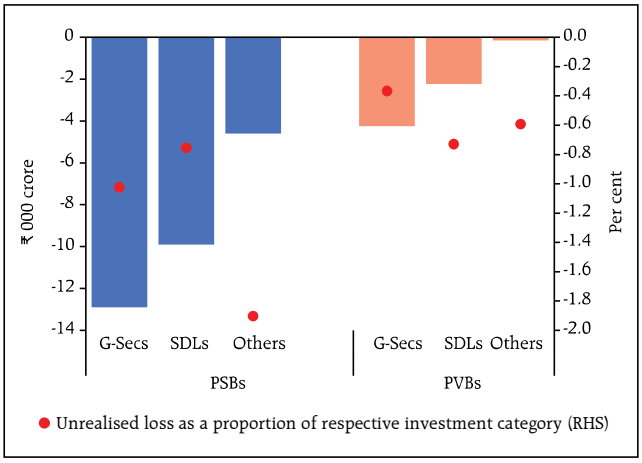
2.31 If a parallel upward shock of 250 bps in the yield curve is applied, the mark-to-market impact on the HTM portfolio of banks excluding unrealised losses would reduce the system level CRAR by 319 bps. In respect of two banks, the CRAR would fall below the regulatory minimum.

2.32 In March 2024, holding of statutory liquidity ratio (SLR) eligible securities by PSBs and PVBs in the HTM category amounted to 21.4 per cent and 19.9 per cent, respectively, of their net demand and time liabilities (NDTL), while it stood at 4.1 per cent for FBs.

2.33 An assessment of the interest rate risk of banks[20] using traditional gap analysis (TGA) for rate sensitive global assets, liabilities and off-balance sheet items shows that for time buckets up to one year, earnings at risk (EAR) are assessed at 11.2 per cent and 9.4 per cent of NII for PSBs and PVBs, respectively, for a 200 bps increase in interest rate, whereas the impact would be marginal for FBs and SFBs (Table 2.5). The impact of the interest rate rise on earnings is positive as the cumulative gap[21] at bank group level was positive in March 2024. Conversely, if the interest rates are to decrease, they would lead to an adverse impact.

2.34 As per the duration gap analysis[22] (DGA) assessment for risk sensitive global assets, liabilities and off-balance sheet items, PVBs' and FBs' market value of equity (MVE) would reduce marginally

Chart 2.18: HTM Portfolio – Unrealised Gain/Loss as on March 31, 2024



Source: Individual bank submissions and staff calculations.

Table 2.5: Earnings at Risk (EAR) - Traditional Gap Analysis (TGA)

Bank Group	Earnings at Risk (till one year) as percentage of NII	
	100 bps increase	200 bps increase
PSBs	5.6	11.2
PVBs	4.7	9.4
FBs	0.3	0.5
SFBs	1.1	2.1

Source: RBI supervisory seturns and staff calculations.

[20] In terms of circular on "Guidelines on Banks' Asset Liability Management Framework – Interest Rate Risk" dated November 04, 2010.

[21] Gap refers to Rate Sensitive Assets (RSA) minus Rate Sensitive Liabilities (RSL). Advances, HTM investments, swaps/ forex swaps, reverse repos are major contributors to RSA whereas deposits, swaps/ forex swaps and repos are observed to be the main elements under RSL.

[22] The DGA involves bucketing of all RSA and RSL as per residual maturity/ re-pricing dates in various time bands and computing the Modified Duration Gap (MDG).

Table 2.6: Market Value of Equity (MVE) - Duration Gap Analysis (DGA)

Bank Group	Market Value of Equity (MVE) as percentage of Equity	
	100 bps increase	200 bps increase
PSBs	0.8	1.5
PVBs	-0.9	-1.7
FBs	-2.2	-4.3
SFBs	-5.0	-10.1

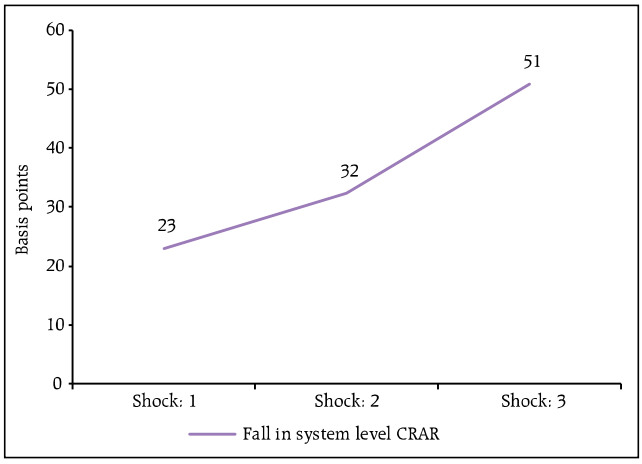
Source: RBI supervisory returns and staff calculations.

from an upward movement in the interest rate, while that of PSBs would be positively impacted. SFBs' MVE would be particularly weighed down by an interest rate rise (Table 2.6). If the interest rates are to decrease, impact would be the other way.

e. Equity Price Risk

2.35 As banks have limited capital market exposures owing to regulatory prescriptions, any impact of a possible significant fall in equity prices on banks' CRAR would be low for the select universe of 46 major banks. Under the scenarios of 25 per cent, 35 per cent and 55 per cent drops in equity prices, the system level CRAR would reduce by 23 bps, 32 bps and 51 bps, respectively (Chart 2.19).

Chart 2.19: Equity Price Risk



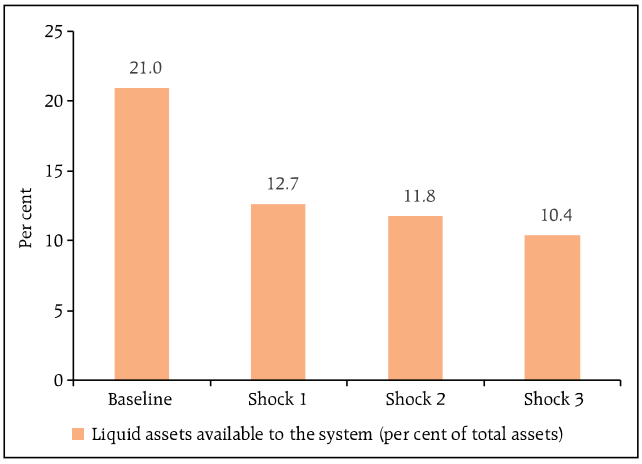
Note: For a system of select 46 SCBs.
Shock 1: Equity prices drop by 25 per cent.
Shock 2: Equity prices drop by 35 per cent.
Shock 3: Equity prices drop by 55 per cent.
Source: RBI supervisory returns and staff calculations.

f. Liquidity Risk

2.36 Liquidity risk analysis aims to capture the impact of any possible run on deposits and increased demand for unutilised portions of sanctioned/ committed/guaranteed credit lines. In an extreme scenario of sudden and unexpected withdrawal of around 15 per cent of uninsured deposits along with the utilisation of 75 per cent of unutilised portion of committed credit lines, liquid assets[23] at the system level would decrease from 21.0 per cent of total assets to 10.4 per cent (Chart 2.20).

2.37 Under the assumption of 75 per cent utilisation of unutilised committed credit lines, reverse stress test reveals that for the majority of banks, an uninsured deposit run-off of over 30 per cent is required to knock off their liquid resources completely (Chart 2.21).

Chart 2.20: Liquidity Risk – Shocks and Outcomes



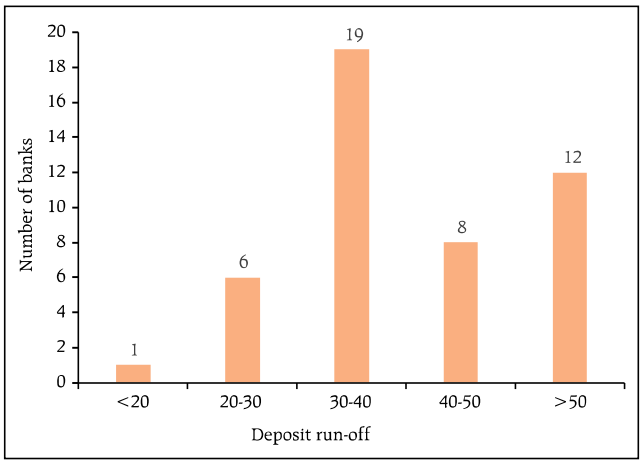
Note: Liquidity shocks include a demand for 75 per cent of the committed credit lines (comprising unutilised portions of sanctioned working capital limits as well as credit commitments) and withdrawal of a portion of un-insured deposits as given below:

Shock	Shock 1	Shock 2	Shock 3
Per cent withdrawal of un-insured deposits	10	12	15

Source: RBI supervisory returns and staff calculations.

[23] Liquid assets were computed as cash reserves in excess of required CRR, excess SLR investments, SLR investments at 2 per cent of NDTL (under MSF) (following the Circular DOR.RET.REC.73/12.01.001/2021-22 dated December 10, 2021) and additional SLR investments at 16 per cent of NDTL (following the Circular DOR.LRG.REC.No.19/21.04.098/2022-23 dated April 18, 2022).

Chart 2.21: Liquidity Risk- Reverse Stress Test Results



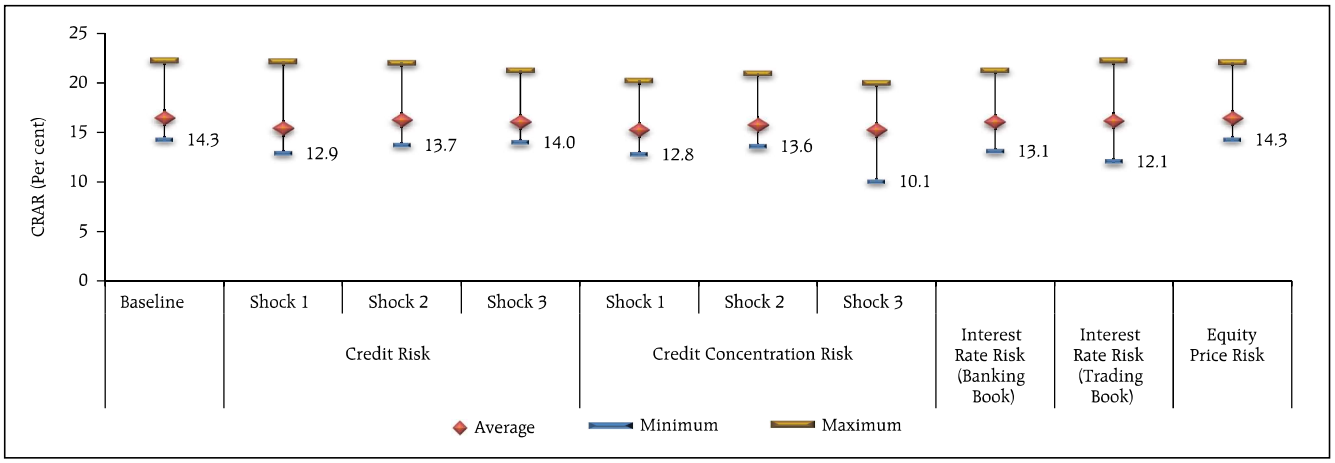
Source: RBI supervisory returns and staff calculations.

II.1.8 Bottom-up Stress Tests: Credit, Market and Liquidity Risk

2.38 A suite of bottom-up stress tests (sensitivity analyses) for select banks'[24] March 2024 position affirmed the resilience of banks to multiple types and magnitude of shocks. These results broadly validate the top-down stress test assessment. All the sample banks would be able to meet the regulatory minimum CRAR under diverse shock scenarios (Chart 2.22).

2.39 The bottom-up stress test for liquidity risk reveals that liquid assets ratios[25] of all the sample banks would remain positive under different shock scenarios, emphasising the adequacy of their HQLAs to withstand any plausible liquidity pressure from sudden and unexpected withdrawal of deposits. Under the scenarios of (i) a 10 per cent deposit run-off in 1-2 days and (ii) a 3 per cent deposit run-off for five consecutive days, the average liquid asset ratios of the select banks would drop from 23 per

Chart 2.22: Bottom-up stress tests: Credit and Market Risks – Impact on CRAR



Credit Risk: Gross Credit	Shock 1	NPAs increase by 50 per cent
	Shock 2	30 per cent of restructured assets become NPAs
	Shock 3	5 percentage points increase in NPAs in each of the top 5 sectors / industries
Credit Risk: Concentration	Shock 1	The top three individual borrowers default into sub-standard category
	Shock 2	The largest group defaults into sub-standard category
	Shock 3	The largest borrower of each of top five industries/ sectors defaults into sub-standard category
Interest Rate Risk – Banking Book	Shock	Parallel upward shift in INR yield curve by 2.5 percentage points
Interest Rate Risk – Trading Book	Shock	Parallel upward shift in INR yield curve by 2.5 percentage points
Equity Price Risk	Shock	Equity price index drops by 40 percent

Source: Sample banks (Bottom-up stress tests).

[24] Stress tests were conducted by a sample of 27 select banks.

[25] Liquid Assets Ratio $= \frac{\text{Liquid Assets}}{\text{Total Assets}} \times 100$

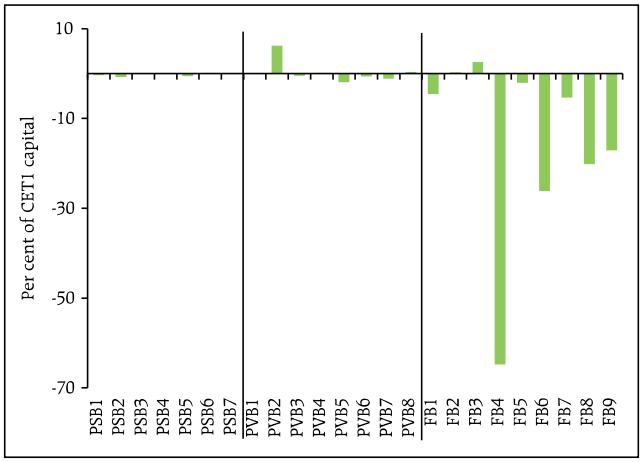
cent to 16.3 per cent and 12.6 per cent, respectively (Chart 2.23).

II.1.9 Bottom-up Stress Tests: Derivatives Portfolio

2.40 A series of bottom-up stress tests (sensitivity analyses) on derivative portfolios have been conducted for select banks[26] with the reference date of end-March 2024. The derivative portfolios of the banks in the sample are subjected to four separate shocks on interest and foreign exchange rates. While the interest rates shocks range from 100 to 250 basis points, in the case of foreign exchange rates, shocks of 20 per cent appreciation/ depreciation are assumed. The stress tests are carried out for individual shocks on a stand-alone basis.

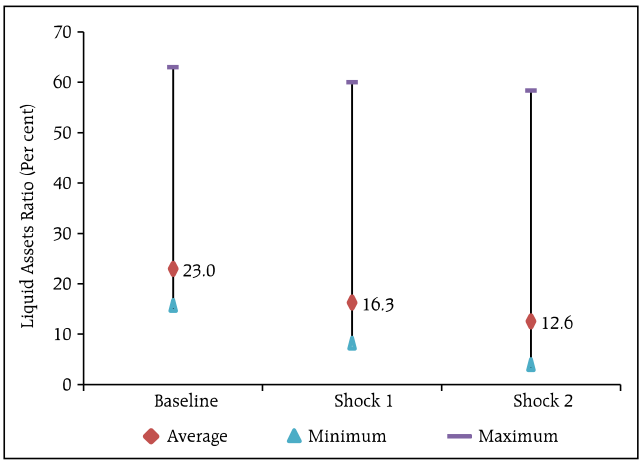
2.41 Keeping parity with the trend observed in the recent past, most of the FBs maintained a significantly negative net mark-to-market (MTM) position as a proportion of CET1 capital in March 2024. The MTM impact is, by and large, muted for PSBs and PVBs (Chart 2.24). At the system level, the extent of negative MTM position is the highest in the last two years.

Chart 2.24: MTM of Total Derivatives Portfolio of Select Banks – March 2024



Note: PSB: Public sector bank, PVB: Private sector bank, FB: Foreign bank.
Source: Sample banks (Bottom-up stress tests on derivatives portfolio).

Chart 2.23: Bottom-up Stress Tests - Liquidity Risk

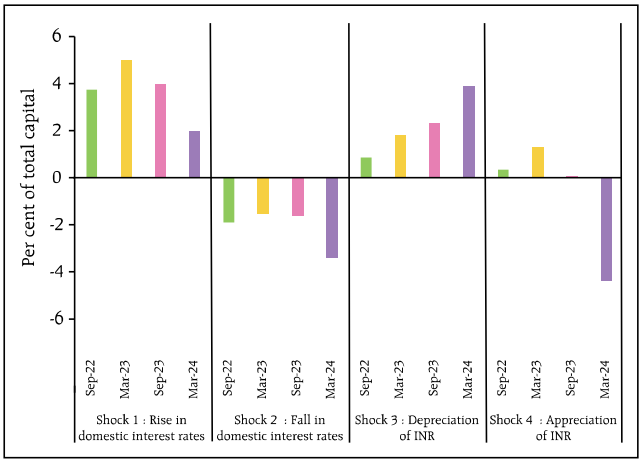


Liquid Assets Definitions	
1	High Quality Liquid Assets (HQLAs) as per Liquidity Coverage Ratio (LCR) guidelines.
Liquidity Shocks	
Shock1	10 per cent deposits withdrawal (cumulative) during a short period (say 1 or 2 days)
Shock2	3 per cent deposits withdrawal (each day) within 5 days.

Source: Sample banks (Bottom-up stress tests).

2.42 The stress test results show that the select set of banks would gain, on an average, from an interest rate rise, which is akin to the experience in the recent past (Chat 2.25). As regards exposures to forex derivatives, they stand to benefit from INR depreciation. Potential gains from interest rate

Chart 2.25: Impact of Shocks on Derivatives Portfolio of Select Banks
(change in net MTM on application of a shock)



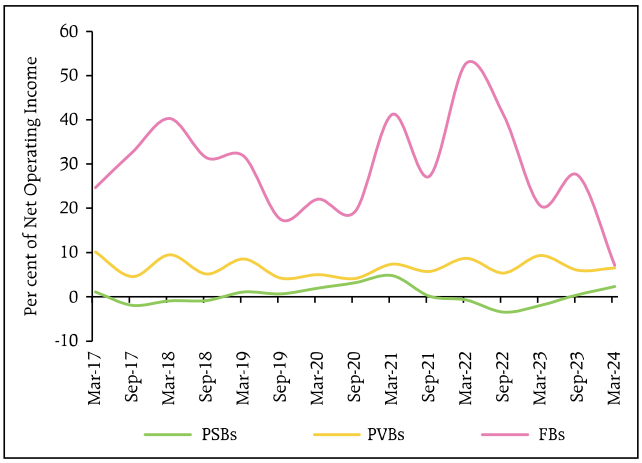
Note: Change in net MTM due to an applied shock is with respect to the baseline.
Source: Sample banks (Bottom-up stress tests on derivatives portfolio).

[26] Stress tests on derivatives portfolios were conducted by a sample of 24 banks, constituting the major active authorised dealers and interest rate swap counterparties. Details of test scenarios are given in Annex 2.

increase dipped further in March 2024, while they have been on the rise for INR depreciation. The pay-off profile in respect of foreign exchange risk has become more asymmetric, with potential losses from appreciation increasing significantly.

2.43 Banks' income from the derivatives portfolios includes both the realised income and change in MTM position of the banks. It is for this reason that despite many foreign banks consistently reporting a negative MTM position in their derivatives portfolios, their income (from derivative portfolio) forms a substantial portion of their earnings. From the highs of 2022, the contribution of the derivative portfolio of foreign banks to their net operating income (NOI) has been continuously decreasing and stood at 7.1 per cent of NOI in March 2024. For PSBs, it has been on the rise since the low recorded in September 2022 (Chart 2.26). Based on the notional principal amount, FBs have more diversified counterparties while most of the positions taken by PVBs and PSBs are with other banks.

Chart 2.26: Income from the Derivatives Portfolio



Source: Sample banks (Bottom-up stress tests on derivatives portfolio).

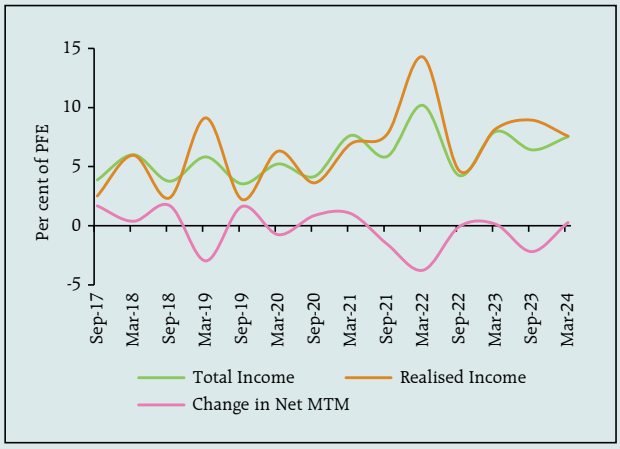
2.44 Using bank-level data since the start of the survey in March 2017, a panel of 13 banks was built to study the determinants of income from derivatives portfolio (and its components) (Box 2.2). The causal effect of interest rates and

Box 2.2: Derivative Portfolio: Determinants of Income

Using bank-level half-yearly feedback since March 2017, a panel of 13 banks is built to understand major contributing factors driving banks' income from their derivative portfolios. The total income from the derivative portfolio is split into two constituents: (i) change in net marked-to-market (MTM) position and (ii) residual (termed as realised income). As a proportion to potential future exposure (PFE) at the aggregate level, total income and realised income seem to be co-moving with an upward trend, with the movements in realised income being more volatile. Also, this volatility seems to have increased over time. The movement in net MTM changes, on the other hand, is found to be moving in the opposite direction, highlighting the possibility of banks getting more aggressive in churning their portfolio when their net MTM undergoes a decline (Chart 1).

In a panel regression framework, the following models are estimated.

Chart 1: Income and its Constituents



Source: Sample banks (Bottom-up stress tests on derivatives portfolio).

1. Realised Income (RIncome) (fixed effect):

$$RIncome_{nt}/_{PFE_{nt}} = \alpha\, RIncome_{n(t-1)}/PFE_{n(t-1)} + \beta_1 \Delta GDP_{t-1} + \beta_2 \Delta CPI_t + \beta_3 \Delta TBill_t^{+} + \beta_4 \Delta TBill_{t-1}^{-} + \beta_5 \Delta USDINR_t^{a} + \beta_6 \Delta USDINR_t^{d} + \beta_7 CRAR_{n(t-1)} + cons$$

(Contd.)

2. Change in Net MTM (random effect):

$$\Delta NetMTM_{nt}/_{PFE_{nt}} = \alpha\,\Delta NetMTM_{n(t-1)}/PFE_{n(t-1)} + \beta_1\Delta GDP_{t-1} + \beta_2\Delta CPI_t + \beta_3\Delta TBill_t^{+} + \beta_4\Delta TBill_t^{-} + \beta_6\Delta USDINR_{(t-1)}^{d} + \beta_7 CET1\ Ratio_{nt} + cons$$

3. Total Income (TIncome) (fixed effect):

$$TIncome_{nt}/_{PFE_{nt}} = \alpha\,TIncome_{n(t-1)}/PFE_{n(t-1)} + \beta_1\Delta GDP_{t-1} + \beta_2\Delta CPI_t + \beta_3\Delta TBill_t^{+} + \beta_4\Delta TBill_{t-1}^{-} + \beta_5\Delta USDINR_t^{a} + \beta_6\Delta USDINR_t^{d} + \beta_7 CET1\ Ratio_{nt} + cons$$

where n denotes bank (n=1,2…13) and t denotes number of periods (t=1,2…13). Potential future exposure of bank n at time point t is denoted by PFE. Year-on-year percentange change in half-yearly real gross domestic product and half-yearly consumer price index is denoted by ΔGDP and ΔCPI, respectively. $\Delta TBill^{+}$ ($\Delta TBill^{-}$) is equal to half year-on-half year increase (decrease) in 90-days treasury bill rate when it increases (decreases), zero otherwise. Similarly, $\Delta USDINR^{a}$ ($\Delta USDINR^{d}$) is equal to half year-on-half year decrease (increase) in average USD-INR exchange rates when it decreases (increases), zero otherwise.

The results show a significant powerful causal effect of interest rates and exchange rates on total income rather than on realised income. In both the cases, the selected banks tended to gain with any change in interest rates (increase or decrease) and tended to lose with any change in exchange rates (appreciation or depreciation) (Table 1). This indicates that banks are able to position their derivative portfolios in a better way with respect to interest rate movements rather than exchange rate movements.

A significantly positive causal effect of banks' capital on total income reveals that banks with higher capital ratios tend to earn more: better capital ratios allow banks to take more risks in the derivative market.

Table 1: Causal Effect of Interest Rate and Exchange Rate on Income from Derivatives

Coefficients	Realised Income	Change in Net MTM	Total Income
α	-0.47*** (0.07)	-0.43*** (0.07)	-0.06 (0.08)
β_1	0.34* (0.20)	-0.13 (0.09)	0.23*** (0.08)
β_2	-1.86* (0.99)	-0.49 (0.61)	-1.10*** (0.40)
β_3	4.31* (2.60)	2.21 (1.56)	3.06*** (1.10)
β_4	-8.00** (4.00)	-2.02* (1.22)	-5.83*** (1.69)
β_5	2.32 (1.45)		1.06* (0.59)
β_6	-0.88* (0.45)	-0.30 (0.28)	-0.48** (0.19)
β_7	0.46 (0.33)	0.08 (0.16)	0.23* (0.13)
constant	5.86 (6.43)	1.19 (3.61)	4.36* (2.55)
R-square (overall)	0.07	0.21	0.01
No. of obs.	169	169	169
Prob > Chi^2	0.00	0.00	0.01
Hausman chi^2 Prob > chi^2	59.13 0.0	0.52 0.99	181.03 0.0

Note: 1. Figures in parentheses refer to standard errors.
2. ***, ** and * indicate level of significance at the 1 per cent, 5 per cent and 10 per cent, respectively.
3. In the case of change in net MTM, Hausman test suggests random effects model.

Source: Sample banks (Bottom-up stress tests on derivatives portfolio) and RBI staff calculations.

exchange rates on total derivative income is found to be significantly more powerful than on realised income and banks tended to gain with interest rate changes and tended to lose with exchange rate changes. Also, better capitalised banks take more risks in the derivative market.

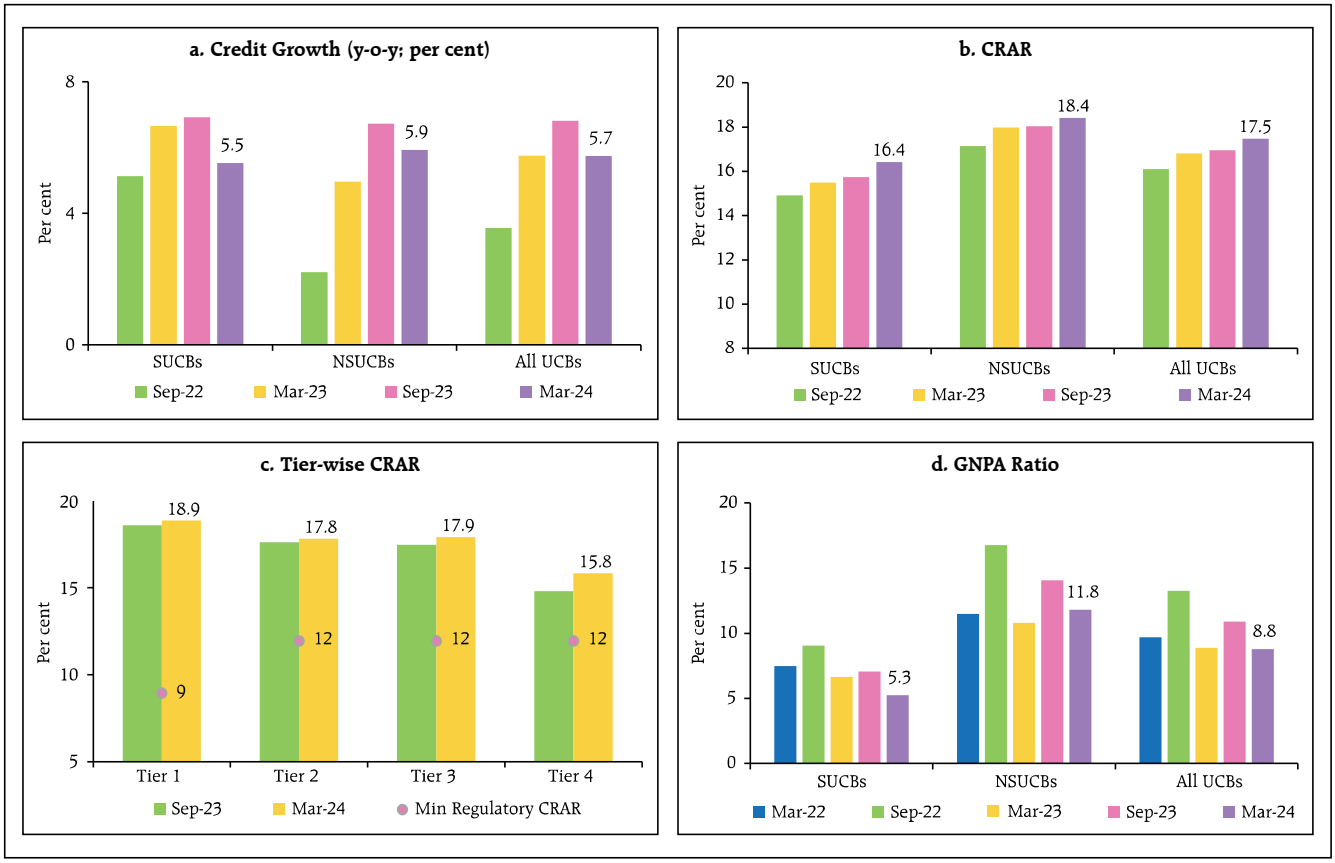
II.2 Primary (Urban) Cooperative Banks[27]

2.45 Credit by primary urban cooperative banks (UCBs)[28] recorded a dip in growth (y-o-y) during H2:2023-24 – it stood at 5.7 per cent in March 2024. Both scheduled UCBs (SUCBs) and non-scheduled UCBs (NSUCBs) recorded moderation (Chart 2.27 a).

2.46 The capital position of UCBs has been continuously improving in the post-pandemic period, with their CRAR increasing to 17.5 per cent in March 2024. This improvement has been experienced across SUCBs and NSUCBs as well as across the tiers[29] of UCBs (Chart 2.27 b and c).

2.47 The GNPA ratio and NNPA ratio of UCBs decreased in March 2024 from September 2023 and March 2023 ratios, except for a marginal uptick in NSUCBs (Charts 2.27 d and e). Trend in provisioning coverage ratio (PCR) also shows improvement post-pandemic, with PCR increasing from both March 2023 and September 2023 levels (Chart 2.27 f).

Chart 2.27: Credit Profile and Asset Quality Indicators of UCBs *(Contd.)*

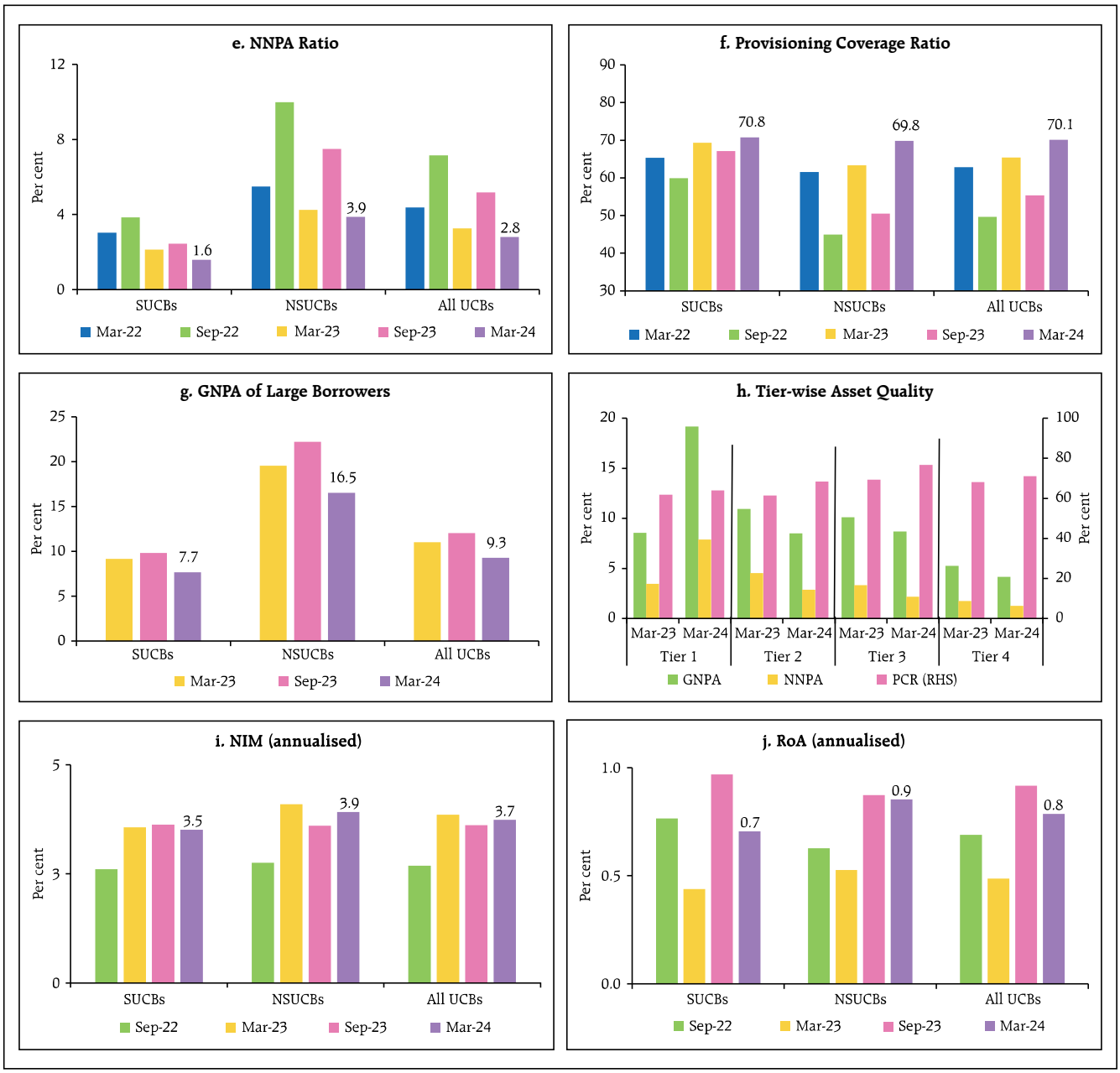


[27] Data are provisional and based on off-site surveillance (OSS) returns.

[28] Based on common sample of 1377 UCBs covering over 90 per cent of gross loans extended by UCBs.

[29] Revised Regulatory Framework for Urban Co-operative Banks (UCBs) – Net Worth and Capital Adequacy (circular DOR.CAP.REC.No.86/09.18.201/2022-23 dated December 01, 2022 and DOR.CAP.REC. No.109/09.18.201/2022-23 dated March 28, 2023)

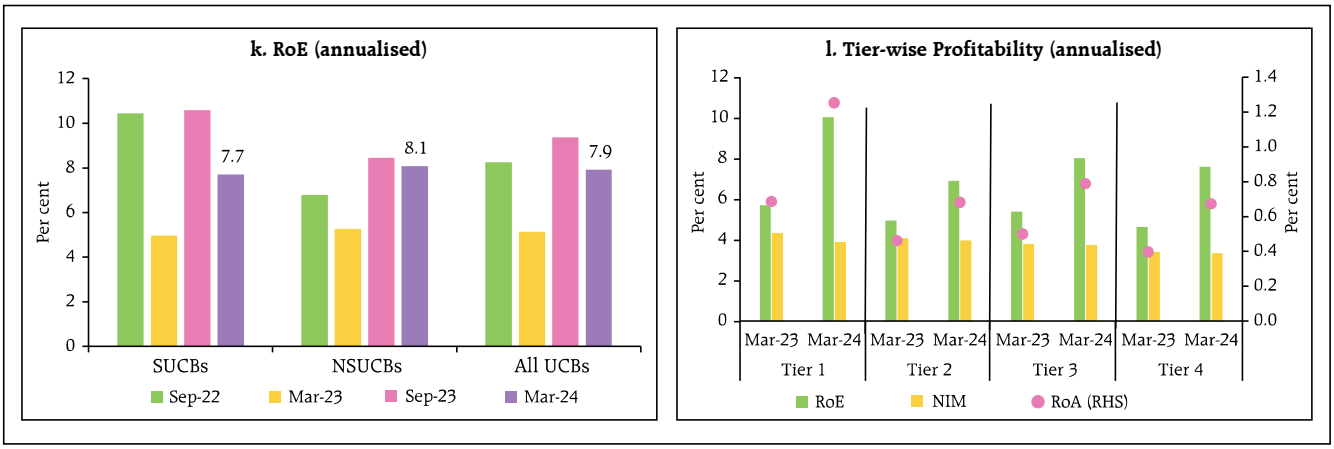
Chart 2.27: Credit Profile and Asset Quality Indicators of UCBs *(Contd.)*



GNPA ratio of large borrowers, which accounted for 24 per cent of UCBs' loan book, followed similar trend (Chart 2.27 g). The improvement in asset quality in March 2024 was witnessed across all tiers except the smallest one (Tier 1), where GNPA and NNPA ratios worsened significantly but PCR showed slight improvement (Chart 2.27 h).

2.48 UCBs' profitability went up across scheduled and non-scheduled categories of UCBs and all tiers. Both RoA and RoE ratios increased during 2023-24, and NIM remained healthy at 3.7 per cent during H2:2023-24 (Chart 2.27 i, j, k and l).

Chart 2.27: Credit Profile and Asset Quality Indicators of UCBs *(Concld.)*



Source: RBI supervisory returns and staff calculations.

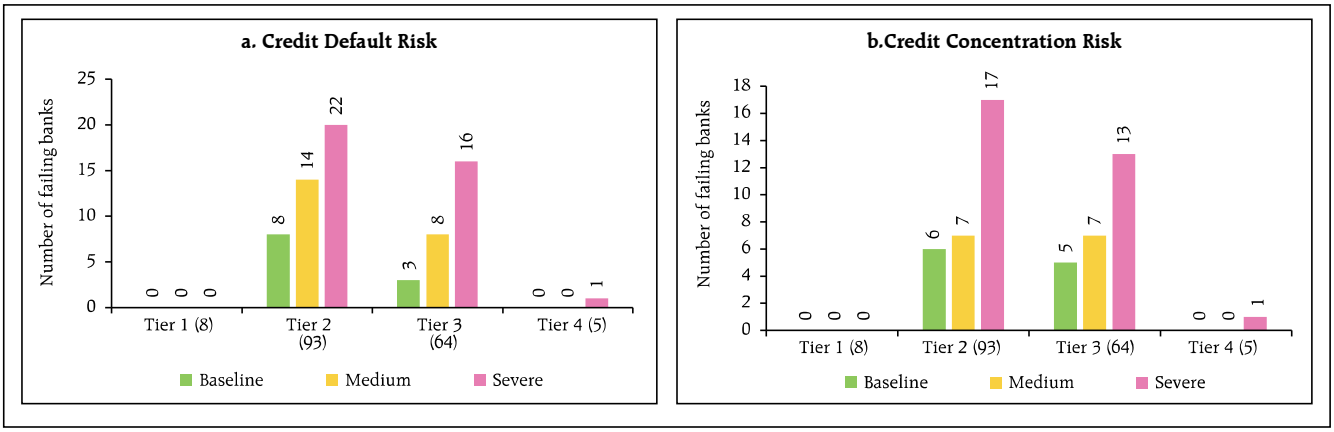
II.2.1 Stress Testing

2.49 Stress tests were conducted on a select set of UCBs[30] to assess credit risk (default risk and concentration risk), market risk (interest rate risk in trading book and banking book) and liquidity risk, based on their reported financial positions as of March 2024.

2.50 One bank in the Tier 4 UCB sample - the largest category of UCBs with deposits above ₹10,000 crore - would fail to meet the minimum regulatory requirement[31] of 10 per cent CRAR under a severe stress scenario for both credit default risk and credit concentration risk. For Tier 2 and Tier 3 UCBs, the impact of credit risk under severe stress is significant. For the smallest UCBs (Tier 1), liquidity mismatch may exceed 20 per cent under all scenarios (Chart 2.28).

2.51 Under the severe stress scenario of credit default risk, credit concentration risk and interest rate risk in the trading book, the system level CRAR

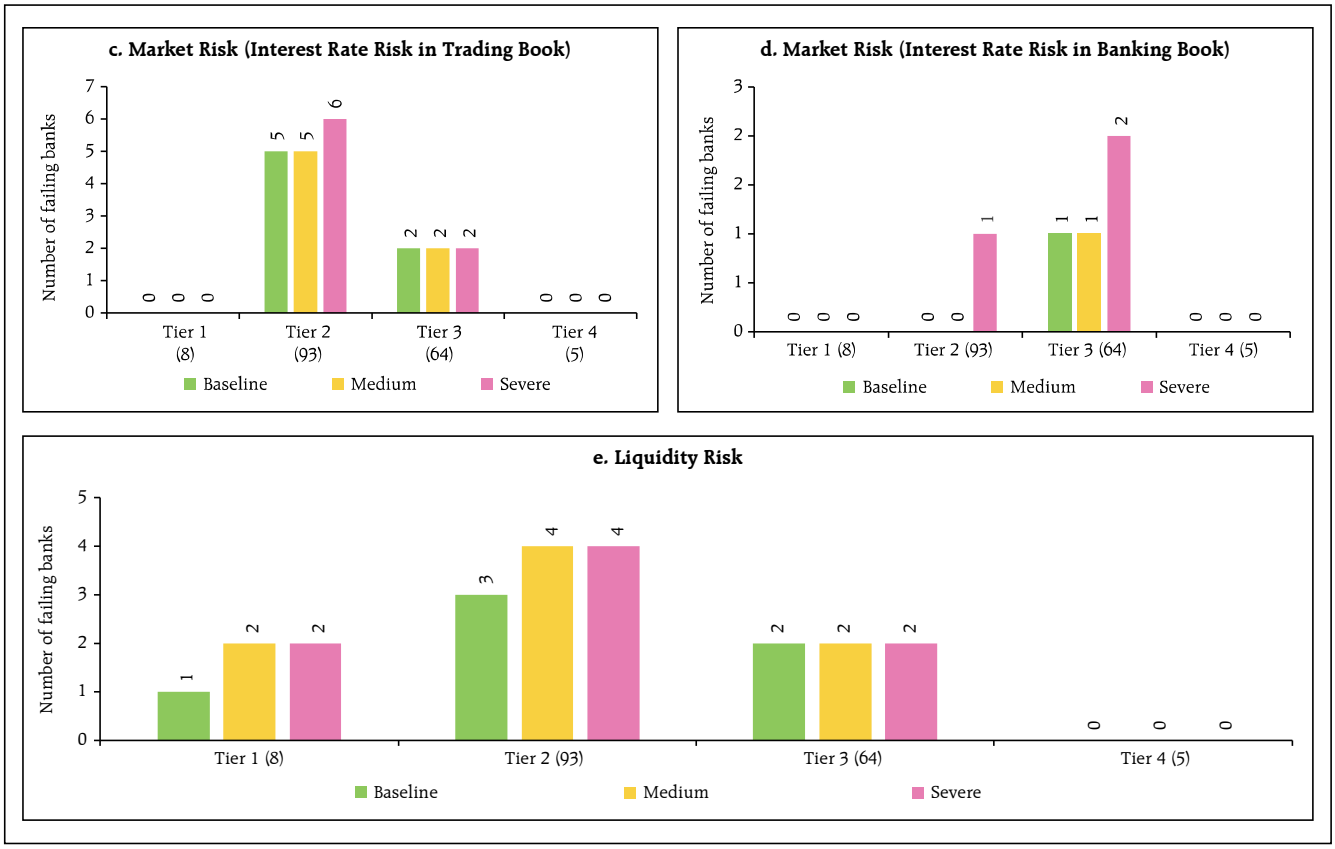
Chart 2.28: Stress Test of UCBs *(Contd.)*



[30] The stress test is conducted with reference to the financial position of March 2024 for select 170 UCBs with asset size of more than ₹500 crore, excluding banks under the Reserve Bank's All Inclusive Directions (AID). These 170 UCBs together cover 62 per cent of the total assets of the UCB sector. The detailed methodology used for stress test is given in Annex 2.

[31] The regulatory minimum CRAR for Tier 1 UCBs is 9 per cent and the UCBs in Tier 2 to 4 shall achieve the CRAR of 10 per cent by March 31, 2024, 11 per cent by March 31, 2025, and 12 per cent by March 31, 2026.

Chart 2.28: Stress Test of UCBs *(Concld.)*



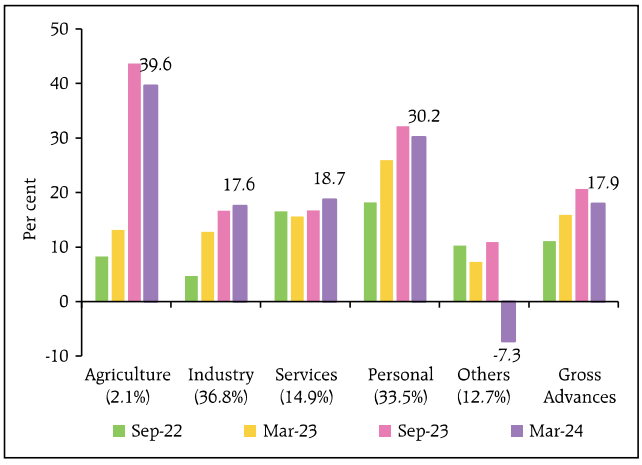
Source: RBI supervisory returns and staff calculations.

would reduce from the pre-shock position of 16.5 per cent to 12.5 per cent, 13.0 per cent and 15.4 per cent, respectively. A severe interest rate shock in the banking book would dent NII by 6.1 per cent at the system level.

II.3 Non-Banking Financial Companies (NBFCs)[32]

2.52 NBFCs maintained robust credit growth in 2023-24 despite some moderation in the second half of the year. Personal loan growth decelerated whereas growth in loans to industry and services accelerated (Chart 2.29). Growth in industrial advances was largely contributed by the Government NBFCs. Major categories in the

Chart 2.29: Sectoral Credit Growth of NBFCs (y-o-y)



Note: Figures in bracket represent shares in outstanding loans in Mar-24.
Source: RBI supervisory returns and staff calculations.

[32] The analyses done in this section are based on NBFCs in upper layer, middle layer and base layer (meeting certain threshold asset size criteria) but excludes HFCs. The analysis includes 7 NBFCs presently under resolution. The analyses are based on data available as of June 10, 2024 which are provisional.

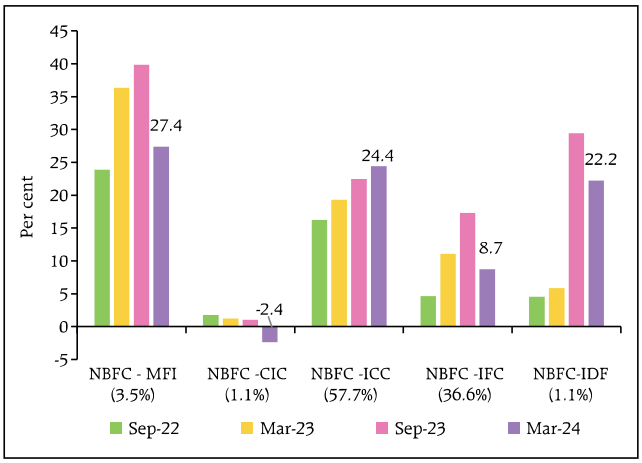
personal loans segment like vehicle/auto loans (34.6 per cent share in retail loans in March 2024), advances to individuals against gold (11.2 per cent share), microfinance loan/ self-help group (SHG) loan (10.9 per cent share) recorded lower growth than the overall growth of the personal loans segment.

2.53 Credit growth in respect of the largest category of NBFC by activity, *viz.*, investment and credit companies (NBFC-ICCs), has been accelerating in the post-pandemic period, while that of the second largest category, *viz.*, infrastructure finance companies (NBFC-IFCs) moderated after witnessing double digit growth for four successive quarters (Chart 2.30).

2.54 The GNPA ratio of NBFCs (including those under resolution) continued its downward trajectory in the post-pandemic period to reach 4.0 per cent in March 2024. Improvement was recorded across major sectors (Chart 2.31). Within the retail segment, vehicle/auto loans had the highest GNPA ratio (5.0 per cent), while other categories of loans had a ratio of below 3 per cent. Asset quality improved for both Government and private NBFCs. Private NBFCs' industrial advances, which account for one-fifth of the overall GNPA stock of the NBFC sector, saw further moderation in the GNPA ratio to 10.2 per cent in March 2024. The aggregate NNPA ratio of NBFCs improved further due to higher PCR and the fall in GNPA (Chart 2.32).

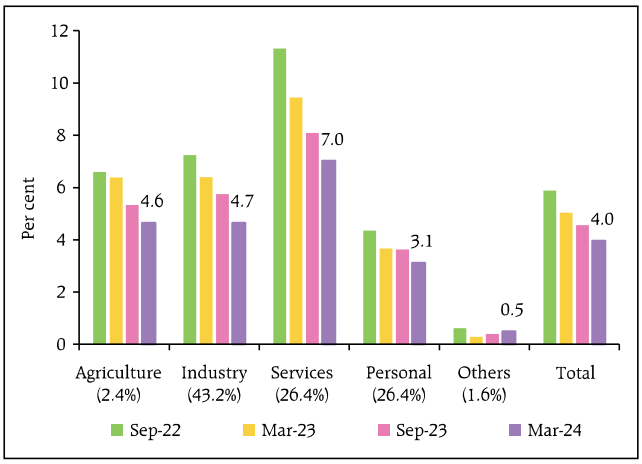
2.55 The capital position of NBFCs remains healthy: their CRAR stood at 26.6 per cent in March 2024, well above the regulatory minimum requirement. The RoA ratio has been rising, the cost-to-income ratio[33] has maintained a declining

Chart 2.30: Activity-based Credit Growth of NBFCs (y-o-y)



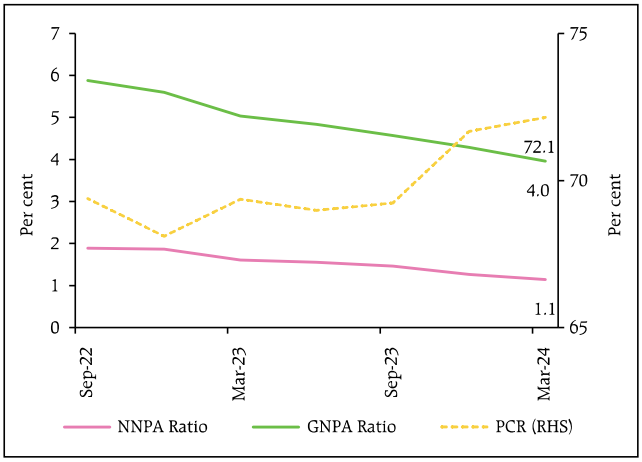
Note: Figures in bracket represent shares in outstanding loans in Mar-24.
Source: RBI supervisory returns and staff calculations.

Chart 2.31: Sectoral GNPA Ratio of NBFCs



Note: Figures in brackets represent sectoral shares in GNPA in Mar-24.
Source: RBI supervisory returns and staff calculations.

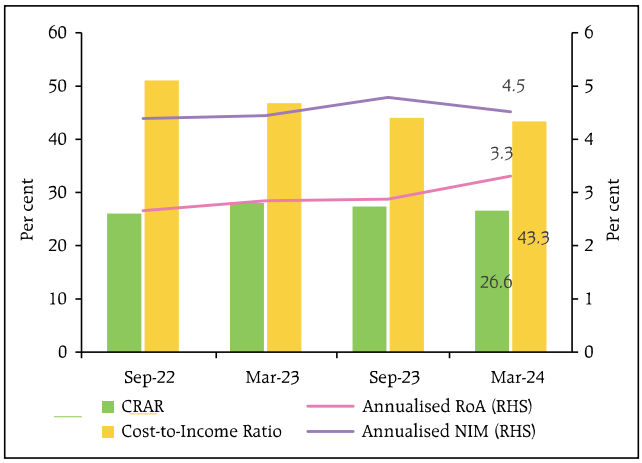
Chart 2.32: Asset Quality of NBFCs



Source: RBI supervisory returns and staff calculations.

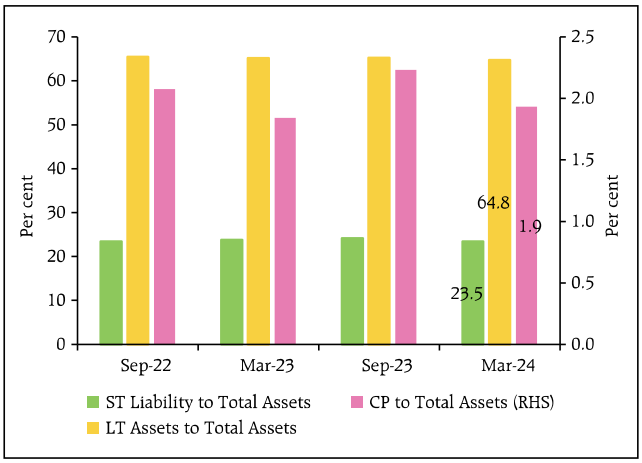
[33] Cost-to-income ratio = $\frac{\text{(Total Expenses – Interest Expense)}}{\text{(Total Income – Interest Expense)}}$

Chart 2.33: Capital Adequacy, Profitability and Efficiency



Note: Figures in bracket represent shares in outstanding loans in Mar-24.
Source: RBI supervisory returns and staff calculations.

Chart 2.34: Liquidity Stock Measures



Note: Figures in bracket represent shares in outstanding loans in Mar-24.
Source: RBI supervisory returns and staff calculations.

trend in the post-pandemic period and the NIM stood strong during 2023-24 (Chart 2.33).

2.56 Liquidity stock measures for NBFCs have remained stable – the ratio of short-term liability to total assets remained below 25 per cent; long-term assets constitute about two-thirds of assets; and CPs had less than two per cent asset share in total assets (Chart 2.34).

2.57 Share capital, reserves and surplus of NBFCs declined during 2023-24 and constituted 28.3 per cent of their total liabilities in March 2024. Their borrowing from banks rose gradually over the years while mobilisation of resources through debentures declined and mobilisation through CPs remained almost unchanged (Table 2.7). In March 2024, about four-fifth of the funds sourced from banks were secured in nature.

Table 2.7: NBFCs' Sources of Funds

(per cent)

Item Description	Mar-21	Mar-22	Mar-23	Mar-24
1. Share Capital, Reserves and Surplus	26.7	29.4	29.4	28.3
2. Total Borrowings	63.0	60.6	61.1	62.4
Of which:				
2(i) Borrowing from banks	19.8	20.6	21.7	22.6
2(ii) CPs subscribed by banks	0.4	0.4	0.3	0.3
2(iii) Debentures subscribed by banks	3.0	2.9	2.7	2.1
Total from banks [2(i)+2(ii)+2(iii)]	**23.2**	**23.8**	**24.8**	**25.0**
2(iv) CPs excluding 2(ii)	1.6	1.4	1.5	1.6
2(v) Debentures excluding 2(iii)	22.8	20.4	19.4	19.7
3. Others	10.2	10.0	9.6	9.2
Total	**100.0**	**100.0**	**100.0**	**100.0**

Source: RBI supervisory returns and staff calculations.

II.3.1 Stress Tests[34] - Credit Risk

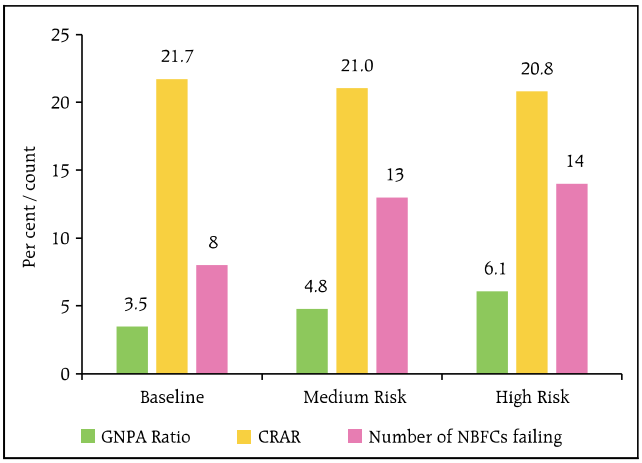
2.58 System level stress tests for assessing the resilience of the NBFC sector to credit risk shocks are conducted on a sample of 163[35] NBFCs that had capital adequacy ratio of 23.9 per cent and the GNPA ratio of 2.7 per cent in March 2024. The tests are carried out under a baseline and two stress scenarios – medium and high risk – with increase in GNPA ratio by 1 SD and 2 SDs, respectively, for the risk scenarios.

[34] The detailed methodology used for stress tests for NBFCs is given in Annex 2.

[35] The sample comprised 9 NBFCs in Upper Layer and 154 NBFCs in Middle Layer with total advances of ₹23.03 lakh crore as of March 2024, which forms around 95 per cent of total advances of non-Government NBFCs. The sample for stress test excluded Government NBFCs, companies presently under resolution, standalone primary dealers, and investment focused companies to ensure better representation of credit risk of the sector.

2.59 Under the baseline scenario, one year ahead GNPA ratio for the system is estimated to be 3.5 per cent and system level CRAR at 21.7 per cent, with CRARs of 8 NBFCs falling below the minimum regulatory requirement of 15 per cent. Under the medium and high-risk scenarios, income loss and additional provision requirements would reduce CRAR of the sector further (compared to the baseline) by around 70 bps and 90 bps, respectively (Chart 2.35).

Chart 2.35: Credit Risk in NBFCs - System Level



Note: Baseline scenario is based on assumptions of business continuing under usual conditions for one year ahead, whereas medium risk and high-risk scenarios assume GNPA ratio increasing by 1 SD and 2 SD, respectively over one-year horizon.
Source: RBI supervisory returns and staff calculations.

II.3.2 Stress Test - Liquidity Risk

2.60 The resilience of the NBFC sector to liquidity shocks has been assessed by estimating the impact of an increase in cash outflows, coupled with a decrease in cash inflows[36]. It is observed that liquidity mismatch over one year will mostly remain 20 per cent or below. Only one small NBFC (having 0.1 per cent share in assets of the sector) may experience over 50 per cent liquidity mismatch under the high risk scenario (Table 2.8).

Table 2.8: Liquidity Risk in NBFCs

Cumulative Mismatch as percentage of Outflows over next one year	No. of NBFCs having Liquidity Mismatch		
	Baseline	Medium	High
Over 50 per cent	0 (0.0)	0 (0.0)	1 (0.1)
Between 20 and 50 per cent	2 (0.4)	5 (1.7)	6 (1.9)
20 per cent and below	5 (1.6)	14 (5.6)	26 (20.8)

Note: (i) Baseline scenario is based on projected outflows and inflows over next one year as of March 2024; medium risk scenario assumes 5 per cent decrease in inflows and 5 per cent increase in outflows and high-risk scenario assumes 10 per cent decrease in inflows and 10 per cent increase in outflows.
(ii) Figures in parenthesis represent percentage share in asset size of the sample.
Source: RBI supervisory returns and staff calculations.

II.4 Insurance Sector

2.61 The solvency ratio of an insurance company assesses the ability of the insurer to meet its obligations towards policyholders by reflecting the level of its assets over and above its liabilities. The minimum solvency ratio requirement set by the Insurance Regulatory and Development Authority of India (IRDAI) for insurance companies in India is 150 per cent. The higher the solvency ratio, the better will be ability of the insurer to meet its liabilities. As insurance liabilities involve an assessment of future contingent events, a higher solvency ratio implies resilience of the insurer to withstand future uncertainties.

[36] Stress testing based on liquidity risk was performed on a sample of 222 NBFCs – which includes 9 NBFCs in Upper Layer and 213 NBFCs in Middle Layer. The total asset size of the sample was ₹ 30.69 lakh crore, comprising around 99 per cent of total assets of non-government, non-CIC NBFCs in the sector.

2.62 At an aggregate level, the solvency ratio for life insurance companies has remained above the prescribed threshold for both public and private sectors (Table 2.9). The solvency ratio for public sector non-life insurers stood below the baseline prescription (Table 2.10).

Table 2.9: Solvency Ratio of Life Insurance Sector

(per cent)

	Public Sector	Private Sector	Industry
Mar-23	187	228	197
Jun-23	189	222	197
Sep-23	190	220	197
Dec-23	193	215	198

Source: IRDAI.

Table 2.10: Solvency Ratio of Non-Life Insurance Sector

(per cent)

	PSU Insurers	Private Insurers	Standalone Health Insurers	Specialised Insurers	Total General Insurers
Mar-23	44	225	203	642	163
Jun-23	38	227	203	677	162
Sep-23	39	228	195	688	164
Dec-23	39	223	209	774	165

Source: IRDAI.

II.5 Stress Testing of Mutual Funds

2.63 The Securities and Exchange Board of India (SEBI) has mandated asset management companies (AMCs) to carry out stress testing[37] of all open-ended debt schemes (except overnight schemes) every month to evaluate the impact of various risk parameters (*viz.*, interest rate risk, credit risk and liquidity risk) faced by such schemes on their net asset values (NAVs). The Association of Mutual Funds in India (AMFI) and each AMC specify the thresholds of impact for risk parameters – breach of either AMFI or AMC threshold requires reporting and remedial action.

2.64 In April 2024, 28 open-ended debt schemes with total assets under management (AUM) of ₹ 1.76 lakh crore reported risk above the AMFI or AMC prescribed threshold (Table 2.11). In this respect, all the MFs have reported initiation of remedial action to be completed in the prescribed timeframe.

Table 2.11: Stress Testing of Open-Ended Debt Schemes of Mutual Funds – Summary Findings – April 2024

	Risk above Threshold	Risk below Threshold	Total
No. of AMCs	12	32	44
No. of Schemes	28*	273	301
AUM (₹ crore)	1,76,406	13,29,514	15,05,920

* No. of schemes showing interest rate risk, credit risk and liquidity risk above threshold are 20, 4 and 6 respectively while total number of unique schemes remain 28.

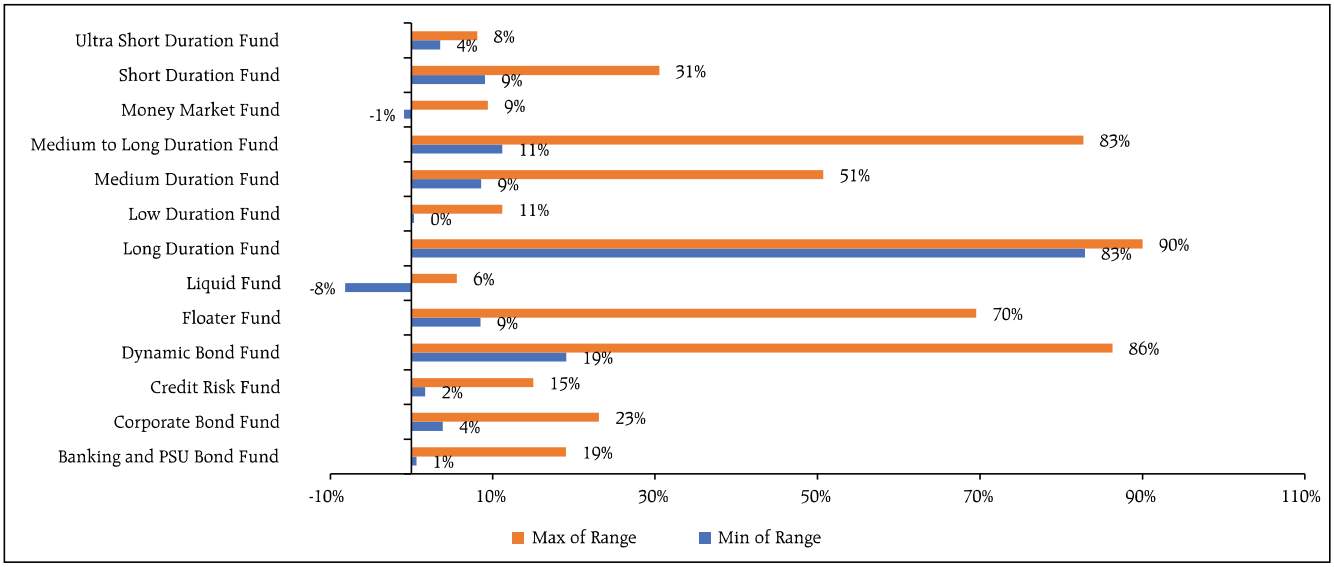
Source: AMFI.

2.65 Furthermore, as part of liquidity risk management for open-ended debt schemes, two types of liquidity ratios, *viz.*, (i) redemption at risk (LR-RaR), which represents likely outflows at a given confidence interval, and (ii) conditional redemption at risk (LR-CRaR), which represents the behaviour of the tail at the given confidence interval, are used. All AMCs are mandated to maintain these liquidity ratios above the threshold limits which are derived from scheme type, scheme asset composition and potential outflows (modelled from investor concentration in the scheme). Mutual funds (MFs) are required to carry out back-testing of these liquidity ratios for all open-ended debt schemes (except overnight funds, gilt funds and gilt funds with 10-year constant duration) on a monthly basis.

[37] The methodology used for stress testing of mutual funds is given in Annex 2.

Chart 2.36: Range (Surplus (+)/ Deficit (-)) of LR-RaR Maintained by AMCs over AMFI Prescribed Limits

(per cent)

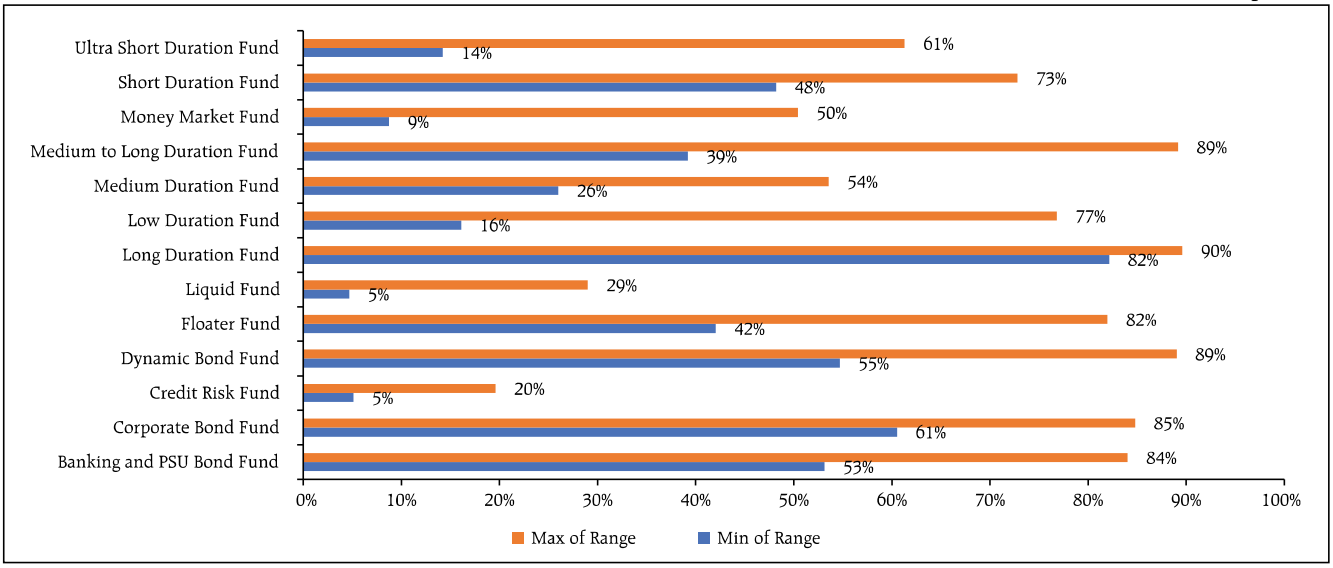


Note: Data pertains to Top 10 AMCs based on AUM as on March 31, 2024.
Source: SEBI.

2.66 The LR-RaR and LR-CRaR computed by top 10 MFs (based on AUM) for 13 categories of open-ended debt schemes for March 2024 were well above the respective threshold limits for most of the MFs. A few instances of the ratios falling below the threshold limits were addressed by the respective AMCs in a timely manner (Chart 2.36 and Chart 2.37).

Chart 2.37: Range (Surplus (+)/ Deficit (-)) of LR-CRaR Maintained by AMCs over AMFI Prescribed Limits

(per cent)



Note: Data pertains to Top 10 AMCs based on AUM as on March 31, 2024.
Source: SEBI.

II.6 Stress Testing Analysis at Clearing Corporations

2.67 Stress testing[38] is carried out at clearing corporations (CCs) to determine the segment-wise minimum required corpus (MRC) of the core settlement guarantee fund (SGF). MRC is determined for each segment (*viz.*, equity cash, equity derivatives, currency derivatives, commodity derivatives, debt and tri-party repo segment) every month, based on stress testing.

2.68 The actual MRC for any given month is determined as the higher of the MRC of the month and the MRC arrived at any time in the past. Based on the stress testing analysis for the period October 2023 to April 2024, it is observed that though the monthly calculated amounts of MRC at CCs varied, the actual MRC requirement for equity cash and equity derivatives segments remained the same in line with SEBI stipulation. The MRC requirement in the currency derivatives segment increased during the period at one of the CCs (Table 2.12).

II.7 Interconnectedness

2.69 Interconnections among financial institutions involve funding gaps arising from liquidity mismatches and maturity transformation, payments processes, and risk transfer mechanisms. The financial system can be visualised as a network in which financial institutions act as nodes and the bilateral exposures among them serve as links connecting these nodes. These links could be in the form of loans to/ investments in/ deposits with each other, which act as a source of funding, liquidity, investment and risk diversification. While these links enable gains in efficiency and diversification of risks, they can become conduits of risk transmission and risk amplification in a

Table 2.12: Minimum Required Corpus of Core SGF Based on Stress Testing Analysis at Clearing Corporations

(Amount in ₹ crore)

Segment	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24
Clearing Corporation 1							
Average Stress Test Loss							
Equity Cash Segment	75	71	48	45	85	59	83
Equity Derivatives Segment	303	353	402	404	571	561	603
Currency Derivatives Segment	180	171	203	218	222	189	163
Debt Segment	4	4	4	4	4	4	4
Tri-Party Repo Segment	17	17	17	17	17	17	17
Commodity Derivatives Segment	0	0	1	0	0	0	0
Total	578	617	675	689	900	831	871
Actual MRC Requirement							
Equity Cash Segment	348	348	348	348	348	348	348
Equity Derivatives Segment	2,423	2,423	2,423	2,423	2,423	2,423	2,423
Currency Derivatives Segment	242	242	242	242	242	242	242
Debt Segment	4	4	4	4	4	4	4
Tri-Party Repo Segment	17	17	17	17	17	17	17
Commodity Derivatives Segment	10	10	10	10	10	10	10
Total	3,044	3,044	3,044	3,044	3,044	3,044	3,044
Clearing Corporation 2							
Average Stress Test Loss							
Equity Cash Segment	9	12	11	9	20	16	19
Equity Derivatives Segment	17	22	24	13	19	29	21
Currency Derivatives Segment	61	90	371	388	187	105	14
Commodity Derivatives Segment	0	0	0	0	0	0	0
Total	87	123	405	411	225	149	54
Actual MRC Requirement							
Equity Cash Segment	194	194	194	194	194	194	194
Equity Derivatives Segment	74	74	74	74	74	74	74
Currency Derivatives Segment	235	235	371	388	388	388	388
Commodity Derivatives Segment	14	14	14	14	14	14	14
Total	517	517	653	670	670	670	670
Clearing Corporation 3 (Commodity Derivatives Segment)							
Average Stress Test Loss	60	63	55	57	55	53	54
Actual MRC requirement	124	124	124	124	124	124	124
Clearing Corporation 4 (Commodity Derivatives Segment)							
Average Stress Test Loss	540	540	505	546	536	326	-
Actual MRC requirement	562	562	562	562	562	562	562

Source: Clearing Corporations.

[38] The methodology used for stress testing at clearing corporations is given in Annex 2.

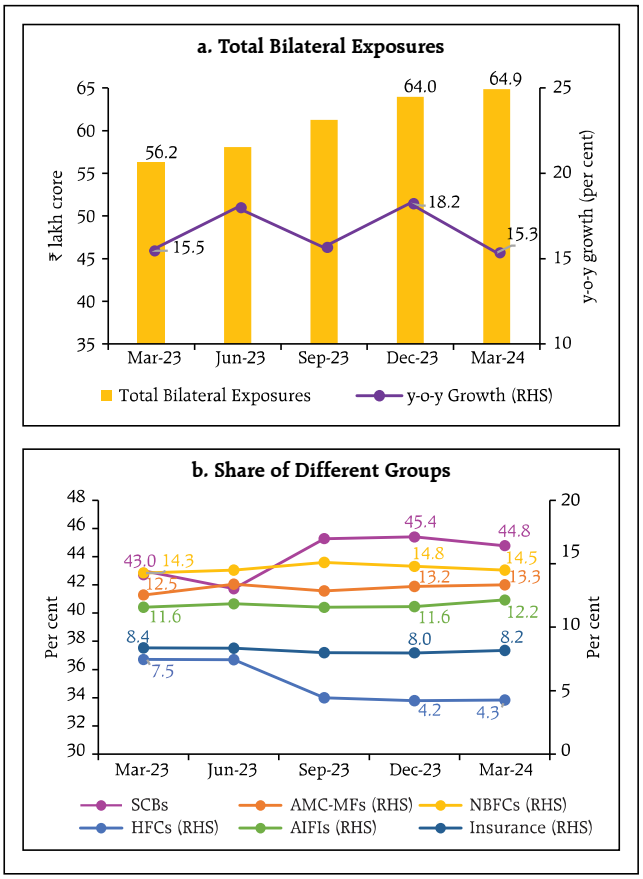
crisis. Understanding the nuances in propagation of risk through networks is useful for devising appropriate policy responses for safeguarding financial and macroeconomic stability.

II.7.1 Financial System Network[39] [40]

2.70 The total bilateral exposures[41] among the entities in the Indian financial system continued to expand during H2:2023-24, primarily driven by increasing exposure of AMC-MFs with SCBs and all India financial institutions (AIFI) with SCBs. Further, while the growth (y-o-y) of bilateral exposures fluctuated between 15 to 18 per cent, the share of SCBs and HFCs in bilateral exposures stabilised post the merger of a housing finance company (HFC) with a PVB in September 2023 quarter (Chart 2.38 a and b).

2.71 The funding mix of the financial system shows that long-term funding – primarily loans and advances, equity and long-term (LT) debt instruments – provided a major channel for bilateral exposures in the system. A segment wise analysis indicates that in general (a) LT loans were mainly advanced by SCBs to NBFCs; (b) AMC-MFs were major investors in equities issued by PVBs and NBFCs; and (c) in the LT debt market, insurance companies held a majority of instruments issued by PVBs, NBFCs and HFCs. In the short-term (ST)

Chart 2.38: Bilateral Exposures between Entities in the Financial System



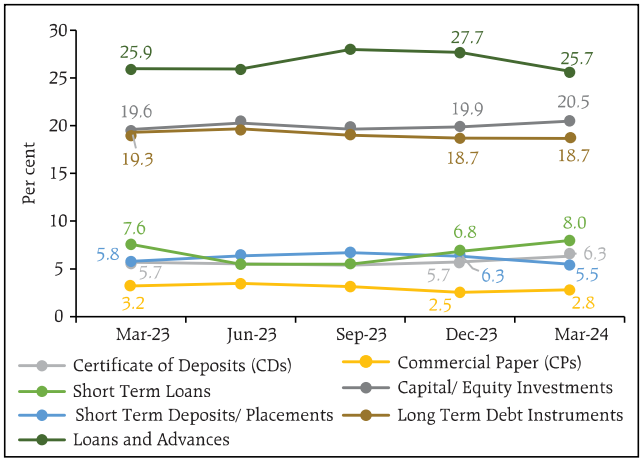
Note: Exposures between entities of the same group are included.
Source: RBI supervisory returns and staff calculations.

[39] The network model used in the analysis has been developed by Professor Sheri Markose (University of Essex) and Dr. Simone Giansante (Bath University) in collaboration with the Financial Stability Department, Reserve Bank of India.

[40] Analysis presented here and in the subsequent part is based on data of 230 entities from the following eight sectors: SCBs, scheduled UCBs (SUCBs), AMC-MFs, NBFCs, HFCs, insurance companies, pension funds and AIFIs. These 230 entities covered include 77 SCBs, 12 small finance banks (SFBs), 20 SUCBs; 25 AMC-MFs (which cover more than 98 per cent of the AUMs of the mutual fund sector); 41 NBFCs (both deposit taking and non-deposit taking systemically important companies, which represent about 70 per cent of total NBFC assets); 22 insurance companies (that cover more than 95 per cent of assets of the sector); 18 HFCs (which represent more than 90 per cent of total HFC assets); 10 PFs and 5 AIFIs (NABARD, EXIM, NHB, SIDBI and NaBFID).

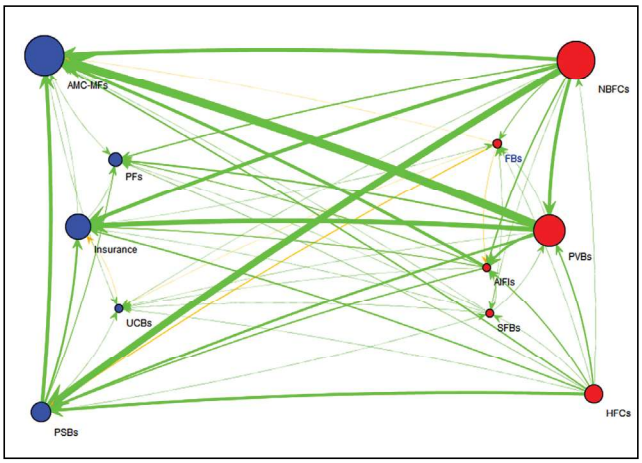
[41] Includes exposures between entities of the same group. Exposures are outstanding position as on March 31, 2024 and are broadly divided into fund-based and non-fund-based exposure. Fund-based exposure includes money market instruments, deposits, loans and advances, long-term debt instruments and equity investments. Non-fund-based exposure includes letter of credit, bank guarantee and derivative instruments (excluding settlement guaranteed by CCIL).

Chart 2.39: Instrument-wise Exposure among Entities in the Financial System



Note: Exposures between entities of the same group are included.
Source: RBI supervisory returns and staff calculations.

Chart 2.40: Network Plot of the Financial System - March 2024



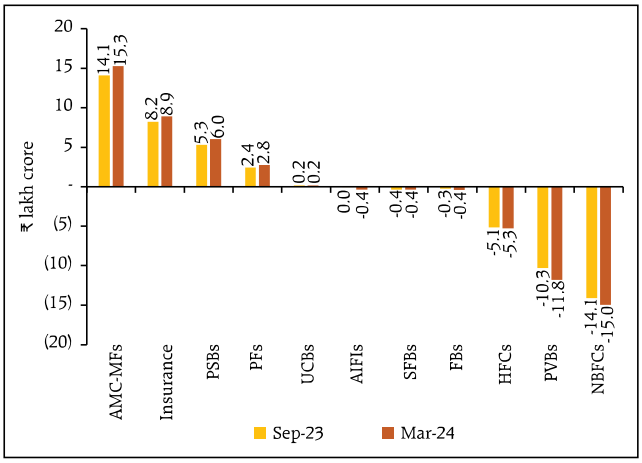
Note: Receivables and payable do not include transactions among entities of the same group. Red circles are net payable institutions and the blue ones are net receivable institutions.
Source: RBI supervisory returns and staff calculations.

funding mix, CPs and CDs played a significant role apart from the inter-bank ST loans and deposits. In the CP market, AIFIs, NBFCs and HFCs were the largest receivers of funds and AMC-MFs were the largest investor group. On the other hand, PSBs, PVBs and AIFIs were the major fund receivers in the CD market, with AMC-MFs being the largest fund providers (Chart 2.39).

2.72 In terms of inter-sectoral exposures[42], AMC-MFs, insurance companies and PSBs remained the largest fund providers in the system, whereas NBFCs and PVBs were the largest receivers of funds, followed by HFCs. Among bank groups, PSBs and UCBs had net receivable positions *vis-à-vis* the entire financial sector whereas PVBs, FBs and SFBs had net payable positions (Chart 2.40).

2.73 The net receivable position of AMC-MFs and net payable position of PVBs recorded a large increase in March 2024 *vis-à-vis* September 2023 (Chart 2.41).

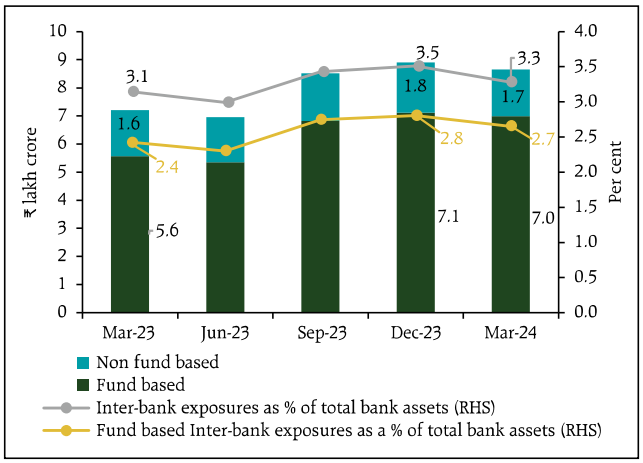
Chart 2.41: Net Receivables (+ve)/ Payables (-ve) by Institutions



Note: Receivables and payable do not include transactions among entities of the same group.
Source: RBI supervisory returns and staff calculations.

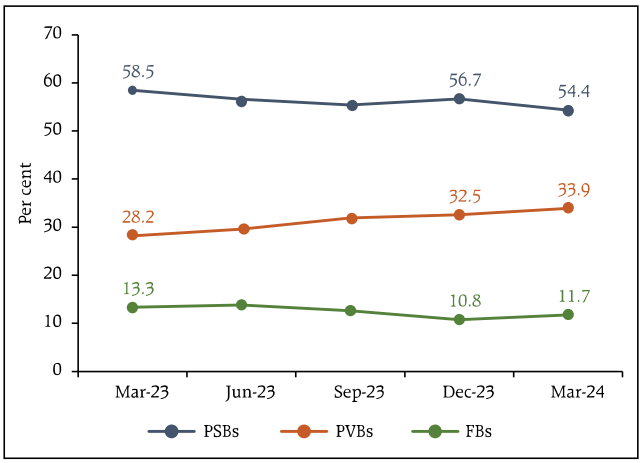
[42] Inter-sectoral exposures do not include transactions among entities of the same sector in the financial system.

Chart 2.42: Inter-Bank Market



Source: RBI supervisory returns and staff calculations.

Chart 2.43: Share of Different Bank Groups in the Inter-Bank Market



Source: RBI supervisory returns and staff calculations.

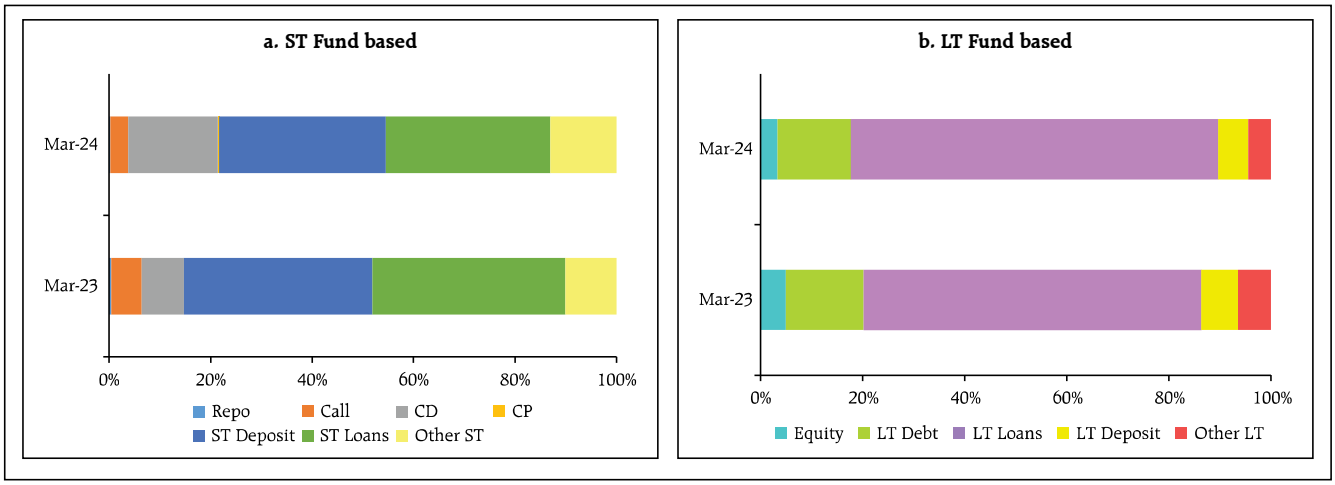
a. Inter-Bank Market

2.74 Inter-bank exposures were 3.3 per cent of the total assets of the banking system in March 2024. During H2:2023-24, fund-based exposure[43] increased marginally while non-fund-based exposure[44] remained stable (Chart 2.42).

2.75 PSBs continued to dominate the inter-bank market, followed by PVBs and FBs. The share of PSBs and FBs decreased in H2:2023-24 whereas the share of PVBs increased (Chart 2.43).

2.76 Unlike in the overall financial network in which LT fund-based exposure forms a major part, ST funding plays a crucial role in the inter-bank market. As at end-March 2024, 67 per cent of the fund-based inter-bank market was short-term in nature, in which ST deposits and ST loans constituted about 65 per cent, followed by CDs and call money market exposure. The share of LT loans in LT fund-based inter-bank market increased over a year ago, while those of equity, LT deposits and LT debt decreased (Chart 2.44).

Chart 2.44: Composition of Fund based Inter-Bank Market



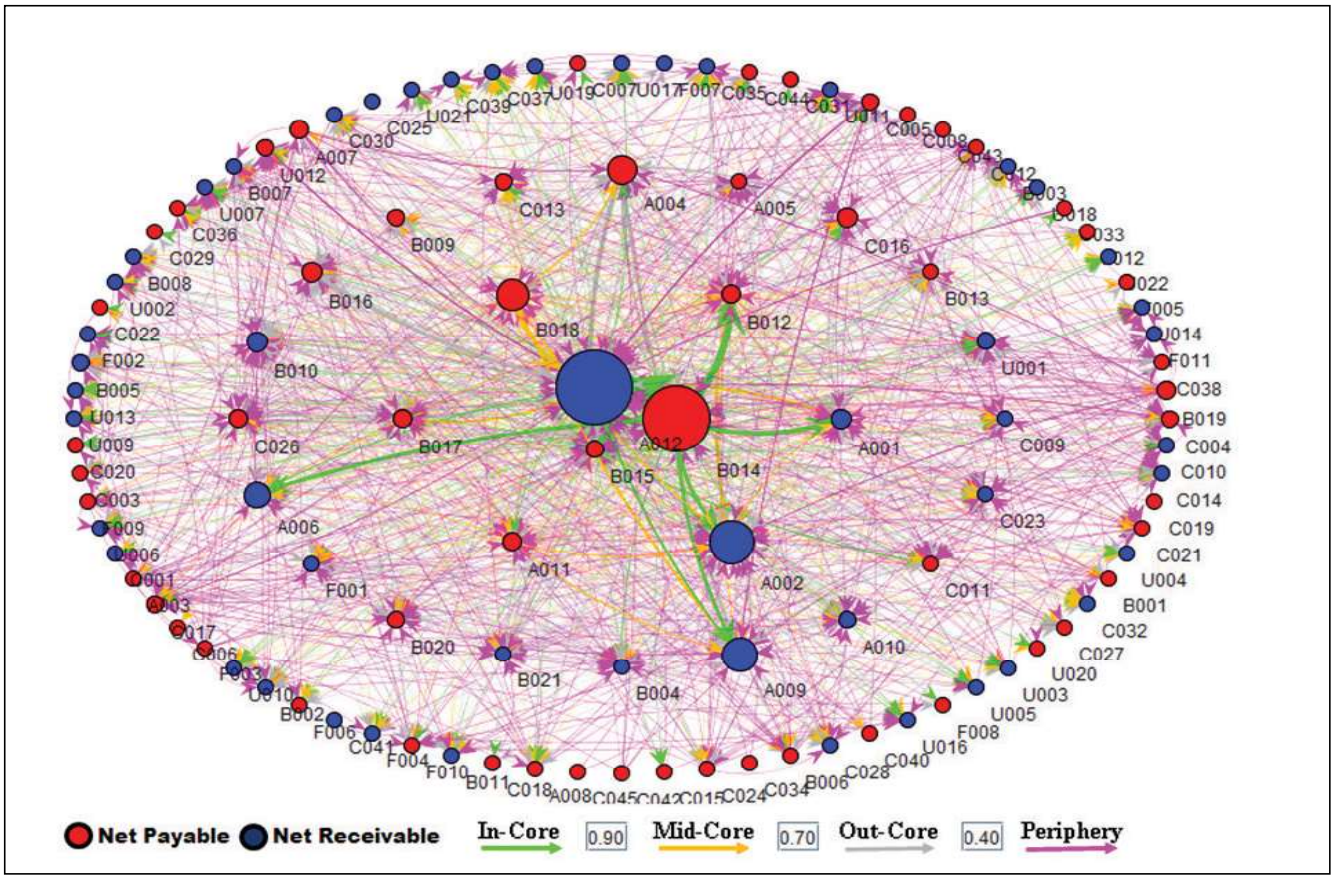
[43] Fund-based exposure includes both short-term exposures and long-term exposures. Data on short-term exposures are collected across seven categories – repo (non-centrally cleared); call money; commercial paper; certificates of deposits; short-term loans; short-term deposits and other short-term exposures. Data on long-term exposures are collected across five categories – Equity; Long-term Debt; Long-term loans; Long-term deposits and Other long-term liabilities.

[44] Non-Fund based exposure includes - outstanding bank guarantees, outstanding Letters of Credit, and positive mark-to-market positions in the derivatives market (except those exposures for which settlement is guaranteed by the CCIL).

b. Inter-Bank Market: Network Structure and Connectivity

2.77 The distribution of the number of links between entities in the inter-bank market network is highly skewed, with most banks having few links and few banks having many links. This has resulted in a typical core-periphery network structure[45] [46]. As of end-March 2024, three banks were in the inner-most core and six banks in the mid-core circle. The three banks in the inner-most core included one PSB and two PVBs. The banks in the mid-core were PSBs and PVBs. Most of the old PVBs along with FBs, SUCBs and SFBs formed the periphery (Chart 2.45).

Chart 2.45: Network Structure of the Indian Banking System (SCBs + SFBs + SUCBs) – March 2024



Source: RBI supervisory returns and staff calculations.

[45] The diagrammatic representation of the network of the banking system is that of a tiered structure, in which different banks have different degrees or levels of connectivity with others in the network. The most connected banks are in the inner-most core (at the centre of the network diagram). Banks are then placed in the mid-core, outer core and the periphery (concentric circles around the centre in the diagram), based on their level of relative connectivity. The colour coding of the links in the tiered network diagram represents borrowings from different tiers in the network (for example, the green links represent borrowings from the banks in the inner core). Each ball represents a bank and they are weighted according to their net positions *vis-à-vis* all other banks in the system. The lines linking each bank are weighted on the basis of outstanding exposures.

[46] 77 SCBs, 12 SFBs and 20 SUCBs were considered for this analysis.

2.78 The degree of interconnectedness among SCBs – measured by the connectivity ratio[47] – decreased marginally in H2:2023-24 and the cluster coefficient[48] remained unchanged (Chart 2.46).

c. Exposure of AMCs-MFs

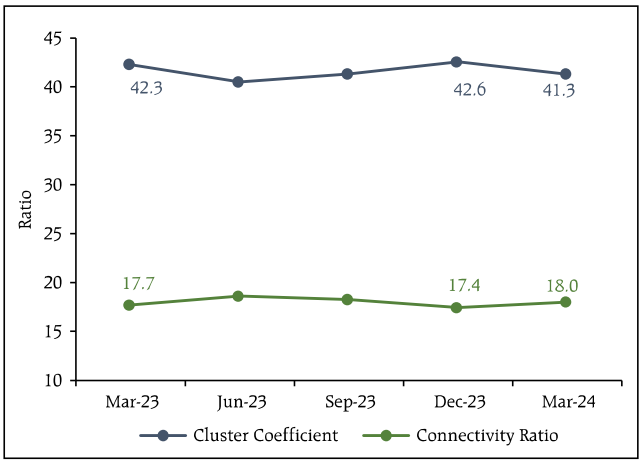
2.79 Gross receivables of AMC-MFs stood at ₹16.16 lakh crore (around 29 per cent of their average AUM) whereas their gross payables were ₹0.88 lakh crore as at end-March 2024. SCBs (primarily PVBs) remained the major recipients of their funding, followed by NBFCs, AIFIs and HFCs (Chart 2.47 a).

2.80 The share of equity holdings in total assets of AMC-MFs continued to increase, supported by the buoyant equity market. The share of AMC-MFs' investments in CPs reduced in H2:2023-24, while those in CDs and LT debt fluctuated during the year (Chart 2.47 b).

d. Exposure of Insurance Companies

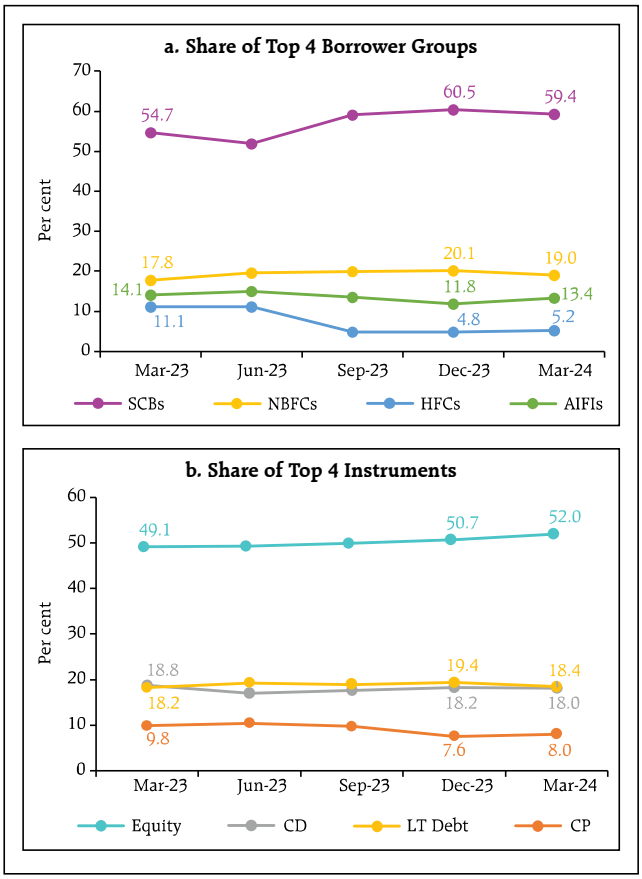
2.81 With gross receivables at ₹9.55 lakh crore and gross payables at ₹0.63 lakh crore, insurance companies were the second largest net providers of funds to the financial system as at end-March 2024. SCBs (primarily PVBs) were the largest recipients of their funds, followed by NBFCs and HFCs. LT debt and equity accounted for more than 90 per cent of receivables of insurance companies, with limited exposure to ST instruments (Charts 2.48 a and b).

Chart 2.46: Connectivity Statistics of the Banking System (SCBs)



Source: RBI supervisory returns and staff calculations.

Chart 2.47: Gross Receivables of AMC-MFs from the Financial System

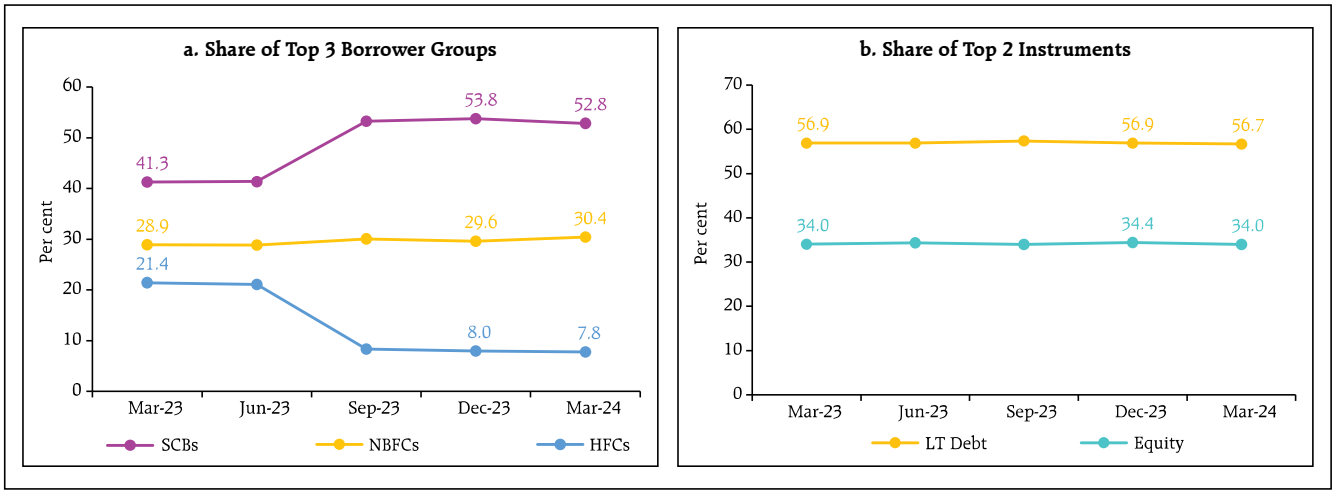


Source: RBI supervisory returns and staff calculations.

[47] The Connectivity ratio measures the actual number of links between the nodes relative to all possible links in a complete network.

[48] Cluster Coefficient: Clustering in networks measures how interconnected each node is. Specifically, there should be an increased probability that two of a node's neighbours (banks' counterparties in case of the financial network) are also neighbours themselves. A high cluster coefficient for the network corresponds with high local interconnectedness prevailing in the system.

Chart 2.48: Gross Receivables of Insurance Companies from the Financial System



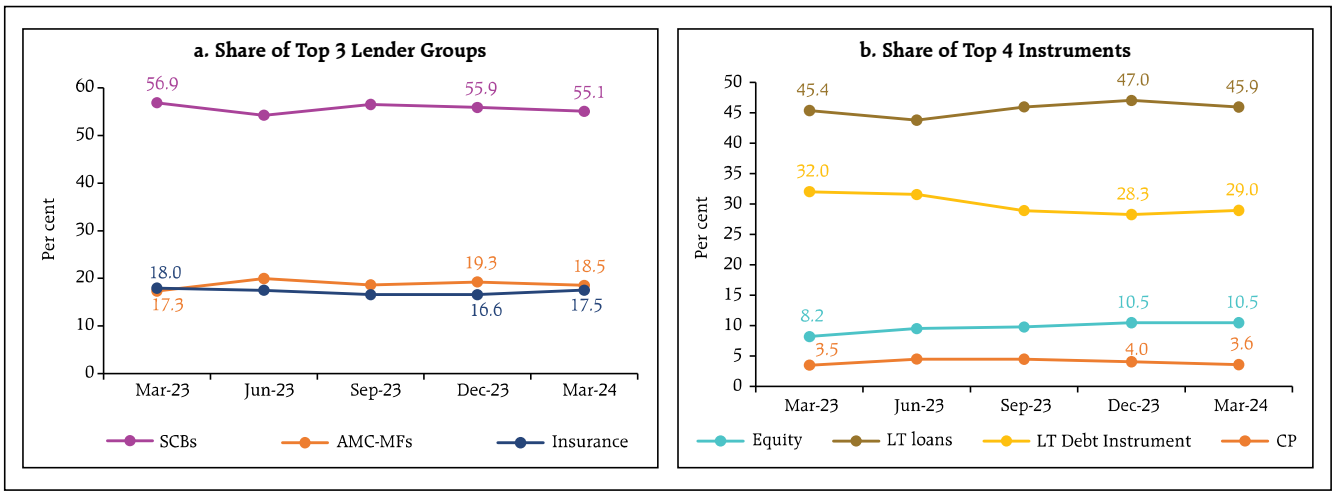
Source: RBI supervisory returns and staff calculations.

e. Exposure to NBFCs

2.82 NBFCs were the largest net borrowers of funds from the financial system, with gross payables of ₹16.58 lakh crore and gross receivables of ₹1.61 lakh crore as at end-March 2024. A breakup of their gross payables reveals that the bulk of funds were sourced from SCBs, followed by AMC-MFs and insurance companies (Chart 2.49 a).

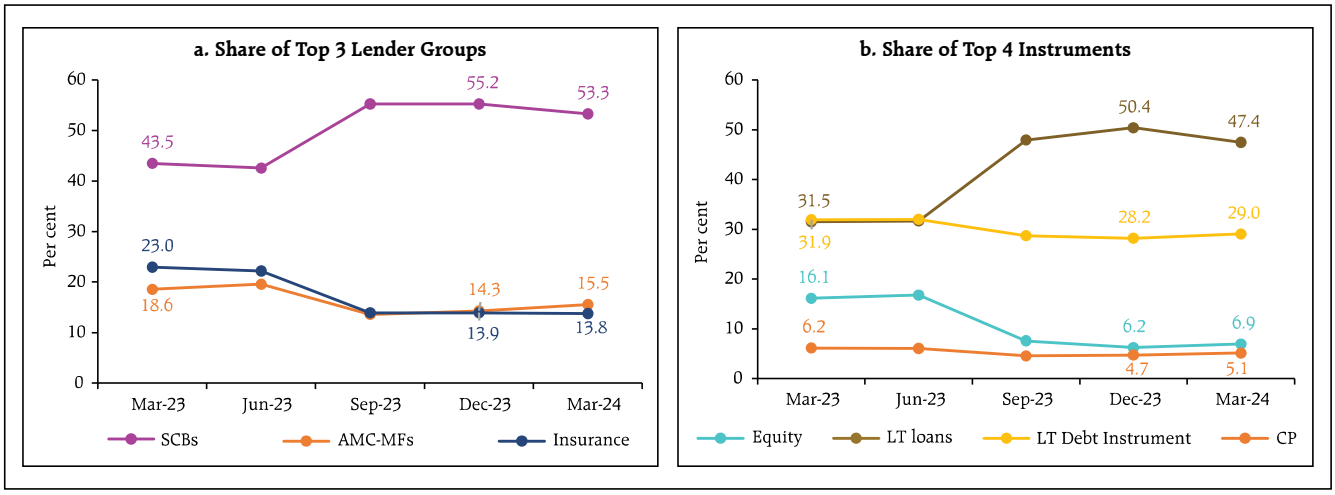
2.83 The choice of instruments in the funding mix of NBFCs shows continued reliance on LT funds. The share of LT debt instruments (held by insurance companies and AMC-MFs) moderated in 2023-24 (Chart 2.49 b).

Chart 2.49: Gross Payables of NBFCs to the Financial System



Source: RBI supervisory returns and staff calculations.

Chart 2.50: Gross Payables of HFCs to the Financial System



Source: RBI supervisory returns and staff calculations.

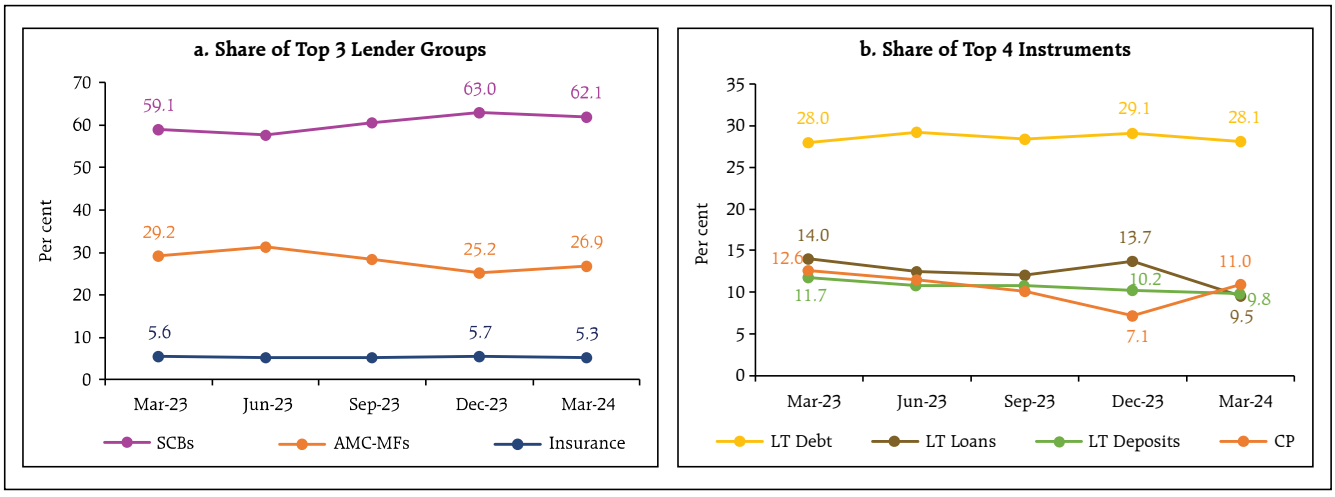
f. Exposure of HFCs

2.84 HFCs remained the second largest net borrowers and had gross payables of ₹5.41 lakh crore against gross receivables of ₹0.12 lakh crore in March 2024. Over 75 per cent of HFCs' resource mobilisation was through LT loans and LT debt instruments (Chart 2.50 a and b).

g. Exposure of AIFIs

2.85 With gross payables and receivables at ₹8.04 lakh crore and ₹7.67 lakh crore, respectively, AIFIs were net receiver of funds from the financial system in March 2024 at the margin. They raised funds mainly from SCBs, AMC-MFs and insurance companies. Given their nature of operations, LT debt, LT Loans and LT deposits remained their preferred instruments for resource mobilisation, though the combined share of these instruments came down to 47.6 per cent from 53.8 per cent a year ago (Chart 2.51 a and b).

Chart 2.51: Gross Payables of AIFIs to the Financial System



Source: RBI supervisory returns and staff calculations.

II.7.2 Contagion Analysis

2.86 Contagion analysis uses network technology to estimate the systemic importance of different financial institutions. The failure of a systemically important bank entails solvency and liquidity losses for the banking system which, in turn, depends on the initial capital and liquidity position of banks along with the number, nature (whether it is a lender or a borrower) and magnitude of the interconnections that the failing bank has with the rest of the banking system.

a. Joint Solvency[49]- Liquidity[50] Contagion Impact on SCBs due to Bank Failure

2.87 A contagion analysis of the banking network on the end-March 2024 position indicates that if the bank with the maximum capacity to cause contagion losses fails, it will cause a solvency loss of 5.06 per cent (as compared to 3.63 per cent in September 2023) of total Tier 1 capital of SCBs and a liquidity loss of 0.31 per cent (as compared with 0.33 per cent in September 2023) of total HQLA of the banking system. Also, it will not lead to failure of any additional bank (Table 2.13).

b. Solvency Contagion Impact on SCBs due to NBFC/ HFC Failure

2.88 As noted earlier, NBFCs and HFCs are among the largest borrowers of funds from the financial system, with a substantial part of funding from banks. Therefore, failure of any NBFC or HFC will act as a solvency shock to their lenders which can spread through contagion.

2.89 By end-March 2024, the hypothetical failure of the NBFC with the maximum capacity to cause solvency losses to the banking system would have knocked off 2.29 per cent (2.72 per cent in September 2023) of the latter's total Tier 1 capital but it would not lead to failure of any bank. Similarly, the hypothetical failure of the HFC with the maximum capacity to cause solvency losses to the banking system would have knocked off 3.87 per cent (4.34 per cent in September 2023) of the latter's total Tier 1 capital but without failure of any bank (Tables 2.14 and 2.15).

Table 2.13: Contagion Losses due to Bank Failure – March 2024

Name of Bank	Solvency Losses as per cent of Tier 1 Capital of the Banking System	Liquidity Losses as per cent of HQLA	Number of Banks Defaulting due to Solvency	Number of Banks Defaulting due to Liquidity
Bank 1	5.06	0.31	0	0
Bank 2	2.25	0.21	0	0
Bank 3	1.47	0.02	0	0
Bank 4	1.31	0.11	0	0
Bank 5	1.22	0.21	0	0

Note: Top five 'Trigger banks' have been selected on the basis of solvency losses caused to the banking system.
Source: RBI supervisory returns and staff calculations.

Table 2.14: Contagion Losses due to NBFC Failure – March 2024

Name	Solvency Losses as per cent of Tier 1 Capital of the Banking System	Number of Banks Defaulting due to Solvency
NBFC 1	2.29	0
NBFC 2	2.23	0
NBFC 3	2.13	0
NBFC 4	1.70	0
NBFC 5	1.56	0

Note: Only Private NBFCs are considered. Top five 'Trigger NBFCs' have been selected on the basis of solvency losses caused to the banking system.
Source: RBI supervisory returns and staff calculations.

[49] In solvency contagion analysis, gross loss to the banking system owing to a domino effect of hypothetical failure of one or more borrower banks is ascertained. Failure criterion for contagion analysis has been taken as Tier 1 capital falling below 7 per cent.

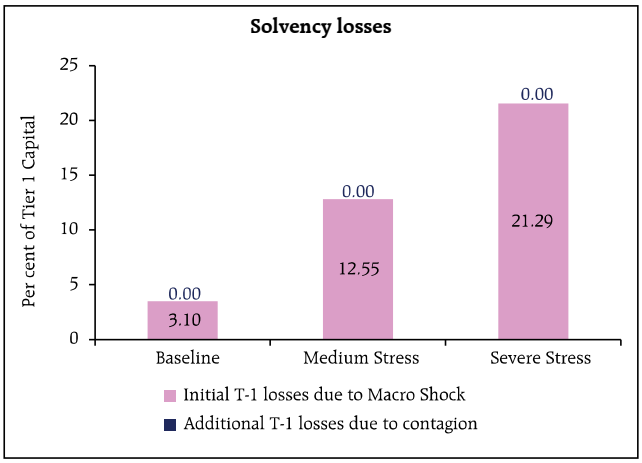
[50] In liquidity contagion analysis, a bank is considered to have failed when its liquid assets are not enough to tide over a liquidity stress caused by the hypothetical failure of large net lender. Liquid assets are measured as: 18 per cent of NDTL + excess SLR + excess CRR.

Table 2.15: Contagion Losses due to HFC Failure – March 2024

Name	Solvency Losses as per cent of Tier 1 Capital of the Banking System	Number of Banks Defaulting due to Solvency
HFC 1	3.87	0
HFC 2	1.38	0
HFC 3	1.06	0
HFC 4	0.91	0
HFC 5	0.69	0

Note: Top five 'Trigger HFCs' have been selected on the basis of solvency losses caused to the banking system.
Source: RBI supervisory returns and staff calculations.

Chart 2.52: Contagion Impact of Macroeconomic Shocks (Solvency Contagion)



Source: RBI supervisory returns and staff calculations.

c. Solvency contagion impact[51] after macroeconomic shocks to SCBs

2.90 The contagion from the failure of a bank is likely to get magnified if macroeconomic shocks result in distress to the banking system. Such shocks may cause some SCBs to fail the solvency criterion, which then acts as a trigger for further solvency losses.

2.91 In the previous iteration, a shock was applied to the entity that could cause the maximum solvency contagion losses. In another iteration in which the initial impact of such a shock on an individual bank's capital is taken from the macro-stress tests[52], the initial capital loss due to macroeconomic shocks stood at 3.10 per cent, 12.55 per cent and 21.29 per cent of Tier 1 capital for baseline, medium and severe stress scenarios, respectively. No bank fails to maintain the Tier 1 capital adequacy ratio of 7 per cent in baseline, medium and severe stress scenarios. As a result, there are no additional solvency losses to the banking system due to contagion (over and above the initial loss of capital due to the macro shocks) (Chart 2.52).

Summary and Outlook

2.92 SCBs' credit has continued to expand on the back of robust economic demand conditions and outlook, but primarily driven by services and personal loans. Deposits mobilisation is gathering pace especially in the term deposit segment. Asset quality of banks has continued to improve and capital positions remain robust, supported by capitalisation of high profits, the latter reflected in close to decadal high levels of return on equity and return on assets ratios.

2.93 With the yield curve trending down, notional losses in the HTM book of SCBs have declined. Macro-stress tests for credit risk reveal that all banks would be able to meet the minimum capital requirements of 9 per cent even under the severe stress scenario.

[51] Failure Criterion for both PSBs and PVBs has been taken as Tier 1 CRAR falling below 7 per cent.

[52] The contagion analysis used the results of the macro-stress tests and made the following assumptions:

(a) The projected losses under a macro scenario (calculated as reduction in projected Tier 1 CRAR, in percentage terms, in March 2025 with respect to the actual value in March 2024) were applied to the March 2024 capital position assuming proportionally similar balance sheet structures for both March 2024 and March 2025

(b) Bilateral exposures between financial entities are assumed to be similar for March 2024 and March 2025.

2.94 Interconnectedness among the entities in the financial system in terms of total bilateral exposures, continued to rise with SCBs remaining the most dominant players. AMC-MFs remain the largest provider of funds and NBFCs the largest receiver of funds in the financial network. Contagion loss due to the hypothetical failure of the bank with maximum capacity to cause such loss has risen in March 2024 but contagion loss due to failure of NBFCs or HFCs has reduced.

Chapter III

Regulatory Initiatives in the Financial Sector

Global regulatory initiatives are increasingly concentrated on fortifying the resilience of the financial system against new and emerging sources of risk. Concurrently, efforts continue to focus on reinforcing the resilience of both bank and non-bank financial intermediaries. Domestically, the regulatory endeavor has emphasised enhancing the soundness and resilience of the financial sector, fostering the development of deeper and more sophisticated financial markets and implementing global best practices while keeping in view country-specific circumstances.

Introduction

3.1 As the global economy navigates heightened uncertainty, policymakers have maintained the focus on enhancing the resilience of the financial system and consolidating the improvements in regulation and supervision. Global regulatory efforts are also prioritising the mitigation of risks arising from climate change, leveraging advancements in financial technology and dealing with cyber threats, reinforcing the resilience of both traditional banking institutions and non-bank financial intermediaries.

3.2 Against this backdrop, this chapter reviews recent regulatory initiatives undertaken globally and in India to improve the resilience and efficiency of the financial system.

III.1 Global Regulatory Initiatives

III.1.1 Markets and Financial Stability

3.3 In its study[1] of vulnerabilities in short-term funding markets, the Financial Stability Board (FSB) has presented an analytical framework aimed at evaluating potential market reforms in Commercial Paper (CP) and Certificate of Deposit (CD) markets. It advocates exploring structural modifications in these markets to complement investor-focused reforms such as the resilience of key investors like money market funds (MMFs). The proposed reforms encompass improvements in market microstructure, enhancement of regulatory reporting and public disclosures and the expansion of private repo markets for CP and CD collateral. Adjustments to market microstructure may involve digitisation, adoption of shorter settlement conventions and streamlining of ISIN[2] generation processes, although requirements in this regard may vary considerably across jurisdictions. Strengthened regulatory reporting and enhanced public disclosure within CP and CD markets could facilitate improved monitoring by regulatory authorities and potentially foster greater market participation by providing more detailed market information to investors.

3.4 The FSB has also issued revised policy recommendations[3] for enhancement of liquidity management practices of open-ended fund

[1] Financial Stability Board (2024), 'Enhancing the Functioning and Resilience of Commercial Paper and Negotiable Certificates of Deposit Markets', May.

[2] International Securities Identification Number.

[3] Financial Stability Board (2023), 'Revised Policy Recommendations to Address Structural Vulnerabilities from Liquidity Mismatch in Open-Ended Funds', December.

(OEF) managers beyond current standards. The recommendations emphasise: (a) the need for clearer guidance on the redemption terms that OEFs could offer to investors, aligning them with the liquidity profile of their asset holdings; (b) the importance of ensuring the availability of a diverse range of anti-dilution and quantity-based liquidity management tools (LMT) for use by OEF managers under both normal and stressed market conditions; and (c) increased utilisation and consistency in the use of anti-dilution LMTs across normal and stressed market conditions. The International Organisation of Securities Commissions (IOSCO) plans to operationalise the revised FSB recommendations and monitor progress in implementation in collaboration with the FSB.

3.5 In April 2024[4], the FSB introduced new global standards to support orderly resolution of central counterparties (CCPs) which aims to ensure that resolution authorities have ready access to a set of specific financial resources and tools as well as any unused recovery resources to support orderly resolution of a CCP. The objective is to ensure that adequate liquidity, loss absorbing and recapitalisation resources and financial tools are available to maintain continuity of a CCP's critical functions.

3.6 In view of financial institutions' rising dependencies on third party service providers in supporting critical shared services, in March 2024[5], the FSB has specified how authorities and firms should approach each of the operational continuity factors (*viz*, legal, contractual and governance frameworks, resourcing, management information systems and financial resources) for digital services as a supplementary note to the earlier document on 'Guidance on Arrangements to Support Operational Continuity in Resolution (2016)'.

III.1.2 FinTech and Financial Stability

3.7 Widespread adoption of digitalisation has spurred innovation and has led to the emergence of new business models alongside increased dependency of traditional financial players on third party technology providers as many financial services get increasingly provided through new distribution channels. The application of distributed ledger technology (DLT), application programming interfaces (API), cloud computing, artificial intelligence (AI) and machine learning (ML) in finance - broadly referred to as 'fintech' - has pertinent implications for financial intermediation process as well as for banks and regulators. The report[6] of the Basel Committee on Banking Supervision (BCBS) on the implications of digitalisation of finance for banks and supervisors covers three broad areas, *viz.*, (a) stocking of 'fintech' penetration in the banking sector; (b) benefits and risks of new technologies and their suppliers on the financial services provided by banks; and (c) policy recommendations to mitigate potential risks. The report states that while cloud computing has been widely adopted, banks appear to be using AI/ML technologies cautiously, especially for customer-facing services and for revenue generation.

3.8 The report notes that digitalisation has created new sources of vulnerabilities while amplifying existing risks to banks, their customers and to financial stability. Banks are facing 'strategic risk' as they need to adapt their business strategies to an increasingly digital environment in which higher dependence on third parties and automated

[4] Financial Stability Board (2024), 'Financial Resources and Tools for Central Counterparty Resolution', April.

[5] Financial Stability Board (2024), 'Arrangements to Support Operational Continuity in Resolution' (revised version), March.

[6] Basel Committee on Banking Supervision (2024), 'Report on Digitalisation of Finance', May.

processes has heightened 'reputational risk' and 'operational risk'. Denser interconnectivity among financial entities poses broader financial stability risks such as higher contagion and amplification of procyclical behaviour in times of stress. The regulatory and supervisory implications for banks and supervisors include: (a) effective monitoring of evolving risks and adopting a responsible approach to innovation; (b) safeguarding data and implementing robust risk management processes; and (c) building technological expertise to assess and mitigate risks from new technologies and business models.

3.9 Global regulatory bodies and multilateral organisations such as the Financial Action Task Force (FATF) and the IOSCO have been examining developments in the field of Decentralised Finance[7] (DeFi), prompted by concerns that rapid growth in such segments could have implications for broader asset market and global financial stability. To create a regulatory framework for digital assets, the United States is considering the 'Financial Innovation and Technology for the 21st Century Act (FIT21)', which is intended to provide market certainty, grant legal recognition to digital assets and allocate jurisdiction to Securities and Exchange Commission (SEC) and Commodity Futures Trading Commission (CFTC) over involved assets, venues and entities. Meanwhile, the SEC approved the trading of exchange traded products (ETP), based on select cryptocurrencies, to create a level playing field for such ETP issuers and ensure customer protection.

III.1.3 Banking and Financial Stability

3.10 The BCBS implemented revisions[8] to the Basel 'Core Principles'[9], drawing on supervisory insights and structural changes to the global banking system since the previous review in 2012. The review was intended to improve drafting consistency among various 'Core Principles' and ensure better alignment with the Basel Framework. The modifications, *inter alia*, cover: (a) assessment of financial risks; (b) corporate governance and risk management guidelines; and (c) supervisory powers and responsibilities. The revised 'Core Principles' introduce the definition of 'climate-related financial risks' and adjustments to the requirements for scenario analysis and stress testing to facilitate a more flexible and proportionate application by supervisors.

3.11 The BCBS's consultative document[10] on the revised assessment framework for global systemically important banks (G-SIBs) is aimed at discouraging window-dressing behaviour. BCBS found that the G-SIB framework is sensitive to the year-end values of the indicators reported by banks, which are prone to manipulation. The resultant mismeasurement of a bank's systemic importance in the G-SIB methodology has implications for financial sector resilience and resource efficiency as well as broader unintended consequences for both financial stability and monetary policy. The document details potential measures to address the relevant shortcomings in the framework, including calculating G-SIB scores based on average values over the reporting year, rather than year-end values.

[7] DeFi platforms allow users to lend, borrow and save in digital assets, using the blockchain technology that underpins crypto-assets to bypass the traditional gatekeepers of finance such as banks and exchanges.

[8] Basel Committee on Banking Supervision (2024), 'Core Principles for effective banking supervision', April.

[9] The Basel Core Principles are the de facto minimum standards for sound prudential regulation and supervision of banks and banking systems. They are universally applicable and accommodate a range of banking systems and a broad spectrum of banks.

[10] Basel Committee on Banking Supervision (2024), 'Consultative Document: Global systemically important banks – revised assessment framework', March.

III.1.4 Climate Finance and Financial Stability

3.12 The IOSCO published a report[11] outlining current global best practices to address greenwashing[12] and the associated challenges faced by supervisors, including data gaps, lack of transparency and reliability of environmental, social, and governance (ESG) ratings, inconsistency in labelling and product classification. The report covers the key elements of the existing supervisory tools and educational measures used by regulators to prevent and address greenwashing. It also specifies the enforcement measures and cross-border cooperation mechanisms which play a key role in addressing sustainability risks at a global level.

3.13 The International Sustainability Standards Board (ISSB), an independent standard-setting body of the International Financial Reporting Standards (IFRS) foundation, published the digital sustainability taxonomy (ISSB taxonomy)[13] to help investors analyse sustainability disclosures efficiently. Use of the ISSB taxonomy by companies will enable investors to search, extract and compare the disclosures done as per IFRS S1 and IFRS S2– the sustainability-related financial disclosures for capital markets.

3.14 The European Systemic Risk Board (ESRB) published a report[14] focussing on how financial information contained in IFRS disclosures can reflect climate-related risks from a financial stability perspective. It also suggests that additional work on the accounting treatment of carbon pricing mechanism should be prioritised.

3.15 The BCBS discussion paper[15] on how climate scenario analysis (CSA), aimed at strengthening the management and supervision of climate-related financial risks, can help banks assess the impact of climate related risks on their overall risk profile and gauge resilience of their business models to climate risks. It, however, acknowledges the limitations of lack of data and variation in assessment methodologies used by jurisdictions in achieving the intended objectives.

3.16 The Network for Greening the Financial System (NGFS) published a cover note[16] and three reports on climate transition plans which, *inter alia*, give recommendations on designing transition plans and assessments of how they can improve risk management frameworks of financial institutions. The NGFS also published a cover report[17] and two technical documents on 'sustainable and responsible investment (SRI) in central banks' portfolio management' which make several recommendations on SRI policies and refine central banks' investment practices, including incorporating climate change analyses into their investment policies.

3.17 The Bank for International Settlements (BIS) Innovation Hub Eurosystem Centre has developed a generative artificial intelligence (AI) tool to help

[11] International Organisation of Securities Commission (2023), 'Supervisory Practices to Address Greenwashing', December.

[12] IOSCO's Asset Management Report (2021) described greenwashing as the practice of misrepresenting sustainability-related practices or the sustainability-related features of investment products.

[13] https://www.ifrs.org/news-and-events/news/2024/04/issb-publishes-its-digital-sustainability-taxonomy/

[14] European Systemic Risk Board (2024), 'Climate-related risks and accounting', April.

[15] Basel Committee on Banking Supervision (2024), 'The role of climate scenario analysis in strengthening the management and supervision of climate-related financial risks', April.

[16] Network for Greening the Financial System (2024), 'NGFS: Transition Plan Package', April

[17] Network for Greening the Financial System (2024), 'Sustainable and responsible investment in central banks' portfolio management – Practices and recommendations', May.

measure climate risks in the financial system through its initiative 'Project Gaia'[18]. The tool is aimed at using AI to search corporates' climate-related disclosures and extract related data such as carbon emissions and green bond issuances. The tool has been designed with inbuilt flexibility to adapt to broader use by central banks and the financial sector.

III.1.5 Cyber Security and Financial Stability

3.18 Cybersecurity is an integral element of ensuring financial stability in an ever-changing and interconnected world in which cross-border coordination has become paramount. The G7[19] Cyber Expert Group consistently engages in exercises to ensure members' capability to effectively coordinate and communicate responses in the event of a significant cross-border cyber incident affecting the financial system. The group completed one such exercise[20] in April 2024 under the hypothetical scenario of a large-scale cyberattack on financial market infrastructures and entities in all G7 jurisdictions.

3.19 As part of its macroprudential strategy to advance system-wide cyber resilience, the ESRB published a report[21] reviewing the operational policy tools used to address systemic cyber crises with focus on three aspects: (a) tools for gathering, sharing and managing information about cyber incidents; (b) coordination tools to ensure an effective joint response by financial institutions and authorities; and (c) emergency and backup systems.

III.2 Domestic Regulatory Initiatives

3.20 During the period under review, financial regulators undertook several initiatives to improve the resilience of the Indian financial system (major measures are listed in Annex 3).

III.2.1 Operational Risk Management and Operational Resilience

3.21 To align domestic regulatory guidance with global best practices on operational resilience including the BCBS principles, a 'Guidance Note on Operational Risk Management and Operational Resilience' was issued by the Reserve Bank. The Note has adopted a principle-based and proportionate approach to ensure smooth implementation across REs of various sizes, nature, complexity, geographic location and risk profile of their businesses. It provides overarching guidance to REs to strengthen their operational risk management framework and also enhances their operational resilience to deliver critical operations even through disruption. It has been built on the three pillars: (a) prepare and protect[22]; (b) build resilience[23] and (c) learn and adapt[24], together consisting of 17 principles.

III.2.2 Voluntary transition of Small Finance Banks to Universal Banks

3.22 The guidelines for 'on-tap' licensing of small finance banks (SFBs) provided for a transition path for SFBs to convert into universal banks. With the objective to bring better clarity, the following eligibility criteria have been stipulated for an SFB to

[18] Bank of International Settlements (2024), 'Project Gaia: enabling climate risk analysis', March

[19] The G7 is an informal bloc of industrialised democracies—the United States, Canada, France, Germany, Italy, Japan, and the United Kingdom (UK)-that meets annually to coordinate global economic policy and address other transnational issues.

[20] US Department of Treasury (2024), 'G7 Cyber Expert Group Conducts Cross-Border Coordination Exercise in the Financial Sector' - Press Release, April.

[21] European Systemic Risk Board (2024), 'Advancing macroprudential tools for cyber resilience – Operational policy tools', April.

[22] Focusing on Governance and operational risk management.

[23] Consisting of areas such as business continuity, incident management, cyber security, *etc.* for ensuring delivery of critical operations through disruption.

[24] For the creation of a feedback loop through disclosures, lessons learnt exercises, *etc.*

transition into a universal bank: (i) scheduled status with a satisfactory track record of performance for a minimum period of five years; (ii) listing of bank's shares on a recognised stock exchange; (iii) minimum net worth of ₹1,000 crore as at the end of the previous quarter (audited); (iv) meeting the prescribed CRAR requirements for SFBs; (v) net profit in the last two financial years; and (vi) GNPA and NNPA of less than or equal to three per cent and one per cent, respectively, in the last two financial years.

III.2.3 Reserve Bank of India (Government Securities Lending) Directions

3.23 In order to add depth and liquidity to the Government securities market and aid efficient price discovery, the Reserve Bank permitted lending and borrowing of Government securities, which will augment the existing market for 'special repos'[25]. These Directions are applicable to all Government securities lending transactions undertaken in over-the-counter (OTC) markets. Government securities (excluding Treasury Bills) issued by the Central Government are eligible for lending/borrowing under a Government Securities Lending (GSL) transaction[26]. Government securities issued by the Central Government (including Treasury Bills) and the State Governments are eligible as collateral under a GSL transaction.

3.24 An entity eligible to undertake repo transactions in Government securities in terms of the Repurchase Transactions (Repo) (Reserve Bank) Directions, 2018, as amended from time to time, is eligible to participate in GSL transactions as lender of securities. Entities that are eligible to undertake short sale transactions in terms of Short Sale (Reserve Bank) Directions, 2018, as amended from time to time, are eligible to borrow securities under a GSL transaction. The system is expected to facilitate wider participation in the securities lending market by providing investors an avenue to deploy idle securities and enhance portfolio returns.

III.2.4 Margining for Non-Centrally Cleared OTC Derivatives

3.25 In order to improve safety of settlement of OTC derivatives that are not centrally cleared and following G-20 recommendations, the Reserve Bank issued Master Directions on margining for non-centrally cleared OTC derivatives to implement global practices. Margins for non-centrally cleared derivatives (NCCDs) are expected to reduce contagion and spillover effects by ensuring that collateral is available to offset any default losses. Margin requirements can also have broader macroprudential benefits by reducing the financial system's vulnerability to potentially destabilising procyclicality and limiting the build-up of uncollateralised exposures within the financial system.

3.26 All financial firms that engage in NCCDs must exchange initial margin (IM) and variation margin (VM), while non-financial entities that engage in NCCDs must exchange VM, to mitigate counterparty risks posed by such transactions, as appropriate. A 'covered entity'[27] is required to exchange IM

[25] A special repo is a type of repurchase agreement (repo) transaction where the party must deliver a specific security.

[26] GSL transaction refers to dealing in Government securities involving lending of eligible Government securities, for a fee, by the owner of those securities (the lender) to a borrower, on the collateral of other Government securities, for a specified period of time, with an agreement that the borrower shall return to the lender the security borrowed and the latter shall return the security received as collateral to the former at the end of the agreed period.

[27] Financial firms and non-financial entities, subject to criteria, are classified as 'covered entities'. The Directions specify the criteria of 'covered entities' for exchange of initial margin (IM) (*i.e.*, the collateral that is collected to cover the potential future exposure that could arise from future changes in the market value of a derivative contract during the time it takes to close out and/or replace the position in the event of a counterparty default) and variation margin (VM) (*i.e.*, the collateral that is collected or paid to reflect the current mark-to-market exposure resulting from changes in the market value of a derivative contract), based on their average aggregate notional exposure (AANA) of outstanding NCCDs.

and VM with other covered entities for NCCD transactions only. VM shall be exchanged on an aggregate net basis across all NCCD contracts that are executed under a single, legally enforceable netting agreement. The initial margin is to be exchanged on a gross basis without any netting of initial margin amounts owed by the two counterparties across all NCCD contracts that are executed under a single, legally enforceable netting agreement. Eligibility criteria for qualifying assets to be collected as collateral for IM and VM purposes have been specified along with the prescribed risk-sensitive haircut to be applied.

III.2.5 Investments in Alternative Investment Funds (AIFs)

3.27 In view of certain regulatory concerns regarding the use of Alternative Investment Funds (AIFs) by regulated entities (REs), for evergreening stressed loans, a circular on 'Investment in Alternative Investment Funds' was issued in 2023 prohibiting REs from investing in any AIF scheme with direct or indirect downstream investments in a debtor company of the RE. REs were directed to divest such investments within 30 days, failing which they must make full provisions for them. Additionally, investments by REs in 'subordinated units' of any AIF scheme with a 'priority distribution model' shall be subject to full deduction from the RE's capital funds.

3.28 In this regard, in order to ensure an effective and consistent implementation of the said circular across REs, a follow-up clarificatory circular was issued, providing the following clarifications/ directives: (i) downstream investments exclude equity shares but include all other investments, including hybrid investments; (ii) provisioning shall be required only to extent of RE's investment in the AIF scheme which is further invested by the AIF in the debtor company and not the entire investment in AIF scheme; (iii) proposed deductions from capital shall take place equally from both Tier-1 and Tier-2 capital, encompassing all forms of subordinated exposures including investment in nature of sponsor units; (iv) compliance with paragraph 3[28] of the said circular, regarding full capital deduction for investment by REs in junior/subordinated tranche of AIF scheme, will be applicable only if the AIF does not have any downstream investment in a debtor company; and (v) investments in AIFs through intermediaries such as fund of funds or mutual funds have been scoped out.

III.2.6 Omnibus Framework for recognising Self-Regulatory Organisations (SROs) for REs

3.29 Self-regulatory organisations (SROs) enhance the effectiveness of regulations by drawing upon the technical expertise of practitioner members. Their feedback and moral suasion aids in framing/ fine-tuning regulatory policies and managing nuances and trade-offs involved. SROs can also help in fostering innovation, transparency, fair competition and consumer protection. The Reserve Bank issued an Omnibus SRO Framework to develop industry standards of self-governance, supplementing the regulatory and supervisory efforts to instil a stronger compliance culture and to provide a consultative platform for all stakeholders. The framework prescribes the general objectives, functions, eligibility criteria, governance standards and lays down broad membership criteria along with other terms and conditions to be followed by SROs before recognition. Within the broad contours of the framework, along with certain specific instructions, the Reserve Bank in June 2024 invited

[28] Paragraph 3 of RBI Circular No. DOR.STR.REC.58/21.04.048/2023-24 on 'Investments in Alternative Investment Funds (AIFs)' dated December 19, 2023 states that investment by REs in the subordinated units of any AIF scheme with a 'priority distribution model' shall be subject to full deduction from RE's capital funds.

applications for recognition of SROs for the NBFC sector.

III.2.7 Credit/Investment Concentration Norms – Credit Risk Transfer

3.30 The extant large exposure framework (LEF) for NBFC - Upper layer (NBFC-UL) allows for offsetting of exposures to the original counterparty with eligible credit risk transfer instruments. In order to ensure uniformity and consistency in computation of exposures across the NBFC sector, middle layer entities (*i.e.*, NBFC-ML) and base layer entities (*i.e.*, NBFC-BL) are permitted to offset their exposures with eligible credit risk transfer instruments, namely cash margin/caution money/security deposit, central/state government guarantees and certain specified guarantees issued under the credit guarantee schemes.

3.31 Under eligible credit risk transfer instruments, guarantees from central/ state government shall be direct, explicit, irrevocable and unconditional. Further, direct exposures to central/state governments as well as exposures fully guaranteed by the central government have been exempted from concentration limits. While no concentration limit is prescribed for NBFC-BL, they are advised to put in place internal Board approved policies for credit/investment concentration limits for both single borrower/party and single group of borrowers/parties.

III.2.8 Framework for dealing with D-SIBs

3.32 The Reserve Bank had issued the framework for dealing with Domestic Systemically Important Banks (D-SIBs) in 2014. The framework requires the Reserve Bank to: (a) identify and disclose the names of banks designated as D-SIBs annually; and (b) review the assessment methodology stipulated for identification of the D-SIBs on a periodic basis. Accordingly, a review of the assessment methodology was carried out, taking into consideration the functioning of the framework since its introduction, international developments in the field of systemic risk measurement and the experience of other countries in implementing the D-SIB framework. In the process, certain revisions have been implemented for the 'payments' sub-indicator (to account for the significant changes in payment landscape in India) under the 'substitutability' indicator, along with modifications in data requirements under 'interconnectedness' and 'complexity' indicators, to ensure a more comprehensive representation of systemic importance of banks.

III.2.9 Regulatory Framework for Index Providers in the Indian Securities Market

3.33 Given the growing importance of passive funds and concerns regarding conflict of interest and governance practices relating to indices, the SEBI has brought index providers under its regulatory ambit through the Index Providers Regulations, 2024.

3.34 These regulations are applicable only to index providers that administer 'significant indices'[29] and are based on IOSCO principles for financial benchmarks. Accordingly, an index provider shall have to carry out assessment of adherence to the principles at least once in two years. These regulations are not applicable to index providers that administer (a) indices consisting only of global asset classes or consisting

[29] 'Significant indices' consist of securities listed on a recognised stock exchange in India for use in the Indian securities market. In this context, 'significant indices' are the indices administered by an index provider, which are tracked or benchmarked by domestic mutual fund schemes, with cumulative AUM exceeding the limits as may be specified from time to time

of global assets and Indian securities, whether for use in the Indian securities market or elsewhere; and (b) indices for exclusive use in a foreign jurisdiction. The benchmarks in the financial markets regulated by the Reserve Bank, including the significant benchmark notified by the Reserve Bank under section 45W of the Reserve Bank of India Act, 1934, are excluded from the purview of these regulations.

III.2.10 Introduction of Beta version of T+0 rolling settlement cycle on optional basis

3.35 Pursuant to the recommendations of Risk Management Review Committee of the SEBI and approval of the SEBI Board, it was decided to put in place a framework for introduction of the Beta version of T+0 settlement cycle on an optional basis, in addition to the existing T+1 settlement cycle in the equity cash market for a limited set of 25 scrips and with a limited number of brokers. To ensure smooth implementation, the market infrastructure institutions (MIIs) have disseminated operational guidelines and frequently asked questions (FAQs) along with the list of 25 scrips for the Beta version of T+0 settlement cycle on their respective websites. A shortened settlement cycle will bring in cost and time efficiency as well as transparency in charges to investors and strengthen risk management at clearing corporations and the overall securities market ecosystem.

III.2.11 Business Continuity for Clearing Corporations through Software as a Service (SaaS) Model

3.36 Clearing corporations (CCs) are important MIIs that provide risk management, centralised clearing and guaranteed settlement of trades. CCs operate as a multilateral system between stock exchanges, market participants, clearing banks and depositories. As a part of their risk management mechanism, CCs carry out comprehensive risk management across exchanges based on each trade executed by the members under the inter-operability framework.

3.37 Risk management systems (RMSs) of CCs aim to ensure smooth and uninterrupted functioning of the securities market by carrying out online real-time risk management of trades happening on stock exchanges. To manage disruptions impacting availability of RMS, the SEBI had issued a circular on 'Business Continuity for Clearing Corporations through Software as a Service (SaaS) Model' with detailed guidelines relating to the SaaS model for RMS of CCs. Each CC shall design a system to run its RMS related operations to risk manage trades for its clearing members using the RMS software of another CC. This system would be called SaaS-RMS.

3.38 Accordingly, two inter-operable CCs, *i.e.*, National Clearing Limited (NCL) and Indian Clearing Corporation Limited (ICCL), have implemented the SaaS-RMS which would be activated within 30 minutes of occurrence of malfunction in their RMS. This remains the first of its kind redundancy model globally.

III.3 Other Developments

III.3.1 Customer Protection

3.39 The pattern of complaints received by the Offices of the Reserve Bank of India Ombudsman (ORBIOs) during the second half of 2023-24 indicates that complaints pertaining to loans and advances and digital complaints (*i.e.*, complaints pertaining to mobile/ electronic banking, credit cards and ATM/ CDM/ debit cards) continue to constitute over

Table 3.1: Category of Complaints Received under the RB-IOS, 2021

Sr. No.	Grounds of Complaint	RB-IOS (October-December 2023)		RB-IOS (January-March 2024)	
		Number	Share in per cent	Number	Share in per cent
1	Loans and Advances & Non-adherence to FPC	15,591	21.4	14,329	19.2
2	Mobile/ Electronic Banking	11,328	15.6	11,278	15.1
3	Credit Card	9,635	13.2	10,145	13.6
4	Opening/ Operation of Deposit accounts	8,355	11.5	7,663	10.3
5	ATM/ CDM/ Debit card	6,829	9.4	4,902	6.6
6	Others	971	1.3	559	0.8
7	Remittance and Collection of instruments	681	0.9	629	0.8
8	Para-Banking	621	0.9	511	0.7
9	Pension	656	0.9	411	0.6
10	Other products and services*	18,180	25.0	24,121	32.4
Total		72,847	100.0	74,548	100.0

Note: * includes bank guarantee/ letter of credit, customer confidentiality, premises and staff, grievance redressal, death/ missing claims, *etc.*
Source: Reserve Bank of India.

half of the total complaints (Table 3.1), with two per cent sequential (q-o-q) growth during Q4:2023-24.

III.3.2 Enforcement

3.40 During December 2023 – May 2024, the Reserve Bank undertook enforcement action against 161 REs {four PSBs; nine PVBs; one SFB; one foreign bank, two regional rural banks (RRBs); 132 co-operative banks; nine NBFCs and three HFCs} and imposed an aggregate penalty of ₹22.83 crore for non-compliance with/contravention of statutory provisions and/ or directions issued by the Reserve Bank.

III.3.3 Deposit Insurance

3.41 The Deposit Insurance and Credit Guarantee Corporation (DICGC) extends insurance cover to bank depositors with the objective of maintaining their confidence in the banking system and promoting financial stability. The deposit insurance extended by DICGC covers all banks operating in India. The total number of banks registered with the DICGC stood at 1,997 comprising 140 commercial banks {including 43 regional rural banks (RRBs), two local area banks (LABs), six payment banks and 12 SFBs} and 1,857 co-operative banks.

3.42 With the current deposit insurance limit of ₹5 lakh, 97.8 per cent of the total number of deposit accounts (289.8 crore) are fully insured. Of the total assessable deposits of ₹218.23 lakh crore, 43.1 per cent were insured as on March 31, 2024. (Table 3.2).

3.43 The insured deposits ratio (*i.e.*, the ratio of insured deposits to assessable deposits) was higher for cooperative banks (63.2 per cent), followed by commercial banks (42 per cent) (Table 3.3). Within

Table 3.2: Coverage of Deposits

(Amount in ₹ crore and No. of Accounts in crore)

Sr. No.	Item	Mar 31, 2023	Sep 30, 2023	Mar 31, 2024 (P)	Percentage Variation	
					(4) over (3)	(5) over (4)
(1)	(2)	(3)	(4)	(5)	(6)	
(A)	Number of Registered Banks	2,026	2,009	1,997		
(B)	Total Number of Accounts	276.3	287.9	289.8	4.2	0.6
(C)	Number of Fully Protected Accounts	270.5	281.8	283.3	4.2	0.5
(D)	**Percentage (C)/(B)**	97.9	97.9	97.8		
(E)	Total Assessable Deposits	1,94,58,915	2,04,18,707	2,18,23,481	4.9	6.9
(F)	Insured Deposits	86,31,259	90,32,340	94,10,674	4.6	4.2
(G)	**Percentage (F)/(E)**	44.4	44.2	43.1		

Note: P = Provisional.
Source: DICGC

Table 3.3: Bank Group-wise Deposit Protection Coverage (As on March 31, 2024)

(₹ crore)

Bank Groups	No. of Insured Banks	Insured Deposits (ID)	Assessable Deposits (AD)	ID / AD (per cent)
I. Commercial Banks	**140**	**86,66,217**	**2,06,46,359**	**42.0**
i) Public Sector Banks	12	56,47,647	1,15,49,283	48.9
ii) Private Sector Banks	21	23,63,912	72,35,902	32.7
iii) Foreign Banks	44	50,568	10,08,505	5.0
iv) Small Finance Banks	12	89,532	2,15,426	41.6
v) Payment Banks	6	16,794	16,937	99.2
vi) Regional Rural Banks	43	4,96,827	6,19,010	80.3
vii) Local Area Banks	2	937	1,295	72.4
II. Cooperative Banks	**1,857**	**7,44,457**	**11,77,122**	**63.2**
i) UCBs	1,472	3,71,859	5,56,977	66.8
ii) SCCBs	33	62,395	1,46,144	42.7
iii) District Central Cooperative Banks	352	3,10,202	4,74,000	65.4
Total	**1,997**	**94,10,674**	**2,18,23,481**	**43.1**

Note: Data is provisional.
Source: DICGC.

commercial banks, PSBs had a much higher insured deposit ratio *vis-à-vis* PVBs.

3.44 Deposit insurance premium received by the DICGC grew by 11.7 per cent (Y-o-Y) to ₹23,879 crore (P) during 2023-24, of which commercial banks had a share of 94 per cent (Table 3.4).

3.45 The DIF with the DICGC is primarily built out of the premium paid by insured banks, investment income and recoveries from settled claims, net of income tax. DIF recorded a 17.2 per cent year on year increase to reach ₹1.99 lakh crore as on March 31, 2024. The reserve ratio (*i.e.*, ratio of DIF to insured deposits) increased to 2.11 per cent from 1.96 per cent a year ago (Table 3.5). This is in line with global median of 2 per cent[30].

Table 3.4: Deposit Insurance Premium

(₹ crore)

Period	Commercial Banks	Co-operative Banks	Total
2022-23	**20,104**	**1,277**	**21,381**
2022-23:H1	9,872	641	10,513
2022-23:H2	10,232	636	10,868
2023-24 (P)	**22,543**	**1,336**	**23,879**
2023-24:H1	10,962	666	11,628
2023-24:H2	11,581	670	12,251

Note: P - Provisional.
Source: DICGC.

Table 3.5: Deposit Insurance Fund and Reserve Ratio (₹crore)

As on	Deposit Insurance Fund (DIF)	Insured Deposits (ID)	Reserve Ratio (DIF/ID) (Per cent)
Mar 31, 2023	1,69,602	86,31,259	1.96
Sep 30, 2023	1,82,701	90,32,340	2.02
Mar 31, 2024 (P)	1,98,753	94,10,674	2.11

Note: P = Provisional.
Source: DICGC.

III.3.4 Corporate Insolvency Resolution Process (CIRP)

3.46 Since the provisions relating to the corporate insolvency resolution process (CIRP) came into force in December 2016, a total of 7,567 CIRPs commenced by March 2024, out of which 5,647 (74.6 per cent) have been closed. Of the closed CIRPs, around 20 per cent have been closed on appeal or review or settled, 19 per cent have been withdrawn, around 44 per cent have ended in orders for liquidation and 17 per cent

[30] International Association of Deposit Insurers (2024), "Deposit Insurance in 2024 : Global Trends and Key Issues", April.

Table 3.6: Corporate Insolvency Resolution Process

Year/Quarter	CIRPs at the beginning of the Period	Admitted	Closure by				CIRPs at the end of the Period
			Appeal/ Review/ Settled	Withdrawal under Section 12A	Approval of Resolution Plan	Commencement of Liquidation	
2016-17	0	37	1	0	0	0	36
2017-18	36	707	95	0	19	91	538
2018-19	538	1,157	157	97	75	305	1,061
2019-20	1,061	1,990	348	220	132	539	1,812
2020-21	1,812	536	92	168	119	349	1,620
2021-22	1,620	890	124	200	144	340	1,702
2022-23	1,702	1,263	188	226	189	409	1,953
Apr- Jun, 23	1,953	252	38	46	43	96	1,982
Jul- Sep, 23	1,982	249	56	48	85	124	1,918
Oct- Dec, 23	1,918	247	34	34	80	133	1,884
Jan- Mar, 24	1,884	239	21	31	61	90	1,920
Total		**7,567**	**1,154**	**1,070**	**947**	**2,476**	**1,920**

Source: Compilation from website of the NCLT and filing by IPs.

have ended in approval of resolution plans (Table 3.6 and 3.7).

3.47 As on March 31, 2024, the outcome of CIRPs shows that of the operational creditor initiated

Table 3.7: Sectoral Distribution of CIRPs as on March 31, 2024

Sector	No. of CIRPs						
	Admitted	Closed					Ongoing
		Appeal/ Review/ Settled	Withdrawal under Section 12 A	Approval of RP	Commencement of Liquidation	Total	
Manufacturing	**2849**	**399**	**414**	**452**	**1018**	**2283**	**566**
Food, Beverages & Tobacco Products	368	45	54	56	139	294	74
Chemicals & Chemical Products	303	53	59	47	91	250	53
Electrical Machinery & Apparatus	200	25	22	19	91	157	43
Fabricated Metal Products	154	23	28	20	50	121	33
Machinery & Equipment	313	57	53	32	105	247	66
Textiles, Leather & Apparel Products	485	58	74	62	198	392	93
Wood, Rubber, Plastic & Paper Products	333	44	48	59	115	266	67
Basic Metals	478	60	43	119	168	390	88
Others	215	34	33	38	61	166	49
Real Estate, Renting & Business Activities	**1631**	**302**	**259**	**139**	**451**	**1151**	**480**
Real Estate Activities	463	93	69	40	72	274	189
Computer and related activities	214	28	36	17	83	164	50
Research and Development	10	2	3	1	2	8	2
Other Business Activities	944	179	151	81	294	705	239
Construction	**881**	**170**	**143**	**103**	**180**	**596**	**285**
Wholesale & Retail Trade	**764**	**100**	**74**	**68**	**324**	**566**	**198**
Hotels & Restaurants	**156**	**30**	**27**	**25**	**41**	**123**	**33**
Electricity & Others	**211**	**27**	**20**	**42**	**80**	**169**	**42**
Transport, Storage & Communications	**209**	**24**	**23**	**20**	**88**	**155**	**54**
Others	**866**	**102**	**110**	**98**	**294**	**604**	**262**
Total	**7567**	**1154**	**1070**	**947**	**2476**	**5647**	**1920**

Note: The distribution is based on the CIN of corporate debtors and as per National Industrial Classification (NIC 2004).
Source: Insolvency and Bankruptcy Board of India (IBBI).

Table 3.8: Outcome of CIRPs, Initiated Stakeholder-wise, as on March 31, 2024

Outcome	Description	CIRPs initiated by				
		Financial Creditor	Operational Creditor	Corporate Debtor	FiSPs	Total
Status of CIRPs	Closure by Appeal/Review/Settled	347	798	9	0	1,154
	Closure by Withdrawal u/s 12A	306	756	8	0	1,070
	Closure by Approval of RP	547	322	74	4	947
	Closure by Commencement of Liquidation	1,148	1071	257	0	2,476
	Ongoing	1,092	720	108	0	1,920
	Total	**3,440**	**3,667**	**456**	**4**	**7,567**
CIRPs yielding RPs	Realisation by FCs as per cent of Liquidation Value	176.3	129.5	146.7	134.9	161.8
	Realisation by FCs as per cent of their Claims	32.4	25.1	18.2	41.4	32.1
	Average time taken for Closure of CIRP (days)	683	691	573	677	679
CIRPs yielding Liquidations	Liquidation Value as per cent of Claims	5.6	9.1	8.5	-	6.3
	Average time taken for Closure of CIRP (days)	495	492	437	-	495

Note: FiSPs = Financial service providers. A "Financial service provider" means a person engaged in the business of providing financial services (other than banks) in terms of authorisation issued or registration granted by a financial sector regulator.

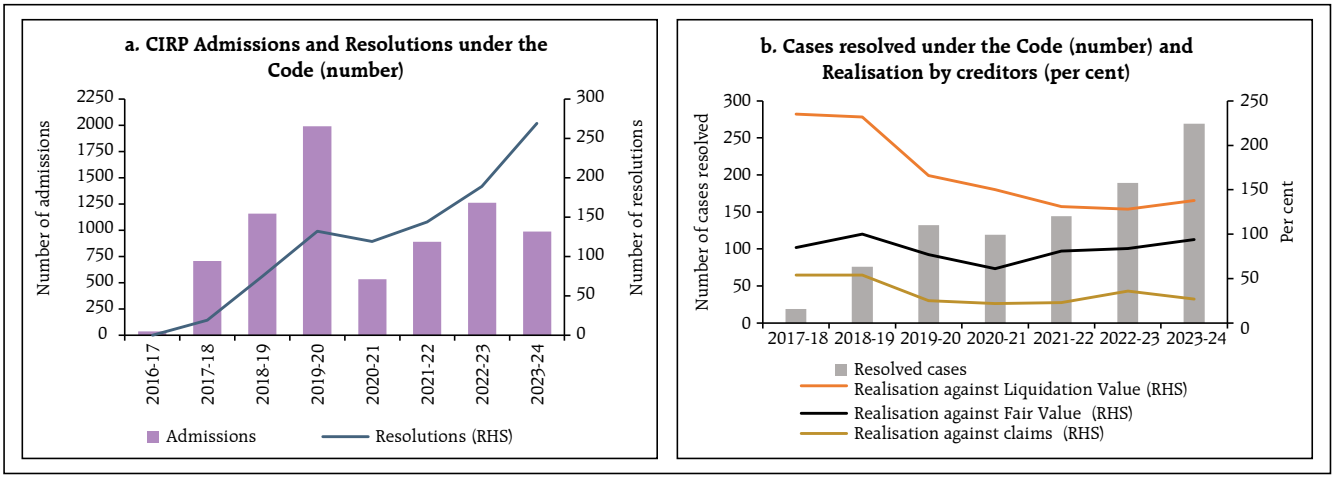
Source: Insolvency and Bankruptcy Board of India (IBBI).

CIRPs that were closed, 53 per cent were closed on appeal, review, or withdrawal (Table 3.8).

3.48 The initiatives being taken to improve the outcomes under the Insolvency and Bankruptcy Code, 2016 (the 'Code') include amendments in the regulations, increasing the effective strength of the National Company Law Tribunal (NCLT), setting up of an integrated IT platform and regular interactions with all stakeholders, including NCLT. Some of these initiatives have started yielding results with a rise in the number of admitted cases, approved resolution plans and realisable value (Chart 3.1 a). The number of resolved cases under the Code and realisation by creditors as a proportion to liquidation value and fair value show an increasing trend (Chart 3.1 b).

3.49 Till March 31, 2024, a total of 947 corporate debtors have been resolved under the Code.

Chart 3.1: Summary of Outcomes



Source: Insolvency and Bankruptcy Board of India (IBBI).

Cumulatively till March 31, 2024, creditors have realised ₹3.36 lakh crore under the resolution plans. Creditors have realised around 162 per cent of liquidation value, 85 per cent of fair value and over 32 per cent of admitted claims. Realisable value through resolution plans does not include: (a) possible realisation through corporate and personal guarantors and recovery against avoidance transactions; (b) CIRP cost; and (c) other probable future realisations, such as increase in value of diluted equity and funds infused into the corporate debtor, including capital expenditure by the resolution applicants. About 40 per cent of the CIRPs that yielded resolution plans were defunct companies. In these cases, the claimants have realised 155 per cent of the liquidation value and 20 per cent of their admitted claims.

3.50 Although the primary objective of the Code is providing relief to corporate debtors in distress, the Code has also resulted in behavioural changes among debtors who are settling their dues even before start of insolvency proceedings. Till March 2024, 28,818 applications for initiation of CIRPs of corporate debtors having underlying default of ₹10.22 lakh crore were withdrawn before their admission.

3.51 At end-March 2024, the total number of CIRPs ending in liquidation was 2,476 of which, final reports have been submitted in 960 cases for which corporate debtors together had outstanding claims of ₹2.28 lakh crore, but the assets were valued at only ₹0.10 lakh crore. The liquidation of these companies resulted in 87 per cent realisation of the liquidation value.

3.52 The Code endeavours for early closure of various processes in resolution. The 947 CIRPs that have yielded resolution plans by March 2024 took, on an average, 565 days (adjusting for the time excluded by the Adjudicating Authority) for conclusion of processes, while incurring an average cost of 1.25 per cent of liquidation value and 0.74 per cent of resolution value. Similarly, the 2,476 CIRPs that ended up in orders for liquidation took an average of 495 days for conclusion. Further, 960 liquidation processes that were closed by submission of final reports took an average of 605 days for closure.

III.3.5 Developments in International Financial Services Centre (IFSC)

3.53 The total asset size of IFSC banking units (IBU) stood at US$ 60.4 billion in March 2024. The cumulative banking transactions undertaken by IBUs crossed US$ 796 billion. Additionally, the cumulative non-deliverable forwards (NDFs) booked reached US$ 439 billion.

3.54 As on April 30, 2024, five entities had been registered by the International Financial Services Centres Authority (IFSCA) as bullion trading members (Bullion TM), six as bullion trading and clearing member (Bullion TMCM), two as bullion professional clearing members (Bullion PCM) and three as bullion trading members cum self-clearing members. Further, 126 'Qualified Jewellers' were notified by the IFSCA. As on April 30, 2024, 8.38 tonnes of gold and 926.86 tonnes of silver had been traded on the India International Bullion Exchange (IIBX) and the turnover stood at US$ 531.44 million and US$ 714.43 million for gold and silver, respectively. The IIBX facilitates efficient price discovery and ensures standardisation, quality assurance and sourcing integrity, apart from giving impetus to financialisation of gold in India.

3.55 The asset management ecosystem at the GIFT-IFSC is growing rapidly and comprises 114 Fund Management Entities, 120 AIFs and four Investment Advisors. The total targeted corpus to be raised by AIFs in the IFSC, including *via* 'green shoe' options, stood at around US$ 33 billion up to March 2024.

3.56 The insurance ecosystem in the GIFT-IFSC comprises 35 entities, including 12 IFSC Insurance Offices (IIOs) and 23 IFSC Insurance Intermediary Offices (IIIOs). The total reinsurance premium booked by IFSC Insurance offices was US$ 360 million and the total reinsurance premium transacted by insurance intermediaries was US$ 918 million, up to March 2024.

III.3.6 Insurance

3.57 During 2023-24, new business premium of life insurance industry grew by 1.8 per cent, reaching ₹3.78 lakh crore (provisional) from ₹3.71 lakh crore in the last financial year. The total premium[31] underwritten by general and health insurers was ₹2.90 lakh crore during 2023-24 (provisional) as against ₹2.57 lakh crore reported during the previous financial year - a y-o-y growth of 12.8 per cent. Among various lines of business, the health insurance segment (the largest among the non-life insurance sector) has reported the highest growth of 20.2 per cent while the growth in motor insurance premium (second largest segment under non-life insurance) was 12.9 per cent year-on-year.

3.58 In alignment with the 2023-24 budgetary announcements regarding reducing regulatory compliance burden and promoting ease of doing business, encouraging innovation, competition, and sustainable growth in the insurance industry, the IRDAI has replaced 37 regulations with seven regulations and has introduced two new regulations to enhance clarity and coherence in the regulatory landscape. These changes and new regulations, *inter alia*, (a) provide more flexibility to insurers to manage their expenses including commissions; (b) modify the parameters for compliance and measurement of statutory rural, social sector and motor third party obligations by insurers; (c) establish a digital public infrastructure named 'Bima Sugam' to serve as a one stop solution for all insurance stakeholders; (d) improve the procedures and practices adopted by insurers and distribution channels to fulfil their obligations towards policyholders; (e) promote prudent practices in risk management related to outsourcing activities by insurers; and (f) promote good governance in product design and pricing, including strengthening of the principles governing guaranteed surrender value and special surrender value along with disclosures thereof.

3.59 Furthermore, the revamped regulations on 'Registration, Capital structure, Transfer of shares and Amalgamation of Insurers' of the Insurance Regulatory and Development Authority of India (IRDAI) aim to simplify various processes, including registration of insurers, transfer of shareholding, amalgamation of insurers and listing of shares on stock exchanges. The regulation on 'Corporate governance for Insurers' aims to establish a robust governance framework for insurers, defining the roles and responsibilities of the board and management. The regulation on 'Registration and Operations of Foreign Reinsurers Branches and Lloyd's India' aims to improve the environment for the growth and expansion of the reinsurance sector, ultimately benefiting both insurers and policyholders in India. Further, the regulation on 'Actuarial, Finance and Investment Functions of Insurers' aims to implement sound and responsive management practices for effective discharge of actuarial, finance, and investment functions, safeguarding policyholders' interests, and promoting ease of doing business.

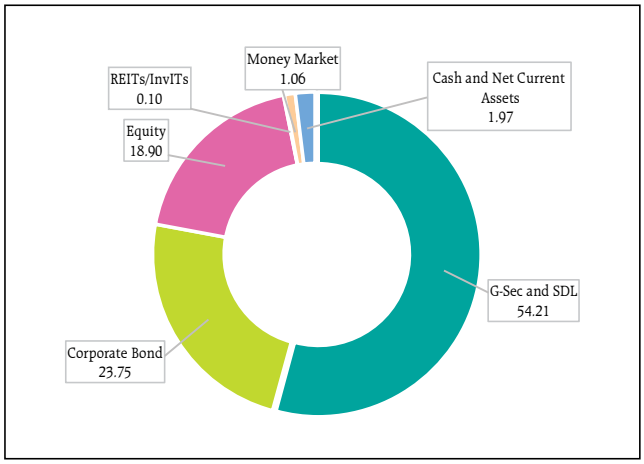
III.3.7 Pension Funds

3.60 The National Pension System (NPS) and the Atal Pension Yojana (APY) have continued to

[31] Total Premium collected = New business premium + Renewal business premium.

progress in terms of the total number of subscribers and Asset Under Management (AUM). During 2023-24, the number of subscribers under NPS and APY together have shown a growth of 16.3 per cent, whereas their AUM has recorded 30.5 per cent growth. The combined subscriber base under NPS and APY has reached 7.35 crore in March 2024, with an AUM of ₹11.72 lakh crore (Chart 3.2), which is primarily invested in fixed income instruments (Chart 3.3).

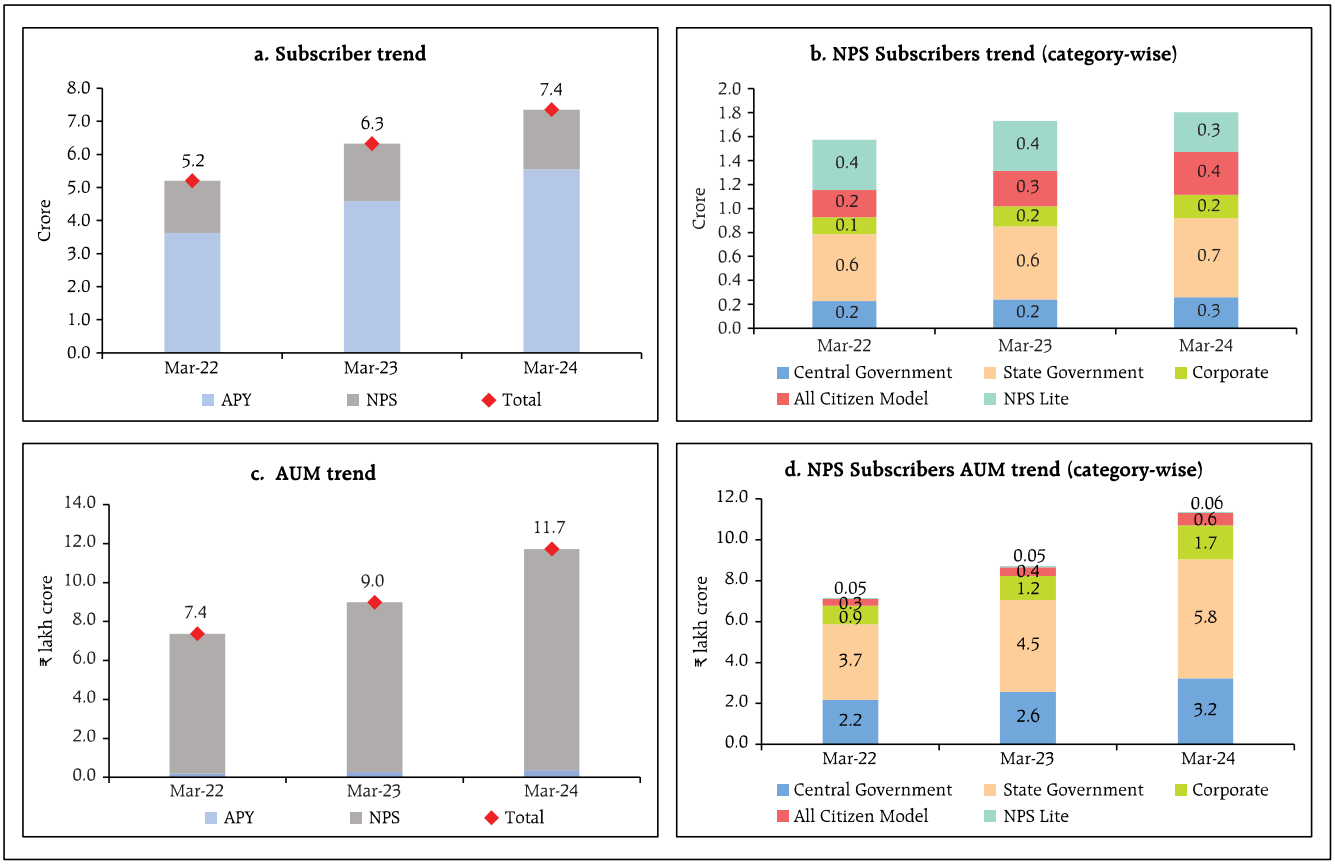
Chart 3.3: NPS and APY AUM: Asset Class-wise Bifurcation (per cent of Total AUM)



Source: Pension Fund Regulatory and Development Authority.

3.61 According to a Position paper[32] by NITI Aayog, 78 per cent of India's older population is currently living without any pension cover. Further, the United Nations Population Fund[33] has estimated the decadal growth of India's elderly population at 41 per cent. The elderly population is projected to

Chart 3.2: NPS and APY – Subscribers and AUM Trend



Source: Pension Fund Regulatory and Development Authority.

[32] NITI Aayog (2024), 'Senior Care Reforms in India - Reimagining the Senior Care Paradigm: A Position Paper', February.
[33] United Nations Population Fund (2023). 'India Ageing Report', September.

double to over 20 per cent of the total population by 2050. By 2046, the elderly population is likely to surpass the population of children aged 0 to 15 years. This demographic shift will significantly impact the demand for pension benefits and the sustainability of pension schemes in India. If adequate provisions are not made for pension it can lead to a systemic risk in the economy.

3.62 To address the challenges posed by anticipated demographic shifts in India, the following steps have been taken over the years: (a) transition from Defined Benefit pension system to Defined Contribution pension system through the NPS in 2004; and (b) introduction of various old age pension schemes by central government such as Indira Gandhi Old Age Pension Scheme (IGNOAPS), Pradhan Mantri Vaya Vandana Yojana, and Pradhan Mantri Shram Yogi Maandhan Yojana along with similar such schemes by various state governments. An effective participation and coordination between various private and public entities, along with a multipronged and multiagency approach, are essential to make India a fully pensioned society.

3.63 As India embraces technological advancements including Artificial Intelligence (AI) and the Internet of Things (IoT), the pension sector will also face a structural transformation in how services are delivered and managed. While the integration of cutting-edge technologies will improve the efficiency of the overall architecture of the pension ecosystem in India, it will also pose serious threats in terms of cyberattacks, data privacy and security. With respect to the evolving cybersecurity risks, the Pension Fund Regulatory and Development Authority (PFRDA) has been proactively taking various measures to strengthen the IT infrastructure of the NPS ecosystem. Given the dynamic nature of these challenges, active cooperation amongst stakeholder bodies is vital to effectively address the cybersecurity issues in India.

Summary and Outlook

3.64 The global financial system has demonstrated remarkable resilience in the face of numerous shocks over the past year. Nonetheless, the attention of global regulatory bodies is on mitigating new and emerging sources of risk that could potentially undermine this resilience. In this context, regulators are prioritising the management of risks stemming from the rapid advancement of financial technology and the escalating threat of cyberattacks. Recognising the potential for these factors to heighten vulnerabilities both at the institutional and systemic levels, regulatory institutions are intensifying their efforts to fortify financial institutions' standard operating procedures for ensuring business continuity in any resolution process.

3.65 Domestic regulatory initiatives continue to focus on the resilience of financial intermediaries, bolstering efficiency within financial markets, implementing global best practices, streamlining regulatory compliance processes and enhancing customer protection measures. Regulators are consolidating the gains of the past while remaining vigilant in monitoring and adapting to the evolving financial landscape and making the financial system future ready.

Annex 1

Systemic Risk Survey

In the latest round of the half yearly systemic risk survey (SRS), all major groups were in the medium risk category. Risk perceptions relating to global spillovers receded while macroeconomic risks declined marginally. Going forward, respondents' perceptions of risk to financial stability included: geopolitical risks; tight global financial conditions; and capital outflows and exchange rate pressures.

The 26th round of the Reserve Bank's Systemic Risk Survey (SRS) was conducted during May 2024 to solicit perceptions of experts, including market participants, on major risks faced by the Indian financial system. In addition to its regular questions, this round of the survey also captures respondents' views on (i) impact of the 'higher for longer' policy rate scenario on macro-financial stability in H2:2024; and (ii) sustainability of the sharp increase in domestic credit growth witnessed in the last two years. The feedback from 44 respondents is presented below.

- The panellists perceived that global spillover risks have receded sharply to the 'medium' risk category. Assessment of macroeconomic risks witnessed a marginal decline whereas risks emanating from financial markets and institutional risks remained unchanged. Overall, all major risk groups are perceived to be in the 'medium' risk category (Figure 1).

Figure 1: Systemic Risk Survey: Major Risk Groups

Major Risk Groups	November-23	May-2024	Change in Risk Perception[1]
A. Global risks	6.0	5.6	Decline
B. Macroeconomic risks	5.4	5.2	Decline
C. Financial market risks	5.8	5.8	Unchanged
D. Institutional risks	5.4	5.4	Unchanged

Source: Systemic Risk Survey (May 2024 and November 2023).

Risk Category

Above 8-10	Above 6-8	Above 4-6	Above 2-4	0-2
Very high	**High**	**Medium**	**Low**	**Very low**

- In terms of global risks, global growth, funding risk, banking turmoil and risk emanating from monetary tightening in advanced economies were perceived to have moderated, whereas the perception on commodity price risk has remained at an elevated level (Figure 2).
- In case of domestic risks, climate risk has moved up within the 'high' risk category and risk to consumption demand inched up. Other key risks (viz., domestic inflation, current account balance, capital flows and fiscal deficit) are assessed to have declined and provided support to domestic macro-financial stability. Risk emerging from domestic growth and investment growth was perceived to have remained unaltered (Figure 2).

[1] The risk perception, as it emanates from the systemic risk survey conducted at different time periods (on a half-yearly basis in May and November), may shift from one risk category to the other, which is reflected by the change in colour. However, within the same risk category (that is, boxes with the same colour), the risk perception may also increase/decrease or remain the same, the shift being indicated accordingly through average numeric values.

- Among drivers of financial market risks, foreign exchange rate risk and liquidity risk were gauged to have moderated while risk emanating from equity price volatility and interest rate risk picked up (Figure 2). Risk from equity price volatility was perceived to have moved from the 'medium' to the 'high' risk category.

Figure 2: Systemic Risk Survey: Risks Identified

Risk items		November-23	May-2024	Change in Risk Perception
A. Global Risks	Global growth	6.7	5.9	Decline
	Funding risk (External borrowings)	5.4	5.3	Decline
	Commodity price risk (including crude oil prices)	6.4	6.4	Unchanged
	Banking turmoil	5.2	4.9	Decline
	Monetary tightening in advanced economies	6.3	5.4	Decline
B. Macroeconomic Risks	Domestic growth	4.5	4.5	Unchanged
	Domestic inflation	5.5	5.2	Decline
	Current account deficit	5.2	4.5	Decline
	Capital inflows/ outflows (Reversal of FPIs, Slowdown in FDI)	5.9	5.3	Decline
	Fiscal deficit	5.3	4.7	Decline
	Corporate sector risk	4.7	4.6	Decline
	Real estate prices	5.0	5.1	Increase
	Consumption Demand	5.3	5.6	Increase
	Investment Growth	5.3	5.3	Unchanged
	Household savings	5.8	5.8	Unchanged
	Climate risks	6.4	6.9	Increase
C. Financial Market Risks	Foreign exchange rate risk	5.8	5.3	Decline
	Equity price volatility	6.0	6.5	Increase
	Interest rate risk	5.6	5.8	Increase
	Liquidity Risk	5.8	5.5	Decline
D. Institutional Risks	Asset quality deterioration	5.1	4.8	Decline
	Banks' exposure to interest rate risk	5.4	5.3	Decline
	Cyber risk	6.2	6.8	Increase
	Operational risk	5.3	5.6	Increase
	Profitability	5.0	4.7	Decline

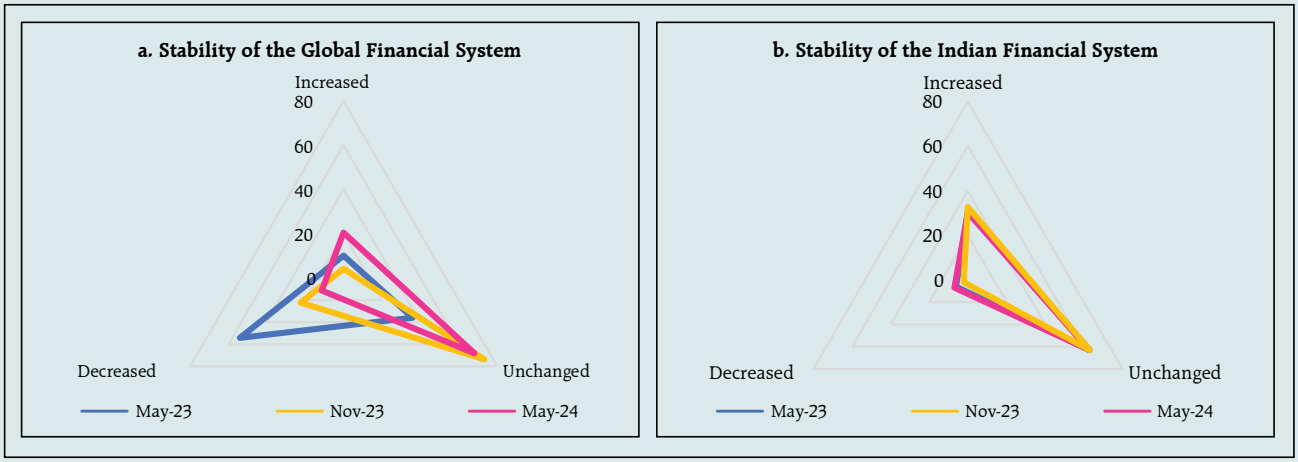
Risk Category

Above 8-10	Above 6-8	Above 4-6	Above 2-4	0-2
Very high	**High**	**Medium**	**Low**	**Very low**

- Among drivers of institutional risks, cyber risk is assessed to have risen within the 'high' risk category. Risk emanating from asset quality deterioration and banks' exposure to interest rate risk eased while operational risk increased.
- About one fifth of the respondents reported higher confidence in the stability of the global financial system from the previous survey round (Chart 1a).
- Around one third expressed higher confidence in the Indian financial system while another 63 per cent felt there was no change (Chart 1b).

Chart 1: Confidence in the Stability of the Financial System

(share of respondents, per cent)



- 75 per cent of the panellists expected that the Indian economy will be impacted somewhat/to a limited extent by instability in the global financial system in H2:2024 (Chart 2).
- Nearly 90 per cent of the respondents assessed better or similar prospects for the Indian banking sector over a one-year horizon (Chart 3).
- Most of the respondents (67.4 per cent) expected the quality of banking sector assets to remain unchanged over the next six months, whereas over 25.6 per cent expected it to marginally improve due to higher economic growth, healthy corporate balance sheet, slower increase in slippage ratio and recent prudential measures (Chart 4a).
- About 47.6 per cent of the respondents expected higher credit demand during H2:2024 owing to factors such as higher GDP growth, pickup in manufacturing sector activity, government spending and credit demand from real estate and infrastructure. Another one fourth of panellists assessed credit demand to remain unchanged (Chart 4b).

Chart 2: Impact from Global Spillover on Indian Economy

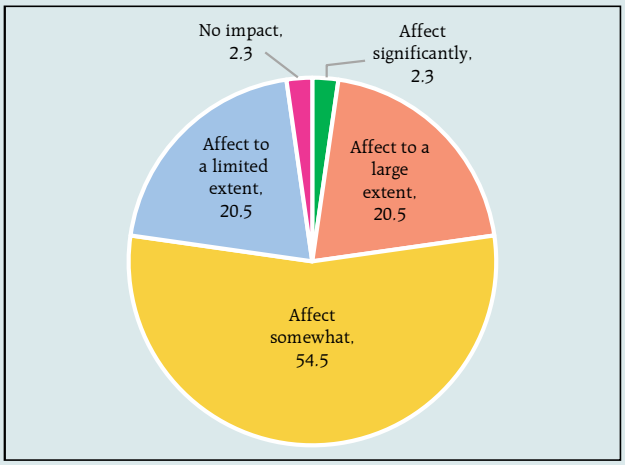


Chart 3: Prospects of Indian Banking Sector- Next One Year

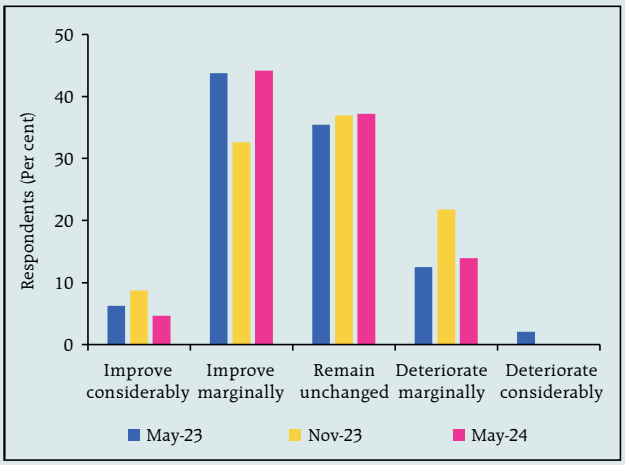
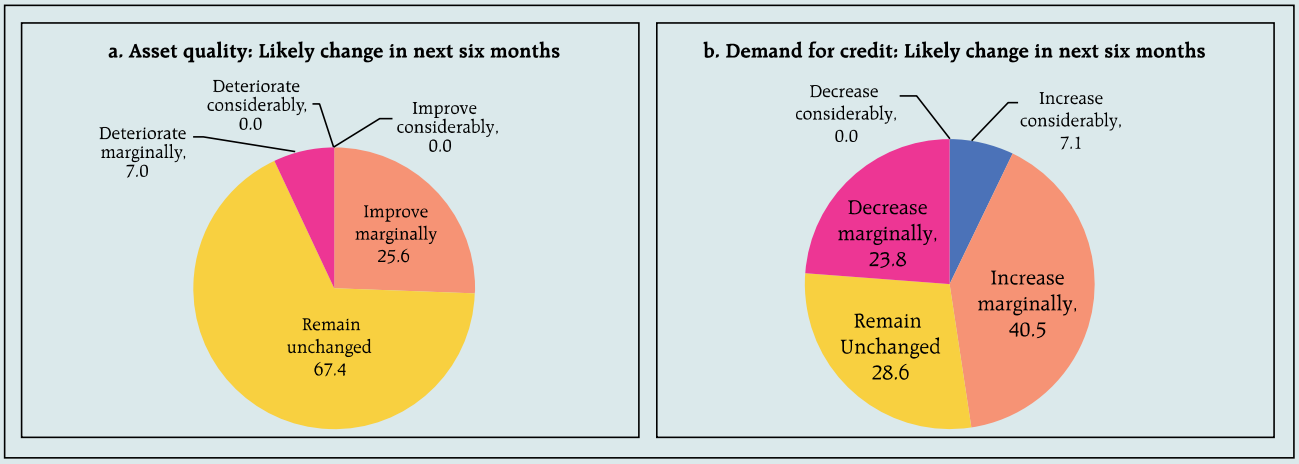


Chart 4: Indian Banking Sector – Outlook



- Nearly three fourths of the panellists expected that the Indian economy will be impacted somewhat/to a limited extent by the 'higher for longer' policy rate stance of systemic central banks (Chart 5).
- 27.3 per cent of the panellists perceived credit acceleration witnessed in the last two years as largely sustainable and another 52.3 per cent felt that it was somewhat sustainable (Chart 6). Some of the respondents, however, expressed concerns over consumer loan quality, cost of funds and asset quality.

Risks to Financial Stability

Going forward, respondents identified the following major risks to financial stability in the near term:

- Geopolitical risks;
- Tightening of global financial conditions and interest rate risk;
- Capital outflows and exchange rate;
- Rise in commodity (including oil) prices;
- Increase in climate risks;
- Cyber risk; and
- Global growth slowdown.

Chart 5: Impact of 'Higher for Longer' Policy Rate in H2:2024

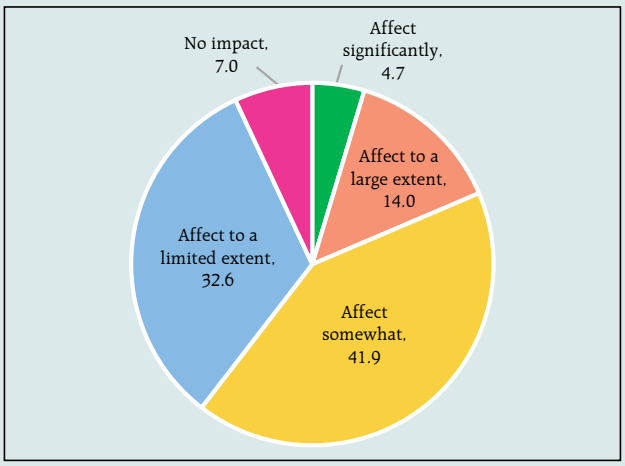
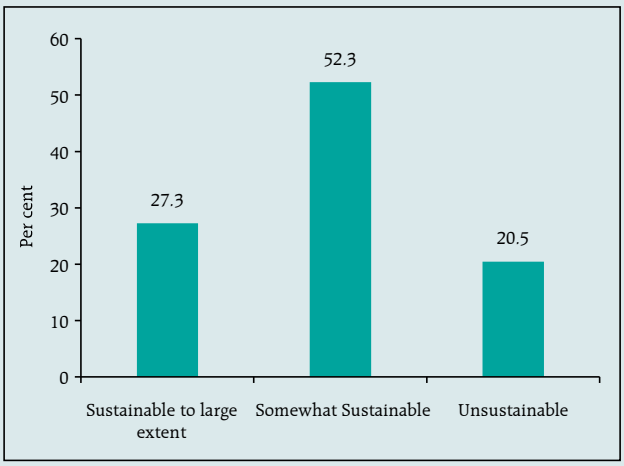


Chart 6: Sustainability of Domestic Credit Growth



Annex 2

Methodologies

2.1 Scheduled Commercial Banks

(a) Banking stability indicator

The banking stability indicator presents an overall assessment of changes in underlying conditions and risk factors that have a bearing on the stability of the banking sector during a period. The six composite indices represent risk in six dimensions - soundness, asset quality, profitability, liquidity, efficiency and sensitivity to market risk. Each composite index is a relative measure of risk during the sample period used for its construction, where a higher value would mean higher risk in that dimension.

The financial ratios used for constructing each composite index are given in Table 1. Each financial ratio is first normalised for the sample period using the following formula:

$$Y_t = \frac{X_t - min\ (X_t)}{max(X_t) - min(X_t)}$$

where X_t is the value of the ratio at time t. If a variable is negatively related to risk, then normalisation is done using 1-Y_t. Composite index of each dimension is then calculated as a simple average of the normalised ratios in that dimension. Finally, the banking stability indicator is constructed as a simple average of these six composite indices. Thus, each composite index and the overall banking stability indicator take values between zero and one.

Table 1: Ratios used for constructing the banking stability indicator

Dimension	Ratios			
Soundness	CRAR #	Net NPAs-to-Capital	Tier 1 Capital-to-Assets #	
Asset Quality	Gross NPAs-to-Total Advances	Provisioning Coverage Ratio #	Sub-standard Advances-to-Gross NPAs #	Restructured Standard Advances-to-Standard Advances
Profitability	Return on Assets #	Net Interest Margin #	Growth in Profit before Tax #	Interest Margin-to-Gross Income #
Liquidity	Liquid Assets-to-Total Assets #	Liquidity Coverage Ratio #	Customer Deposits-to-Total Assets #	Non-Bank Advances-to-Customer Deposits
Efficiency	Cost-to-Income	Business (Credit + Deposits)-to-Staff Expenses #	Staff Expenses-to-Total Expenses	
Sensitivity to market risk	RWA (market risk)-to-Capital	Trading Income-to-Gross Income		

Note: # Negatively related to risk.

(b) Macro stress testing

Macro stress test ascertains the resilience of banks against macroeconomic shocks by assessing the impact of macro shocks on capital adequacy of a set of major scheduled commercial banks (46 banks presently). Macro stress test attempts to project capital ratios over a one-year horizon, under a baseline and two adverse (medium and severe) scenarios. The macro stress test framework consists of (i) designing the macro scenarios, (ii) projection of GNPA ratios, (iii) projection of profit after tax (PAT), (iv) projection of sectoral probability of default (PD) and (v) projection of capital ratios.

I. Designing Macro Scenarios

Macro scenarios are designed using several macroeconomic and macrofinancial variables such as real and nominal GDP growth, CPI (combined) inflation, WPI inflation, Current account balance-to-GDP ratio ($\frac{CAB}{GDP}$), Gross fiscal deficit-to-GDP ratio ($\frac{GFD}{GDP}$), Export-to-GDP ratio ($\frac{EXP}{GDP}$), Weighted average lending rate (WALR), 10-year and 5-year AAA / BBB Corporate bond spread, 10-year and 5-year term spread, NIFTY 50 growth, Real effective exchange rate (REER), Oil price growth, bank-group wise WALR, Interest coverage ratio (ICR), Net profit-to-sales, Operating profit-to-sales, House price-to-income ratio, Private final consumption expenditure (PFCE) growth, Credit growth, Sectoral GVA growth etc. The baseline scenario is derived from the projected values of macro variables. The medium and severe adverse scenarios have been obtained by applying 0.25 to one standard deviation (SD) shocks and 1.25 to two SD shocks, respectively, to the macro variables, increasing the shocks sequentially by 25 basis points in each quarter.

II. Projection of GNPA ratios

GNPA ratios are projected for each of the three bank groups, *viz*, public sector banks (PSBs), private sector banks (PVBs) and foreign banks (FBs). Natural logarithm of GNPA ratios of these bank-groups are modelled using two complementary econometric models, *viz;* (i) Autoregressive distributed lag (ADL) model and (ii) Vector auto regression (VAR) model. The values projected based on both these models are averaged to arrive at the final projections of GNPA ratios for each bank-group. The natural logarithm of GNPA ratios of each bank group are modelled as follows:

II.1 Public Sector Banks

II.1a ADL Model

$$LGNPA_t = \alpha_1 + \beta_1 \, LGNPA_{t-1} - \beta_2 \, \Delta NGDP_{t-3} + \beta_3 \, RWALR\_PSB_{t-1} - \beta_4 \left(\frac{Exp}{GDP}\right)_{t-1}$$

$$+ \beta_5 \, 5y\_BBB\_Spread_{t-1} - \beta_6 ICR_{t-2} + \beta_7 Dummy1 - \beta_8 Dummy2$$

where, $\alpha_1, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$ and $\beta_8 > 0$

II.1b VAR Model

Log GNPA ratio of PSBs along with the macro variables, *viz*, Nominal GDP growth, RWALR of PSBs and 5-year BBB bond spread are modelled using VAR model of order 1.

II.2 Private Sector Banks

II.2a ADL Model

$$LGNPA_t = \alpha_1 + \beta_1 \, LGNPA_{t-1} - \beta_2 \, \Delta GDP_{t-3} + \beta_3 \, RWALR\_PVB_{t-1} - \beta_4 \left(\frac{Exp}{GDP}\right)_{t-3} + \beta_5 \, 10y\_BBB\_Spread_{t-3} - \beta_6 \left(\frac{Operating\ Profit}{Sales}\right)_{t-1} - \beta_7 \, \Delta NIFTY_{t-3}$$

where, $\alpha_1, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ and $\beta_7 > 0$

II.2b VAR Model

Log GNPA ratio of PVBs along with the macro variables, *viz*, RWALR of PVBs, 10-year BBB bond spread, Operating profit-to-sales ratio, Export-to-GDP ratio and NIFTY 50 annual growth are modelled using VAR model of order 1.

II.3 Foreign Banks

II.3a ADL Model

$$LGNPA_t = \alpha_1 + \beta_1 \, LGNPA_{t-1} - \beta_2 \, \Delta GDP_{t-3} + \beta_3 \, \Delta Oil_{t-1} + \beta_4 \, WALR\_FB_{t-2} - \beta_5 \left(\frac{Exp}{GDP}\right)_{t-2} + \beta_6 \, 10y\_BBB\_Spread_{t-2} - \beta_7 ICR_{t-3} + \beta_8 Dummy1 - \beta_9 Dummy2$$

where, $\alpha_1, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8$ and $\beta_9 > 0$

II.3b VAR Model

Log GNPA ratio of FBs along with the macro variables, *viz*, WALR of FBs, Exports-to-GDP ratio, Oil price growth and CPI inflation are modelled using VAR model of order 1.

II.4 All SCBs

The system-level GNPA ratios are projected by aggregating the bank-group level projections using weighted average method with gross loans and advances as weights. The projections are done under the baseline and adverse scenarios.

III. Projection of PAT

The components of PAT such as, net interest income (NII), other operating income (OOI), operating expenses (OE) and provisions are projected for each of the bank-groups using the following models.

III.1 Public Sector Banks

III.1.1 Projection of Net Interest Income (NII)

NII is the difference between interest income and interest expense. The ratio of NII to total average assets of PSBs is modelled using the following ADL and VAR models and the projected values based on these models are averaged to arrive at the final projections.

III.1.1a ADL Model

$$NII_t = -\alpha_1 + \beta_1 \, NII_{t-1} + \beta_2 \, 5y\_TermSpread_{t-1} + \beta_3 \, \Delta NGDP_{t-4} + \beta_4 \left(\frac{Exp}{GDP}\right)_{t-1} + \beta_5 \, Spread\_PSB_t - \beta_6 GNPA\_PSB_{t-1}$$

where, $\alpha_1, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and $\beta_6 > 0$

Here, 5y_TermSpread is the difference between 5-year G-Sec yield and 3-month T-Bill rate. Spread_PSB is the difference between average interest rate earned by interest earning assets and average interest rate paid on interest bearing liabilities of PSBs.

III.1.1b VAR Model

NII-to-total average assets ratio is modelled using VAR model of order 1 together with the variables, *viz*, incremental GNPA ratio of PSBs, NIFTY 50 annual growth rate, 5-year term spread, and incremental interest rate spread of PSBs.

III.1.2 Projection of Other Operating Income (OOI)

The ratio of OOI to total average assets is modelled using the following ADL model:

$$OOI_t = \alpha_1 + \beta_1\, OOI_{t-1} + \beta_2\, 10y\_AAA\_Spread_{t-1} + \beta_3\, \Delta GDP_{t-2} + \beta_4 \left(\frac{CAB}{GDP}\right)_{t-1}$$

where, $\alpha_1, \beta_1, \beta_2, \beta_3 and\ \beta_4 > 0$

III.1.3 Projection of Operating Expense (OE)

The y-o-y growth of OE is modelled using the following ADL model:

$$OE_t = \alpha_1 + \beta_1\, OE_{t-1} + \beta_2\, OE_{t-2} - \beta_3\, OE_{t-3} + \beta_4\, \Delta CPI_{t-1}$$

where, $\alpha_1, \beta_1, \beta_2, \beta_3 and\ \beta_4 > 0$

III.1.4 Projection of Provisions

The ratio of provisions to gross loans and advances is modelled using the following ADL and VAR models and the projected values based on these models are averaged to arrive at the final projections.

III.1.4a ADL Model

$$Provisions_t = \beta_1\, Provisions_{t-1} + \beta_2\, GNPA\_PSB_{t-1} - \beta_3\, \Delta GDP_{t-2} + \beta_4 \left(\frac{GFD}{GDP}\right)_{t-3}$$

where, $\beta_1, \beta_2, \beta_3 and\ \beta_4 > 0$

III.1.4b VAR Model

Provisions-to-gross loans and advances ratio is modelled using VAR model of order 2 along with the variables, *viz*, GNPA ratio of PSBs, 5-year term spread and gross fiscal deficit.

III.2 Private Sector Banks

III.2.1 Projection of Net Interest Income

The ratio of NII to total average assets for PVBs is modelled using the following ADL and VAR models and the projected values based on these models are averaged to arrive at the final projections.

III.2.1a ADL Model

$$NII_t = \alpha_1 + \beta_1\, NII_{t-1} + \beta_2\, 5y\_TermSpread_{t-1} + \beta_3 \left(\frac{Exp}{GDP}\right)_{t-1} + \beta_4\, Spread\_PVB_t - \beta_5 GNPA\_PVB_{t-1}$$

where, $\alpha_1, \beta_1, \beta_2, \beta_3, \beta_4$ and $\beta_5 > 0$

Spread_PVB is the difference between average interest rate earned by interest earning assets and average interest rate paid on interest bearing liabilities of PVBs.

III.2.1b VAR Model

NII-to-total average assets ratio is modelled using VAR model of order 1 along with the variables, *viz*, GNPA ratio of PVBs, NIFTY 50 annual growth rate and interest rate spread of PVBs.

III.2.2 Projection of Other Operating Income

The ratio of OOI to total average assets is modelled using the following ADL model:

$$OOI_t = \alpha_1 + \beta_1\, OOI_{t-1} + \beta_2\, \Delta GDP_{t-2} + \beta_3 \left(\frac{CAB}{GDP}\right)_{t-1}$$

where, $\alpha_1, \beta_1, \beta_2$ and $\beta_3 > 0$

III.2.3 Projection of Operating Expense

The y-o-y growth of OE is modelled using the following ADL model:

$$OE_t = \alpha_1 + \beta_1\, OE_{t-1} + \beta_2\, OE_{t-2} + \beta_3\, OE_{t-3} - \beta_4\, OE_{t-4} + \beta_5\, \Delta WPI_{t-1}$$

where, $\alpha_1, \beta_1, \beta_2, \beta_3, \beta_4$ *and* $\beta_5 > 0$

III.2.4 Projection of Provisions

The ratio of provisions to gross loans and advances of PVBs is modelled using the following ADL and VAR models and the projected values based on these models are averaged to arrive at the final projections.

III.2.4a ADL Model

$$Provisions_t = \alpha_1 + \beta_1\, Provisions_{t-1} + \beta_2\, GNPA\_PVB_{t-1} - \beta_3\, \Delta GDP_{t-2} - \beta_4 \left(\frac{Exp}{GDP}\right)_{t-1}$$

where, $\alpha_1, \beta_1, \beta_2, \beta_3$ *and* $\beta_4 > 0$

III.2.4b VAR Model

Provisions-to- gross loans and advances ratio is modelled using VAR model of order 1 together with the variables, *viz*, GNPA ratio of PVBs, exports-to-GDP ratio and 5-year term spread.

III.3 Foreign Banks

III.3.1 Projection of Net Interest Income

The ratio of NII to total average assets for FBs is modelled using the following ADL and VAR models and the projected values based on these models are averaged to arrive at the final projections.

III.3.1a ADL Model

$$NII_t = \alpha_1 + \beta_1 NII_{t-1} + \beta_2 \Delta \text{NGDP}_{t-2} - \beta_3 REER_{t-3} + \beta_4 Spread\_FB_t - \beta_5 GNPA\_FB_{t-1}$$

where, $\alpha_1, \beta_1, \beta_2, \beta_3, \beta_4$ and $\beta_5 > 0$

Spread_FB is the difference between average interest rate earned by interest earning assets and average interest rate paid on interest bearing liabilities of FBs.

III.3.1b VAR Model

NII-to-total average assets ratio is modelled using VAR model of order 2 along with the variables, *viz*, GNPA ratio of FBs and interest rate spread of FBs.

III.3.2 Projection of Other Operating Income

The ratio of OOI to total average assets is modelled using the following ADL model:

$$OOI_t = \alpha_1 + \beta_1 OOI_{t-1} + \beta_2 \Delta GDP_{t-2} + \beta_3 \left(\frac{Exp}{GDP}\right)_{t-2}$$

where, $\alpha_1, \beta_1, \beta_2$ and $\beta_3 > 0$

III.3.3 Projection of Operating Expense

The y-o-y growth of OE is modelled using the following ADL model:

$$OE_t = \alpha_1 + \beta_1 OE_{t-1} + \beta_2 OE_{t-2} + \beta_3 \Delta WPI_{t-1}$$

where, $\alpha_1, \beta_1, \beta_2$ and $\beta_3 > 0$

III.3.4 Projection of Provisions

The ratio of provisions to gross loans and advances of FBs is modelled using the following ADL and VAR models and the projected values based on these models are averaged to arrive at the final projections.

III.3.4a ADL Model

$$Provisions_t = \alpha_1 + \beta_1 Provisions_{t-1} + \beta_2 GNPA\_FB_{t-1} - \beta_3 \Delta GDP_{t-1} - \beta_4 \left(\frac{Exp}{GDP}\right)_{t-1}$$

where, $\alpha_1, \beta_1, \beta_2, \beta_3$ and $\beta_4 > 0$

III.3.4b VAR Model

Provisions-to- gross loans and advances ratio is modelled using VAR model of order 1 together with the variables, *viz*, GNPA ratio of FBs and GDP growth.

Projection of PAT for each bank group are derived from the projected values of its components using the following identity:

$$PAT = NII + OOI - OE - Provisions\ \&\ Writeoff - Income\ Tax$$

Projection of PAT is made under the baseline and adverse scenarios. The applicable income tax is assumed as 35 per cent of profit before tax, which is based on the past trend of ratio of income tax to profit before tax.

The bank-wise profit after tax (PAT) is derived using the following steps:

- For each bank-group, components of PAT are projected under baseline and adverse scenarios.
- Share of components of PAT of each bank (except income tax) in their respective bank-group is calculated.
- For each bank, a component of PAT (except income tax) is projected by applying that bank's share in the component of PAT on the projected value of that component in the respective bank-group.
- Finally, bank-wise PAT is projected by appropriately applying the aforesaid identity on the projected values of components derived in the previous step.

IV. Projection of Sectoral PDs

Sectoral PDs of 18 sectors/ sub-sectors (Table 2) are modelled using ADL models and projected for four quarters ahead under assumed baseline as well as adverse scenarios.

Table 2: List of selected sectors/ sub-sectors

Sr. No.	Sector	Sr. No.	Sector
1	Engineering	10	Basic Metal and Metal Products
2	Auto	11	Mining
3	Cement	12	Paper
4	Chemicals	13	Petroleum
5	Construction	14	Agriculture
6	Textiles	15	Services
7	Food Processing	16	Retail-Housing
8	Gems and Jewellery	17	Retail-Others
9	Infrastructure	18	Others

The ADL models for sectoral PD projections are as follows:

1. *Engineering*

$$PD_t = -\alpha + \beta_1 PD_{t-1} + \beta_2 PD_{t-2} - \beta_3 \Delta GVA(Industry)_{t-3} + \beta_4 RWALR_{t-1} - \beta_5 \left(\frac{CAB}{GDP}\right)_{t-1} + \beta_6 REER_{t-1} + \beta_7 Dummy_t$$

where, $\alpha, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ and $\beta_7 > 0$

2. *Automobile*

$$PD_t = \alpha + \beta_1 PD_{t-1} - \beta_2 PD_{t-2} - \beta_3 \left(\frac{CAB}{GDP}\right)_{t-3} + \beta_4 Dummy_t$$

where, $\alpha, \beta_1, \beta_2, \beta_3$ *and* $\beta_4 > 0$

3. *Cement*

$$PD_t = -\alpha + \beta_1 PD_{t-1} - \beta_2 \Delta Credit_{t-1} + \beta_3 WALR_{t-1} + \beta_4 Dummy_t$$

where, $\alpha, \beta_1, \beta_2, \beta_3$ *and* $\beta_4 > 0$

4. *Chemicals and Chemical Products*

$$PD_t = -\alpha + \beta_1 PD_{t-1} + \beta_2 PD_{t-2} - \beta_3 \Delta GVA(Industry)_{t-3} + \beta_4 WALR_{t-1} + \beta_5 REER_{t-2} + \beta_6 Dummy_t$$

where, $\alpha, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and $\beta_6 > 0$

5. *Construction*

$$PD_t = -\alpha + \beta_1 PD_{t-1} + \beta_2 PD_{t-2} - \beta_3 \Delta GDP_{t-3} + \beta_4 RWALR_{t-1} - \beta_5 \left(\frac{Exp}{GDP}\right)_{t-1} + \beta_6 REER_{t-3} + \beta_7 Dummy_t$$

where, $\alpha, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ and $\beta_7 > 0$

6. *Textiles*

$$PD_t = \alpha + \beta_1 PD_{t-1} - \beta_2 PD_{t-2} - \beta_3 \Delta GDP_{t-3} + \beta_4 \Delta REER_{t-2} - \beta_5 \Delta NIFTY50_{t-1} + \beta_6 Dummy_t$$

where, $\alpha, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and $\beta_6 > 0$

7. *Food Processing*

$$PD_t = \alpha + \beta_1 PD_{t-1} + \beta_2 \Delta REER_t - \beta_3 \left(\frac{Exp}{GDP}\right)_{t-3} - \beta_4 ICR_{t-1} + \beta_5 \Delta WPI_{t-1} + \beta_6 Dummy_t$$

where, $\alpha, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and $\beta_6 > 0$

8. *Gems and Jewellery*

$$PD_t = -\alpha + \beta_1 PD_{t-1} - \beta_2 PD_{t-4} - \beta_3 \Delta GDP_{t-1} + \beta_4 REER_{t-1} - \beta_5 \left(\frac{Exp}{GDP}\right)_{t-3} + \beta_6 RWALR_{t-2}$$

where, $\alpha, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and $\beta_6 > 0$

9. *Infrastructure*

$$PD_t = -\alpha + \beta_1 PD_{t-1} - \beta_2 PD_{t-4} - \beta_3 \Delta GDP_{t-2} + \beta_4 REER_{t-2} + \beta_5 RWALR_{t-3} + \beta_6 Dummy_t$$

where, $\alpha, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and $\beta_6 > 0$

10. *Basic Metal*

$$PD_t = \alpha + \beta_1 PD_{t-1} - \beta_2 PD_{t-2} - \beta_3 \Delta GVA(Industry)_{t-3} + \beta_4 \Delta REER_{t-4} - \beta_5 \left(\frac{Exp}{GDP}\right)_{t-1} + \beta_6 \Delta WALR_t + \beta_7 Dummy_t$$

where, $\alpha, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ and $\beta_7 > 0$

11. *Mining & Quarrying*

$$PD_t = -\alpha + \beta_1 PD_{t-1} - \beta_2 \Delta GVA(Mining)_{t-2} + \beta_3 REER_{t-2} - \beta_4 \left(\frac{Exp}{GDP}\right)_{t-2} - \beta_5 \Delta Credit_{t-1}$$

where, $\alpha, \beta_1, \beta_2, \beta_3, \beta_4$ *and* $\beta_5 > 0$

12. *Paper & Paper products*

$$PD_t = \alpha + \beta_1 PD_{t-1} - \beta_2 \Delta PD_{t-2} - \beta_3 \left(\frac{CAB}{GDP}\right)_{t-3} + \beta_4 \Delta WALR_t + \beta_5 Dummy_t$$

where, $\alpha, \beta_1, \beta_2, \beta_3, \beta_4$ *and* $\beta_5 > 0$

13. *Petroleum and Petroleum Products*

$$PD_t = \alpha + \beta_1 PD_{t-1} + \beta_2 \Delta Oilprice_{t-1} - \beta_3 \Delta Credit_{t-2} + \beta_4 RWALR_{t-4} - \beta_5 \Delta PFCE_{t-2}$$

where, $\alpha, \beta_1, \beta_2, \beta_3, \beta_4$ *and* $\beta_5 > 0$

14. *Agriculture*

$$PD_t = \alpha + \beta_1 PD_{t-1} - \beta_2 PD_{t-2} - \beta_3 \Delta PFCE_{t-1} - \beta_4 \left(\frac{Exp}{GDP}\right)_{t-2} + \beta_5 \Delta CPI_{t-1} + \beta_6 \Delta WALR_t$$

where, $\alpha, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and $\beta_6 > 0$

15. *Services*

$$PD_t = \alpha + \beta_1 PD_{t-1} - \beta_2 \Delta GVA(Services)_{t-2} - \beta_3 \left(\frac{Exp}{GDP}\right)_{t-2} - \beta_4 \Delta NIFTY50_{t-1}$$

where, $\alpha, \beta_1, \beta_2, \beta_3$ *and* $\beta_4 > 0$

16. *Retail Loan- Housing*

$$PD_t = -\alpha + \beta_1 PD_{t-1} + \beta_2 (House\ price\text{-}to\text{-}Income)_{t-1} - \beta_3 \Delta NGDP_{t-4} + \beta_4 \Delta WALR_t$$

where, $\alpha, \beta_1, \beta_2, \beta_3$ *and* $\beta_4 > 0$

17. *Retail Loan- Other than Housing*

$$PD_t = -\alpha + \beta_1 PD_{t-1} + \beta_2 RWALR_{t-3} + \beta_3 \Delta CPI_{t-3}$$

where, α, β_1, β_2 and $\beta_3 > 0$

18. *Other Sectors*

$$PD_t = \alpha + \beta_1 PD_{t-1} + \beta_2 PD_{t-3} - \beta_3 \Delta GVA(Industry)_{t-4} + \beta_4 RWALR_{t-1} - \beta_5 \left(\frac{CAB}{GDP}\right)_{t-4}$$

where, $\alpha, \beta_1, \beta_2, \beta_3, \beta_4$ *and* $\beta_5 > 0$

V. Projection of Capital Ratios

Capital projections are made for each of the 46 banks under baseline and adverse stress scenarios. Capital projections are made by estimating risk-weighted assets (RWAs) using internal rating based (IRB) formula and under the assumption that 65 per cent of PAT would be transferred to capital funds in the subsequent period.

The formulae used for projection of CRAR and Common Equity Tier 1 (CET1) ratio are given below:

$$CRAR_{t+1} = \frac{Total\ Capital_t + 0.65 * PAT_{t+1}}{RWA(credit\ risk)_{t+1} + RWA(others)_{t+1}}$$

$$CET1\ Ratio_{t+1} = \frac{CET1\ Capital_t + 0.65 * PAT_{t+1}}{RWA(credit\ risk)_{t+1} + RWA(others)_{t+1}}$$

PAT is projected using the models listed in the previous section. RWA (others), which is total RWA minus RWA of credit risk, is projected based on average growth rate observed in the past one year. RWA (credit risk) is estimated using the IRB formula given below:

IRB Formula: Bank-wise RWAs for credit risk were estimated using the following IRB formula;

$$RWAs(credit\ risk) = 12.5 \times \left(\sum_{i=1}^{n} EAD_i \times K_i\right)$$

where, EAD_i is exposure at default of a bank in the sector i (i=1,2….n).

K_i is minimum capital requirement for the sector i which is calculated using the following formula:

Capital requirement (K_i)

$$= \left[LGD_i \times N\left[(1-R_i)^{-0.5} \times G(PD_i) + \left(\frac{R_i}{1-R_i}\right)^{0.5} \times G(0.999)\right] - PD_i \times LGD_i\right]$$
$$\times \left(1 - 1.5 \times b(PD_i)\right)^{-1} \times \left(1 + (M_i - 2.5) \times b(PD_i)\right)$$

where, LGD_i is loss given default of sector i, PD_i is probability of default of sector i, $N(..)$ is cumulative distribution function of standard normal distribution, $G(..)$ is the inverse of the cumulative distribution function of standard normal distribution, M_i is average maturity of loans of sector i (which is taken as 2.5 for all sectors), $b(PD_i)$ is smoothed maturity adjustment and R_i is the correlation of sector i with the general state of the economy. Calculation of both $b(PD)$ and R depends upon PD.

The aforesaid IRB formula requires three major inputs, *viz*, sectoral PD, EAD and LGD. Here, annual slippages of the sectors are assumed as proxies of sectoral PDs. PD of a particular sector is assumed as the same for each of the 46 selected banks. EAD of a bank for a particular sector is considered as the total outstanding loan (net of NPAs) of the bank in that sector. LGD is assumed as 60 per cent (broadly as per the RBI guidelines on 'Capital Adequacy - The IRB Approach to Calculate Capital Requirement for Credit Risk') under the baseline scenario, 65 per cent under medium stress scenario and 70 per cent under the severe stress scenario.

Using these formulae, assumptions and inputs, the capital ratio of each bank is estimated. The differences between IRB-based capital ratios estimated for the latest quarter and those of the ensuing quarters projected under the baseline scenario and the incremental change in the ratios from baseline to adverse scenarios are appropriately applied on the latest observed capital ratios (under Standardised Approach) to arrive at the final capital ratio projections.

(c) Single factor sensitivity analysis - Stress testing

As part of quarterly surveillance, stress tests are conducted covering credit risk, interest rate risk, liquidity risk etc. and the resilience of commercial banks in response to these shocks is studied. The analysis is done for individual SCBs as well as at the system level.

I. Credit risk (includes concentration risk)

To ascertain the resilience of banks, the credit portfolio was given a shock by increasing GNPA ratio for the entire portfolio. For testing the credit concentration risk, default of the top individual borrower(s)

and the largest group borrower(s) was assumed. The analysis was carried out both at the aggregate level as well as at the individual bank level. The assumed increase in GNPAs was distributed across sub-standard, doubtful and loss categories in the same proportion as prevailing in the existing stock of NPAs. However, for credit concentration risk (exposure based), the additional GNPAs under the assumed shocks were considered to fall into sub-standard category only and for credit concentration risk (based on stressed advances), stressed advances were considered to fall into loss category. The provisioning requirements were taken as 25 per cent, 75 per cent and 100 per cent for sub-standard, doubtful and loss advances respectively. These norms were applied on additional GNPAs calculated under a stress scenario. As a result of the assumed increase in GNPAs, loss of income on the additional GNPAs for one quarter was also included in total losses, in addition to the incremental provisioning requirements. The estimated provisioning requirements so derived were deducted from banks' capital and stressed capital adequacy ratios were computed.

II. Sectoral credit risk

To ascertain the sectoral credit risk of individual banks, the credit portfolio of a particular sector was given a shock by increasing GNPA ratio for the sector. The analysis was carried out both at the aggregate level as well as at the individual bank level. Sector specific shocks based on standard deviation (SD) of GNPA ratios of a sector are used to study the impact on individual banks. The additional GNPAs under the assumed shocks were considered to fall into sub-standard category only. As a result of the assumed increase in GNPAs, loss of income on the additional GNPAs for one quarter was also included in total losses, in addition to the incremental provisioning requirements. The estimated provisioning requirements so derived were deducted from banks' capital and stressed capital adequacy ratios were computed.

III. Interest rate risk

Under assumed shocks of shift in the INR yield curve, there could be losses on account of the fall in value of the portfolio or decline in income. For interest rate risk in the trading portfolio (HFT + AFS) and HTM portfolio, a duration analysis approach was considered for computing the valuation impact (portfolio losses). The portfolio losses on these investments were calculated for each time bucket (HFT + AFS) or overall (HTM) based on the applied shocks. These estimated losses were reduced from the banks' capital and market risk weighted losses from RWA to arrive at stressed CRAR.

Interest rate risk of banks refers to the risk to a bank's capital and earnings arising from adverse movements in interest rates that affect bank's books. The impact on earning is measured using the Traditional Gap Analysis (TGA) and capital impact is measured by Duration Gap Analysis (DGA). The focus of TGA is to measure the level of a bank's exposure to interest rate risk in terms of the sensitivity of its net interest income (NII) to interest rate movements over one-year horizon. It involves bucketing of all Rate-Sensitive Assets (RSA), Rate-Sensitive Liabilities (RSL), and off-balance sheet items as per residual maturity/ re-pricing date, in various time bands and computing Earnings-at-Risk (EAR) *i.e.*, loss of income under different interest rate scenarios over a time horizon of one year. Advances, HTM investments, swaps/forex swaps, reverse repos are the major contributors to RSA whereas deposits, swaps /forex swaps and repos are the main elements under RSL. The DGA involves

bucketing of all RSA and RSL as per residual maturity/ re-pricing dates in various time bands and computing the Modified Duration Gap (MDG) to estimate the impact on the Market value of Equity. MDG is calculated with the following formula: MDG = [MDA - MDL * (RSL / RSA)], where MDA and MDL are the weighted averages of the Modified Duration (MD) of items of RSA and RSL, respectively. Thereafter, change in Market Value of Equity (MVE) is computed as $\Delta E / E = -[MDG]*RSA* \Delta i / E$, where Δi is the change in interest rate and E is equity (*i.e.* net worth).

IV. Equity price risk

Under the equity price risk, the impact of the shock of a fall in the equity price index, by certain percentage points, on bank capital was examined. The loss due to the fall in the value of the portfolio on account of assumed change in equity prices was deducted from the bank's capital to arrive at the stressed capital.

V. Liquidity risk

The aim of liquidity stress tests is to assess the ability of a bank to withstand unexpected liquidity drain without taking recourse to any outside liquidity support. Various scenarios depict different proportions (depending on the type of deposits) of unexpected deposit withdrawals on account of sudden loss of depositors' confidence along with a demand for unutilised portion of sanctioned/ committed/guaranteed credit lines (taking into account the undrawn working capital sanctioned limit, undrawn committed lines of credit and letters of credit and guarantees). The stress tests were carried out to assess banks' ability to fulfil the additional and sudden demand for credit with the help of their liquid assets alone.

Assumptions used in the liquidity stress tests are given below:

- Banks will meet stressed withdrawal of deposits or additional demand for credit through sale of liquid assets only.
- The sale of investments is done with a haircut of 10 per cent on their market value.
- The stress test is done under a 'static' mode.

(d) Bottom-up Stress testing: Credit, Market and Liquidity Risks

Bottom-up sensitivity analyses for credit, market and liquidity risks were performed by 27 select scheduled commercial banks. A set of common scenarios and shock sizes were provided to the select banks. The tests were conducted using March 2024 data. Banks used their own methodologies for calculating losses in each case.

(e) Bottom-up stress testing: Derivatives portfolios of select banks

Stress tests on derivatives portfolio (in terms of notional value) were carried out by a sample of 24 banks, constituting the major active authorised dealers and interest rate swap counterparties. Each bank in the sample was asked to assess the impact of stress conditions on their respective derivatives portfolio.

In case of domestic banks, the derivatives portfolio of both domestic and overseas operations was included. In case of foreign banks, only the domestic (Indian) position was considered for the exercise. Derivatives trades where hedge effectiveness was established were exempted from the stress tests, while all other trades were included.

The stress scenarios incorporated four shocks consisting of the spot USD/INR rate and domestic interest rates as parameters (Table 3).

Table 3: Shocks for sensitivity analysis

	Domestic interest rates	
Shock 1	Overnight	+2.5 percentage points
	Up to 1-year	+1.5 percentage points
	Above 1-year	+1.0 percentage points
	Domestic interest rates	
Shock 2	Overnight	-2.5 percentage points
	Up to 1-year	-1.5 percentage points
	Above 1-year	-1.0 percentage points
	Exchange rates	
Shock 3	USD/INR	+20 per cent
	Exchange rates	
Shock 4	USD/INR	-20 per cent

2.2 Primary (Urban) Co-operative Banks

Single factor sensitivity analysis – Stress testing

Stress testing of UCBs was conducted with reference to the reported position as of March 2024. The banks were subjected to baseline, medium and severe stress scenarios in the areas of credit risk, market risk and liquidity risk as follows:

I. Credit default risk

- Under credit default risk, the model aims to assess the impact of stressed credit portfolio of a bank on its CRAR.
- The arithmetic mean of annual growth rates of GNPAs was calculated based on reported data between 2009 and 2023 of the UCB sector as a whole. The annual growth rate was calculated separately for each NPA class [sub-standard, Doubtful 1 (D1), Doubtful 2 (D2), Doubtful 3 (D3) and loss assets]. This annual growth rate formed the baseline scenario, which was further stressed by applying shocks of 1.5 SD and 2.5 SD to generate medium and severe stress scenarios for each category separately. These were further adjusted bank-wise based on their NPA divergence level.

- Based on the above methodology, the annual NPA growth rate matrix arrived at under the three scenarios are as below.

(per cent)

	Increase in Substandard Assets	Increase in D1 assets	Increase in D2 assets	Increase in D3 assets	Increase in Loss assets
Baseline	21.71	17.10	15.93	14.38	29.83
Medium Stress	62.37	46.09	39.56	49.27	169.57
Severe Stress	89.47	65.42	55.32	72.53	262.72

II. Credit concentration risk

The impact on CRAR under assumed scenarios of top 1, 2 and 3 single borrower exposures moving from 'Standard Advances' category to 'Loss Advances' category, which in turn requires 100 per cent provision, was assessed.

III. Interest rate risk in Trading Book

- Duration analysis approach was adopted for analysing the impact of upward movement of interest rates on the AFS and HFT portfolio of UCBs.
- Upward movement of interest rates by 50 bps, 100 bps and 150 bps was assumed under the three stress scenarios and the consequent provisioning impact on CRAR was assessed.

IV. Interest rate risk in Banking Book

- The Banking Book of UCBs was subjected to interest rate shocks of 50 bps, 100 bps and 150 bps under three stress scenarios and its impact on Net Interest Income was assessed.

V. Liquidity risk

The stress test was conducted based on cumulative cash flows in the 1-28 days' time bucket. The cash inflows and outflows were stressed under baseline, medium, and severe scenarios.

While the inflows are stressed uniformly at 5 per cent under all the stress scenarios, outflows are stressed based on respective bank's past ten years' (2013-23) negative deposit growth recorded for short term (3 months) during the similar period of the year (March-June here). Since UCBs are primarily dependent on deposits as major source of funds, negative growth in deposits is considered as representative of stressed outflows. Further, three months period is considered as representative of 1-28 days' bucket, as this is the closest short-term period for which deposits data is available for all the banks (given that all the banks submit quarterly returns). The average negative deposit growth rate for ten years is considered as baseline scenario, which is further stressed by 1.5 SD (covering 87 per cent of sample) and 2.5 SD (covering around 98 per cent of sample) to generate medium and severe stress scenarios for outflows.

The banks with negative cumulative mismatch (cash inflow less cash outflow) exceeding 20 per cent of the outflows were considered to be under stress on the basis of the circular RBI/2008-09/174 UBD. PCB. Cir. No12/12.05.001/2008-09 dated September 17, 2008, which stipulates that the mismatches (negative gap between cash inflows and outflows) during 1-14 days and 15-28-days' time bands in the normal course should not exceed 20 per cent of the cash outflows in each time band.

2.3 Non-Banking Financial Companies (NBFCs)

Single factor sensitivity analysis- Stress Testing

Credit and liquidity risk stress tests for NBFCs have been performed under baseline, medium and high risk scenarios.

I. Credit risk

Major items of the balance sheet of NBFCs over one year horizon were projected by applying moving average and smoothing techniques. Assets, advances to total assets ratio, earnings before profit and tax (EBPT) to total assets ratio, risk-weight density and slippage ratio were projected over the next one year; and thereafter, based on these projections – new slippages, provisions, EBPT, risk-weighted assets and capital were calculated for the baseline scenario. For the medium and high-risk scenarios, GNPA ratios under baseline scenario were increased by 1 SD and 2 SD and accordingly new capital and CRAR were calculated.

II. Liquidity risk

Stressed cash flows and mismatch in liquidity position were calculated by assigning predefined stress percentage to the overall cash inflows and outflows in different time buckets over the next one year. Projected outflows and inflows as on March 2024 over the next one year were considered for calculating the liquidity mismatch under the baseline scenario. Outflows and inflows of the sample NBFCs were applied a shock of 5 per cent and 10 per cent for time buckets over the next one year for the medium and high-risk scenarios, respectively. Cumulative liquidity mismatch due to such shocks were calculated as per cent of cumulative outflows and, NBFCs with negative cumulative mismatch were identified.

2.4 Stress Testing Methodology of Mutual Funds

SEBI has mandated all open-ended debt schemes (except overnight schemes) to conduct stress testing. Accordingly, Association of Mutual Funds in India (AMFI) prescribed the "Best Practice Guidelines on Stress Testing by Debt Schemes of Mutual Funds". The stress testing is carried out internally by all Asset Management Companies (AMCs) on a monthly basis and when the market conditions require so. A uniform methodology is being followed across the industry for stress testing with a common outcome, *i.e.*, impact on NAV as a result of the stress testing.

Stress testing parameters

The stress testing is conducted on the three risk parameters, *viz.*, Interest rate risk, Credit risk and Liquidity risk.

A. Interest rate risk parameter

For interest rate risk parameter, AMCs subject the schemes at portfolio level to the following scenarios of interest rate movements and assess the impact on NAV.

a) Highest increase in G-Sec yield in the last 120 months (1-year G-Secs or 10 year G-Secs whichever is higher on month-on-month basis comparing maximum yield of a month to minimum yield of previous month).

b) Two-third of the highest increase in G-Sec yield in the last 120 months.

c) One-third of the highest increase in G-Sec yield in the last 120 months

B. Credit risk parameter

For credit risk parameter, AMCs may subject the securities held by the scheme to the following:

1. Calculate the probability of downgrade of each security. In this regard, to incorporate all possible downgrade scenarios (notches) for each security, probability tables published by rating agencies are being used.
2. Further, each potential notched down rating will correspond to a change in valuation yield for the security corresponding to that change in rating. The change in valuation yields for the respective rating changes is derived from the valuation matrix used by the valuation agencies.
3. The sum product of probability of downgrade within investment grade and change in yield on that downgrade of a security, is then multiplied by the duration of that security and the weightage of that security in the portfolio. Separately, the sum product of probability of downgrade below investment grade with haircut applicable on that downgrade of any security, is multiplied with the weightage of that security in the portfolio. These two sum products are added to get the aggregate potential impact at a security level.
4. The summation of all these security level outputs is considered as the portfolio level credit impact.

C. Liquidity risk parameter

For liquidity risk parameter, the following analysis is being undertaken:

1. Data for past periods of stress (*viz.* stress scenarios during the years 2008, 2013, 2018, 2020) along with rise in yields for a given credit rating, type of security, etc. in respective matrices for the relevant duration bucket is considered.
2. The change in median yield differential over G-Sec during stress period compared to the preceding normal period (normal period is a period starting 6 months prior to the start of the stress period and ending at the start of the stress period) is considered as rise in spread for the purpose of stress testing.
3. AMCs take yield spike as higher than the AMFI-specified values for stress testing based on market scenarios.
4. These calculations are again reiterated for individual securities based on respective ratings, matrix-based sector as provided in the matrix files and duration bucket and aggregated at the portfolio level to get the portfolio level output.

AMCs additionally consider extreme stress scenarios of time bound liquidation (*viz.* 5 days, 3 days and 1 day) of full portfolios and its impact on NAV by applying suitable haircuts.

2.5 Methodology for Stress Testing Analysis at Clearing Corporations

SEBI has specified the granular norms related to core settlement guarantee fund (SGF); stress testing and default procedures to create a core fund (called core SGF) within the SGF against which no exposure is given and which is readily and unconditionally available to meet settlement obligations of clearing corporation in case of clearing member(s) failing to honour settlement obligation; align stress testing practices of clearing corporations with Principles for Financial Market Infrastructures (norms for stress testing for credit risk, stress testing for liquidity risk and reverse stress testing including frequency and scenarios); capture the risk due to possible default in institutional trades in stress testing; harmonise default waterfalls across clearing corporations; limit the liability of non-defaulting members in view of the Basel capital adequacy requirements for exposure towards central counterparties (CCPs); ring-fence each segment of clearing corporation from defaults in other segments; and bring in uniformity in the stress testing and the risk management practices of different clearing corporations especially with regard to the default of members.

Stress testing is carried out at clearing corporations (CCs) to determine the minimum required corpus (MRC), which needs to be contributed by clearing members (CMs) to the core SGF. The MRC is determined separately for each segment (*viz.* cash market, equity derivatives, currency derivatives, commodity derivatives, debt and tri-party repo segment) every month based on stress testing subject to the following:

i. The MRC is fixed for a month.

ii. By 15th of every month, CCs review and determine the MRC for next month based on the results of daily stress tests of the preceding month.

iii. For every day of the preceding month, uncovered loss numbers for each segment are estimated based on stress test and highest of such numbers is taken as worst-case loss number for the day.

iv. Average of all the daily worst case loss numbers determined in (iii) above is calculated.

v. The MRC for next month is at least the higher of the average arrived in at step (iv) above and the segment MRC as per previous review.

For determining the MRC for cash, equity derivatives and currency derivatives segment, CCs calculate the credit exposure arising out of a presumed simultaneous default of top two CMs. The credit exposure for each CM is determined by assessing the close-out loss arising out of closing open positions (under stress testing scenarios) and the net pay-in/ pay-out requirement of the CM against the required margins and other mandatory deposits of the CM. The MRC or average stress test loss of the month is determined as the average of all daily worst case loss scenarios of the month. The actual MRC for any given month is determined as at least the higher of the average stress test loss of the month or the MRC arrived at any time in the past. For the debt segment, the trading volume is minimal, and hence the MRC for the core SGF is calculated as higher of ₹4 crore or aggregate losses of top two CMs, assuming close out of obligations at a loss of four per cent less required margins. The tri-party repo segment and commodity derivatives segment also follow the same stress testing guiding principles as prescribed for equity cash, equity derivatives and currency derivatives segments. For commodity derivatives segment, however, MRC is computed as the maximum of either credit exposure on account of the default of top two CMs or 50 per cent of credit exposure due to simultaneous default of all CMs. Further, the minimum threshold value of MRC for commodity derivatives segment of any stock exchange is ₹10 crore.

CCs carry out daily stress testing for credit risk using at least the standardised stress testing methodology prescribed by SEBI for each segment. Apart from the stress scenarios prescribed for cash market and derivatives market segments, CCs also develop their own scenarios for a variety of 'extreme but plausible market conditions' (in terms of both defaulters' positions and possible price changes in liquidation periods, including the risk that liquidating such positions could have an impact on the market) and carry out stress testing using self-developed scenarios. Such scenarios include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions. Also, for products for which specific stress testing methodology has not been prescribed, CCs develop extreme but plausible market scenarios (both hypothetical and historical) and carry out stress tests based on such scenarios and enhance the corpus of SGF, as required by the results of such stress tests.

2.6 Interconnectedness – Network analysis

Matrix algebra is at the core of the network analysis, which uses the bilateral exposures between entities in the financial sector. Each institution's lendings to and borrowings from all other institutions in the system are plotted in a square matrix and are then mapped in a network graph. The network model uses various statistical measures to gauge the level of interconnectedness in the system. Some of the important measures are given below:

I. *Connectivity Ratio*: This statistic measures the extent of links between the nodes relative to all possible links in a complete graph. For a directed graph, denoting total number of out-degrees as $K = \sum_{i=1}^{N} k_i$ and the total number of nodes as N, connectivity ratio is given by $\frac{K}{N(N-1)}$.

II. *Cluster coefficient:* Clustering in networks measures how interconnected each node is. Specifically, there should be an increased probability that two of a node's neighbours (banks' counterparties in case of a financial network) are neighbours to each other also. A high clustering coefficient for the network corresponds with high local interconnectedness prevailing in the system. For each bank with k_i neighbours the total number of all possible directed links between them is given by k_i (k_i-1). Let E_i denote the actual number of links between bank i's k_i neighbours. The clustering coefficient C_i for bank i is given by the identity:

$$C_i = \frac{E_i}{k_i(k_i - 1)}$$

The clustering coefficient (C) of the network as a whole is the average of all Ci's:

$$C = \frac{\sum_{i=1}^{N} C_i}{N}$$

III. *Tiered network structures:* Typically, financial networks tend to exhibit a tiered structure. A tiered structure is one where different institutions have different degrees or levels of connectivity with others in the network. In the present analysis, the most connected banks are in the innermost core. Banks are then placed in the mid-core, outer core and the periphery (the respective concentric circles around the centre in the diagram), based on their level of relative connectivity. The range of connectivity of the banks is defined as a ratio of each bank's in-degree and out-degree divided by that

of the most connected bank. Banks that are ranked in the top 10 percentile of this ratio constitute the inner core. This is followed by a mid-core of banks ranked between 90 and 70 percentile and a 3rd tier of banks ranked between the 40 and 70 percentile. Banks with a connectivity ratio of less than 40 per cent are categorised in the periphery.

IV. *Colour code of the network chart*: The blue balls and the red balls represent net lender and net borrower banks respectively in the network chart. The colour coding of the links in the tiered network diagram represents the borrowing from different tiers in the network (for example, the green links represent borrowings from the banks in the inner core).

(a) Solvency contagion analysis

The contagion analysis is in the nature of a stress test where the gross loss to the banking system owing to a domino effect of one or more banks failing is ascertained. We follow the round by round or sequential algorithm for simulating contagion that is now well known from Furfine (2003). Starting with a trigger bank i that fails at time 0, we denote the set of banks that go into distress at each round or iteration by Dq, q=1,2, . . .For this analysis, a bank is considered to be in distress when its Tier I capital ratio goes below 7 per cent. The net receivables have been considered as loss for the receiving bank.

(b) Liquidity contagion analysis

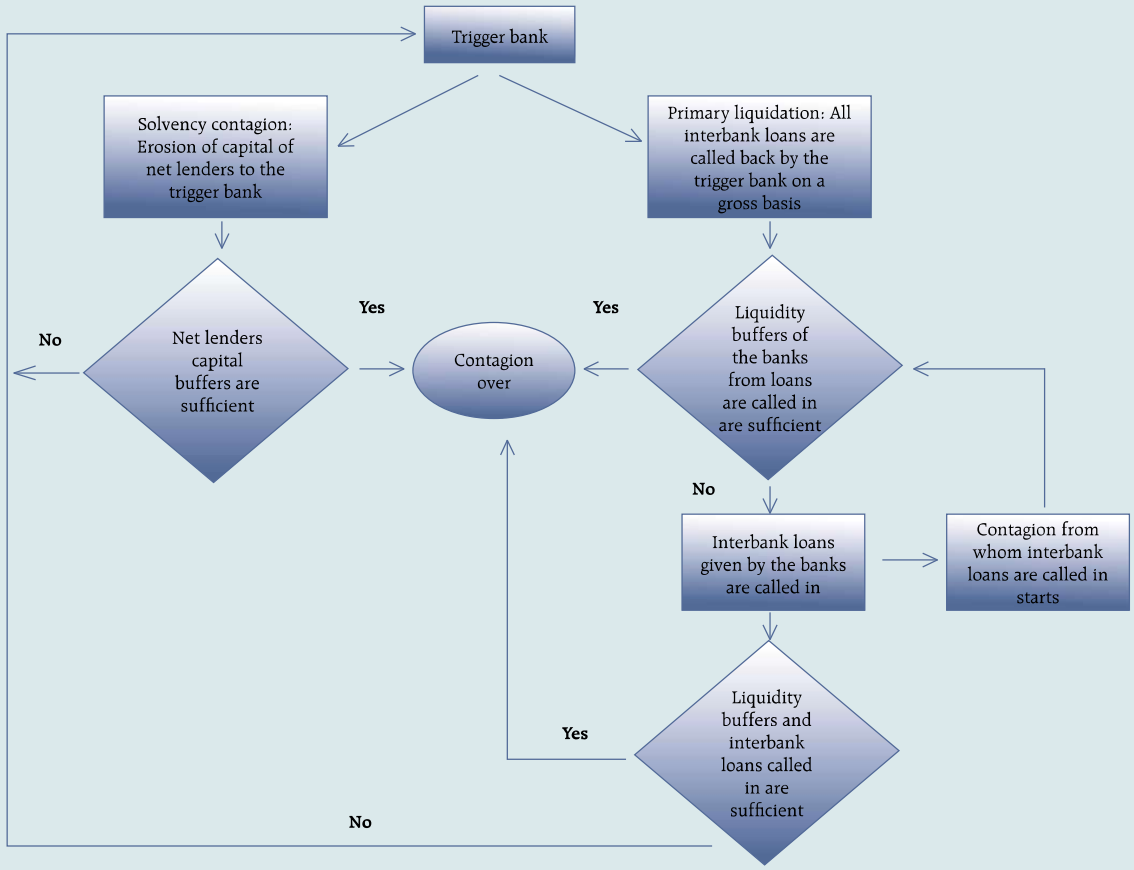
While the solvency contagion analysis assesses potential loss to the system owing to failure of a net borrower, liquidity contagion estimates potential loss to the system due to the failure of a net lender. The analysis is conducted on gross exposures between banks. The exposures include fund based ones and derivatives. The basic assumption for the analysis is that a bank will initially dip into its liquidity reserves or buffers to tide over a liquidity stress caused by the failure of a large net lender. The items considered under liquidity reserves are: (a) excess CRR balance; (b) excess SLR balance; and (c) 18 per cent of NDTL. If a bank is able to meet the stress with liquidity buffers alone, then there is no further contagion.

However, if the liquidity buffers alone are not sufficient, then a bank will call in all loans that are 'callable', resulting in a contagion. For the analysis only short-term assets like money lent in the call market and other very short-term loans are taken as callable. Following this, a bank may survive or may be liquidated. In this case there might be instances where a bank may survive by calling in loans, but in turn might propagate a further contagion causing other banks to come under duress. The second assumption used is that when a bank is liquidated, the funds lent by the bank are called in on a gross basis (referred to as primary liquidation), whereas when a bank calls in a short-term loan without being liquidated, the loan is called in on a net basis (on the assumption that the counterparty is likely to first reduce its short-term lending against the same counterparty. This is referred to as secondary liquidation).

(c) Joint solvency-liquidity contagion analysis

A bank typically has both positive net lending positions against some banks while against some other banks it might have a negative net lending position. In the event of failure of such a bank, both solvency and liquidity contagion will happen concurrently. This mechanism is explained by the following flowchart:

Flowchart of Joint Liquidity-Solvency contagion due to a bank coming under distress



The trigger bank is assumed to have failed for some endogenous reason, *i.e.*, it becomes insolvent and thus impacts all its creditor banks. At the same time, it starts to liquidate its assets to meet as much of its obligations as possible. This process of liquidation generates a liquidity contagion as the trigger bank starts to call back its loans.

Since equity and long-term loans may not crystallise in the form of liquidity outflows for the counterparties of failed entities, they are not considered as callable in case of primary liquidation. Also, as the RBI guideline dated March 30, 2021, permits the bilateral netting of the MTM values in case of derivatives at counterparty level, exposures pertaining to derivative markets are considered to be callable on net basis in case of primary liquidation.

The lender/creditor banks that are well capitalised will survive the shock and will generate no further contagion. On the other hand, those lender banks whose capital falls below the threshold will trigger a fresh contagion. Similarly, the borrowers whose liquidity buffers are sufficient will be able to tide over the stress without causing further contagion. But some banks may be able to address the liquidity stress only by calling in short term assets. This process of calling in short term assets will again propagate a contagion.

The contagion from both the solvency and liquidity side will stop/stabilise when the loss/shocks are fully absorbed by the system with no further failures.

2.7 Financial System Stress Indicator (FSSI)

FSSI is compiled using risk factors spread across five financial market segments (equity, forex, money, government debt and corporate debt), three financial intermediary segments (banks, NBFCs and AMC-MFs) as well as real sector (Table 4). FSSI lies between zero and unity, with higher value indicating more stress. For its construction, the risk factors pertaining to each component segment are first normalised using min-max method and thereafter aggregated based on simple average into a sub-indicator 'y_i' representing the i^{th} market/ sector. Finally, the composite FSSI is obtained as,

$$FSSI_t = \sum_{i=1}^{9} w_i y_{it}$$

where the weight 'w_i' of each sub-indicator 'y_i' is determined from its sample standard deviation 's_i', as,

$$w_i = \frac{1/s_i}{\sum_{i=1}^{9}(1/s_i)}$$

Table 4: Risk factors constituting each component of FSSI

Equity Market	1. Difference between NIFTY 50 monthly returns and its maximum over a two-year rolling window 2. NIFTY 50 Market capitalisation-to-GDP ratio 3. NSE-VIX Index 4. Net Equity FPI flows
Government Debt Market	5. Realised volatility in 10-year G-Sec yield 6. Term Spread: Spread between 10-year G-Sec yield and 3-month T-Bill rate 7. Increase in the 10-year G-Sec yield compared to the minimum over a two-year rolling window 8. Net Debt FPI flows
Forex Market	9. Difference between rupee dollar exchange rate and its maximum over a two-year rolling window. 10. m-o-m appreciation/depreciation of rupee dollar exchange rate 11. GARCH (1,1) volatility of rupee dollar exchange rate 12. Difference between 3-month forward premia and its historical maximum.
Money/Short Term Market	13. Spread between weighted average call rate and weighted average market repo rate 14. Spread between 3-month CD rate and 3-month T-Bill rate 15. Spread between 3-month non-NBFC CP rate and 3-month T-Bill rate 16. Realised volatility of 3-month CP rate 17. Spread between 3-month OIS rate and 3-month T-Bill rate
Corporate Bond Market	18. Yield spread between 3-year AAA corporate bonds and 3-year G-Sec 19. Difference between 3-year BBB and 3-year AAA corporate bond yield 20. Difference between 3-year BBB corporate bond yield and its maximum

Banking Sector	SCBs	21. CRAR (SCBs) 22. RoA (SCBs) 23. LCR (SCBs) 24. Cost-to-Income (SCBs) 25. Stressed Assets Ratio (SCBs) 26. Banking Beta: cov(r,m)/var(m), over 2-year moving window. r= Bank NIFTY y-o-y, m= NIFTY 50 y-o-y
	UCBs	27. GNPA ratio (UCBs) 28. CRAR (UCBs) 29. RoA (UCBs)
NBFC Sector	30. GNPA ratio 31. CRAR 32. RoA 33. Spread between 3-month NBFC CP rate and 3-month T-Bill rate	
AMC-MF Sector	34. Mutual fund redemptions: y-o-y 35. Mutual fund net inflows	
Real Sector	36. GDP growth 37. CPI inflation 38. Current account balance as a share of GDP 39. Gross fiscal deficit as a share of GDP	

Annex 3

Important Domestic Regulatory Measures

1. Reserve Bank of India (RBI)

Date	Regulation	Rationale
December 28, 2023	**Reserve Bank of India (Financial Benchmark Administrators) Directions, 2023:** A comprehensive risk-based regulatory framework covering administration of all benchmarks related to financial markets, regulated by the Reserve Bank, has been issued. It requires benchmark administrators, *inter alia*, to comply with governance and oversight arrangements, controls and transparency and eschew conflict of interest.	To provide greater assurance about the accuracy and integrity of benchmarks.
December 29, 2023	**Master Direction – Reserve Bank of India (Internal Ombudsman for Regulated Entities) Directions, 2023[1]:** The Reserve Bank reviewed the Internal Ombudsmen schemes in line with the integration of the erstwhile three RBI Ombudsman Schemes to improve the customer service standards in REs.	To strengthen the Internal Grievance Redressal mechanism within a RE.
December 29, 2023	**Basel III Framework on Liquidity Standards – Net Stable Funding Ratio (NSFR) – Review of National Development Banks**: On a review, the Reserve Bank decided that EXIM Bank and National Bank for Financing Infrastructure and Development (NaBFID) shall also be considered as National Development Banks (NDBs) for NSFR computation. Further, unencumbered loans to NDBs with a residual maturity of one year or more that would qualify for a 35 per cent or lower risk weight under the Standardised Approach for credit risk have been assigned a Required Stable Funding (RSF) factor of 65 per cent (as against 100 per cent currently).	To bring EXIM Bank and NaBFID on par with other NDBs for NFSR computation.

[1] As also mentioned in the RBI Annual Report 2023-24: Customer Centric Measures: April 2021 to March 2024 (Annex 3).

Date	Regulation	Rationale
January 01, 2024	**Inoperative Accounts /Unclaimed Deposits in Banks- Revised Instructions[2]:** The Reserve Bank has issued guidelines on the measures to be put in place by the banks covering various aspects of classifying accounts and deposits as inoperative accounts and unclaimed deposits, their periodic review, measures to prevent fraud in such accounts/ deposits, grievance redressal mechanism, steps to be taken for tracing the customers of inoperative accounts/ unclaimed deposits including their nominees/ legal heirs for re-activation of accounts and settlement of claims or closure and the process to be followed by them.	To assist the account holders and to reduce the quantum of unclaimed deposits in the banking system and return such deposits to their rightful owners/ claimants.
January 03, 2024	**Master Direction – Reserve Bank of India (Commercial Paper and Non-Convertible Debentures of original or initial maturity up to one year) Directions, 2024:** The extant Directions on Commercial Paper (CP) and Non-Convertible Debentures (NCDs) of original maturity up to one year were reviewed and revised Directions were issued.	To achieve consistency across products in terms of issuers, investors and other participants in the Commercial Papers/ Non-Convertible Debentures markets.
January 05, 2024	**Risk Management and Inter-Bank Dealings – Hedging of foreign exchange risk:** The regulatory framework for hedging of foreign exchange (FX) risks was reviewed and the revised Directions issued consolidates the previous instructions, in respect of all types of transactions {over-the-counter (OTC) and exchange traded}, under a single Master Direction.	To expand the suite of permitted FX derivative products and refine the user classification framework to enable a larger set of users, with the necessary risk management capabilities, to efficiently manage their risks.

[2] As also mentioned in the RBI Annual Report 2023-24: Customer Centric Measures: April 2021 to March 2024 (Annex 3).

Date	Regulation	Rationale
January 17, 2024	**Second Schedule to the Reserve Bank of India Act, 1934 – Norms for inclusion:** Licensed Tier 3 and Tier 4 UCBs, subject to maintenance of minimum deposits required for categorisation as a Tier 3 UCB for two consecutive years and satisfying the following criteria will be considered eligible for inclusion in the second schedule : (a) fulfilling the criteria stipulated by the Reserve Bank for financially sound and well managed (FSWM) UCBs; (b) capital to risk (weighted) assets ratio (CRAR) of at least 3 per cent more than the minimum CRAR requirement applicable to UCBs; and (c) having no major regulatory and supervisory concerns.	To revise the eligibility norms for inclusion of UCBs in the Second Schedule of the Reserve Bank of India Act, 1934 to bring them in conformity with the Revised Regulatory Framework.
February 09, 2024	**Participation of Indian Banks on India International Bullion Exchange IFSC Limited (IIBX):** On a review, the Reserve Bank decided to allow (a) participation of Indian banks (through branch/subsidiary/joint venture) as trading member (TM) / trading and clearing member (TCM) of IIBX; and (b) banks authorised by the Reserve Bank to import gold/silver as special category client (SCC) of IIBX.	To foster increased participation of Indian Banks on IIBX.
February 28, 2024	**Capital Adequacy Guidelines – Review of Trading Book:** The Reserve Bank aligned the capital adequacy guidelines with the new definition of 'Trading Book' in line with the Master Direction on Investment and introduced intermediate scalers for commercial banks under Basel III framework to smoothen the transition towards adoption of 'Minimum Capital Requirements for Market Risk - Basel III'.	To amend the extant instructions for market risk capital charge.
February 29, 2024	**Master Direction – Reserve Bank of India (Bharat Bill Payment System) Directions, 2024[3]:** The process flow of transactions and membership criteria for onboarding operating units in BBPS have been streamlined.	To enhance efficiency of the system, encourage greater participation and enhance customer protection.

[3] As also mentioned in the RBI Annual Report 2023-24: Customer Centric Measures: April 2021 to March 2024 (Annex 3).

Date	Regulation	Rationale
March 06, 2024	**Arrangements with Card Networks for issue of Credit Cards:** The Reserve Bank has mandated that card issuers shall not enter into any arrangement or agreement with card networks that restrain them from availing the services of other card networks and card issuers shall provide an option to their eligible customers to choose from multiple card networks at the time of issue. For existing cardholders, this option may be provided at the time of the next renewal.	To ensure the availability of choice for customer to choose card networks.
March 07, 2024	**Amendment to the Master Direction - Credit Card and Debit Card – Issuance and Conduct Directions, 2022 :** Keeping abreast of dynamic card ecosystem and based on the suggestions/requests received from various stakeholders, certain provisions of the Master Direction have been amended. The amendments encompass issuance of form factors in place of / in addition to plastic credit cards, display of modes by card-issuers for accepting payments towards credit card dues, monitoring of end use of funds using business credit cards, requirement of explicit consent of cardholders for sharing their card data with outsourcing partners, among others.	To strengthen customer conduct related aspects for card operations.
April 15, 2024	**Key Facts Statement (KFS) for Loans & Advances:** All REs have now been mandated to provide their retail and MSME term-loan borrowers a Key Fact Statement (KFS) containing the key information regarding a loan agreement, including all-in cost of the loan, in simple and easy to understand format.	To enhance transparency and reduce information asymmetry on financial products being offered by different REs and empower borrowers to make an informed financial decision.
April 15, 2024	**Hedging of Gold Price Risk in Overseas Markets (OTC derivatives):** The Reserve Bank permitted resident entities to hedge their exposures to price risk of gold using OTC derivatives in the IFSC in addition to the derivatives on the exchanges in the IFSC.	To provide further flexibility to resident entities to hedge their exposures to price risk of gold.

Date	Regulation	Rationale
April 23, 2024	**Dealing in Rupee Interest Rate Derivative products - Small Finance Banks:** The extant guidelines permitted SFBs to use only Interest Rate Futures (IRFs) for the purpose of proprietary hedging. On a review, SFBs were permitted to deal in permissible rupee interest rate derivative products for hedging interest rate risk.	To expand the avenues available to the SFBs for hedging interest rate risk in their balance sheet and commercial operations more effectively as well as with a view to provide them with greater flexibility.
May 03, 2024	**Banks' Exposure to Capital Market - Issue of Irrevocable Payment Commitments (IPCs):** This circular prescribes risk mitigation measures for intraday exposures arising out of issuance of IPCs in terms of capital market exposures and large exposures of the issuing banks.	To specify the risk mitigation measures for all IPCs issued by custodian banks under the T+1 settlement cycle.

2. Securities and Exchange Board of India (SEBI)

Date	Regulation	Rationale
November 08, 2023	**Procedural framework for dealing with unclaimed amounts lying with entities having only listed non-convertible securities, Real Estate Investment Trusts (REITs) and Infrastructure Investment Trusts (InvITs) and manner of claiming such amounts by investors/ unitholders.**	To create a necessary regulatory framework for the ease and convenience of the investors.
December 06, 2023	**Revised framework for computation of Net Distributable Cash Flow (NDCF) by REITs/ InvITs.**	To promote ease of doing business and standardise the framework for calculation of available NDCFs across REITs and InvITs.
January 12, 2024	**Guidelines for Alternate Investments Funds (AIFs) with respect to holding their investments in dematerialised form and appointment of custodian.**	To facilitate ease of compliance and to protect against fraud and operational risk.
January 25, 2024	**Streamlining of Regulatory Reporting by Designated Depository Participants (DDPs) and Custodians.**	To have uniform compliance standards and for ease of compliance reporting.
February 08, 2024	**Revised Pricing Methodology for Institutional Placements of Privately Placed InvITs.**	To promote ease of doing business, enhance price transparency and facilitate smoother fund raising by InvITs.

Date	Regulation	Rationale
February 28, 2024	**Stress Testing of Small and Mid-Cap Schemes.**	To address concerns regarding liquidity and significant run-up in identified pockets of the market.
March 08, 2024	**Introduction of Small and Medium Real Estate Investment Trusts ('SM REITs') framework.**	To facilitate pooled investment in a wider range of real estate assets as a regulated financial product thereby enabling further growth of REITs in India.
March 11, 2024	**Measures to instil trust in securities market – Expanding the framework of Qualified Stock Brokers (QSBs) to more stock brokers.**	To strengthen the compliance culture among stock brokers and to further protect the interests of investors.
March 20, 2024	**Safeguards to address the concerns of the investors on transfer of securities in dematerialised mode.**	To harmonise the classification of inactive/ dormant accounts across Market Infrastructure Institutions and to strengthen the measures to prevent fraud/ misappropriation for inoperative demat accounts.
April 24, 2024	**Relaxation of the requirement to publish the text on Contract Note with respect to Fit and Proper status of shareholders.**	To promote ease of doing business.
April 25, 2024	**Enhancing trust in the Alternate Investments Funds (AIFs) ecosystem by introducing due diligence measures with respect to investors and investments.**	To address the issue with respect to structuring of AIFs and to prevent facilitation of circumvention of financial sector regulations through AIFs.
April 30, 2024	**Nomination for Mutual Fund Unit Holders – exemption for jointly held folios.**	To simplify the process of nomination for joint holders in mutual funds.

3. Insurance Regulatory and Development Authority of India (IRDAI)

Date	Regulation	Rationale
January 23, 2024	**IRDAI (Expenses of Management, including Commission, of Insurers), 2024.**	To enable and provide flexibility to the insurers to manage their expenses, including commissions, within the overall limits as specified by IRDAI.
January 31, 2024	**Guidelines on providing AYUSH coverage in Health Insurance policies.**	To instruct general and health insurers to treat AYUSH treatment coverage at par with other treatments, modify products that contain limitations for AYUSH treatments and ensure compliance with the revised guidelines.
March 20, 2024	**IRDAI (Actuarial, Finance and Investment Functions of Insurers) Regulations, 2024.**	To enhance the efficiency and responsiveness of insurers' actuarial, finance, and investment functions.
March 20, 2024	**IRDAI (Registration and Operations of Foreign Reinsurers Branches & Lloyd's India) Regulations, 2024:** This regulation consolidates two regulations and seeks to streamline the operations of entities engaged in reinsurance operations. By promoting transparency and stability, these regulations aim to create a conducive environment for the growth and expansion of the reinsurance sector, benefiting both insurers and policyholders in India.	To foster the systematic development of the reinsurance sector in India by promoting orderly growth and harmonising the existing legal and regulatory framework.
March 20, 2024	**De-Notification of All Tariffs.**	To de-notify all the prevailing tariffs in general insurance business to allow competitive pricing and designing of products by the insurance companies to serve a broad range of population.

Date	Regulation	Rationale
March 20, 2024	**IRDAI (Rural, Social Sector and Motor Third Party Obligations) Regulations, 2024:** This regulation consolidates two erstwhile regulations pertaining to minimum business obligations in rural, social sector and motor third party business for insurers, as mandated under the Insurance Act, 1938.	To propel inclusivity at the grass root level.
March 20, 2024	**IRDAI (Bima Sugam - Insurance Electronic Marketplace) Regulations, 2024:** 'Bima Sugam' serves as a marketplace offering one stop solution for all insurance stakeholders, including customers, insurers, intermediaries, and agents, thereby promoting transparency, efficiency, and collaboration across the entire insurance value chain.	To promote universalisation and democratisation of insurance, empower and safeguard policyholders' interests and achieve the vision of 'Insurance for all by 2047'.
March 20, 2024	**IRDAI (Protection of Policyholders' Interests, Operations and Allied Matters of Insurers) Regulations, 2024:** This regulation, which consolidates eight regulations into a unified structure, emphasises the adoption of standard procedures and best practices by insurers and distribution channels to fulfil their obligations towards policyholders, including grievance redressal and policyholder-centric governance. It also ensure that the opening or closing of places of business by insurers, both domestically and internationally, is conducted in a manner that prioritises the interests of policyholders. Additionally, the regulations also aim to promote prudent practices in risk management related to outsourcing activities by insurers.	To ensure fair treatment of prospects during solicitation and sale of insurance policies and protect the interests of policyholders throughout their engagement with insurers and distribution channels.

Date	Regulation	Rationale
March 20, 2024	**IRDAI (Insurance Products) Regulations, 2024:** This regulation, which merges six regulations into a unified framework, aims to promote good governance in product design and pricing, ensure that insurers adopt sound management practices for effective oversight and due diligence, encourage the development of innovative insurance products that cater to the requirements of different segments/ strata of the society and foster a competitive marketplace.	To enable insurers to respond to evolving market demands, enhance the ease of conducting business, and boost insurance penetration.
March 20, 2024	**IRDAI (Registration, Capital Structure, Transfer of Shares and Amalgamation of Insurers) Regulations, 2024:** This regulation streamlines seven regulations into a single comprehensive framework including registration of insurers, transfer of shareholding, capital structure, amalgamation of insurers, and listing of shares on stock exchanges.	To foster the growth of the insurance sector by simplifying various processes and enhance the ease of doing business within the insurance industry, facilitating smoother operations and promoting overall sectoral growth.
March 20, 2024	**IRDAI (Corporate Governance for Insurers) Regulations, 2024:** This regulation defines the roles and responsibilities of the board and management and highlights the importance of governance in the functioning of an insurance company by emphasising transparency, accountability, and ethical conduct. It also prioritises meeting the expectations of all stakeholders, especially policyholders, while ensuring the adoption of sound and prudent governance principles and practices.	To establish a robust governance framework for insurers to enhance trust and confidence among stakeholders.
March 27, 2024	**Notification of Domestic Systemically Important Insurers (D-SIIs).**	To notify three domestic insurers namely Life Insurance Corporation of India (LIC), General Insurance Corporation of India (GIC), and New India Assurance Co. Ltd as D-SIIs for the 2023-24.

Date	Regulation	Rationale
May 05, 2024	**Master Circular on Rural, Social Sector and Motor Third Party Obligations.**	To specify minimum rural, social sector and third party motor insurance business that the insurers are required to underwrite.
May 15, 2024	**Master Circular on Expenses of Management, including Commission, of Insurers, 2024.**	To provide guidance to all insurers and other stakeholders regarding the interpretation and implementation of regulations related to expense of management in the insurance sector in India.
May 15, 2024	**Master Circular on Registration, Capital Structure, Transfer of Shares and Amalgamation of Insurers, 2024.**	To specify various forms as referred in the Registration Regulations, 2024, and to provide clarifications on various provisions of IRDAI (Registration, Capital Structure, Transfer of Shares and Amalgamation of Insurers) Regulations, 2024.

4. Pension Fund Regulatory and Development Authority (PFRDA)

Date	Regulation	Rationale
November 17, 2023	**Addendum to the Valuation Guidelines.**	To revise National Pension System (NPS) guidelines related to identification and treatment of loss, disclosures by Pension Funds in their monthly portfolio details, classification of debt securities, amongst others.
November 22, 2023	**Financial Information User under Account Aggregator Framework.**	To port National Pension System (NPS) subscribers' data through the Account Aggregator Framework with Central Record-keeping Agency designated as Financial Information Providers (FIPs).

Date	Regulation	Rationale
November 23, 2023	**Policy on adoption of cloud services by regulated intermediaries.**	To enable and equip the intermediaries with a policy framework on adoption of cloud service by intermediaries for the services rendered by them.
November 29, 2023	**Option for subscribers under NPS All Citizen Model (Tier-I), NPS Corporate Model (Tier-I) and NPS Tier-II (all subscribers) of selection of multiple pension funds in accordance with the asset classes (except alternate asset class or scheme A).**	To facilitate selection of multiple pension funds in accordance with the asset classes available to the existing subscribers.
December 07, 2023	**Convenience of NPS Contribution through Personalized QR Code of D-Remit.**	To enable NPS subscribers to contribute directly from their bank accounts using D-Remit.
December 20, 2023	**PFRDA (Framework for Prevention and Reporting of Fraud Under NPS Architecture) Guidelines, 2023.**	To suggest a set of guidelines and measures for the prevention and reporting of fraud to the Board of the entity, Law enforcement agencies and the Authority to evolve the best practices to detect, prevent and contain fraud.
January 19, 2024	**Surrender of Certificate of Registration (CoR) issued to Point of Presence - SubEntity (PoP-SE) under PFRDA (PoP) Regulations, 2018.**	To facilitate ease of doing business, the PoP-SEs have been subsumed under the agency model wherein PoPs may engage PoP-SEs as pension agents and utilize their services for distribution of pension schemes.

Date	Regulation	Rationale
February 20, 2024	**Securing NPS transactions through Aadhaar-based access of Central Record-keeping Agency system under the government sector:** Nodal Offices in Central and State Governments and their Autonomous Bodies are implementing Aadhaar-based authentication for NPS transactions. The system will be accessible through two-factor authentication (2FA), integrating with the current user ID and password-based process which is being developed by the Central Record-keeping Agency.	To enhance security measures and protect subscribers and stakeholders.
February 21, 2024	**Risk management framework for the Central Record-keeping Agencies under NPS architecture:** The risk management framework emphasises on the importance of internal control systems, procedures and safeguards to be built into the Central Record-keeping Agency systems for safeguarding the interests of the subscribers.	To ensure that the Central Record-keeping Agency render high standards of service, exercise due diligence and ensure proper care in their operations.
March 27, 2024	**PFRDA (Digital safety practices for government nodal offices under NPS architecture) Advisory, 2024:** This aims to establish a comprehensive strategy that integrates optimal methodologies, instructional initiatives and pre-emptive actions to address possible hazards, safeguard confidential data and encourage digital safety practices while accessing digital platforms created by CRA to conduct activities related to NPS by the central/ state government nodal offices.	To improve the online transaction security for government employees investing in the NPS.

5. Insolvency and Bankruptcy Board of India (IBBI)

Date	Regulation	Rationale
December 21, 2023	**Circular regarding application filed under Insolvency and Bankruptcy (Application to Adjudicating Authority for Insolvency Resolution Process for Personal Guarantors to Corporate Debtors) Rules, 2019 (IRP PGCD Rules):** The IBBI issued a circular requiring that in cases where the creditor files an application for initiation of insolvency resolution process of personal guarantor (PG) to corporate debtor, the insolvency professional (IP) proposed to be appointed as resolution professional (RP) in such cases shall also provide the particulars and declaration in Part IV of Form C of the IRP PGCD Rules to the creditor for the consideration of the Adjudicating Authority (AA).	To provide clarification regarding submission of particulars and declaration by the IPs in the application filed by creditor(s) in Part IV of Form C of the IRP PGCD Rules.
January 31, 2024	**Amendment to Insolvency Professional Agency (IPA) Model Bye-Laws Regulations:** The IBBI notified the IBBI (Model Bye-Laws and Governing Board of Insolvency Professional Agencies) (Amendment) Regulations, 2024 to relax the validity of Authorisation for Assignment (AFA) such that the AFA completing one year from the date of its issuance or renewal, as the case may be, between: (a) 1st of January to 30th of June, shall be valid till 30th of June of the same year; and (b) 1st of July to 31st of December, shall be valid till 31st of December of the same year.	To align the validity of AFA held by an IP with the validity of IP Panels prepared for appointment of IP as Interim Resolution Professional (IRP), RP, Bankruptcy Trustee (BT), among other things.
January 31, 2024	**Amendment to IP Regulations:** The IBBI notified the IBBI (Insolvency Professionals) (Amendment) Regulations, 2024 to, *inter alia*, allow Insolvency Professionals to resign from an assignment, subject to the specified recommendation of creditors/ stakeholders, as the case may be, and approval of the Adjudicating Authority.	To address situations such as potential conflict of interest, personal limitations, lack of willingness to continue practising the IP profession and ensure smooth conduct of the processes.

Date	Regulation	Rationale
January 31, 2024	**Amendment to Voluntary Liquidation Process Regulations:** The IBBI notified the IBBI (Voluntary Liquidation Process) (Amendment) Regulations, 2024 to, *inter alia*, provide for disclosure of pending proceedings or litigation before initiation of voluntary liquidation, and procedure for a stakeholder to claim entitlement to funds in the Corporate Voluntary Liquidation Account, before dissolution of the corporate person.	To streamline the voluntary liquidation process and facilitate the distribution of unclaimed proceeds to the stakeholders before the dissolution of the corporate person.
January 31, 2024	**Amendment to Insolvency Resolution Process and Bankruptcy Process Regulations for Personal Guarantors (PG) to Corporate Debtors:** The IBBI notified the IBBI (Insolvency Resolution Process for Personal Guarantors to Corporate Debtors) (Amendment) Regulations, 2024 and IBBI (Bankruptcy Process for Personal Guarantors to Corporate Debtors) (Amendment) Regulations, 2024 to, *inter alia*, remove the restrictions on an IP to be appointed as RP or BT in a PG to corporate debtors process if she has acted or is acting as IRP, RP or Liquidator during the CIRP or liquidation process of the corporate debtors.	To allow the appointment of same IP in both the corporate process as well as the insolvency and bankruptcy proceeding of the PG to corporate debtors for better harmonisation and effective coordination of both the processes.
February 1, 2024	**Circular pertaining to regulatory framework of Insolvency Professional Entities (IPEs):** The IBBI issued a circular to clarify that: (a) in case of an IP which is an IPE, disciplinary proceedings can be initiated against its partner or director or the IPE itself; (b) there shall be no limit on the number of assignments that may be undertaken by an IPE as IP; and (c) the minimum fixed fee structure and a performance-linked incentive fee shall not be applicable on an IPE acting as IP.	To rationalise the regulatory framework of IPEs and facilitate IPEs to undertake their expanded role as IPs.

Date	Regulation	Rationale
February 1, 2024	**Circular pertaining to Insolvency Professionals (IP):** The IBBI issued a circular to clarify that, (a) an IP may render professional service in relation to implementation of a resolution plan approved by the AA, provided details of such service are mentioned in the resolution plan; and (b) in case a professional is engaged by the IP for various services, the bill or invoice for the same may be raised in the name of the IPE or the professional or the firm in which such a professional is a partner.	To facilitate efficient conduct of processes by IPs.
February 12, 2024	**Amendment to Liquidation Process Regulations:** The IBBI notified the IBBI (Liquidation Process) (Amendment) Regulations, 2024 to, *inter alia*, provide for seeking approval of the Stakeholder Consultation Committee (SCC) for reduction in reserve price and private sale of assets. Liquidator shall consult the SCC for running the corporate debtors as a going concern and for initiating or continuing legal proceedings. Further, wherever corporate debtors have given possession to an allottee in a real estate project, such asset shall not form a part of the liquidation estate.	To further streamline the liquidation process, improve accountability and bolster stakeholder confidence.
February 12, 2024	**Circular regarding sharing of report prepared by the RP under section 99:** The IBBI issued a Circular advising Resolution Professionals (RPs) to provide a copy of the report prepared under section 99 of the Code to both debtor and creditor in all cases.	To ensure that the debtor and creditor are well-informed about the evaluation and recommendations made by the RP.
February 13, 2024	**Circular regarding reporting/ sharing of information in voluntary liquidation process:** The IBBI issued a circular to provide that the liquidator shall declare if the corporate falls under category of Financial Service Provider as notified by the Central Government under section 227, IBC and whether prior permission from the appropriate regulator has been obtained. Further, the liquidator shall submit a copy of Form H, final report and order of dissolution to the Board.	To promote transparency and effective information dissemination by the Board.

Date	Regulation	Rationale
February 15, 2024	**Amendment to CIRP Regulations:** The IBBI notified the IBBI (Insolvency Resolution Process for Corporate Persons) (Amendment) Regulations, 2024 to, *inter alia*, provide for disclosure of valuation methodology to members of Committee of Creditors (CoC) before computation of estimates; disclosure of fair value in information memorandum with approval of CoC; invitation of separate plans for each real estate project of a real estate corporate debtors and enabling CoC to constitute a monitoring committee for overseeing implementation of the resolution plan.	To improve transparency, value realisation and further streamline CIRP.
February 22, 2024	**Circular regarding transparency and stakeholder engagement in liquidation process:** The IBBI issued a circular to provide that the liquidator shall share the progress reports with the SCC, seek comments of SCC while preparing the preliminary report and submit a copy of Form H, final report and order of closure / dissolution to the Board.	To promote transparency, stakeholder engagement and effective information dissemination by the Board.
February 13 and February 22, 2024	**Circular regarding deposit and withdrawal of unclaimed dividends and /or undistributed proceeds:** The IBBI issued a circular specifying the Forms for withdrawal of the amount deposited into 'Corporate Liquidation Account' and 'Corporate Voluntary Liquidation Account' before dissolution of the corporate debtors and corporate person, respectively.	To facilitate the liquidator to apply for withdrawal on the request made by a stakeholder who claims to be entitled to any amount deposited into these accounts.

6. International Financial Services Centres Authority (IFSCA)

Date	Regulation	Rationale
December 11, 2023	**'Qualified Suppliers' for supply of bullion on India International Bullion Exchange (IIBX).**	To enable the import of silver by Qualified Jewellers through IIBX (pursuant to the DGFT notification enabling the same) and with a view to more accurately represent the nature of participation of Limited Purpose Trading Members (LPTMs) as clients by renaming 'LPTM' as 'Special Category' client.
December 13, 2023	**Circular on Import of UAE Good Delivery (UAEGD) Gold through IIBX by valid India-UAE TRQ holders under the UAE and India Comprehensive Economic Partnership Agreement (CEPA).**	To enable participation of valid holders of India- UAE Tariff Rate Quota (TRQ) license/ authorisation in the IIBX for the import of UAEGD Gold.
January 05, 2024	**Circular on inclusion of 'Finance Company' and 'Finance Unit' as 'Credit Institution' under clause (f) of section 2 of the Credit Information Companies (Regulation) Act, 2005.**	To specify 'Finance Company' and 'Finance Unit', undertaking applicable permissible activities in IFSC, as 'credit institution'.
January 08, 2024	**Circular on improving processing timelines of cross-border payments:** IFSCA has advised the IFSCA Business Units (IBUs) may consider upgrading their existing messaging solutions to have continuous visibility of the status of a transaction by use of services like SWIFT GPI. IBUs using SWIFT as messaging service may consider using MT 910 (Confirmation of credit message) instead of MT 940 (Customer Statement message) for crediting the accounts of its constituents after due internal approval of such change of process.	To improve the processing timelines of cross-border payments.

Date	Regulation	Rationale
January 25, 2024	**Circular on 'Accredited Investors'[4] in IFSC.**	To notify the eligibility criteria of accredited investors, responsibilities of regulated entities (which intend to accept an investor as an 'Accredited Investor') and the mechanism of withdrawal of consent of an accredited investor.
February 01, 2024	**IFSCA (Payment Service) Regulations 2024.**	To lay down the framework for entities providing the payment services in IFSC.
February 16, 2024	**Maintenance of net worth by Fund Management Entity (FME).**	To specify business restrictions applicable on a FME in case the net worth of any FME falls below the specified net worth.
March 14, 2024	**Registration on Financial Intelligence Unit – India 'FINNET 2.0' portal for compliance with IFSCA {Anti Money Laundering (AML), Counter-Terrorist Financing (CFT) and Know Your Customer (KYC)} Guidelines, 2022.**	To ensure compliance with relevant provisions of the mentioned Guidelines and with the provisions of the Prevention of Money-laundering Act, 2002 and Prevention of Money laundering (Maintenance of Records) Rules, 2005.
March 14, 2024	**Ease of doing business - Settlement of Client's Funds lying with Broker Dealer:** The circular specifies that settlement of funds shall be as per the agreement/consent letter between the broker dealer and its client unless it is specified by IFSCA. The Circular also highlights that stock exchanges in IFSC shall put in place a mechanism for monitoring clients' funds lying with the broker dealers.	To promote ease of doing business in IFSC for both investors and market institutions.

[4] The IFSCA (Fund Management) Regulations, 2022 provide for certain flexibility with respect to investors who are better aware of and have wherewithal to withstand the risks emergent from their investments. Such investors have been termed as "Accredited Investors" and are referred to in clause (c) of sub-regulation (1) of Regulation 2 of IFSCA (Fund Management) Regulations, 2022.

Date	Regulation	Rationale
April 03, 2024	**Remote Trading Participants (RTP) on Stock Exchanges in the IFSC:** Foreign Broker-Dealers, regulated overseas and not having physical presence in IFSC, have been permitted to trade directly on the Stock Exchanges on a proprietary basis. Such an entity shall be referred to as a Remote Trading Participant (RTP). The RTP shall be onboarded by the Stock Exchanges as per the eligibility criteria specified by IFSCA.	To widen the investor base on the stock exchanges and to deepen the liquidity in the listed securities.