Financial Stability Report
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Foreword

As we come to the close of 2023, the global economy and the financial system continue to recover from successive high-intensity shocks over the last four years. There are multiple challenges on the horizon: slow and divergent growth prospects; elevated debt levels; growing geo-economic fragmentation; and prolonging conflicts. High interest rates and large fiscal deficits have added to debt servicing pressures in most countries. As growth prospects remain subdued, policymakers face a daunting task in balancing the pressing requirements of investment in critical public infrastructure, especially those relating to health and education as well as supporting the most vulnerable sections of society.

Inflation has been moderating and a sense of optimism about soft landing of the global economy is taking hold. Global interest rates have peaked in the current monetary policy tightening cycle, though macroeconomic conditions remain too fragile and uncertain for a definite view on growth and inflation conditions going forward. On balance, therefore, it would be prudent to proceed with caution on the evolving outlook and risks.

Against this challenging global backdrop, the Indian economy exhibits macroeconomic resilience, with a robust financial system that is supporting its growth dynamics. We remain alert and committed to act early and decisively to prevent any build-up of risks. Our recent macroprudential measures to curb lenders' exuberance towards certain segments of retail loans underline our commitment to preserve financial stability without compromising availability of funds for productive requirements of the economy.

India is one of the fastest growing major economies in the world with a rising potential growth profile. The sharp rebound in growth is underpinned by sound macroeconomic fundamentals, robust domestic demand and prudent public policies. Achieving durable price stability, ensuring medium-term debt sustainability, further strengthening financial sector resilience, creating new growth opportunities and promoting inclusive and green growth remain key policy priorities.

As this issue of the Financial Stability Report highlights, the health of the Indian financial system is steadily improving on the back of multiyear high earnings, low level of stressed assets, and strong capital and liquidity buffers with financial institutions. We have made significant progress since the onset of the COVID-19 pandemic in steering the economy and the financial system. Now is the time to consolidate these gains and enable the economy to move to a higher growth trajectory with macroeconomic and financial stability.

Even as we confront global headwinds and emerging challenges from technological disruptions, cyber risks and climate change, our endeavour is to continue to fortify the financial system, promote responsible innovation and invigorate inclusive growth. The Reserve Bank and the other financial regulators remain invested in preserving financial stability and fostering a financial system that is resilient to shocks and supportive of growth.

Shaktikanta Das
Governor

December 28, 2023

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List of Select Abbreviations

AA	Account Aggregator
ABHA	Ayushman Bharat Health Account
AD	Authorised Dealer
ADL	Autoregressive Distributed Lag
AEs	Advanced Economies
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
APMI	Association of Portfolio Managers in India
APY	Atal Pension Yojana
ASP	Annuity Service Provider
AUM	Assets Under Management
BCBS	Basel Committee on Banking Supervision
BDI	Baltic Dry Index
BIC	Business Indicator Component
BIFR	Board for Industrial and Financial Reconstruction
BIS	Bank for International Settlements
BoP	Balance of Payments
BSI	Banking Stability Indicator
CAD	Current Account Deficit
CAS	Consolidated Account Statement
CASA	Current Account and Savings Account
CASP	Crypto Asset Service Providers
CCB	Capital Conservation Buffer
CCIL	Clearing Corporation of India Limited
CCPs	Central Counterparties
CCs	Clearing Corporations
CD	Corporate Debtor
CDMDF	Corporate Debt Market Development Fund
CDSL	Central Depository Services Limited
CERT-IN	Computer Emergency Response Team
CET1	Common Equity Tier 1
CFT	Countering the Financing of Terrorism
CIC	Core Investment Company
CIR	Credit Information Reports
CIRP	Corporate Insolvency Resolution Process
CIS	Customer Information Sheet
CLOs	Collateralised Loan Obligations
CMs	Clearing Members
CPI	Consumer Price Index
CRAR	Capital to Risk-Weighted Assets Ratio
CRAs	Credit Rating Agencies
CRE	Commercial Real Estate
CRILC	Central Repository of Information on Large Credits
CVEs	Common Vulnerabilities and Exposures
DDoS	Distributed Denial of Service
DeFi	Decentralised Finance
DFM	Dynamic Factor Model
DGA	Duration Gap Analysis
DICGC	Deposit Insurance and Credit Guarantee Corporation
DIF	Deposit Insurance Fund

DII	Domestic Institutional Investors
DMA	Direct Market Access
DPD	Days Past Due
DSR	Debt Service Ratio
EAR	Earnings At Risk
EBITDA	Earnings Before Interest, Taxes, Depreciations and Amortisation
ECB	External Commercial Borrowings
ECLGS	Emergency Credit Line Guarantee Scheme
EMDEs	Emerging Markets and Developing Economies
EMEs	Emerging Market Economies
EMI	Equated Monthly Instalments
ERPs	ESG Rating Providers
ESG	Environmental, Social, and Governance
ESRB	European Systemic Risk Board
EU	European Union
EXIM Bank	Export Import Bank of India
FAO	Food and Agriculture Organisation
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
FIIs	Foreign Institutional Investors
FIPs	Financial Information Providers
FIU	Financial Information User
FPI	Foreign Portfolio Investment
FRBM	Fiscal Responsibility and Budget Management
FRBs	Foreign Reinsurance Branches
FSB	Financial Stability Board
FSDC	Financial Stability and Development Council
FSDC-SC	Sub Committee of the Financial Stability and Development Council
FSIs	Financial Stress Indices
FSR	Financial Stability Report
FSSI	Financial System Stress Indicator
FVTPL	Fair Value Through Profit and Loss
FY	Financial Year
GAO	Global Administrative Office
GDP	Gross Domestic Product
GFC	Global Financial Crisis
GFCD	Guarantee Fund for Corporate Debt
GFD	Gross Fiscal Deficit
GID	General Information Document
GIFT	Gujarat International Finance Tec-City
GNPA	Gross Non-Performing Asset
GSCD	Guarantee Scheme for Corporate Debt
GSCPI	Global Supply Chain Pressure Index
GSCs	Global Stablecoin Arrangements
GSDP	Gross State Domestic Product
G-SIB	Global Systemically Important Bank
GSS	Green, Social and Sustainability
GST	Goods and Services Tax
HCX	Health Claims Exchange
HFCs	Housing Finance Companies
HFT	Held for Trading
HNFS	Household Net Financial Savings
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
ICR	Interest Coverage Ratio
IDF-NBFCs	Infrastructure Debt Fund – Non-Banking Financial Companies
IEA	International Energy Agency
IFRS	International Financial Reporting Standards
IFSC	International Financial Services Centre
IFSCA	International Financial Services Centres Authority
IIOs	IFSCA Insurance Offices
IIP	Index of Industrial Production
ILM	Internal Loss Multiplier
IMF	International Monetary Fund
InvITs	Infrastructure Investment Trusts
IOSCO	International Organization of Securities Commissions
IRB	Internal Rating Based
IRDAI	Insurance Regulatory and Development Authority of India
IS	Information Systems
ISSB	International Sustainability Standards Board
IT	Information Technology
IU	Information Utility
KID	Key Information Document
KYC	Know Your Customer
LABs	Local Area Banks
LBs	Large Borrowers
LCR	Liquidity Coverage Ratio
LDI	Liability-Driven Investment
LEF	Large Exposure Framework
LEI	Legal Entity Identifier
LMTs	Liquidity Management Tools
LPCC	Limited Purpose Clearing Corporation
LT	Long-term
M&A	Merger and Acquisition
MD	Modified Duration
MDB	Multilateral Development Banks
MDG	Modified Duration Gap
MF	Mutual Fund
MIFOR	Mumbai Interbank Forward Outright Rate
MII	Market Infrastructure Institutions
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
NBFC-ND-SI	Non-Deposit Taking Systemically Important NBFC
NBFIs	Non-Banking Financial Intermediaries
NCD	Non-Convertible Debentures
NCGTC	National Credit Guarantee Trustee Company Limited
NCLT	National Company Law Tribunal
NDL	Non Default Loss
NDTL	Net Demand and Time Liabilities
NHB	National Housing Bank
NHCX	National Health Claims Exchange
NII	Net Interest Income

NIM	Net Interest Margin
NNPA	Net Non performing Assets
NPA	Non-Performing Asset
NPS	National Pension System
NSDL	National Securities Depository Limited
NSE	National Stock Exchange
NSO	National Statistical Office
NSUCBs	Non-Scheduled Urban Cooperative Banks
NTC	New to Credit
OE	Operating Expenses
OECD	Organisation for Economic Co-operation and Development
OIS	Overnight Indexed Swap
OOI	Other Operating Income
OPGSPs	Online Payment Gateway Service Providers
OPS	Old Pension Scheme
ORBIO	Offices of the Reserve Bank of India Ombudsman
ORC	Operational Risk Capital
OSS	Off-Site Surveillance
OTC	Over-the-Counter
P/E	Price-to-Earnings
PA-CB	Payment Aggregators – Cross Border
PAs	Payment Aggregators
PAT	Profit After Tax
PCR	Provisioning Coverage Ratio
PD	Probability of Default
PFCE	Private Final Consumption Expenditure
PFMI	Principles for Financial Market Infrastructures
PFRDA	Pension Fund Regulatory and Development Authority
PMI	Purchasing Managers' Indices
PoP	Points of Presence
PPP	Public Private Partnership
PSBs	Public Sector Banks
PSL	Priority Sector Lending
PSUs	Public Sector Undertakings
PVBs	Private Sector Banks
QIS1	Quantitative Impact Study-1
RBC	Risk Based Capital
RBS	Risk Based Supervision
RECO	Revenue Expenditure to Capital Outlay
REER	Real Effective Exchange Rate
REITs	Real Estate Investment Trusts
REs	Regulated Entities
RFQ	Request For Quote
RO	Representative Office
RoA	Return on Asset
RoE	Return on Equity
RPs	Resolution Plans
RRBs	Regional Rural Banks
RSA	Rate-Sensitive Assets
RSL	Rate-Sensitive Liabilities
RWA	Risk-Weighted Assets
SCBs	Scheduled Commercial Banks
SD	Standard Deviation
SDG	Sustainable Development Goals
SDLs	State Development Loans
SEBI	Securities and Exchange Board of India
SFBs	Small Finance Banks
SGF	Settlement Guarantee Fund
SGX	Singapore Exchange
SGX-ICI	SGX India Connect IFSC Private Limited
SIPs	Systematic Investment Plans
SLCCs	State Level Coordination Committees

SLR	Statutory Liquidity Ratio
SLW	Systematic Lump Sum Withdrawal
SMAs	Special Mention Accounts
SRS	Systemic Risk Survey
SUCBs	Scheduled Urban Cooperative Banks
T-Bills	Treasury Bills
TGA	Traditional Gap Analysis
TOT	Toll-Operate-Transfer
TPA	Third Party Administrators
TReDS	Trade Receivables Discounting System
TREPS	Tri Party Repo Dealing System
UCB	Urban Cooperative Bank
UPI	Unified Payment Interface
USD LIBOR	US Dollar London Interbank Offered Rate
VAR	Vector Auto Regression
VAs	Virtual Assets
VASPs	Virtual Asset Service Providers
WACR	Weighted-Average Call Rate
WALR	Weighted-Average Lending Rate
WTD	Whole Time Directors

Overview

The Financial Stability Report (FSR) is a half-yearly publication with contributions from all financial sector regulators. The FSR reflects 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.

Macrofinancial Risks

The global economy and the financial system, despite displaying resilience in the face of unprecedented monetary tightening and acute banking system stress, are facing difficult challenges. Multiple geopolitical conflicts, growing geo-economic fragmentation, elevated debt levels, and uncertainty about the global economic outlook are some of the key vulnerabilities that pose threat to financial stability. Emerging market economies (EMEs) remain vulnerable to global spillovers and volatile capital flows.

Domestic Economy and Markets

Amidst a challenging global macroeconomic environment, the Indian economy is exhibiting a quickening growth momentum, with resilience and macroeconomic and financial stability. Moderating inflation, improving external position, continuing fiscal consolidation and a strong and stable financial system with fortified balance sheets are hallmarks of this transformation in the post-pandemic period.

Bolstered by strong capital buffers and robust earnings, financial institutions are supporting durable credit growth. At the same time, higher profits and lower leverage are contributing to sound corporate financials. Proactive and prudent policy actions and availability of policy buffers are steering the economy on a rising growth trajectory with stability.

Financial Institutions: Soundness and Resilience

For scheduled commercial banks (SCBs), the capital to risk-weighted assets ratio (CRAR) and the common equity tier 1 (CET1) ratio stood at 16.8 per cent and 13.7 per cent, respectively, in September 2023. Their gross non-performing assets (GNPA) ratio and net non-performing assets (NNPA) ratio fell to multi-year lows of 3.2 per cent and 0.8 per cent, respectively, even as the provisioning coverage ratio (PCR) rose to 75.3 per cent. Healthy interest margins and lower impairments boosted profitability with return on assets (RoA) and return on equity (RoE) reaching decadal high of 1.2 per cent and 12.9 per cent, respectively.

Macro stress tests for credit risk showed that SCBs have sufficient capital buffers and even under adverse stress scenarios their capital ratios will remain above the regulatory minimum.

The CRAR of urban co-operative banks (UCBs) rose to 16.9 per cent in September 2023 while that of NBFCs stood at 27.6 per cent. The consolidated solvency ratio of the insurance sector remains above the minimum threshold limit of 150 per cent.

Network analysis indicates that the total outstanding bilateral exposures among constituents of the financial system continued to grow. As in the past, SCBs had the largest bilateral exposures in September 2023. A simulated contagion analysis shows that losses due to failure of five banks with the maximum capacity to cause contagion would not lead to failure of any additional bank.

Regulatory Initiatives and Other Developments in the Financial Sector

Global regulatory initiatives are refocusing on building up the resilience of the financial system.

These initiatives specifically aim to address fragilities in non-bank financial intermediaries and certain segments of financial markets, leveraged lending, cyber risks, crypto-assets and decentralised finance (DeFi). Management and mitigation of non-default losses (NDLs) by central counterparties (CCPs) is a focus area. Wider adoption of technology, along with new waves of innovations, also poses challenges for financial stability which may have to be addressed through appropriate regulatory/ supervisory measures.

Domestic regulatory initiatives, conditioned by the fast-changing macro-financial environment, are aimed at improving the robustness and resilience of the financial system. Regulatory measures focussed on stemming systemic risk, reducing regulatory arbitrage, expanding secure digitalisation, improving efficiency of the markets, ensuring customer protection and expanding access to finance. Regulators remain vigilant to the rapidly changing economic environment in order to ensure the efficiency and soundness of the financial system.

Assessment of Systemic Risk

A Systemic Risk Survey carried out in November 2023 showed that risk perceptions have either receded or remained unchanged across major categories of risk, except macroeconomic risks. Respondents cited tightening of global financial conditions and increase in commodity prices, particularly crude oil, as a key global risk. While a quarter of the respondents expressed that their confidence in the stability of the global financial system has declined over the last six months, over 95 per cent of them felt that the stability of the Indian financial system has either increased or remained unchanged. Moreover, underlining the resilience and strength of the Indian banking sector, about 80 per cent of the respondents assessed that the prospects of the Indian banking sector have either improved or remained unchanged over a one-year horizon.

Chapter I

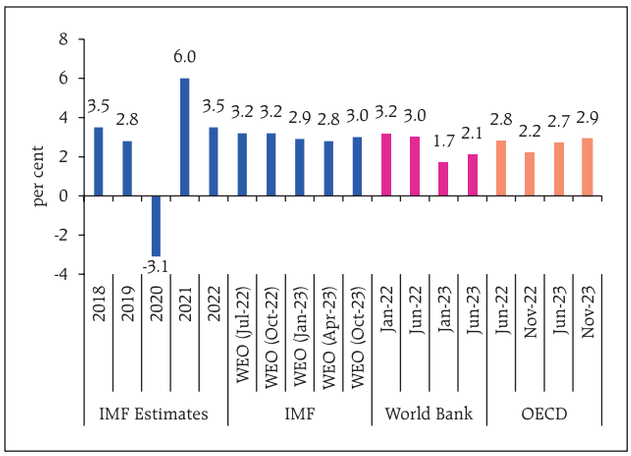
Macrofinancial Risks

Global macrofinancial conditions remain exposed to risks from slowing growth prospects, increasing geopolitical hostilities and high debt levels and tighter financial conditions. Despite a gloomy global environment, the Indian economy has strengthened on the back of strong fundamentals and a stable financial system, with sound balance sheets of financial institutions supporting the funding needs of the growing economy.

Introduction

1.1 Since the June 2023 issue of the Financial Stability Report (FSR), global economy has been in high flux as market expectations shifted from possible recession to 'higher for longer' interest rate to soft landing, amidst heightened geopolitical tensions and volatility in commodity prices. Economic activity is taking divergent paths and has turned uneven across regions. The moderation in inflation from its mid-2022 peak has been interrupted by successive shocks, with core inflation staying elevated across economies. More recently, market expectations have shifted towards an imminent turn in the monetary policy tightening and hawkish pauses are increasingly being expected to give way to rate cuts. Nonetheless, elevated levels of stock of both public and private sector debt and rising servicing costs pose debt sustainability and fiscal risks, and global banks face potential valuation losses in their bond portfolios. Overall, global financial stability risks remain elevated as market participants recalibrate their outlook based on incoming data, with sharp realignment in expectations and resultant repricing of financial assets.

Chart 1.1: Global Growth Forecast for 2023



Sources: IMF, World Bank, OECD.

1.2 The International Monetary Fund (IMF) has projected[1] that global growth would decline to 3.0 per cent in 2023 and 2.9 per cent in 2024, below the pre-pandemic (2000–19) average of 3.8 per cent (Chart 1.1). This moderation in growth momentum is expected to be accompanied by a sharp deceleration in world trade growth, which is projected to fall from 5.1 per cent in 2022 to 0.9 per cent in 2023. Although it is projected to recover to 3.5 per cent in 2024, it would still be below its average growth of 4.9 per cent during 2000-19.

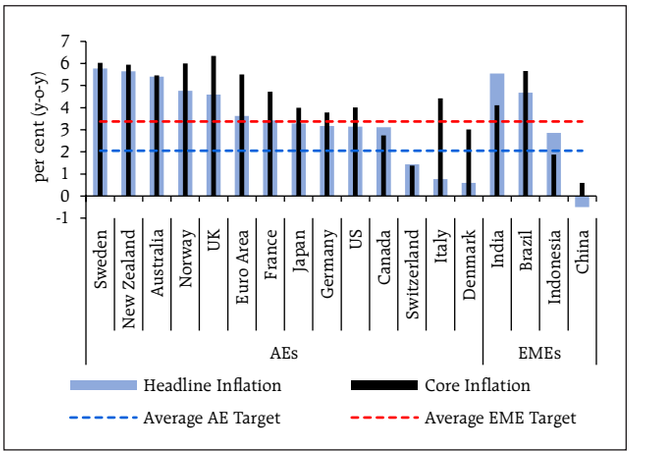
[1] International Monetary Fund (2023), "World Economic Outlook: Navigating Global Divergences", October.

1.3 Inflation trajectories have also turned divergent across economies dispelling the synchronicity in monetary policy among central banks (Chart 1.2).

1.4 The effects of relatively tighter financial conditions are increasingly being felt in rising debt servicing costs and falling savings of households and small businesses. In some AEs, banks have large exposure to commercial real estate (CRE), which is showing signs of impairment in view of higher interest cost co-existent with falling prices, especially for office space. Tight monetary conditions have also affected the profitability of (a) non-bank financial intermediaries (NBFIs) that use leverage to profit from arbitrage opportunities and (b) funds that offer daily liquidity.

1.5 Despite facing successive shocks and large global spillovers, India remains one of the fastest growing major economies in the world, underpinned by sound macroeconomic fundamentals and buffers. The growth momentum remains strong on the back of robust domestic consumption, high public capital expenditure, a recent upturn in private investment and strong exports of services. Real GDP increased by 7.7 per cent in H1:2023-24 and remains on track to expand by 7.0 per cent in FY:2023-24. High frequency indicators support this forecast: despite some recent moderation, purchasing managers' indices (PMIs) for both manufacturing and services sectors remain in expansion terrain and prospects for future activity remain bright. Equity markets are rallying supported by improved valuations and have generally outperformed those in other major peers. Balance sheets of non-financial private corporate entities remain healthy with strong profit margins, as savings on input costs compensated for subdued sales. Global headwinds pose the main risks to the outlook for the Indian economy, although macroeconomic stability is anchored by moderating inflation, ongoing fiscal consolidation and a modest current account deficit (CAD). Headline inflation,

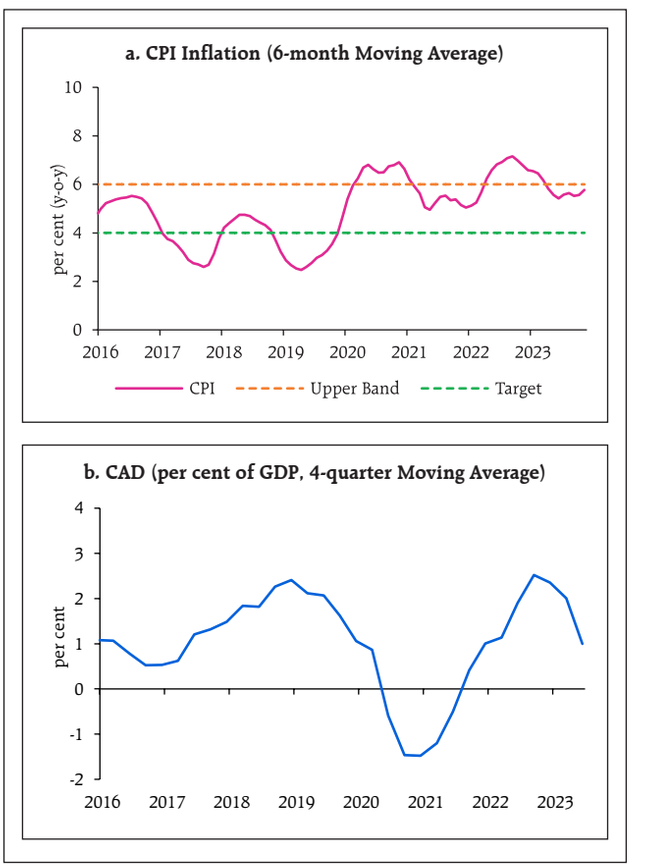
Chart 1.2: Inflation



Note: (1) AEs – Advanced Economies; EMEs – Emerging Market Economies.
(2) Latest available data as on December 14, 2023.
Source: CEIC database.

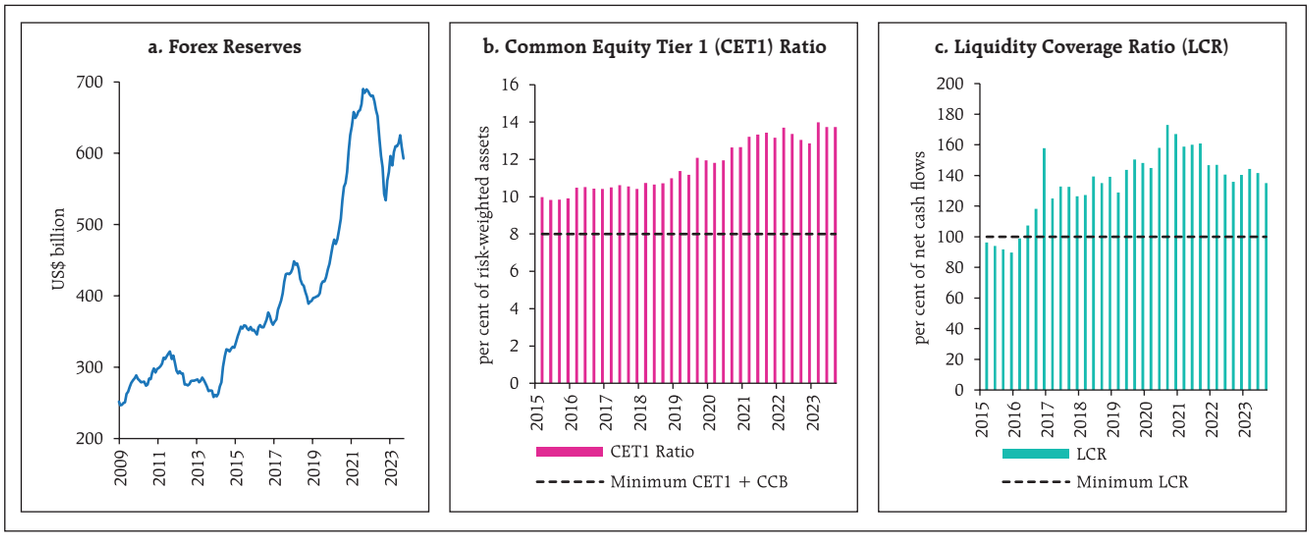
which rose to 7.4 per cent in July 2023 declined to 5.6 per cent by November 2023, easing into the Reserve Bank's tolerance band (Chart 1.3 a). Core inflation

Chart 1.3: Inflation and Current Account Deficit



Sources: National Statistical Office (NSO) and RBI.

Chart 1.4: Forex Reserves and Banking System Buffers



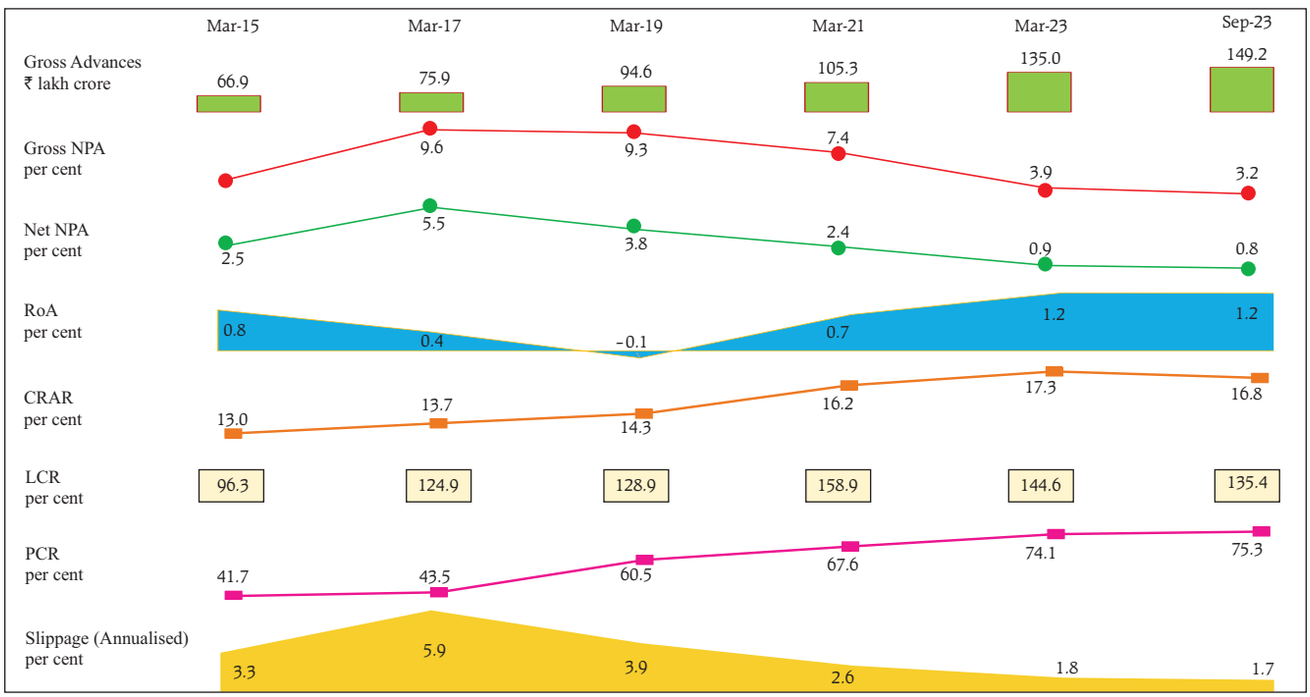
Note: Forex Reserves includes outstanding net FX forwards. CCB - Capital Conservation Buffer.
Source: RBI.

moderated to a 44-month low of 4.1 per cent. The CAD has averaged 1.0 per cent of GDP over the first half of 2023-24 and is expected to remain viable and fully financed (Chart 1.3 b).

1.6 Buffers in the form of foreign exchange reserves, and capital and liquidity in the banking system provide self-insurance against global spillovers (Chart 1.4 a, b and c).

1.7 The resilience of the domestic financial system has been underpinned by robust balance sheets characterised by adequate capital and liquidity buffers and strong earnings (Chart 1.5).

Chart 1.5: Banking Sector Soundness



Note: As on December 11, 2023.
Sources: RBI supervisory returns and staff calculations.

1.8 Healthy balance sheets have enabled banks to maintain a strong and broad-based credit expansion. Non-bank financial companies (NBFCs) have also partaken in extending credit to support economic activity. The strength of the financial system augurs well for maintaining financial stability and strong and sustainable growth.

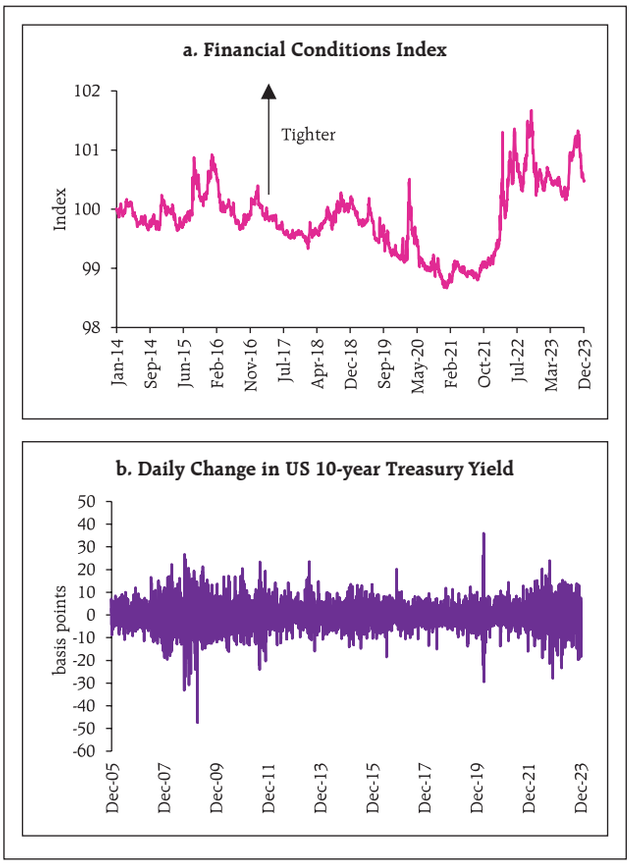
I.1 Global Backdrop

I.1.1. Macrofinancial Development and Outlook

1.9 At the close of 2023, the global economy is negotiating formidable headwinds from (a) geopolitical conflicts in the world's biggest grain and oil supplying regions; (b) geo-economic fragmentation; (c) relatively tighter financial conditions; (d) large fiscal imbalances and elevated public debt and (e) heightened uncertainty on the evolving economic outlook. Consequently, volatility has risen in certain segments of financial markets (Chart 1.6 a and b).

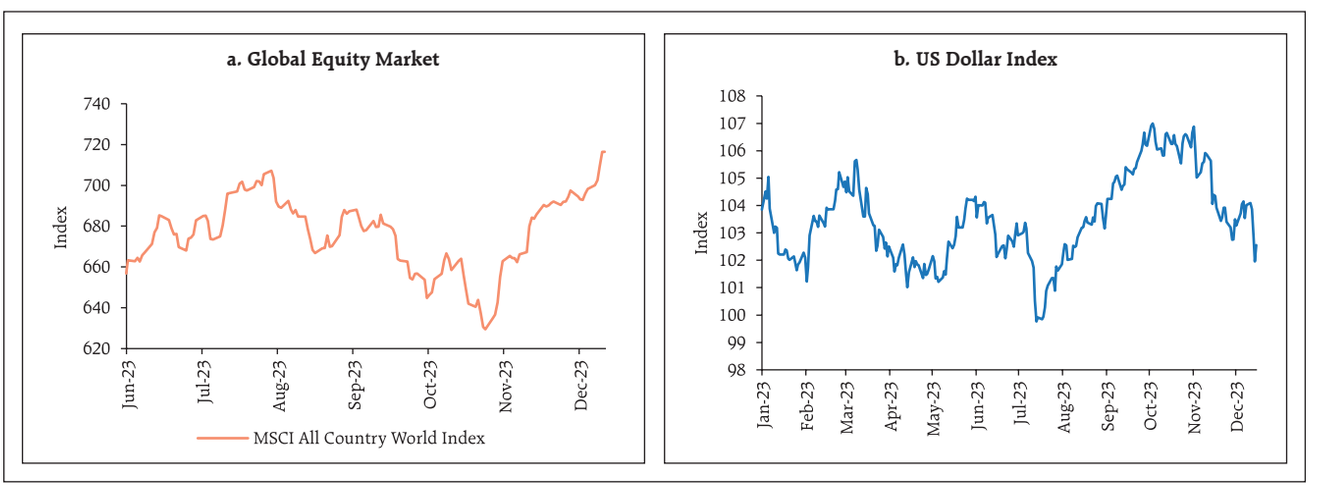
1.10 The future trajectory of monetary policy remains contingent upon the trials of the last mile to be traversed in aligning inflation with targets. Markets nervously gyrate on release of every incoming data as exemplified in movements in equity prices and exchange rates (Chart 1.7 a and b).

Chart 1.6: Financial Conditions and Bond Volatility



Note: 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.
Sources: Goldman Sachs and Bloomberg.

Chart 1.7: Movement in Equity Prices and Exchange Rates



Source: Bloomberg.

1.11 Financial stability challenges have become accentuated in light of these developments. While swift and effective resolution measures by authorities prevented the acute banking stress of March 2023 from spreading to other segments of the financial system and contained cross-border contagion as well as spillovers to the real economy, the global banking system is expected to remain under pressure due to higher funding costs, valuation losses on investments and potential loan losses due to heavier debt burdens on borrowers. Sudden and sharp movements in market prices could create stress in the less regulated NBFI sector, where the build-up of leverage is keeping policy authorities on guard, especially hidden leverage due to the use of derivatives and other off-balance sheet exposures[2].

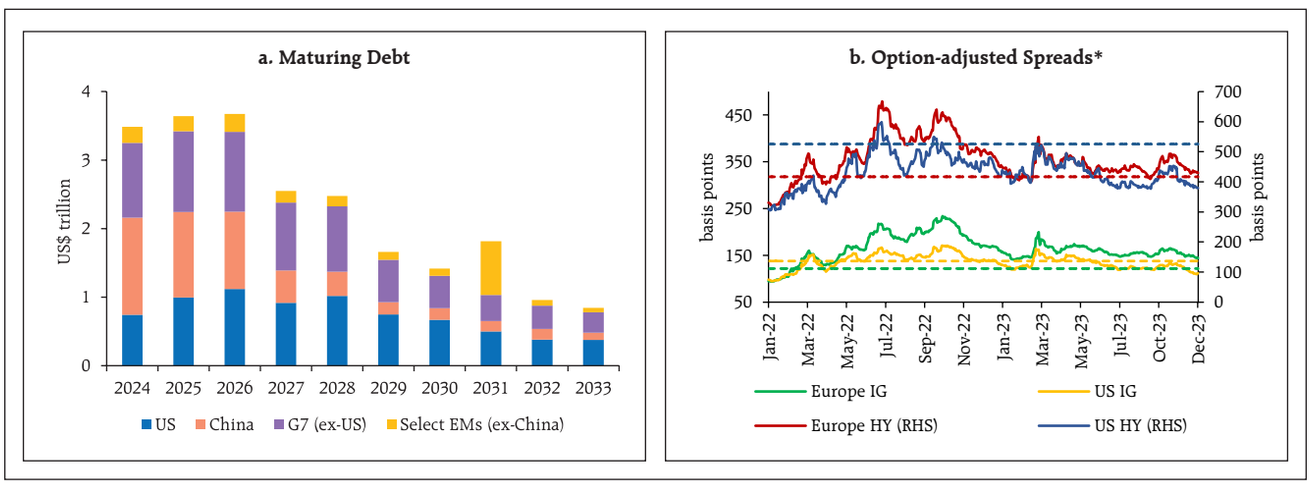
I.1.2 Other Global Macrofinancial Risks

1.12 In the wake of the aggressive and synchronised monetary tightening that has dominated 2022 and 2023, multiple sources of macrofinancial vulnerabilities have surfaced that tilt the balance of global financial stability risks to the downside. Going forward, interest rate risk exposures, large public debt, bond market vulnerabilities, financing of climate transition in emerging markets and developing economies (EMDEs), geo-economic fragmentation and realignment of supply chains are the key near-term and medium-term challenges.

A. Interest Rate Risk Exposures

1.13 Corporates and households have so far displayed resilience to the current rate tightening cycle. Financial buffers built during the pandemic, a relatively lower share of variable rate debt and elongation of debt maturities have mitigated the impact of rate increases and helped them service their debts. Given the lags in monetary policy transmission, interest rate risks tend to materialise over several quarters in financing costs. As regards the non-financial corporate sector, it is staring at an imminent debt maturity wall in coming years even as corporate spreads have moderated (Chart 1.8 a and b). The total number of corporate bond defaults worldwide increased to 118 in September 2023, almost double the amount on a year-on-year basis and far higher than the typical average for this time of the year (101)[3].

Chart 1.8: Corporate Debt Maturity and Spreads



Note: (1) Select EMs include Mexico, Brazil, Chile, India, Sri Lanka, Indonesia, Malaysia, Philippines, Thailand, Vietnam and South Africa.
(2) * Dotted lines indicate median value from 2005 to current date; HY - High Yield; IG - Investment Grade.
Sources: Bloomberg and FRED.

[2] Financial Stability Board (2023), "The financial stability implications of leverage in Non-Bank Financial Intermediation", September.

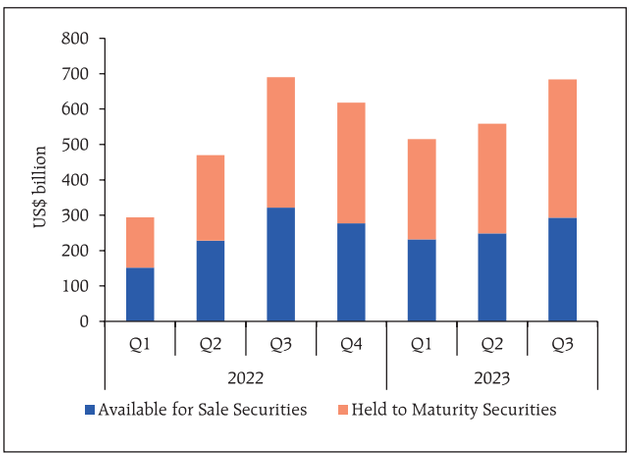
[3] S&P Global Ratings (2023), "Default, Transition, and Recovery: Distressed Exchanges Drive 2023 Global Corporate Defaults To 118", October.

1.14 A prolonged period of high interest rates is also expected to test the resilience of the banking sector, where revaluation of assets is once again becoming a concern similar to the turmoil in March 2023 (Chart 1.9).

1.15 Rising interest rates have benefitted banks and improved their net interest margins (NIM), as the transmission to yield on assets has been faster than that to the cost of funds (Chart 1.10). Nevertheless, as the rate cycle approaches its peak, banks' profitability is expected to come under pressure due to rising valuation losses, increasing risks for asset quality and tempering of credit growth.

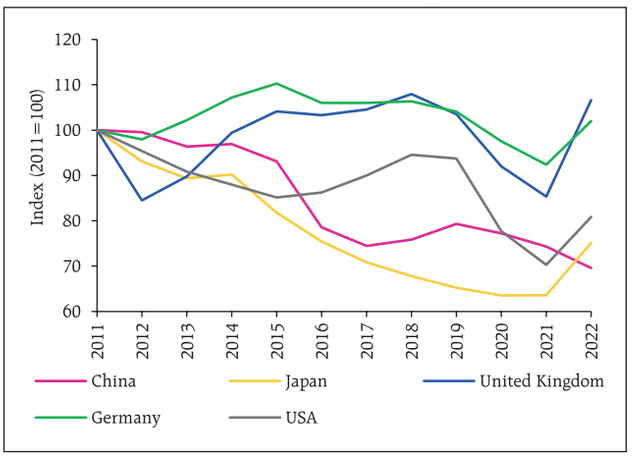
1.16 Another concern relates to the possibility of decline in value of underlying property assets, especially for CRE lending by banks. Preference among businesses to lessen office footprints, the penchant of employees for remote working and cost-cutting exercises have put downward pressure on CRE prices. In a higher interest rate regime with lower than trend economic growth, banks could, therefore, see impairment in their CRE portfolios (Chart 1.11 a, b and c).

Chart 1.9: Unrealised Losses in US Banks



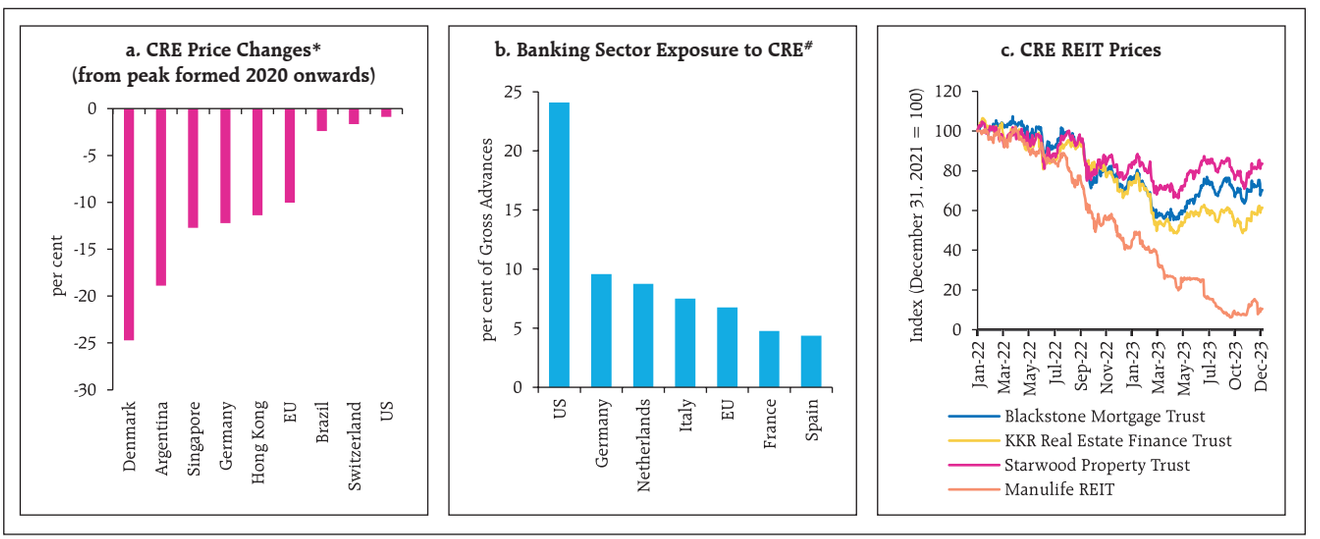
Source: Federal Deposit Insurance Corporation (FDIC).

Chart 1.10: Net Interest Margin



Source: S&P Capital IQ.

Chart 1.11: Commercial Real Estate Exposures

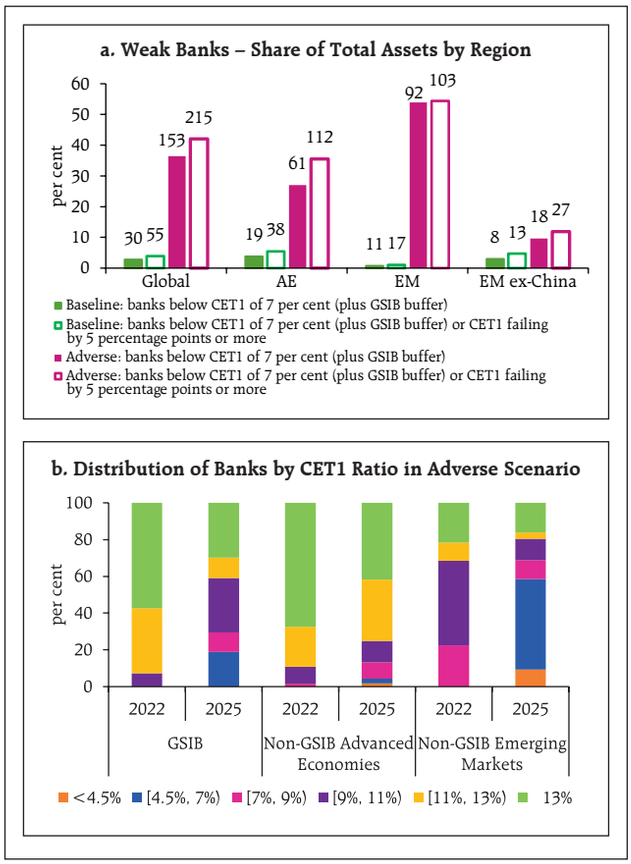


Note: (1) * Based on BIS data with cut-off date as November 27, 2023.
(2) # As at end-June 2023.
Sources: Bank for International Settlements (BIS), EBA, Federal Reserve and Bloomberg.

1.17 According to the IMF's enhanced global stress tests[4], the global banking system remains resilient on an aggregate level but there is a substantial tail of weak banks[5] that is expected to experience large valuation losses in investments and debilitation of loan loss provisions. Under this stress testing framework, an adverse scenario that assumes persistent inflation and more monetary tightening may cause 215 banks representing 42 per cent of global bank assets, especially from AEs and China, to remain weak[6] (Chart 1.12 a and b).

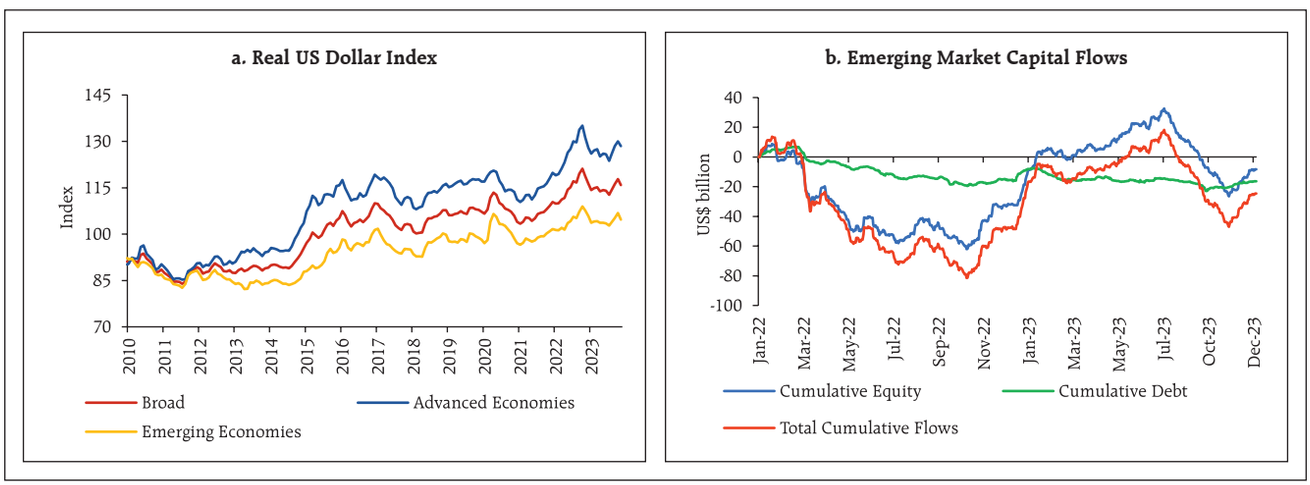
1.18 The relative strength of the US dollar against other currencies and escalating geopolitical tensions pose several challenges for EMDEs such as capital outflows, tighter financial conditions, widening bond spreads and loss of competitiveness of global trade in goods and services due to terms of trade erosion (Chart 1.13 a and b).

Chart 1.12: Global Bank Stress Test Results



Note: Values on top of the bar represent number of banks.
Source: IMF.

Chart 1.13: US Dollar Strength and Capital Outflows



Note: Real US Dollar Index is the monthly average of Federal Reserve Board trade-weighted index based on trade in goods and services. An increase indicates appreciation of the USD.
Sources: Federal Reserve Economic Data (FRED) and Institute of International Finance (IIF).

[4] IMF (2023), "Global Financial Stability Report", October.

[5] A bank is "weak" if either (1) its CET1 ratio falls below 7 percent—the Basel minimum of 4.5 percent plus a capital conservation buffer of 2.5 percent—plus buffers for G-SIBs where applicable, or (2) its CET1 ratio at its lowest point over the stress test horizon (2023–25) represents a decrease of more than 5 percentage points from the stress test's starting point of 2022, excluding banks that are highly capitalized (with more than a 30 percent CET1 ratio).

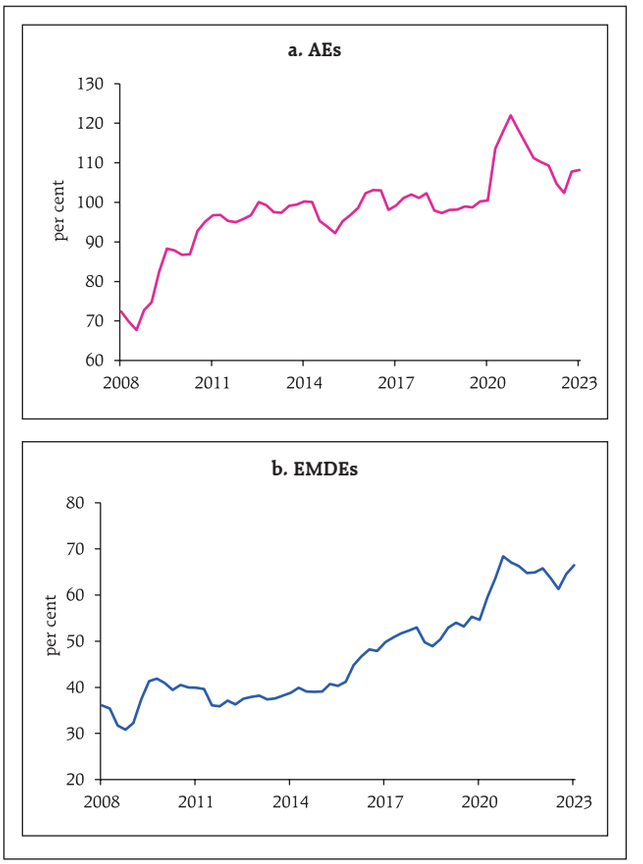
[6] Ibid.

B. Public Debt

1.19 Both AEs and EMDEs have to contend with high public debt-to-GDP ratio as it stays much above the pre-pandemic levels (Chart 1.14 a and b). Global public debt is expected to reach to 93 per cent of world GDP in 2023 and is projected to grow by one percentage point every year to reach nearly 100 per cent of GDP by the year 2030. Within this unabated expansion, public debt is projected to reach 116.3 and 78.1 per cent of GDP for AEs and EMDEs, respectively, by 2028[7].

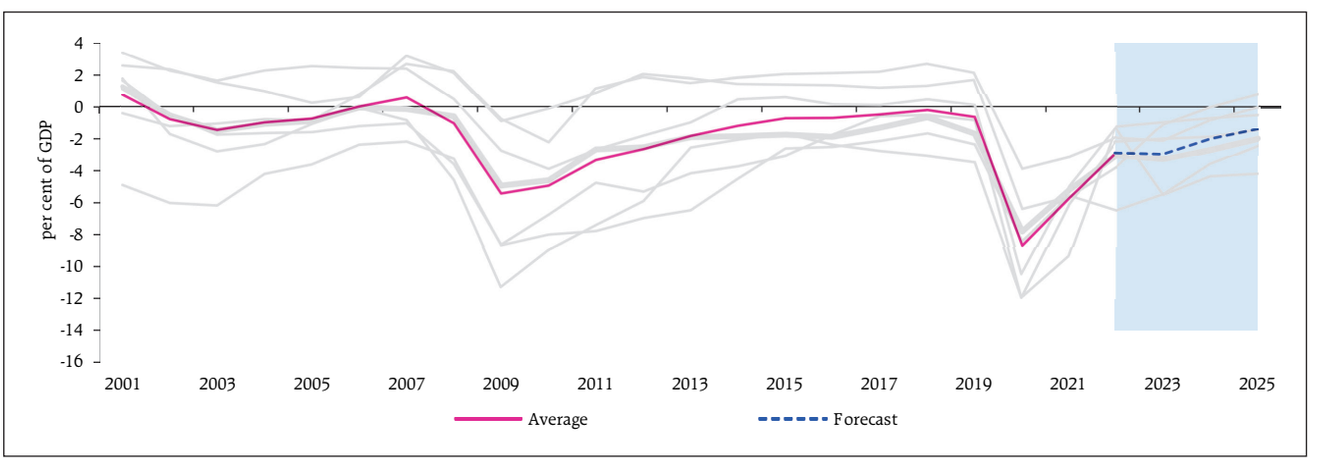
1.20 Public debt and its servicing pose concern because maintenance of persistent primary surpluses has become difficult in the face of slowing growth (Chart 1.15). Interest rate-growth rate differentials are also narrowing in an environment

Chart 1.14: General Government Debt to GDP



Source: BIS.

Chart 1.15: General Government Primary Balance (G7 countries)



Note: Shaded region represents forecast.
Source: IMF and Bloomberg.

[7] IMF (2023), "Fiscal Monitor - Climate Crossroads: Fiscal Policies in a Warming World", October.

Chart 1.16: Interest Rate-Growth Rate Differential (G7 countries)

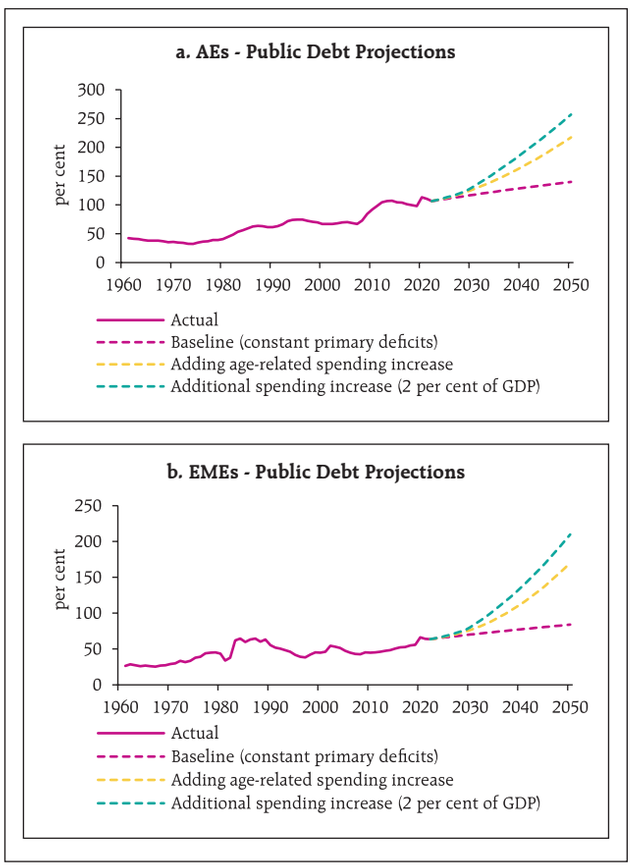
Notes: (1) Forecast is based on real interest rates that are derived by deducting consumer price inflation from nominal 10-year government yields; Nominal yield forecasts are based on analyst estimates provided by Bloomberg while CPI and GDP growth forecasts are based on IMF estimates.
(2) Shaded region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

of slowing growth (Chart 1.16). Moreover, aging population, climate finance needs, and defence spending in response to escalating geopolitical tensions require substantial public resources, posing major challenges for fiscal consolidation. It is estimated that age-related expenditures in the absence of fiscal consolidation would push public debt above 200 per cent and 150 per cent of GDP in AEs and EMEs, respectively by 2050, even if interest rates remain below growth rates (Chart 1.17 a and b). Furthermore, additional spending incurred towards climate finance and defence expenditure can lead up to 50 per cent increase in public debt by 2050[8].

1.21 While country-specific factors will determine market outcomes, it is likely that high interest rates will put pressure on government balances, especially the roll-over of maturing debt, as investors also price higher term premiums for bearing duration risk.

1.22 High public debt is an even larger problem for EMDEs in view of higher debt servicing costs. While larger EMDEs are able to access the market and raise debt, other countries, which face a high

Chart 1.17: Global Public Debt Projections (as per cent of GDP)



Source: BIS.

[8] BIS (2023), "Annual Economic Report", June.

risk of distress, are either losing access to market financing or defaulting. Low-income countries face significant refinancing risk as 20 per cent of their debt is due within one year and 42 per cent within three years[9].

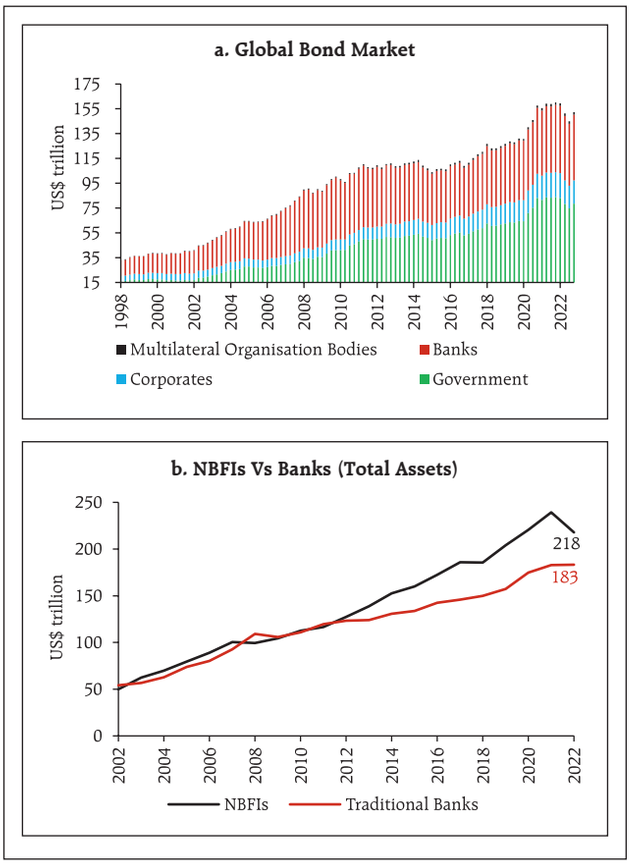
C. Bond Market Vulnerabilities in AEs

1.23 During the last two decades, global bond markets have grown from around US$ 40 trillion at the start of the millennium to US$ 152 trillion by the end of 2022. Alongside, NBFIs have overtaken traditional banks in asset size (Chart 1.18 a and b). In tandem, vulnerabilities in bond markets have also increased, driven by surge in hidden leverage among NBFIs, withdrawal of banks and primary dealers from their traditional role of market makers and a decrease in overall liquidity in government bond markets.

1.24 The rising profile of NBFIs in bond markets poses several challenges with implications for systemic stability. For instance, in March 2020, the US treasury market was impacted by losses of hedge funds, which had taken large and hidden positions in treasuries through derivatives. In September 2022, the actions of pension funds engaged in so-called liability-driven investment (LDI) strategies led to sharp fall in gilt prices in the UK. In both instances, central banks had to intervene to stabilise the markets.

1.25 Recent developments indicate that hedge funds are increasing their exposure to cash-futures basis trade, which involves a long Treasury cash position, a short Treasury futures position, and borrowing in the repo market to finance the trade[10] - the same trade that contributed to massive losses in March 2020. These trades enable hedge funds to arbitrage between underlying bonds and futures. The counterparties to these trades are asset managers like pension funds who prefer buying treasury futures instead of bonds to match the duration of their assets and liabilities as it requires less cash upfront. These trades enable both hedge funds and asset managers to increase exposure of treasury bonds through leverage. More importantly, since arbitrage differences are small, hedge funds must run large positions to earn a meaningful return. As of December 2022, hedge funds borrowed US$ 553 billion in repo borrowing to fund treasury bond purchases as against total capital of US$ 9.9 billion,

Chart 1.18: Bond Market and NBFI Growth



Source: BIS and Financial Stability Board (FSB).

[9] OECD (2023), "OECD Sovereign Borrowing Outlook 2023", May.

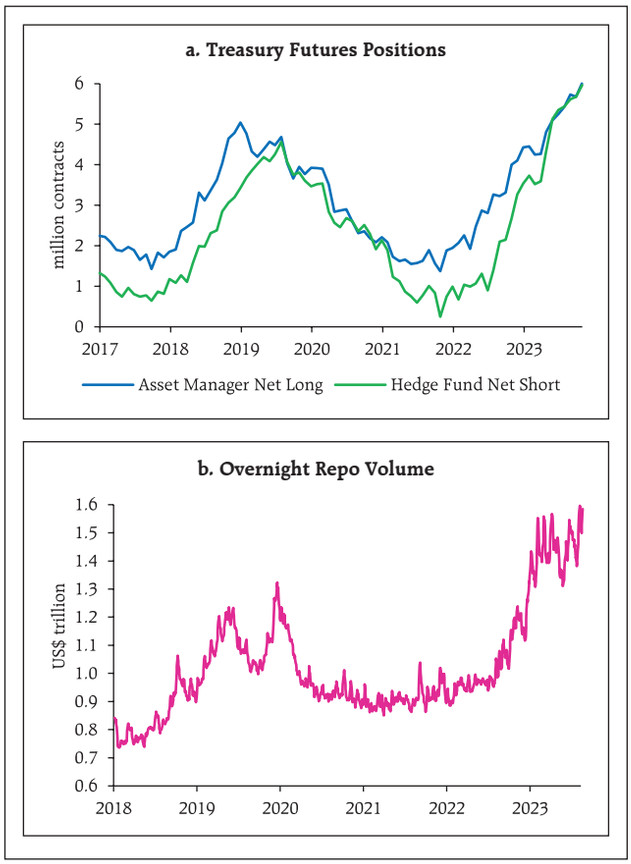
[10] Barth, Daniel, R. Jay Kahn, and Robert Mann (2023). "Recent Developments in Hedge Funds' Treasury Futures and Repo Positions: is the Basis Trade 'Back'?", FEDS Notes. Washington: Board of Governors of the Federal Reserve System, August 30, 2023, https://doi.org/10.17016/2380-7172.3355.

with effective leverage of 56 to 1[11]. Recent data show that both repo borrowing and basis trade positions have grown beyond their previous peaks in 2019 (Chart 1.19 a and b). Since these positions are highly leveraged and are exposed to both changes in futures and repo margins, they impose a financial stability vulnerability.

1.26 According to the Financial Stability Board (FSB)[12], the full extent of NBFIs leverage is difficult to assess as hedge funds, family offices and pension funds are taking on excess leverage through 'synthetic' positions. This poses financial stability concerns as liquidity demands from leveraged positions, which are exposed to margin calls on derivative trades and volatility in underlying assets, have the potential to amplify shocks. As the FSB's recent report on non-bank financial intermediation shows, the size of the sector in 2022 witnessed first notable decrease since 2009 due to the impact of higher interest rate on their asset valuations[13].

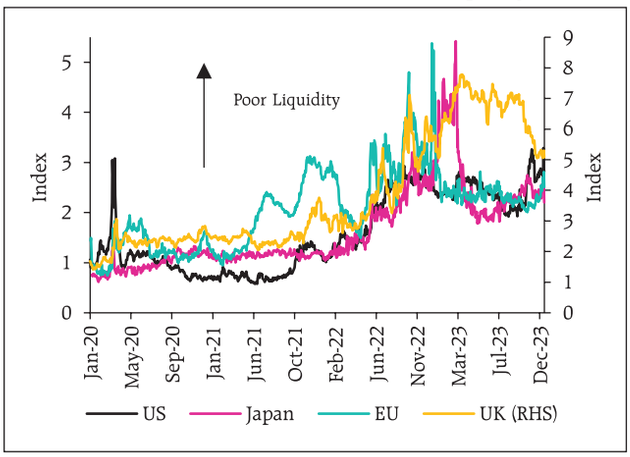
1.27 Structural vulnerabilities in the US treasuries market, which is the largest and most liquid government bond market, have increased as banks that acted as market makers no longer perform that role. New entrants such as NBFIs and other market participants have not stepped in to fill the void. Since 2007, the total size of primary dealer balance sheets has decreased by a factor of roughly four for every US dollar of outstanding treasury securities[14]. This has reduced liquidity in treasuries markets and similar trends are seen in other AE bond markets (Chart 1.20). Reduced liquidity in an environment of heavy sovereign debt raising is likely to impart bouts of volatility in bond markets.

Chart 1.19: US Treasury Market and Repo Volume



Note: Repo volume is estimated using 5-day Moving Average of Secured Overnight Financing Rate (SOFR) Volume.
Sources: CFTC and New York Fed.

Chart 1.20: Government Bond Market Liquidity



Source: Bloomberg.

[11] Banegas, Ayelen, and Phillip Monin (2023). "Hedge Fund Treasury Exposures, Repo, and Margining," FEDS Notes. Washington: Board of Governors of the Federal Reserve System, September 08, 2023, https://doi.org/10.17016/2380-7172.3377.

[12] Financial Stability Board (2023), "The Financial Stability Implications of Leverage in Non-Bank Financial Intermediation", September.

[13] Financial Stability Board (2023), "Global Monitoring Report on Non-bank Financial Intermediation 2023", December.

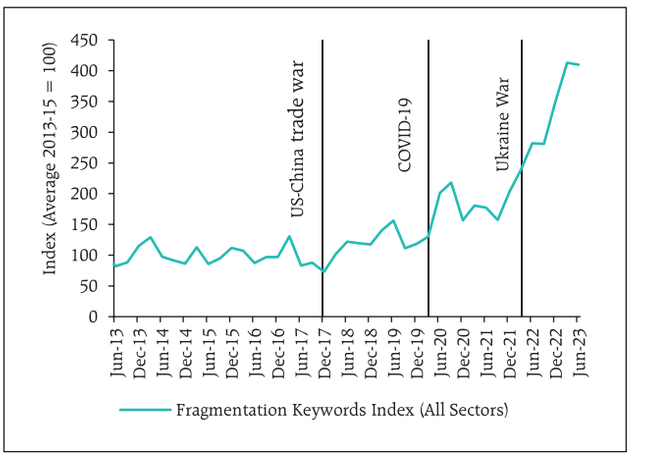
[14] Duffie, Darrell (2023), "Resilience redux in the US Treasury market", August.

D. Geo-economic Fragmentation

1.28 The widening fractures in the global economic order pose macrofinancial risks in different forms such as trade barriers, disruption in capital flows, ruptures in commodity markets, technological decoupling and migration restrictions which are threatening to reverse the benefits of global integration (Chart 1.21).

1.29 The number of new trade barriers have roughly tripled since 2019 to reach nearly 3,000 in 2022 from nearly 300 a decade ago[15] . Meanwhile, global flows of goods and services have tapered (Chart 1.22 a and b). It is estimated that the cost of trade restrictions alone on global output will range from 0.2 per cent in a limited fragmentation scenario to 7.0 per cent under severe conditions[16]. Going forward, measures adopted by certain countries, such as carbon border tax, would further deepen economic fragmentation.

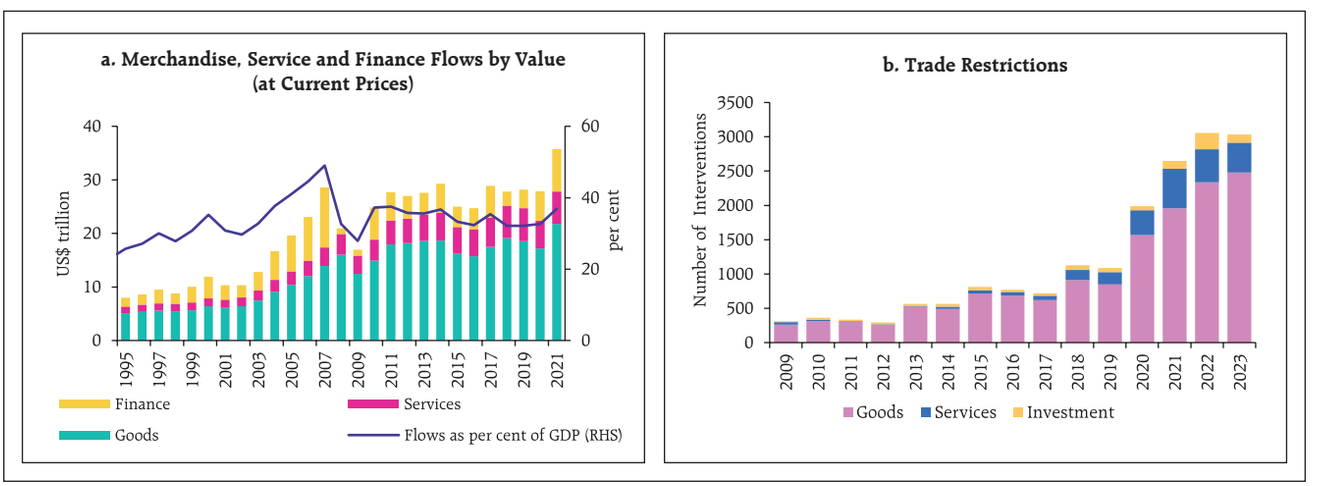
Chart 1.21: Fragmentation Keywords in Earning Calls



Note: Fragmentation Keywords Index (All Sectors) measures the average number of sentences, per thousand earnings calls, that mention at least one of the following keywords: deglobalisation, reshoring, onshoring, nearshoring, friend-shoring, localisation, regionalisation.
Source: IMF.

1.30 Foreign direct investment (FDI) is also increasingly being determined by geopolitical alignments and inward-looking production strategies. FDI flows as a share of GDP have been moderating; in 2022, global FDI flows declined by

Chart 1.22: Trade Flows Restrictions

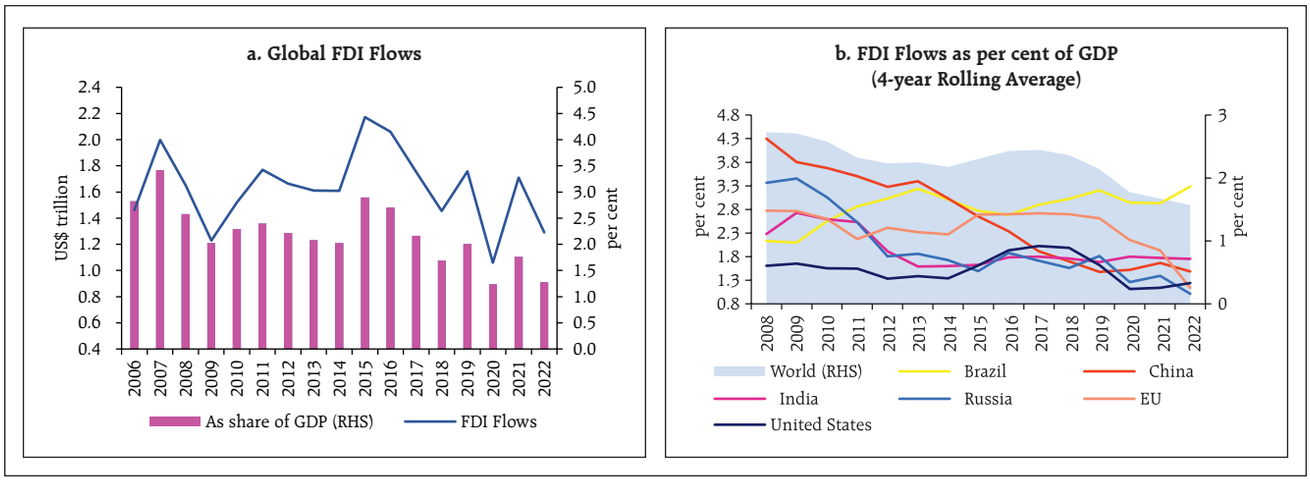


Sources: UNCTAD, IMF and Global Trade Alert.

[15] IMF Blog (2023), "The High Cost of Global Economic Fragmentation", August 28.

[16] Georgieva, Kristalina (2023), "Confronting Fragmentation Where It Matters Most: Trade, Debt, and Climate Action", IMF Blog, January 16.

Chart 1.23: FDI Flows



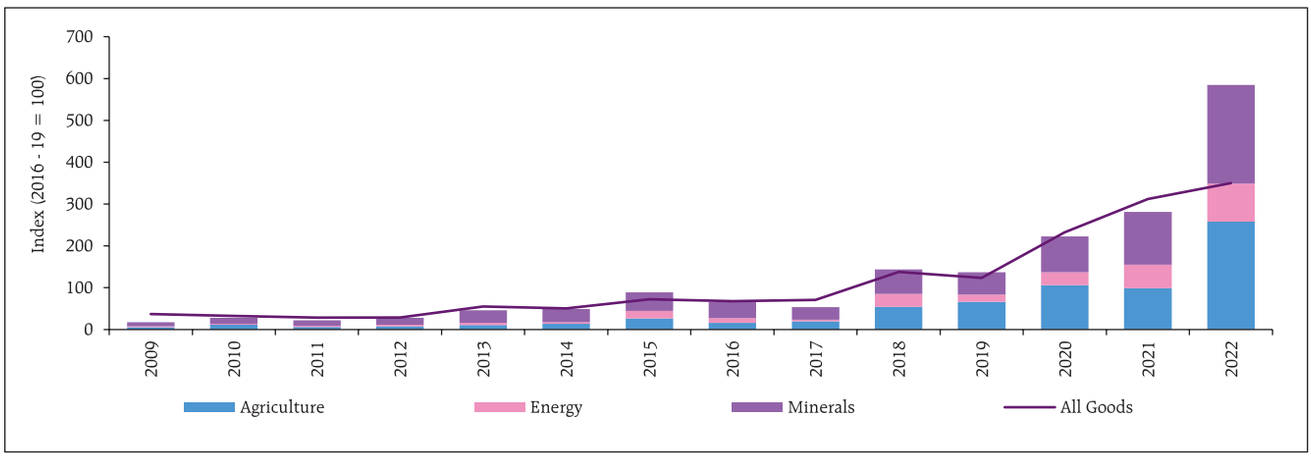
Sources: OECD and IMF.

5 per cent[17] with a dip in cross-border merger and acquisition (M&A) flows (Chart 1.23 a and b).

1.31 Commodity markets are particularly vulnerable to fragmentation due to their inherently high production concentration, low price elasticity of supply, low substitutability and complex supply chains. Trade interventions in commodities have been rising as well, especially in minerals and agricultural commodities (Chart 1.24).

1.32 These disruptions have contributed to supply shocks, high price volatility, widening price differentials across markets, and a decrease in

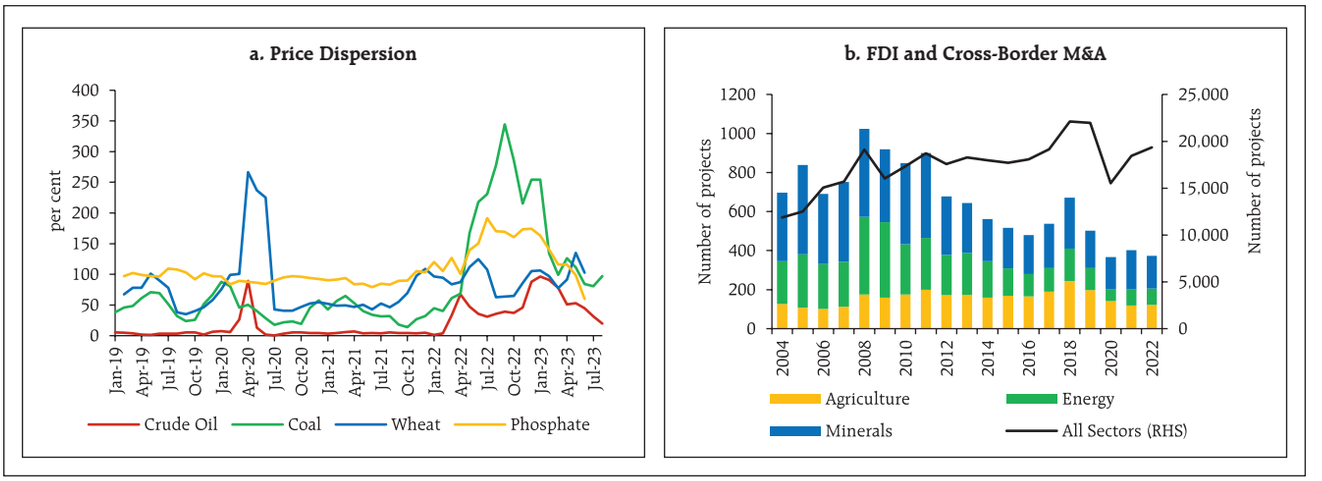
Chart 1.24: Trade Intervention in Commodities



Source: IMF.

[17] OECD (2023), "FDI in Figures", April.

Chart 1.25: Signs of Fragmentation in Commodities



Note: Price dispersion is measured as difference between maximum and minimum as a per cent of minimum price across regions.
Source: IMF.

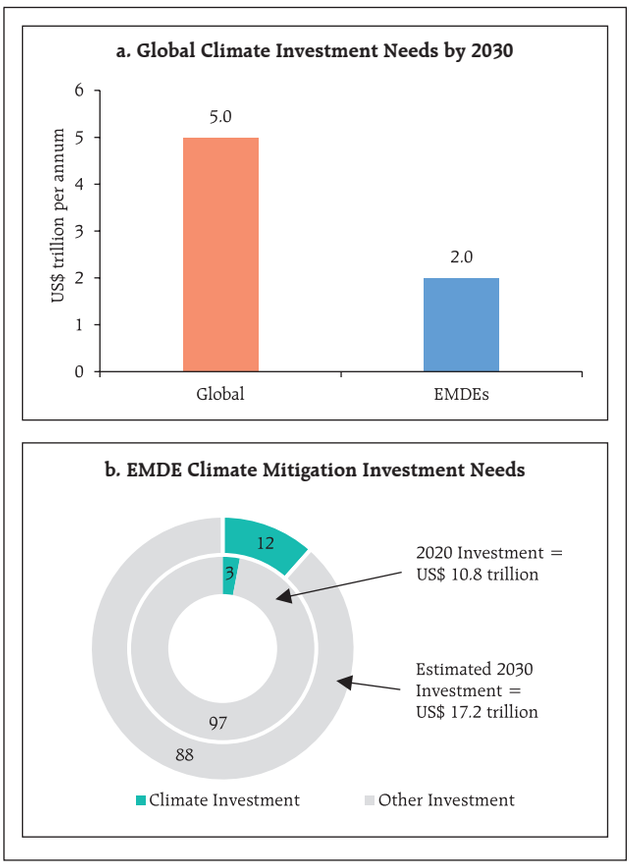
commodity sector FDI activity (Chart 1.25 a and b). EMDEs are particularly vulnerable to commodity market fragmentation, with long-term output losses expected to exceed two per cent of their GDP[18].

E. Climate Finance

1.33 Financing needs for climate change mitigation are large: the International Energy Agency (IEA) estimates that around US$ 5 trillion in yearly global gross investments will be required by 2030 to achieve net zero greenhouse gas emissions by 2050 (Chart 1.26 a). EMDEs, which face important challenges in attracting private capital and have limited fiscal space, need about 40 per cent of these investments so that climate mitigation investments increase to 12 per cent of total investments by 2030 from the 2020 level of 3 per cent[19] (Chart 1.26 b).

1.34 Private finance is critical for EMDEs to meet their climate investment requirements for both mitigation and adaptation. Estimates show that public investments will not be sufficient to meet climate investment needs and the share of private capital has to more than double from the

Chart 1.26: Climate Investment Needs



Source: IMF.

[18] International Monetary Fund (2023), "World Economic Outlook: Navigating Global Divergences", October.

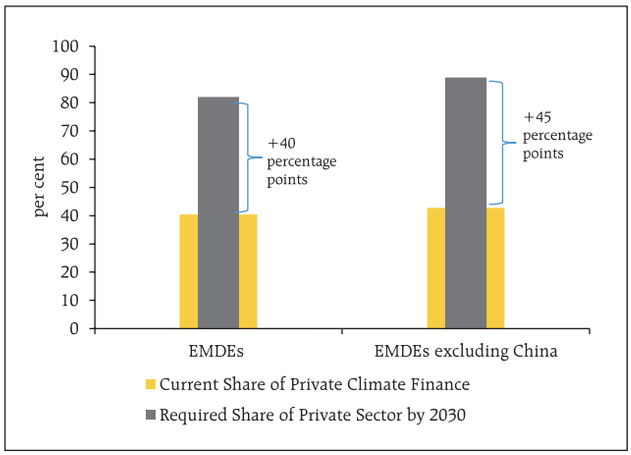
[19] International Monetary Fund (2023), "Global Financial Stability Report: Financial and Climate Policies for a High-Interest-Rate Era", October.

current level of 40 per cent by 2030[20] (Chart 1.27). Risk-return profile of climate projects, however, are not amenable to private capital at scale and public sector participation can help de-risk such projects. Therefore, public-private partnership is essential to mobilise finance to meet the growing climate investment needs.

1.35 Attracting private capital, however, is hard for EMDEs due to multiple constraints: lack of an investment-grade sovereign rating for many of them, stringent environmental, social, and governance (ESG) regulations by their counterparts in AEs, investor concerns about risk-return profiles of investments, policy uncertainty, shallow capital markets, regulatory challenges and management of foreign exchange risk[21]. Green, Social and Sustainability (GSS) bond issuance dipped in 2022 amidst challenging financing conditions in global markets. In terms of issuance currency, US Dollar (USD) and Euro constituted 71 per cent of total bond issuance. For the few select investment-grade EMDEs that can access this market, 42 per cent of bonds were issued in Chinese Yuan (CNY) while Euro and US dollar issuance constituted only 35 per cent (Chart 1.28 a and b).

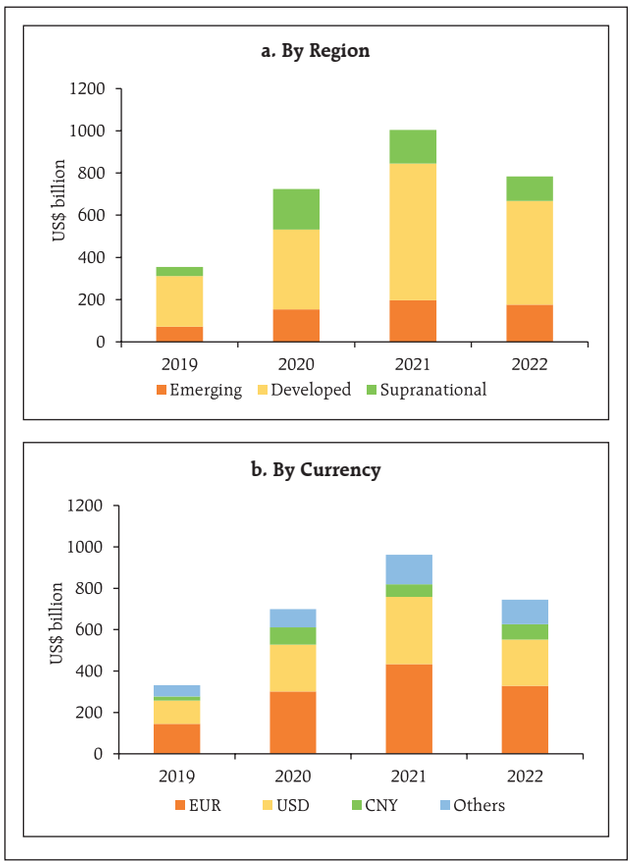
1.36 In order to build an attractive private investment climate and generate private capital flows to EMDEs, public-private collaboration and sound financial sector policies are vital. Taxonomies, disclosure requirements and suitability and appropriateness standards for GSS financial instruments are critical in this regard. The G-20 Independent Expert Group has suggested an increase in annual spending by multilateral development banks (MDBs) by US$ 3 trillion by 2030, including US$ 1.8 trillion for additional climate action, and US$ 1.2 trillion for achieving other sustainable development goals (SDGs).

Chart 1.27: Private Financing Share in EMDE Climate Investments



Source: IMF.

Chart 1.28: Green, Social and Sustainability Bond Issuances



Source: Climate Bond Initiative.

[20] International Monetary Fund (2023), "Global Financial Stability Report: Financial and Climate Policies for a High-Interest-Rate Era", October.

[21] Ibid.

F. Commodity Markets

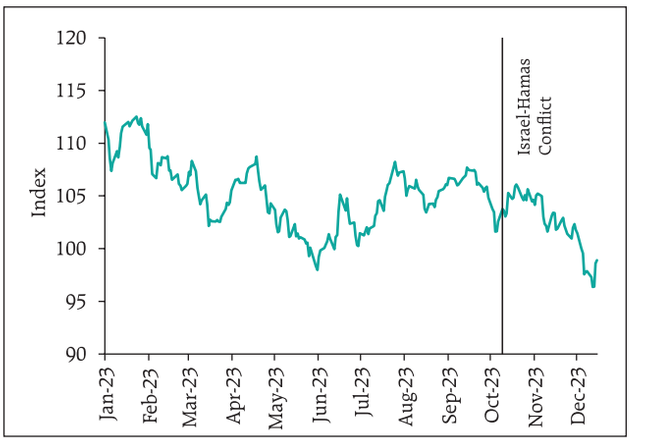
1.37 The recent moderation in commodity prices faces challenges from the conflict in the Middle East and global polarisation, even though their impact has so far been muted (Chart 1.29). Escalation or widening of conflict could flare up these prices, especially those of crude oil.

1.38 Supply chain disruptions, which rose during the COVID-19 pandemic and Russia-Ukraine war, have eased substantially with the global supply chain pressure index (GSCPI)[22] falling to a 26-year low, driven by a sharp reduction in transportation costs. (Chart 1.30).

1.39 Oil prices rose between June and October 2023, driven by cuts in oil production by OPEC+ member countries and the conflict in West Asia. Prices have fallen sharply thereafter as waning global demand and increase in stockpiles outweighed production cuts and the conflict in West Asia has not been allowed to broaden. Futures prices, however, remain above June 2023 levels (Chart 1.31).

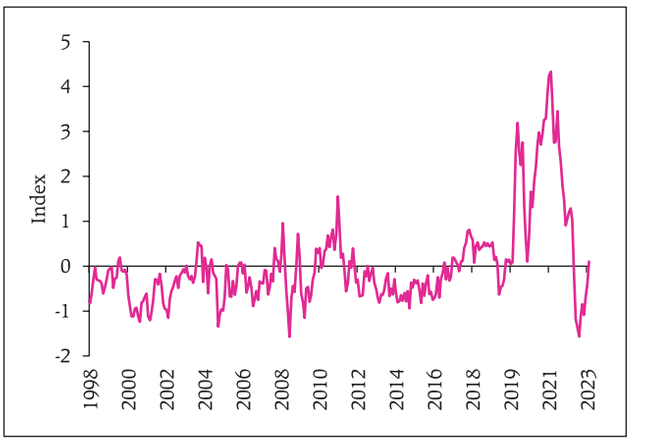
1.40 Historical evidence suggests that military conflicts in the region often create substantial supply disruptions leading to spike in oil prices and

Chart 1.29: Bloomberg Commodity Index



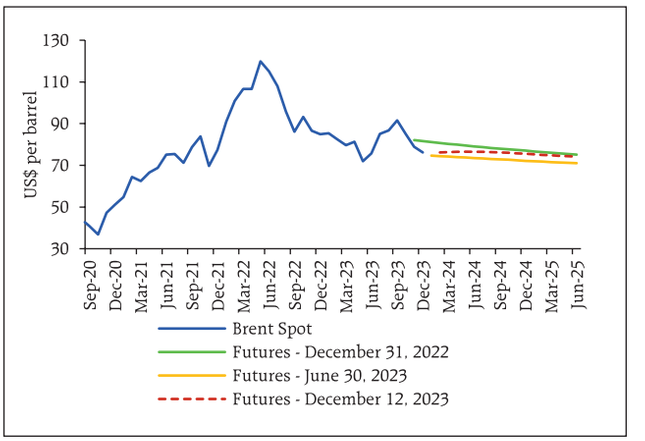
Note: Bloomberg Commodity Index is calculated on an excess return basis and reflects commodity futures price movements.
Source: Bloomberg.

Chart 1.30: Global Supply Chain Pressure Index



Source: Federal Reserve Bank of New York.

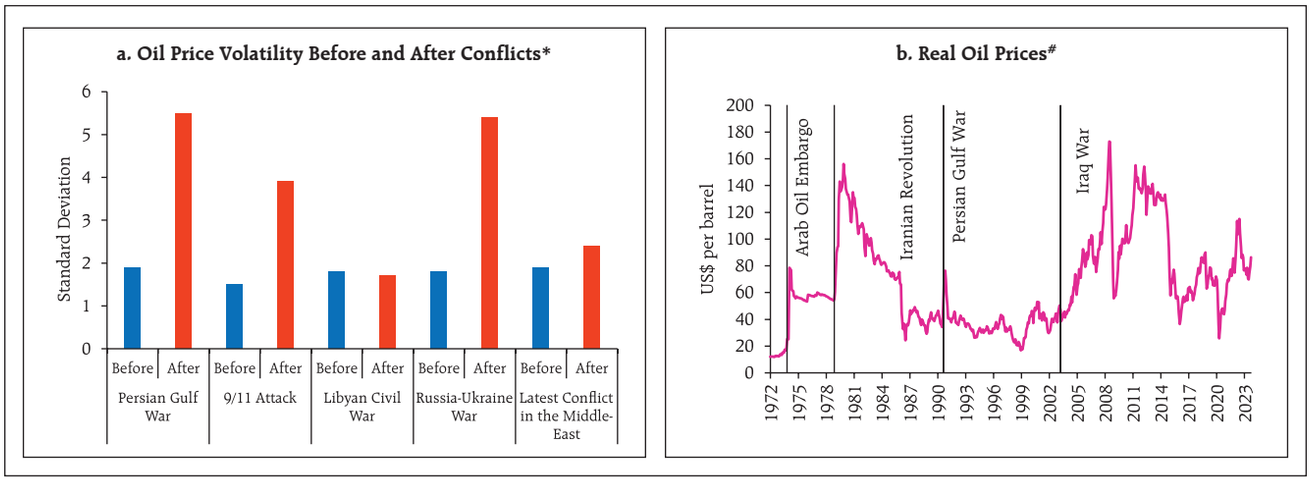
Chart 1.31: Brent Price - Spot and Futures



Source: Bloomberg.

[22] GSCPI developed by Federal Reserve Bank of New York is an index that tracks the state of global supply chains using data from the transportation and manufacturing sectors by integrating a number of commonly used metrics such as Baltic Dry Index (BDI), the Harpex index, Purchasing Managers' Index (PMI) surveys, *etc.*

Chart 1.32: Oil Prices and Geopolitical Conflicts



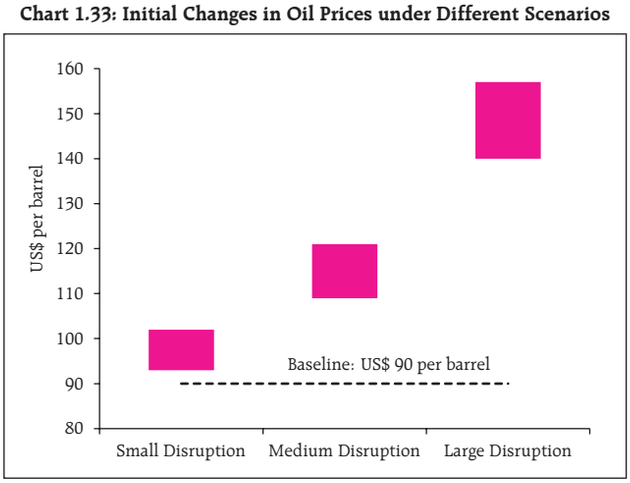
Note: * 30-day volatility in Brent crude oil prices, before and after geopolitical events. For the latest conflict in the Middle East, the period "after" consists of data from October 9 to October 23, 2023 (11 days).
Monthly Brent crude oil prices deflated by U.S. Consumer Price Index (CPI), January 2022=100
Source: World Bank.

increased volatility (Chart 1.32 a and b). Depending on the degree of disruption, crude oil prices could increase by 75 per cent above the baseline in a severe scenario (Chart 1.33).

1.41 The food price index of the Food and Agriculture Organisation (FAO) has been moderating since mid-2022, declining by 10.7 per cent (y-o-y) in November 2023 (Chart 1.34). Agricultural prices are projected to fall by 7 per cent in 2023 and a further 2 per cent in 2024 and 2025 owing to ample supplies[23].

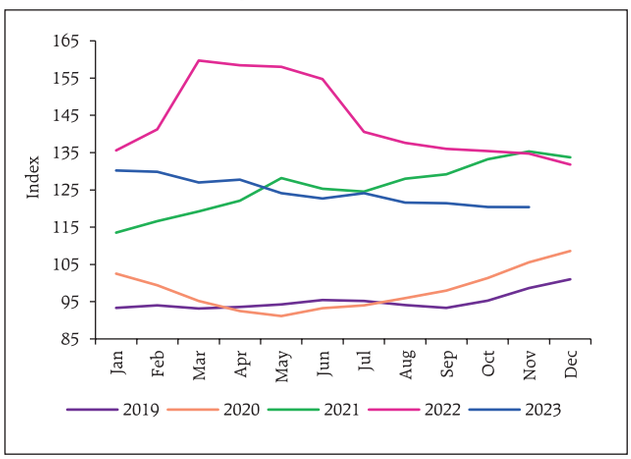
1.42 On balance, the limited impact of war in the Middle East on commodity prices reflects improved supply-demand balance. Additionally, the impact of *El Nino* on agricultural production remains to be fully reflected.

Chart 1.33: Initial Changes in Oil Prices under Different Scenarios



Note: Range of initial prices of brent crude oil in response to supply disruptions against 2023 baseline under three scenarios - small disruption (0.5 to 2 per cent reduction in supply), medium disruption (3 to 5 per cent reduction) and large disruption (6 to 8 per cent reduction).
Source: World Bank.

Chart 1.34: FAO Food Price Index



Source: Food and Agriculture Organisation (FAO).

[23] World Bank Group (2023), "Commodity Markets Outlook: Under the Shadow of Geopolitical Risks", October.

G. Cybersecurity

1.43 The financial sector has always been an early adopter of technological innovations while managing exposures to information technology (IT) disruption risk by building redundancies in the underlying IT architecture and through robust business recovery processes. Nevertheless, they have to take into account the fact that financial markets could, at times, get quickly impacted by entity-level disruptions from system failures, inadequate processes and human errors.

1.44 The IT environment in financial institutions has undergone significant changes. Remote working has expanded the access points and internet exposures to internal systems. Adoption of cloud technologies in place of on-premises data centers and third-party dependencies have further added complexities to traditional security structures and aggravated data-leak exposures.

1.45 The number of common vulnerabilities and exposures (CVEs) detected in IT security have risen in India too, which significantly adds to financial sector vulnerabilities (Table 1.1). The recent episode of disruption in the world's largest treasury market due to ransomware attack faced by a participant is one in a string of these catastrophic events.

1.46 The evolution of the cyber threat landscape has been rapid. Entry-level cyberattack such as distributed denial of service (DDoS) has given way to more sophisticated ransomware attacks, which cause substantial financial and reputational consequences to organisations, in addition to business disruptions. Furthermore, supply chain attacks and zero-day vulnerabilities have potential for causing disruptions simultaneously across many institutions using the affected software/ services. The potential of state-sponsored cyberattacks on financial systems and critical information infrastructure for causing disruptions cannot be underestimated. The use of artificial intelligence (AI) in cyberattack and availability of "as a service" offerings for cybercrime have added to the efficiency of attack vectors and to the scale of looming cyber threats. Inter-connections among financial institutions, common and high degree of dependencies from third party service providers, volume, and speed of transactions due to increased adoption of application programming interfaces (APIs) and innovative and invasive technologies are some of the major factors that make the impact from cyberattacks a plausible scenario from a systemic perspective.

Table 1.1: Security Incidents Handled by CERT-In

Security Incidents	Incidents during January-October, 2023
Phishing	711
Unauthorised Network Scanning/Probing	4,39,431
Vulnerable Services	7,18,548
Virus/ Malicious code	1,44,950
Website Defacements	9,820
Website Intrusion Malware Propagation	967
Others	5,679
Total	**13,20,106**

Sources: Indian Computer Emergency Response Team (CERT-In), Ministry of Electronics and Information Technology.

I.2 Domestic Macrofinancial Risks

1.47 The Indian economy has been successfully navigating the challenge of balancing macrofinancial stability and growth in a period of turbulent global spillovers, new shocks and heightened uncertainties. Strong macroeconomic fundamentals and buffers have supported the resumption of growth alongside price and financial stability. Domestic tailwinds such as easing inflation, improvements in demand conditions, moderation in fiscal and current account deficits, stable financial markets and sound buffers in the form of sizeable forex reserves, high capital and liquidity ratio in financial institutions, healthy corporate balance sheets, and a robust financial system are helping the economy to deal with global

headwinds, geo-economic fragmentation and heightened geopolitical tensions. Banks and NBFCs, bolstered by improved balance sheets, are catalysing economic growth and meeting the productive needs of the economy. Overall, domestic macrofinancial risks have declined and proactive and prudent policies have improved macroeconomic resilience.

I.2.1 Domestic Growth and Inflation

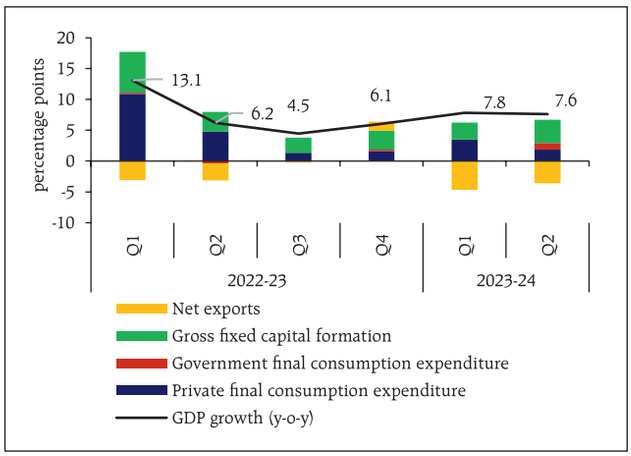
1.48 In India, real GDP grew by 7.6 per cent in Q2:2023-24, buoyed by strong consumption and investment growth that offset the drag from a decline in exports (Chart 1.35)

1.49 Nonetheless, spillover effects from the slowdown in world trade, tighter global financial conditions, increasing fragmentation and geopolitical strife remain contingent risks to external demand. On the domestic side, the impact of El Niño conditions could present a challenge to agricultural output and food prices.

1.50 While decline in global commodity prices and effective domestic supply management could help moderate food inflation, the impact of higher rural inflation relative to the urban sector, as witnessed in the recent months, could have more pronounced impact on rural demand (Chart 1.36).

1.51 Headline inflation, which peaked at 7.4 per cent in July 2023 on the back of volatile food prices, is progressively aligning with the medium-term target of 4 per cent. It has eased to 5.6 per cent in November 2023 but remains susceptible to food price shocks. Meanwhile, core inflation (*i.e.*, consumer price Index (CPI) excluding food and fuel) is exhibiting a sustained disinflation, easing to 4.1

Chart 1.35: GDP Growth (Weighted Contribution)



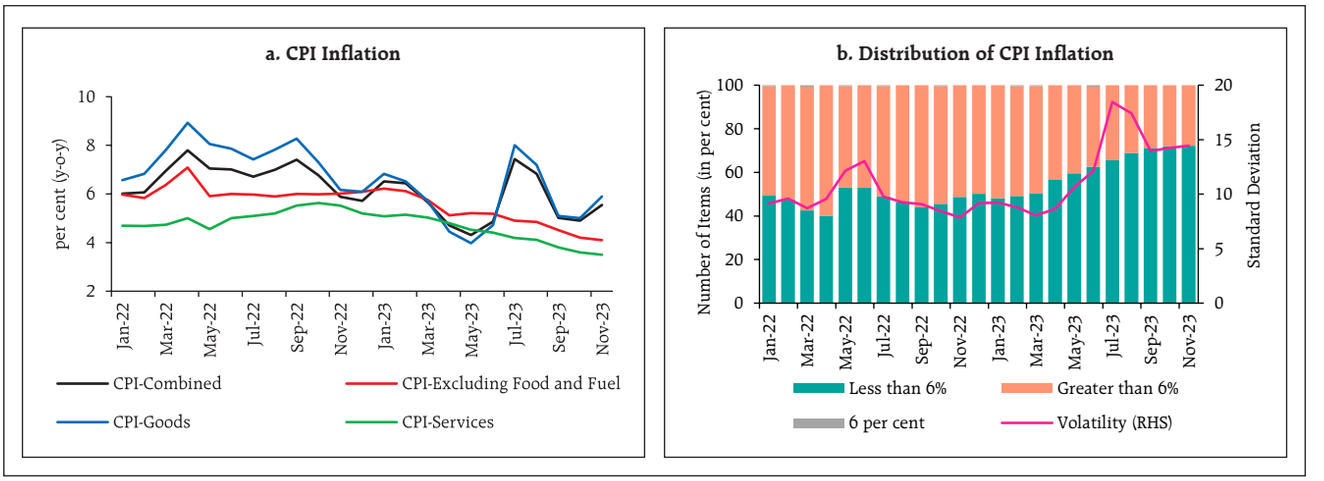
Sources: National Statistics Office (NSO), MOSPI.

Chart 1.36: Rural Demand[24]

Source: CEIC and RBI staff calculations.

[24] A composite index of growth in rural demand has been computed using dynamic factor model (DFM) by extracting common factor from some key proxies of rural demand in growth terms such as tractor sales, fertiliser sales, two-wheeler sales and consumer non-durables index (a component of index of industrial production (IIP)) (Stock and Watson, 1989; 1991).

Chart 1.37: Consumer Price Inflation

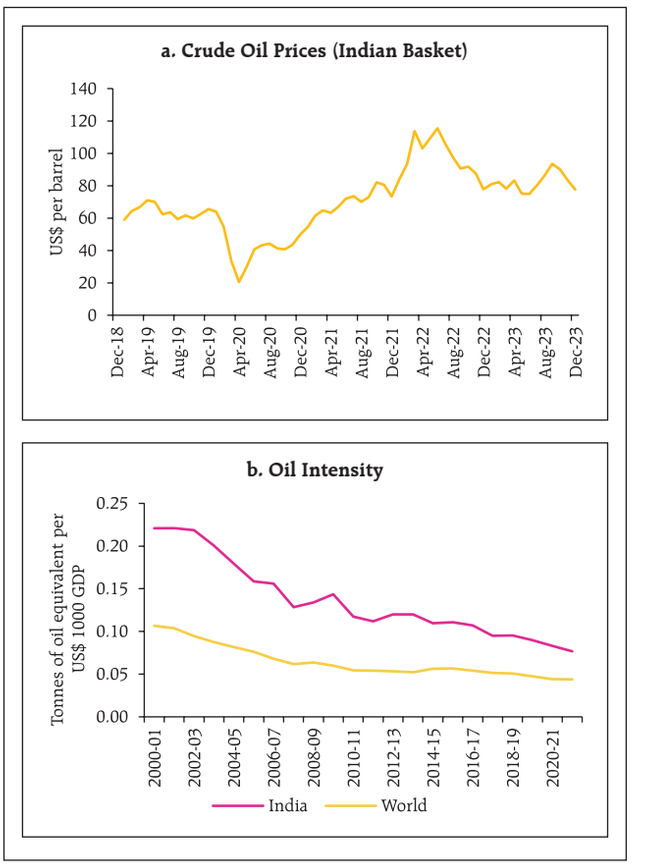


Source: National Statistics Office and RBI staff calculations.

per cent in November 2023 – its lowest level since March 2020 (Chart 1.37 a and b).

1.52 The Indian basket of crude oil prices which was moderating for more than a year, trended upwards during July-October 2023 before a decline in recent months (Chart 1.38 a). Continuation of production cuts by OPEC+[25] alongside mounting uncertainties stemming from the conflict in West Asia could keep prices volatile in the near term and pose risk to the inflation outlook. An oil price surge of 10 per cent from the baseline of US$ 85 per barrel could weaken domestic growth by 15 basis points and increase inflation by 30 basis points[26]. The declining oil intensity of GDP (*i.e.*, the volume of oil consumed per unit of GDP) could, however, offset the impact of the oil price shock (Chart 1.38 b).

Chart 1.38: Crude Oil Price and Oil Intensity



Sources: IMF, Energy Statistics, MoSPI, Statista, PPAC and RBI Staff calculation.

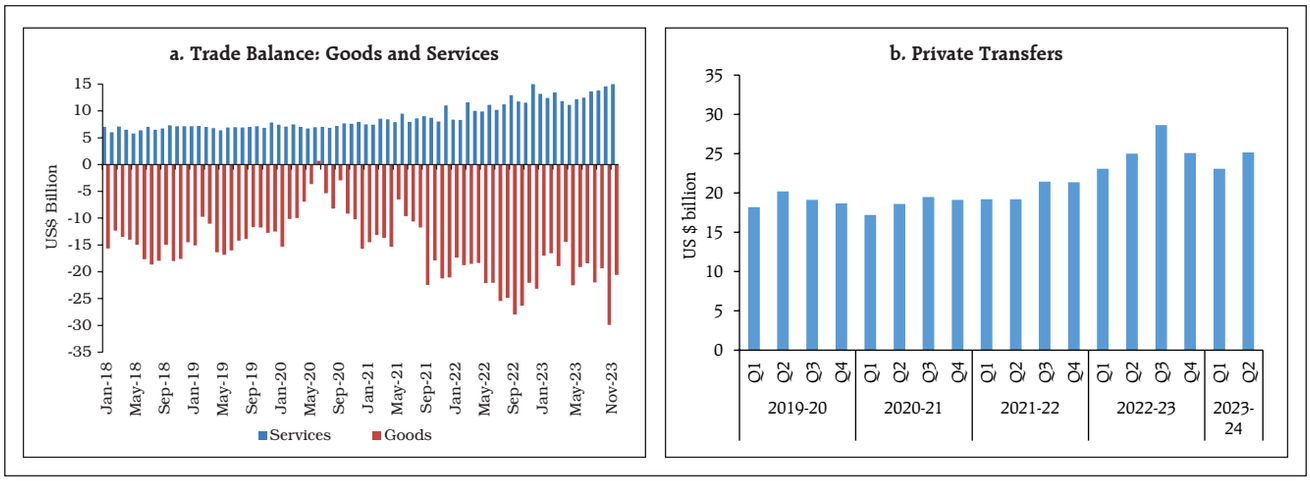
I.2.2 External Sector and Foreign Exchange Market

1.53 External sector resilience has been a key contributing factor in improving domestic macroeconomic stability. Despite overlapping global shocks, the trade deficit improved from US$ 189.2 billion in April-November 2022 to US$ 166.4 billion in April-November 2023 and the current account

[25] In 2016, the Organization of the Petroleum Exporting Countries signed an agreement with 10 other oil-producing countries to create what is now known as OPEC+.

[26] Reserve Bank of India (2023), "Monetary Policy Report", October.

Chart 1.39: Current Account



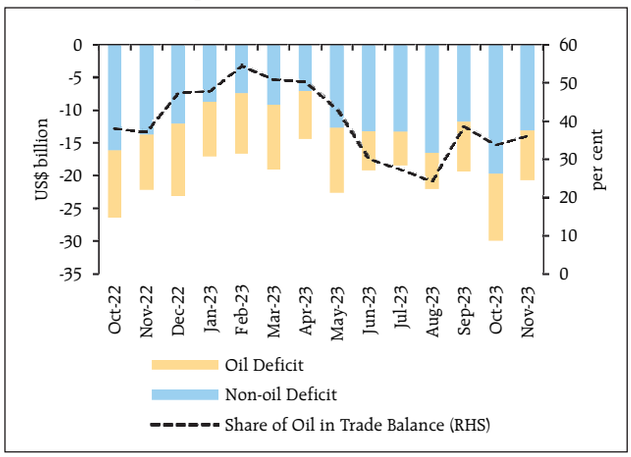
Source: DBIE and Ministry of Commerce and Industry.

deficit (CAD) remains eminently manageable. Strong services exports and remittances are lending stability and sustainability (Chart 1.39 a and b).

1.54 The evolution of the trade balance would depend on (a) the impact of the slowdown in global demand on merchandise exports; and (b) the trajectory of imports, given strong domestic demand and volatile oil prices stemming from geopolitical conflicts (Chart 1.40).

1.55 In a volatile global economic environment, India continued to attract steady capital inflows. During the current fiscal year so far (upto December 20, 2023), net inflows of foreign portfolio investments (FPI) were US$ 30.6 billion as against net outflows of US$ 3.3 billion during the same period last year (Table 1.2). The inclusion of Indian government

Chart 1.40: Decomposition of India's Merchandise Trade Deficit



Source: Directorate General of Commercial Intelligence and Statistics.

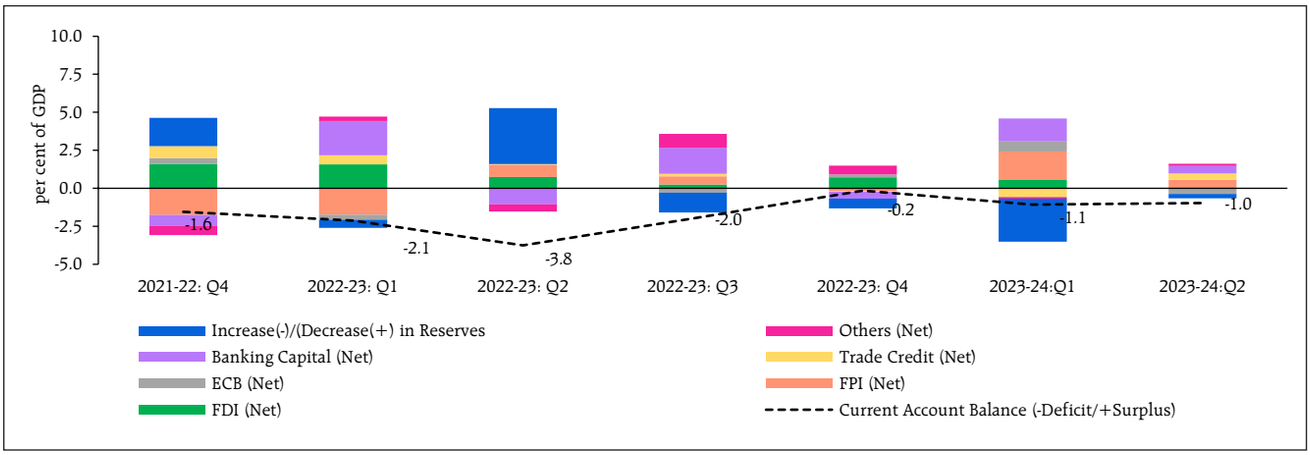
Table 1.2: Capital Flows

(US$ billion)

Component	Financial Year so Far			Financial Year (Apr-Mar)	
	Period	2023-24	2022-23	2022-23	2021-22
FDI (net)	April-October	10.4	20.8	28.0	38.6
FPI to India (net)	April-December	30.6	-3.3	-4.8	-14.1
ECB to India (net)	April-October	3.9	-4.2	-4.1	7.4
Non-Resident Deposits (net)	April-October	6.1	3.1	9.0	3.2

Note: Data on FPI for financial year so far is up to December 20, 2023, sourced from NSDL. Figures for full financial years 2022-23 and 2021-22 are based on BoP.
Sources: RBI and NSDL.

Chart 1.41: Balance of Payments



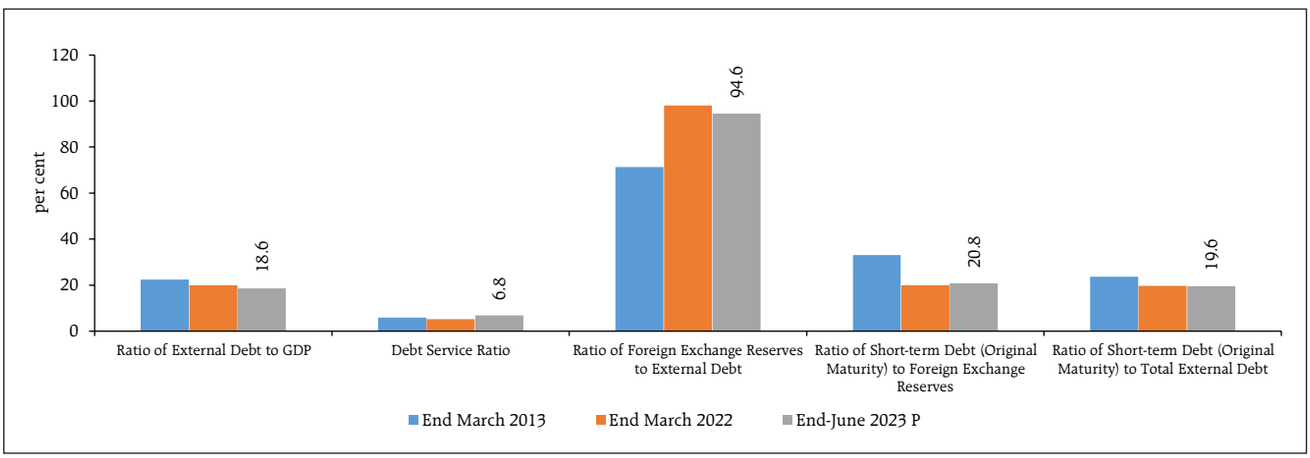
Note: 'Others' includes external assistance, rupee debt service, other capital and errors and omissions.
Source: RBI.

securities in the JP Morgan Global Bond Index - Emerging Markets from June 2024 could augur well for the outlook for capital flows to India. External commercial borrowings (ECB) and non-resident deposits have also registered net inflows in 2023-24. Foreign direct investment (FDI), however, remained subdued, reflecting the global retrenchment of these flows as well as an uptick in repatriations of FDI from India. Overall, the increase in FPI, ECB and non-resident deposit inflows are expected to offset the decline in FDI and support the financing of the CAD.

1.56 Reflecting these developments, there was an accretion to the foreign exchange reserves to the tune of US$ 27.0 billion on a balance of payments (BoP) basis during H1:2023-24 (Chart 1.41).

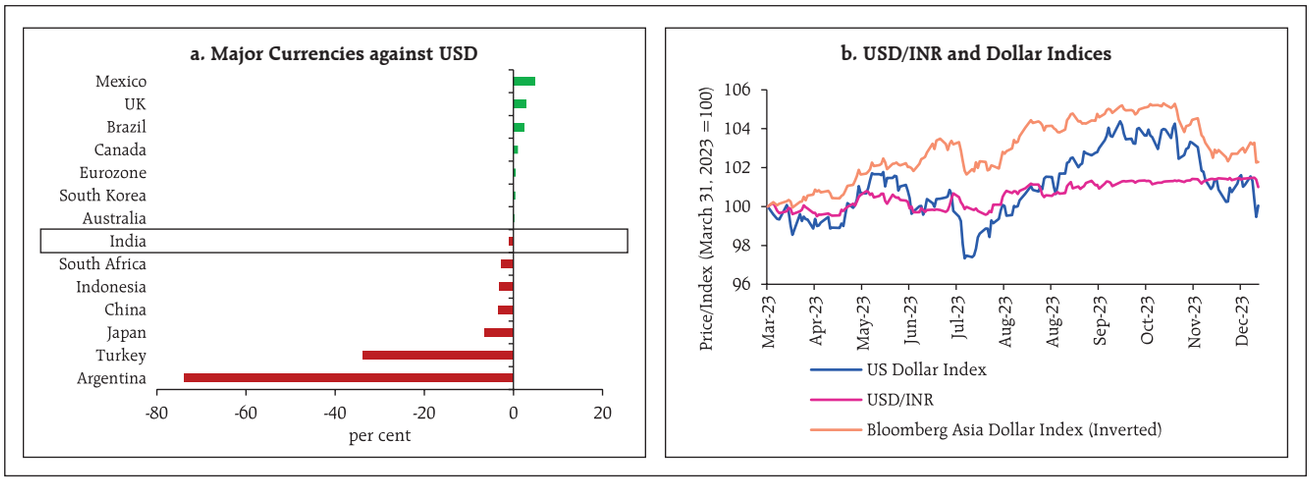
1.57 External vulnerability indicators continue to show improvement: foreign exchange reserves of US$ 616.0 billion as on December 15, 2023, are sufficient to cover about ten months of actual imports (on a BoP basis) for 2022-23; external debt moderated to 18.6 per cent of GDP in June 2023; and the share of short-term debt (with original maturity of up to one year) in total external debt declined to 19.6 per cent in June 2023 (Chart 1.42).

Chart 1.42: External Debt Vulnerability Indicators



Note: P- Provisional.
Sources: RBI and Ministry of Finance.

Chart 1.43: Exchange Rate Movement



Note: Changes from March 31, 2023 to December 15, 2023 in nominal bilateral exchange rates against the USD. Bloomberg Asia Dollar Index (Inverted) aims to replicate the performance of USD against 9 Asian currencies.
Sources: Bloomberg and RBI staff calculations.

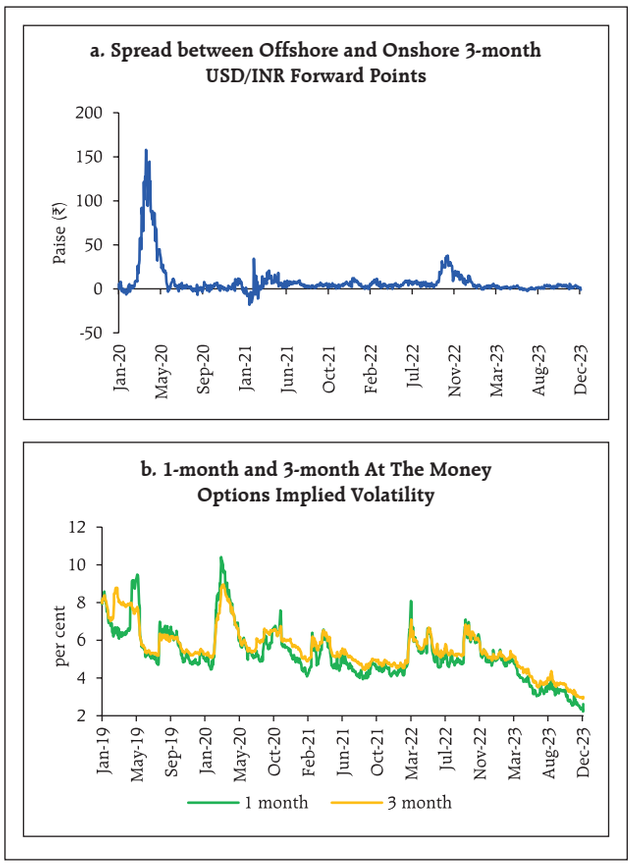
1.58 The stability of the exchange rate has helped in absorbing external shocks and mitigating the impact of global spillovers on domestic macroeconomic and financial stability (Chart 1.43 a and b).

1.59 Exchange rate stability is also reflected in steady fall in implied volatility derived from option prices and compression of onshore-offshore spreads (Chart 1.44 a and b).

I.2.3 Corporate Sector

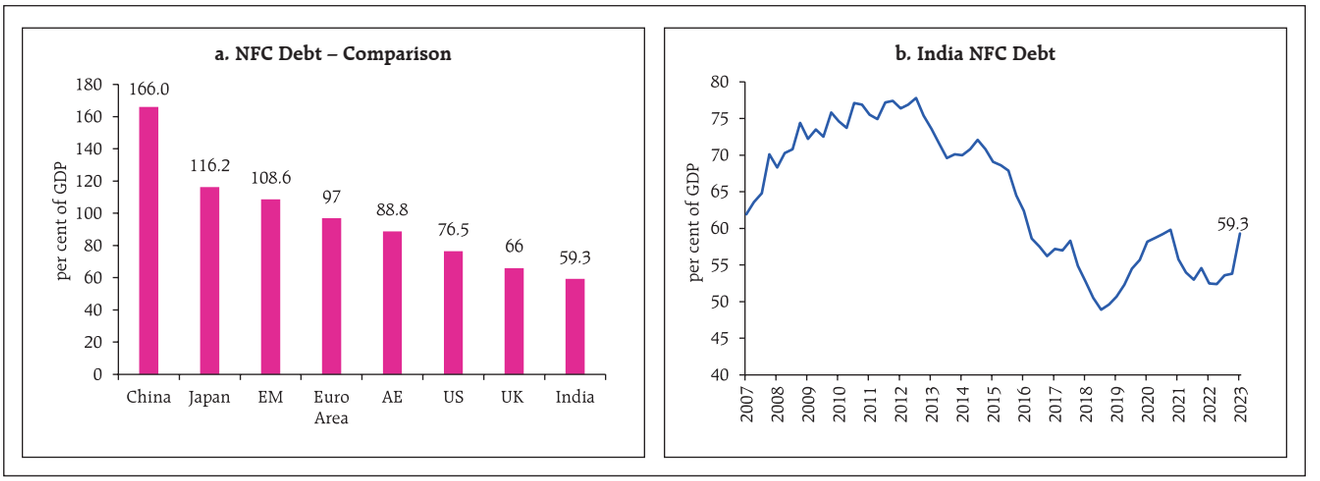
1.60 Material improvement in the balance sheets of listed non-financial corporates (NFCs) and their high profitability have been supported by business and financial restructuring over the years.

Chart 1.44: Onshore-Offshore Spread and Implied Volatility



Source: Bloomberg.

Chart 1.45: Non-financial Corporate Debt to GDP

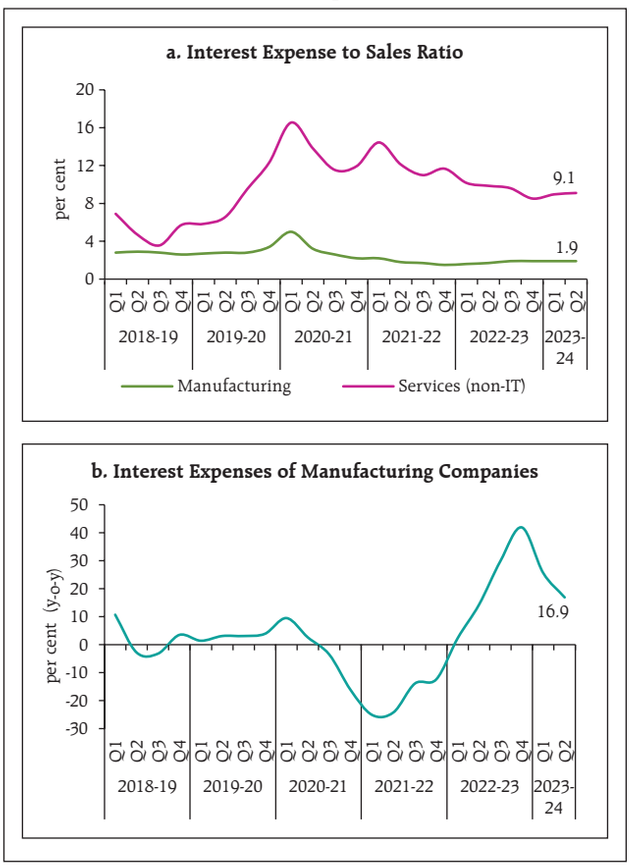


Note: Data pertains to June 2023.
Source: BIS.

The NFC debt to GDP ratio in India is lower than AE and EMDE peers since 2011-12 (Chart 1.45 a and b).

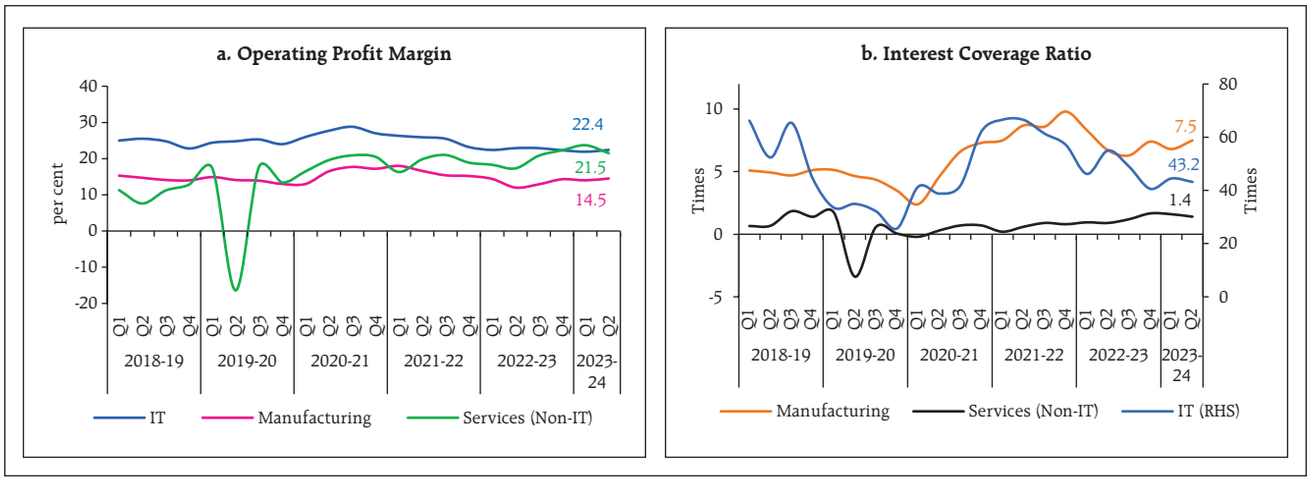
1.61 There are multiple factors that have contributed to the relative stability of NFCs in the current tightening cycle: First, corporates entered the current cycle with robust financials. Second, relative to AEs, the size and length of monetary tightening in India has been moderate. Third, low level of debt in their corporate capital structure allows Indian NFCs to operate with low interest expenses, which has also moderated in Q2:2023-24 (Chart 1.46 a and b). Finally, interest-coverage ratio (ICR) of listed private

Chart 1.46: Listed Private Non-financial Corporates: Interest Expense*



Note: * Q2:2023-24 is based on 1,703 manufacturing companies and 608 non-IT Services companies.
Source: Capitaline and RBI staff calculations.

Chart 1.47: Listed Private Non-financial Corporates: Operating Profit Margin and Interest Coverage Ratio



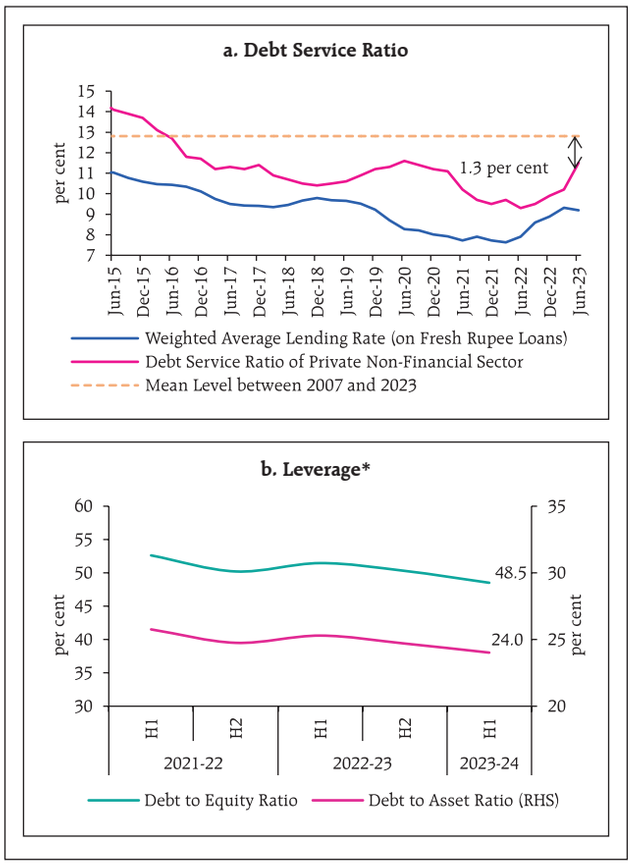
Note: Q2:2023-24 is based on sample of 2,835 listed private non-financial companies.
Sources: Capitaline and RBI staff calculations.

NFCs has improved, supported by strong operating profit (Chart 1.47 a and b).

1.62 Overall, despite the lagged impact of monetary tightening on funding costs, the debt service ratio of NFCs in India has declined by 1.3 percentage points from its mean level (between 2007 and 2023). This, alongside lower leverage augurs well for NFCs' ability to mitigate the impact of interest rate risks on their financials (Chart 1.48 a and b). Capital investment by listed private NFCs improved further: the share of fixed asset to total assets has improved to 34.6 per cent in H1:2023-24 from 33.6 per cent in H1 of the previous year.

1.63 Despite increase in interest burden, the debt share of NFCs with ICR below unity, an indicator of a firm's financial vulnerability, is on a decline, helped by improving profitability. Moreover, the share of sales of such firms in aggregate sales is low, particularly in the manufacturing and IT sectors,

Chart 1.48: Non-financial Corporate Debt Service Ratio and Leverage



Note: * Based on common sample of 2,536 listed private non-financial companies.
Sources: BIS, Capitaline and RBI staff calculations.

Table 1.3: Debt Share of Firms Below/ Above ICR Threshold Values

Items	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	H1: 2023-24
No of Companies	3,238	3,231	3,205	3,163	3,103	2,963	2,990	2,880
ICR <=1 (per cent)	35.5	34.2	34.1	37.6	34.7	32.6	21.0	21.9
1 < ICR <= 4 (per cent)	34.8	34.3	27.6	25.2	31.5	15.2	27.9	30.5
ICR > 4 (per cent)	29.6	31.5	38.3	37.2	33.8	52.2	51.2	47.6

Sources: Capitaline and RBI staff calculations.

indicating that the sub-unity ICR group is dominated by smaller firms (Table 1.3 and 1.4).

1.64 The improvement in corporate sector health is also seen in rating decisions of major credit rating agencies (CRAs). Total number of downgrades as a ratio of total number of ratings (upgrades + downgrades + stable) across three major credit rating agencies (*viz.*, ICRA, CRISIL and CARE) remained stable or declined in Q1 and Q2 of 2023-24 relative to the corresponding quarters of 2022-23. This ratio, which touched a peak of 20.3 per cent during Q1:2020-21, is at a low of 0.4 per cent at the end of Q2:2023-24. Moreover, across the three CRAs, the total number of upgrades and number of ratings remaining stable have increased, while the number of downgrades has decreased in the first two quarters of 2023-24 relative to corresponding quarters of 2022-23. (Chart 1.49 a, b and c).

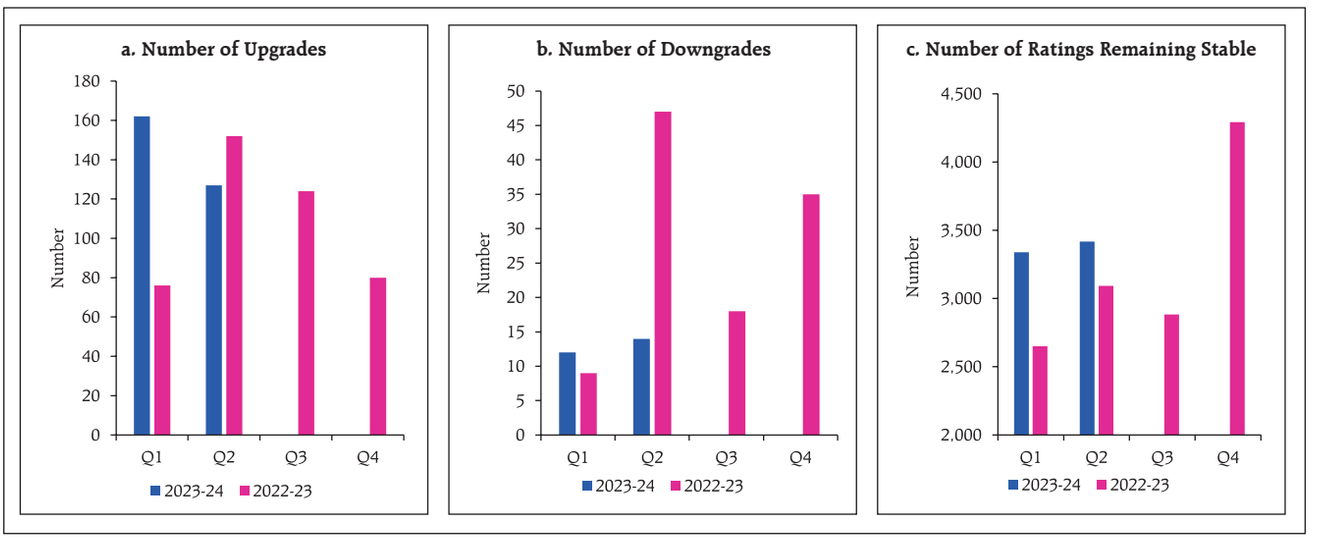
Table 1.4: Sectoral Share in Sales of Companies with ICR<=1

(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

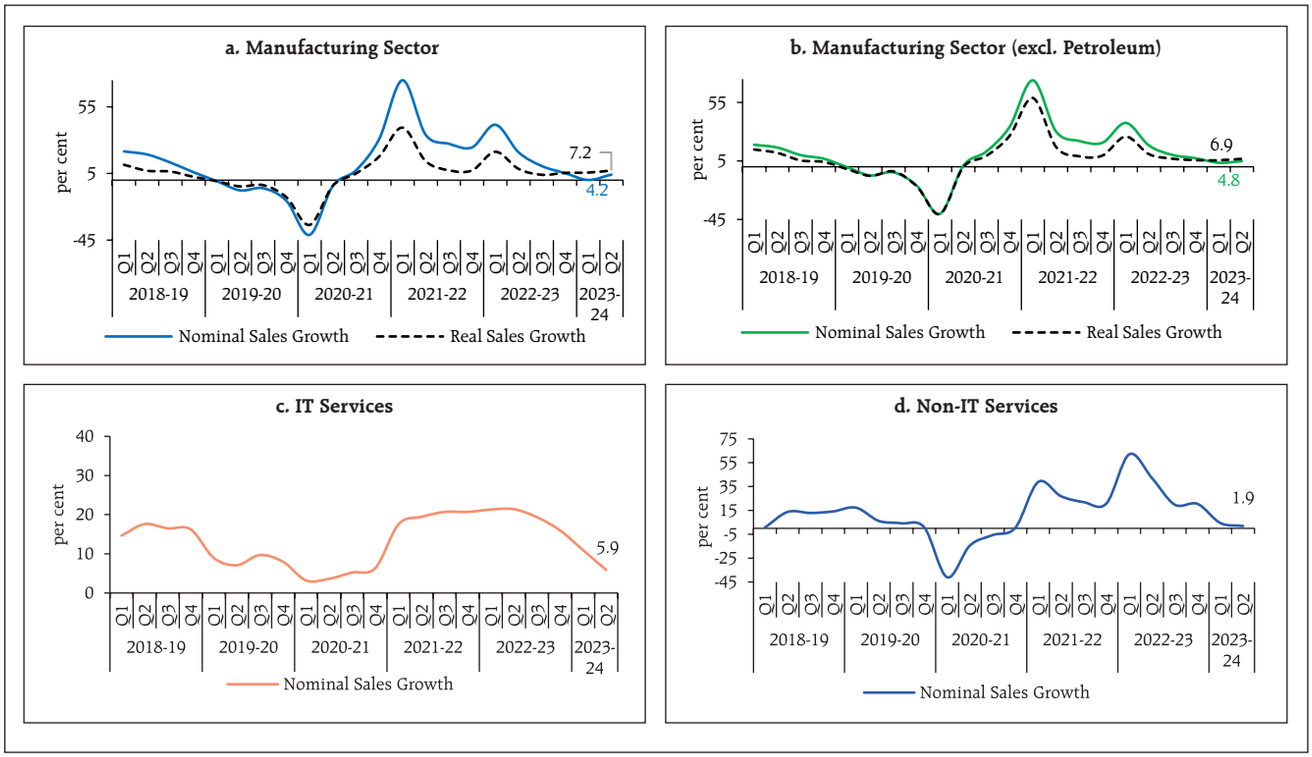
Sources: Capitaline and RBI staff calculations.

Chart 1.49: Trend in Credit Ratings



Sources: CRISIL, ICRA and CARE.

Chart 1.50: Sales Growth of Listed Private Non-Financial Corporates



Note: Sample of 2,835 listed private non-financial companies used for Q2:2023-24.
Sources: Capitaline and RBI staff calculations.

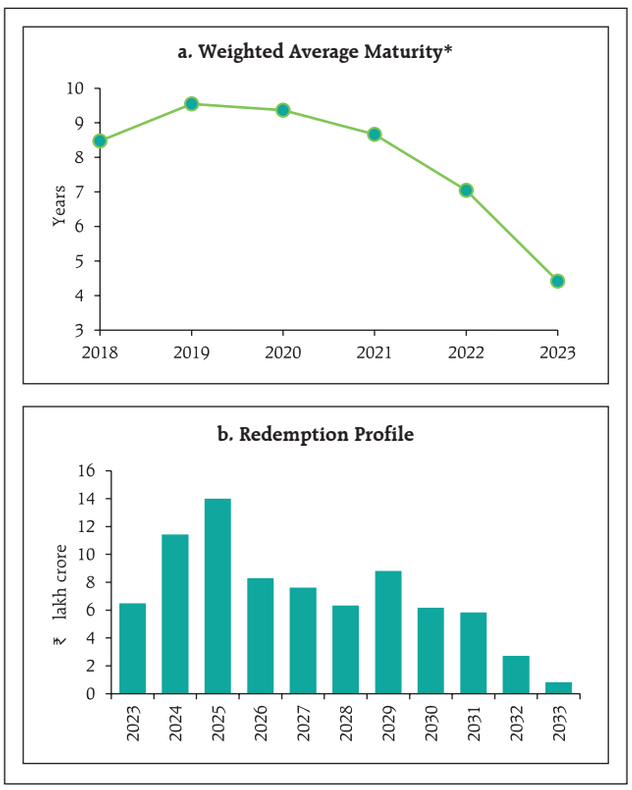
1.65 The key risk to the outlook is the relatively subdued revenues, including volumes (Chart 1.50 a, b, c and d). Sales growth (y-o-y) of information technology (IT) companies has come down to 5.9 per cent after nine consecutive quarters of double digit growth. Also, IT majors have significantly lowered their guidance on revenue growth.

1.66 Though the rising profile of short-term debt in total borrowings appears as a potential risk from redemption pressures in 2024 and 2025, its share in corporate balance sheets remains low. Healthy balance sheets and stable financial conditions provide additional comfort (Chart 1.51 a and b).

I.2.4 Government Finance

1.67 India's fiscal position is improving on the back of ongoing fiscal consolidation, strong tax revenue and improved quality of expenditure

Chart 1.51: Corporate Debt



Note: * The chart represents data on publicly listed bonds (excluding perpetual maturity bonds).
Source: NSDL.

(Table 1.5). Following a sharp increase during the pandemic, the gross fiscal deficit (GFD) of the central government has been on a declining trend and is expected to meet the medium-term target of 4.5 per cent of GDP by 2025-26.

1.68 Gross tax revenue recorded a growth of 14.0 per cent during April-October 2023-24, with direct taxes registering a year-on-year growth of 23.9 per cent. Increased compliance, higher advance tax collections and widening of the tax base have contributed to the robust growth in tax revenue. Indirect taxes recorded a growth of 3.6 per cent, as growth in goods and services tax (GST) and customs revenues outweighed the contraction in excise duties. The average monthly GST collection during April-November 2023-24 was ₹1.67 lakh crore as compared with ₹1.49 lakh crore during April-November 2022-23.

1.69 The quality of expenditure has shown a marked improvement - capital outlay, *i.e.*, capital expenditure excluding loans and advances is projected to increase to 2.8 per cent of GDP in 2023-24 from 1.6 per cent in 2020-21. During April-October 2023-24, capital outlay increased by 28.6 per cent (y-o-y) and helped to reduce the revenue expenditure to capital outlay (RECO) ratio to 3.9 from 4.8 during April-October 2022-23.

1.70 The debt-to-GDP ratio of the Central Government is projected to fall from 62.8 per cent in 2020-21 to 57.4 per cent in 2023-24. Meanwhile, the debt service burden is estimated to remain high (Chart 1.52).

1.71 States' GFD stood at 2.8 per cent in 2022-23, lower than the budget estimates of 3.2 per cent. A sharp decline in revenue deficits has been the primary driver of this fiscal consolidation. For 2023-24, States have budgeted a GFD-GDP ratio of 3.1 per cent, well within the Centre's limit of 3.5 per cent (Table 1.6).

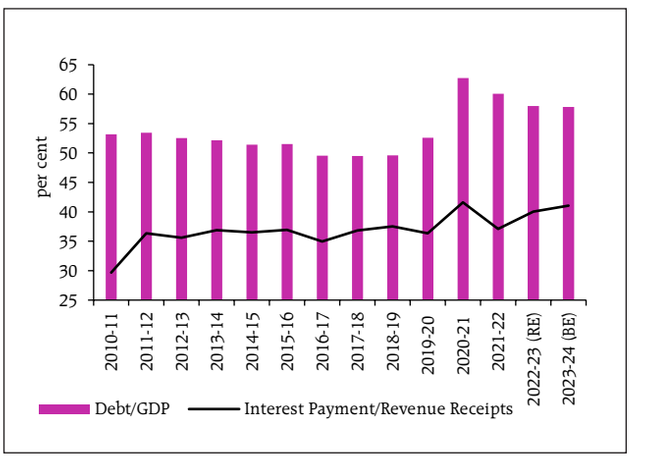
Table 1.5: Central Government - Key Deficit Indicators

(per cent of GDP)

Deficit Indicators	2020-21	2021-22	2022-23 (PA)	2023-24 (BE)
Gross Fiscal Deficit	9.2	6.8	6.4	5.9
Primary Deficit	5.7	3.3	3.0	2.3
Revenue Deficit	7.3	4.4	3.9	2.9

Note: PA- Provisional Accounts; BE – Budget Estimates.
Sources: CGA and Union Budget Documents.

Chart 1.52: Central Government Debt-to-GDP Ratio and Interest Burden



Sources: Union Budget Documents and RBI.

Table 1.6: State Government - Key Deficit Indicators

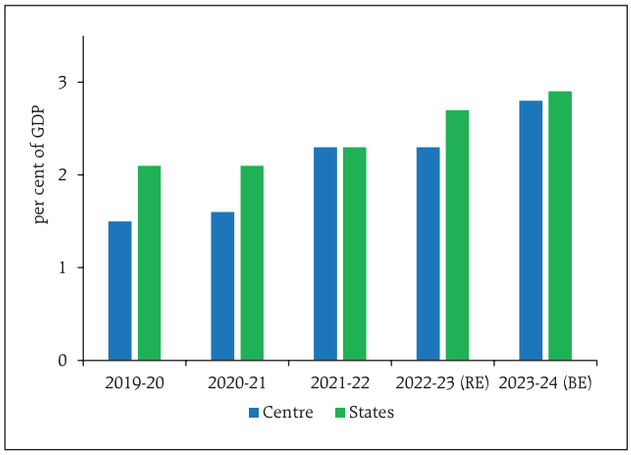
(per cent of GDP)

Deficit Indicators	2020-21	2021-22	2022-23 (PA)	2023-24 (BE)
Revenue Deficit	1.9	0.4	0.3	0.1
Gross Fiscal Deficit	4.1	2.8	2.8	3.1
Primary Deficit	2.1	1	1.2	1.4

Note: PA: Provisional Accounts; BE: Budget Estimates.
Source: Budget document of States; and CAG.

1.72 Alongside steady fiscal consolidation, States have taken steps to improve the quality of expenditure in favour of capital expenditure. Capital outlay is projected to increase to 2.9 per cent of GDP in 2023-24 from 2.1 per cent of GDP in 2020-21. The expansion of capital expenditure is aided by the 'Scheme for Special Assistance to States for Capital Investment' provided by the Central Government under which financial assistance was provided to the States in the form of 50-year interest free loans. Overall, RECO ratio of States is budgeted to improve to 5.0 per cent in 2023-24 (PA) from 6.0 per cent in the previous year. The rise in capital expenditure by both the Centre and States (Chart 1.53) is expected to improve potential growth and crowd-in private capital.

Chart 1.53: Capital Outlay – Centre and States

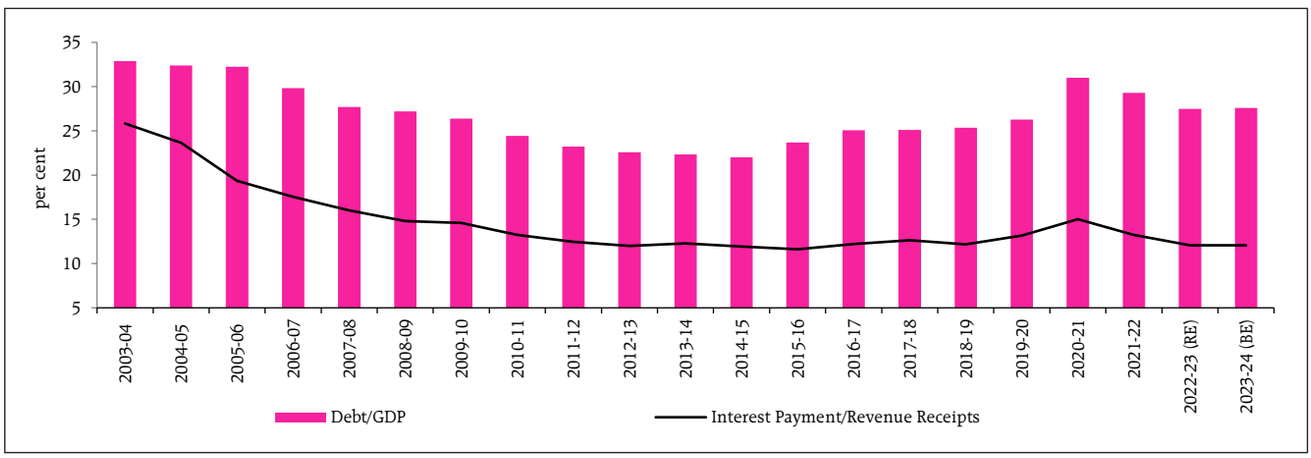


Note: RE: Revised Estimate; BE: Budget Estimate.
Source: Budget Documents of Central and State Governments.

1.73 States' Debt-to-GDP ratio fell to 27.5 per cent by end-March 2023 from the pandemic high of 31 per cent of GDP. Their debt servicing burden has also moderated since the pandemic (Chart 1.54).

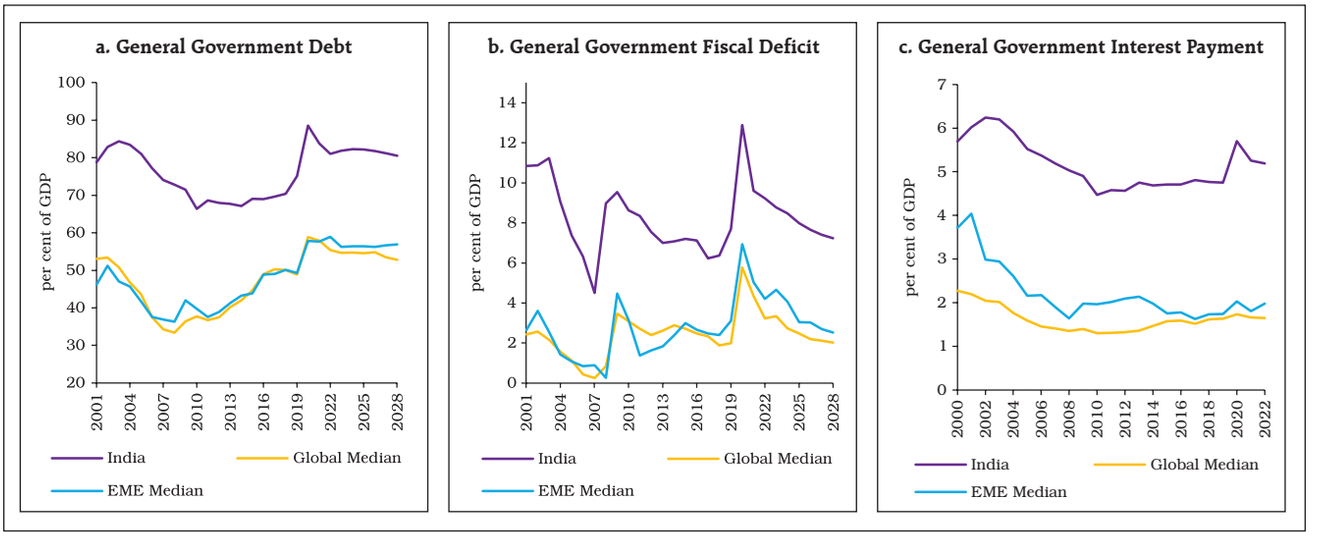
1.74 Notwithstanding these efforts, States' outstanding liabilities are still higher than 20 per cent of gross state domestic product (GSDP) – the limit recommended by the FRBM Review Committee (2018). For some of the larger States, debt ratios have exceeded 35 per cent of GSDP, which may pose redemption pressure in the medium term. Furthermore, the announcements of reversal to the old pension scheme (OPS) by some States could affect their ability to undertake developmental and capital expenditure.

Chart 1.54: States' Debt-to-GDP Ratio and Interest Burden



Note: Data for 2023-24 are budget estimates and for 2022-23 are revised estimates.
Sources: Budget document of States and CAG.

Chart 1.55: India and World – Debt, Deficit and Interest Burden



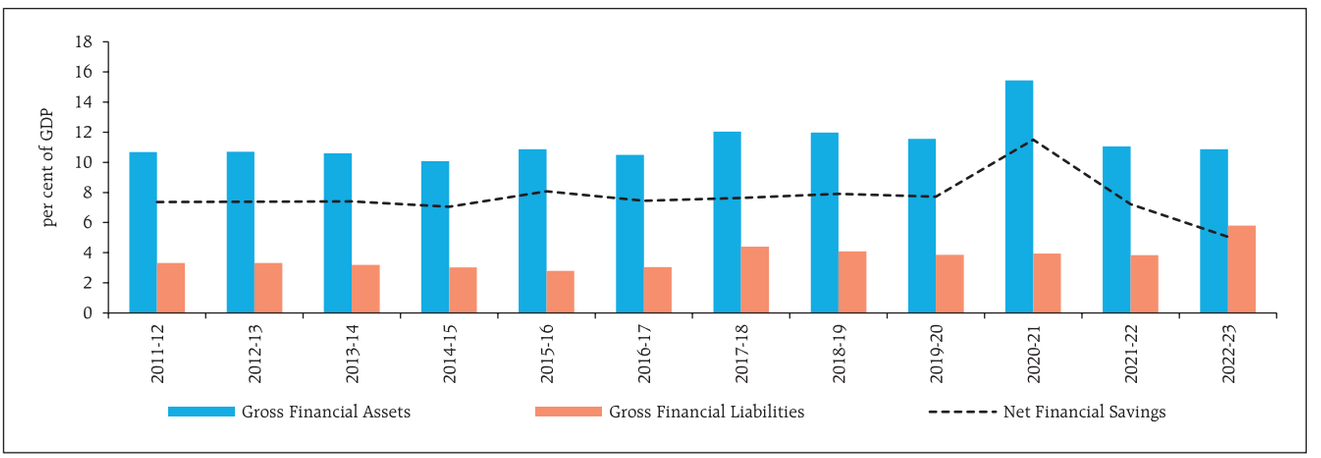
Sources: IMF and RBI staff calculations.

1.75 India's general government debt and deficit are projected to remain higher than the global averages (Chart 1.55 a, b and c).

I.2.5 Household Finance

1.76 Gross household financial savings, which had surged to 15.4 per cent of GDP in 2020-21 (pandemic peak year), supported by large precautionary savings, fell to 11.1 per cent in 2021-22 and further to 10.9 per cent in 2022-23, reverting to its pre-pandemic trend (*viz.*, an average of 11.0 per cent during 2011-12 to 2019-20). In terms of absolute levels, gross household financial savings expanded by 13.9 per cent year-on-year during 2022-23. Household net financial savings (HNFS), however, fell sharply to 5.1 per cent of GDP in 2022-23 from 11.5 per cent in 2020-21, well below its long-run annual average of 7.0-7.5 per cent. The fall in HNFS was driven by a rapid rise in financial liabilities from 3.8 per cent of GDP in 2021-22 to 5.8 per cent in 2022-23 even as financial assets moderated only marginally to 10.9 per cent in 2022-23 from 11.1 per cent in 2021-22 (Chart 1.56).

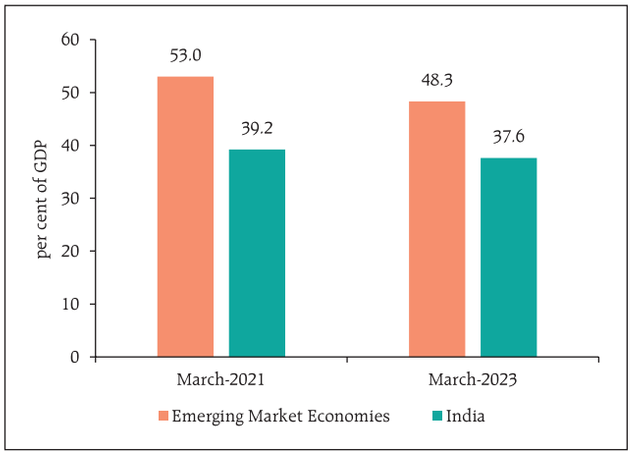
Chart 1.56: Household Financial Savings



Source: RBI.

1.77 The increase in financial liabilities was driven by a steep rise in borrowings from financial institutions, with a large part in physical assets creation (mortgages and vehicles). Thus, the overall savings of households may still hold steady with a compositional shift in favour of physical savings. This would directly add to gross capital formation, supporting an upturn in private investment cycle and, eventually, the prospects for growth. Moreover, recent data show that HNFS rose to 7.0 per cent of GDP in Q4:2022-23 from 4.0 per cent of GDP in the previous quarter, indicating normalisation of HNFS towards the pre-pandemic long-term trend.

Chart 1.57: Credit (Core Debt) to Household Sector



Sources: BIS and RBI.

1.78 Household debt moderated to 37.6 per cent of GDP in March 2023 from its peak level of 39.2 per cent in March 2021 (Chart 1.57). Despite the recent increase in financial liabilities, household debt in India is much lower than in other EMEs and, therefore, the risk of defaults due to greater exposure of higher mortgage payments and floating rate interest is limited in India. Thus, the current level of household debt in India does not pose systemic concern (Box 1.1).

Box 1.1: Household Debt Sustainability

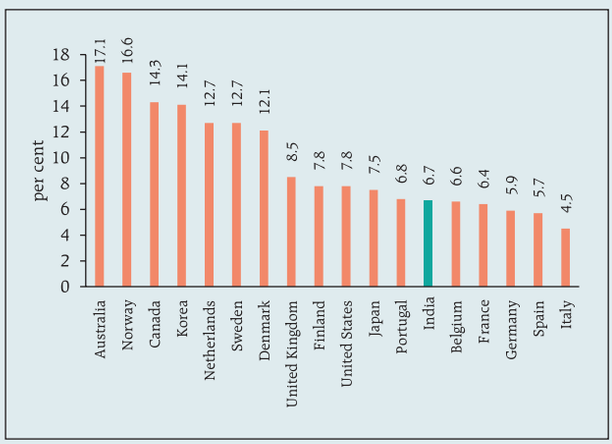
The recent tightening cycle of monetary policy has resulted in rising mortgage rates and tighter lending standards, portending concerns for household debt levels. The experience of the global financial crisis suggests that high household debt levels can be a source of financial vulnerability and contribute to prolonged recession (Mian and Sufi, 2010).

India's household debt[27] to GDP ratio is one of the lowest in the world, as also the debt service ratio (DSR) (Chart 1). Nonetheless, unanticipated income shocks triggering defaults and sensitivity to interest rate changes are risks to household debt that can have macroeconomic and financial stability implications (Lombardi *et al*, 2017).

Historical data show a negative correlation between triennial changes in household debt and consumption growth (Chart 2 a and b) because of rising debt repayment obligations.

To prevent the build-up of systemic risk, it is important to assess the sustainable household debt level that is consistent with debt servicing cost as measured by the

Chart 1: DSR - Select Jurisdictions March 2023

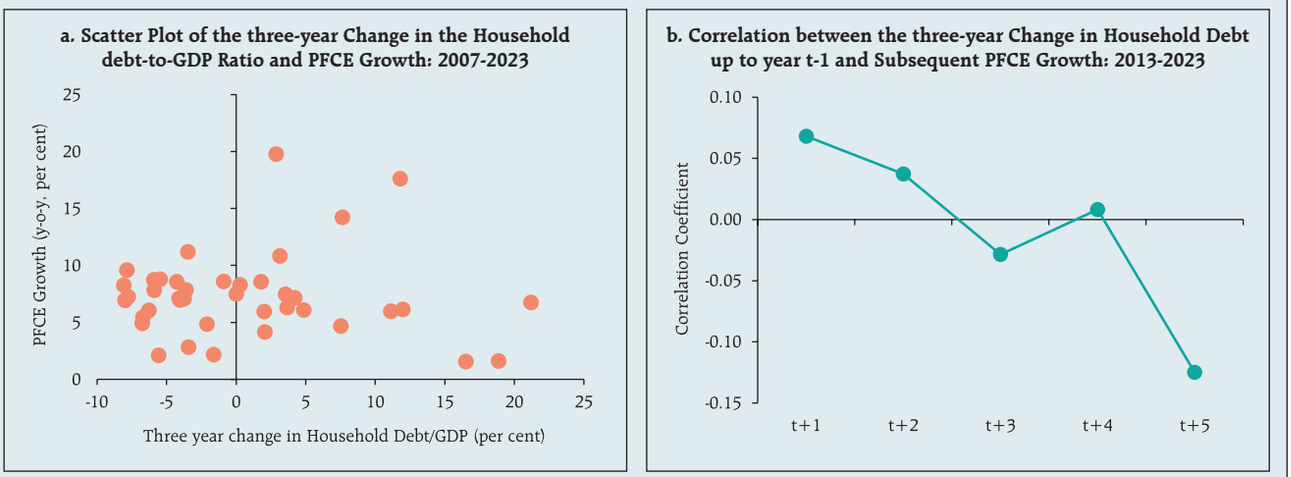


Source: BIS and RBI Staff Calculations.

(Contd.)

[27] Refers to outstanding credit from banks and other financial institutions to households.

Chart 2: Household Debt to GDP Ratio and PFCE Growth



DSR. The DSR is estimated at the system level as follows:

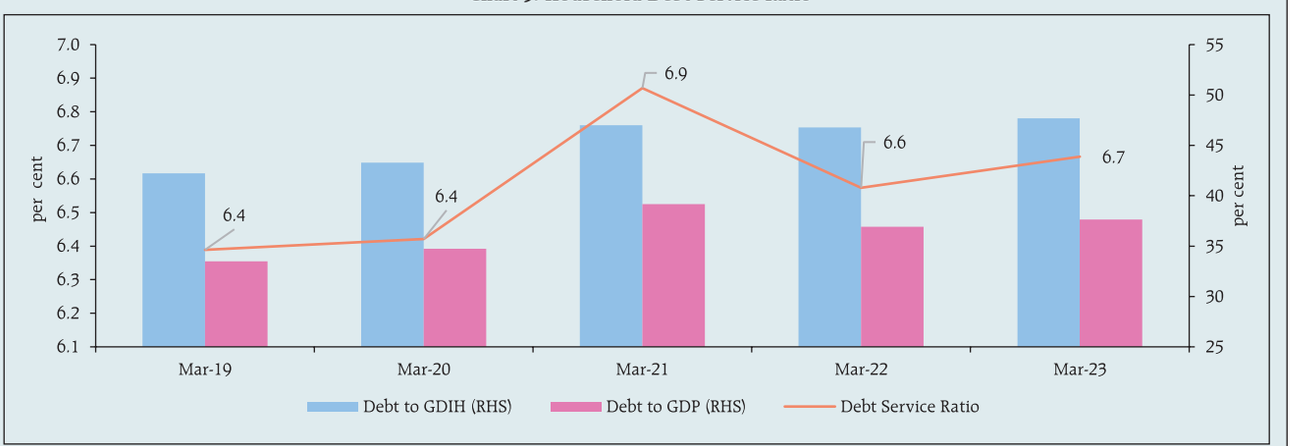
$$DSR = \frac{i}{(1-(1+i)^{-s})} * \frac{D}{Y}$$

where D[28] denotes the total stock of debt, Y[29] denotes the gross disposable income of households, i denotes the effective interest rate on stock of debt and s denotes the average remaining maturity in years (Drehmann *et al*, 2015).

In order to ascertain the effective interest rate and average remaining maturity, retail loan data from a survey of 12 major scheduled commercial banks comprising about 80 per cent of the retail loan portfolio at the system level were considered. The weighted average effective rate of interest stood at 9.7 per cent in March 2023 and residual maturity of retail loans was 12.7 years on the existing stock of debt (credit from banks and other financial institutions). Accordingly, the DSR of Indian households is estimated at 6.7 per cent at end-March 2023 (Chart 3).

Sensitivity analysis is attempted under two different scenarios. In the first scenario, the DSR is increased to 8.5 per cent, based on the maximum rise in the DSR of advanced economies witnessed during the global financial crisis[30]. In this scenario, the household debt to GDP ratio increases to 48.0 per cent from 37.6 per cent in March 2023. In the second scenario, a sharp decline in gross disposable income due to an unanticipated income shock[31] is considered, keeping other variables

Chart 3: Household Debt Service Ratio



Source: BIS and RBI Staff Calculations.

(Contd.)

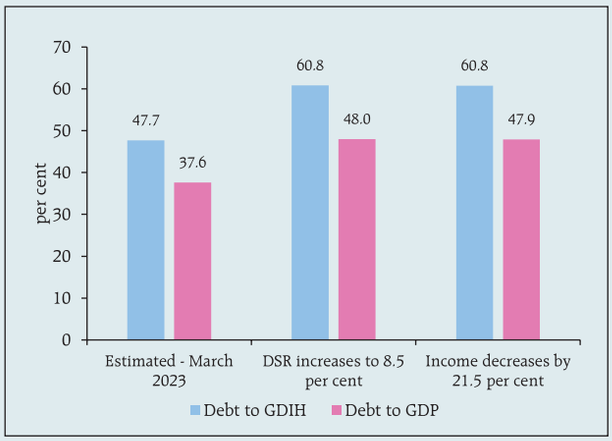
[28] Debt data was sourced from Stocks of Financial Assets and Liabilities of Households, RBI Bulletin.

[29] Gross disposable income of households is taken from national accounts statistics database.

[30] The DSR of advanced economies rose by 26 per cent in March 2008.

[31] Income shock of 21.5 per cent decrease in GVA, as observed in June 2020 quarter. Both GDP and GDIH are decreased by 21.5 per cent for calculating the ratios.

Chart 4: Sensitivity Analysis of Household Debt



Note: GDIH- Gross Disposable Income of Households.
Sources: RBI Staff Calculations; RBI Bulletin, Individual Bank Submissions.

unchanged, the household debt to GDP increases to 47.9 per cent. The debt to gross disposable income of households (GDIH) ratio increased to 60.8 per cent in both the scenarios (Chart 4). India's household debt to GDP remains below the average of 48.3 per cent for EMEs under both scenarios.

References:

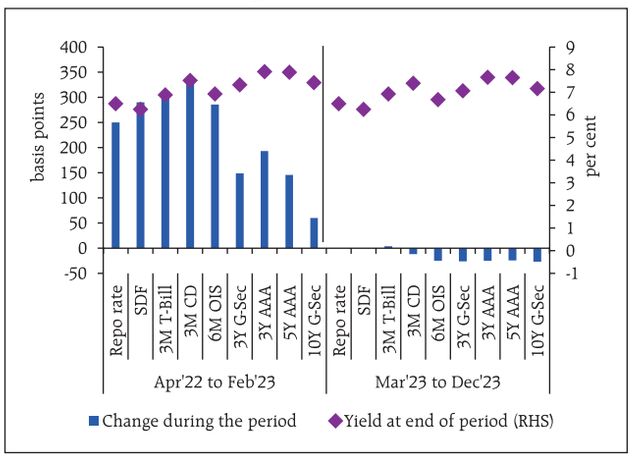
1. Marco Lombardi, Madhusudan Mohanty and Ilhyock Shim (2017), "The real effects of household debt in the short and long run", BIS Working Papers No 607.
2. Mian, A and A Sufi (2010), "Household leverage and the recession of 2007 to 2009", NBER Working Paper, 15896.
3. Drehmann M, A Illes, M Juselius and M Santos (2015), "How much income is used for debt payments? A new database for debt service ratios", BIS Quarterly Review, September.

I.2.6 Money and Capital Markets

1.79 Domestic financial conditions have remained conducive for growth amidst improving consumer and business confidence and rising corporate profitability. Movements in money market rates and bond yields have displayed two phases in the current tightening cycle. During the first phase - from April 2022 to February 2023 - when policy rates were tightened by 250 bps, short-term rates moved in tandem with the policy rate while transmission to long-term rates was less complete. In the second phase - from March 2023 to November 2023 - when there was a pause in the policy rate, both short-term and long-term money and bond market rates have eased though they remain elevated (Chart 1.58).

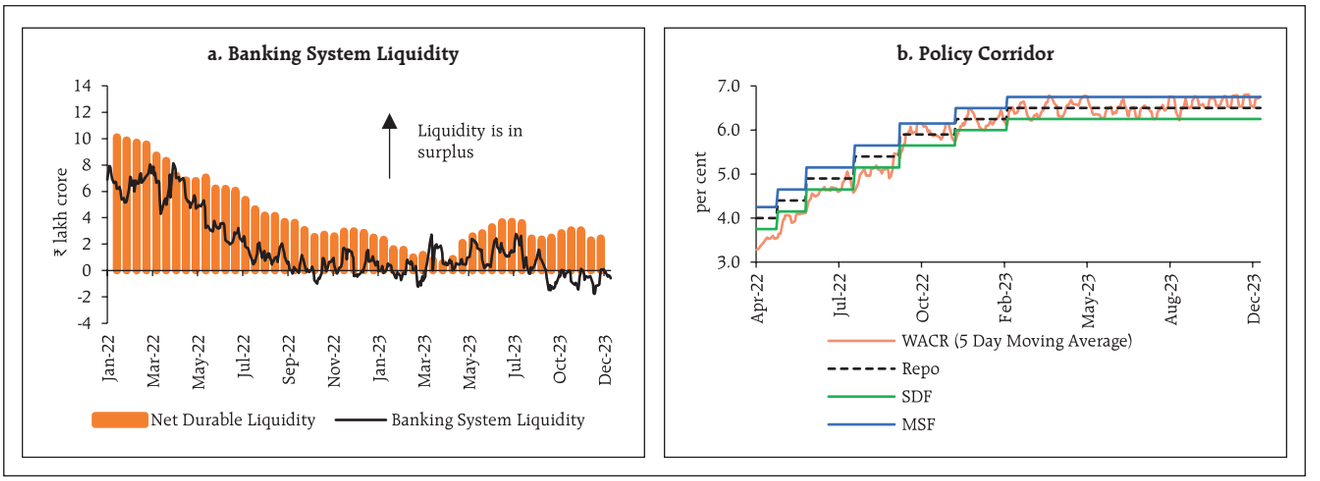
1.80 Liquidity conditions have evolved in line with the monetary policy stance. After the decision in May 2023 to withdraw ₹2000 denomination banknotes from circulation, banking system liquidity rose for a brief period. Proactive intervention through imposition of an incremental cash reserve ratio (I-CRR) of 10 per cent and fine-

Chart 1.58: Money Market Rates and Bond Yields



Note: Change in yields computed using month end rates (updated till December 15, 2023).
Source: Bloomberg.

Chart 1.59: Banking System Liquidity and Policy Corridor



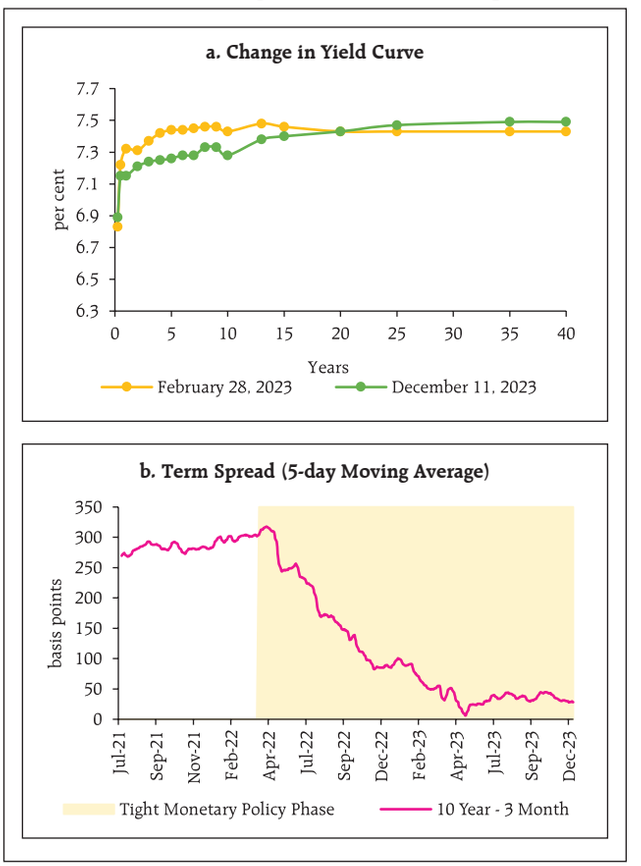
Note: Durable liquidity adjusts the banking system liquidity for government cash balances.
Source: RBI.

tuning operations helped modulate liquidity (Chart 1.59 a). Consequently, operating target of monetary policy, *i.e.*, weighted-average call rate (WACR), has largely remained within the policy corridor (Chart 1.59 b).

1.81 With short-term rates rising faster than long-term rates, the sovereign yield curve flattened in the initial phase of the monetary tightening cycle, reverting thereafter to an upward sloping curve on the improving outlook for growth and anchoring of inflation expectations (Chart 1.60 a and b).

1.82 India's inclusion in the JP Morgan Global Bond Index - Emerging Markets is expected to increase bond market liquidity, widen the investor base and improve price discovery. Bond index inclusion typically results in benchmark-driven investments[32], providing access to a larger and more diverse pool of external investments and paving the way for increased flow of foreign investments into

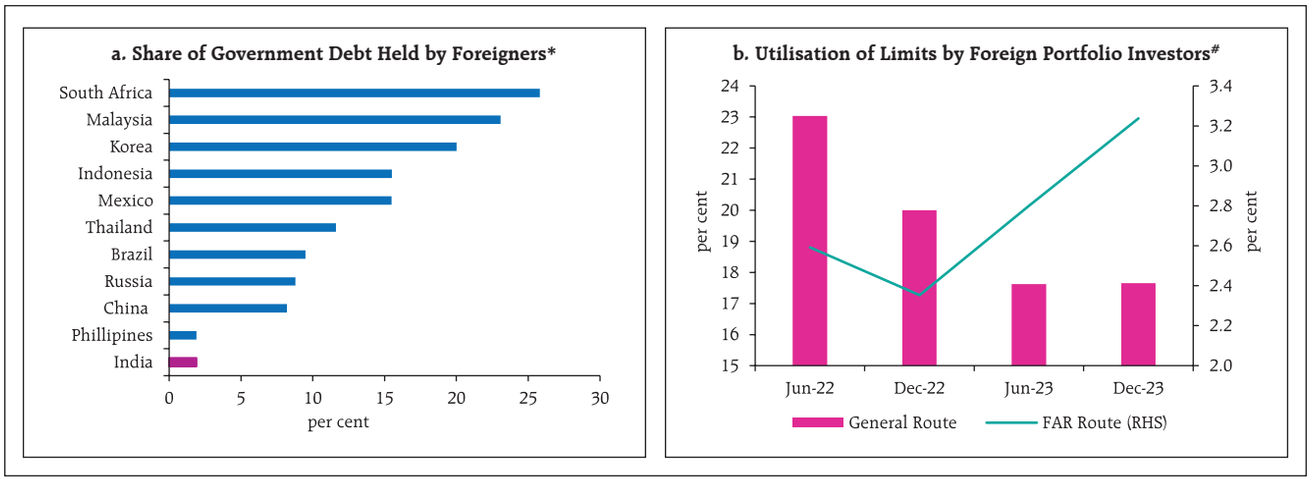
Chart 1.60: Sovereign Yield Curve and Term Spread



Source: FBIL and Refinitiv.

[32] A benchmark-driven investment is one in which the national weights in a benchmark index serve as a guidance for the portfolio allocation of investments across nations.

Chart 1.61: Foreign Holding of Government Bonds



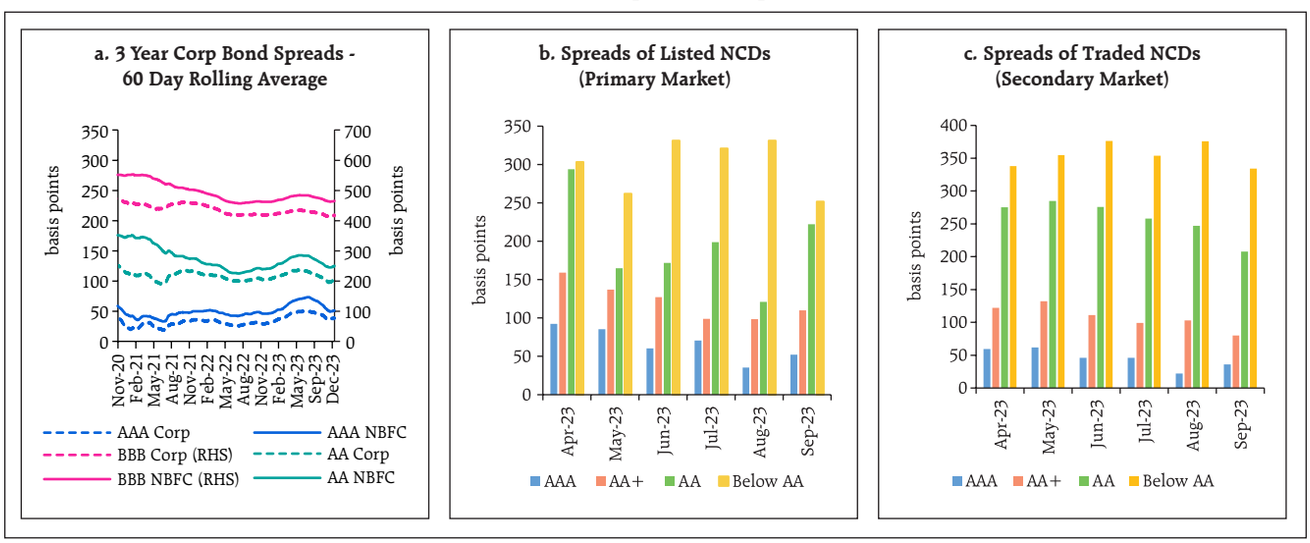
Note: (1) * For India, holdings refer to central government debt held under the medium-term framework and fully accessible route (FAR). Data as on December 08, 2023. For other countries, data as on June 30, 2023.
(2) # General Route includes FPI holdings under medium term framework for FPI investments in Government securities. FAR includes FPI holdings of 'specified securities', which are central government securities opened fully for non-resident investors without any restrictions.
Sources: CCIL, Bloomberg and RBI staff calculations.

government securities under the fully accessible route (FAR) (Chart 1.61 a and b).

1.83 Due to procyclicality, benchmark-driven investments are generally prone to external shocks and could pose vulnerabilities: they are about three to five times more sensitive to global risk factors than the traditional measures of portfolio flows[33].

1.84 Corporate bond spreads have declined across institutions and rating categories, suggesting that interest rates may be approaching or at their peak in the current cycle (Chart 1.62 a). The median spreads of listed non-convertible debentures (NCDs) over the yield of the 3-year government security benchmark have also declined for all rating grades in both primary and secondary market segments (Chart 1.62 b and c).

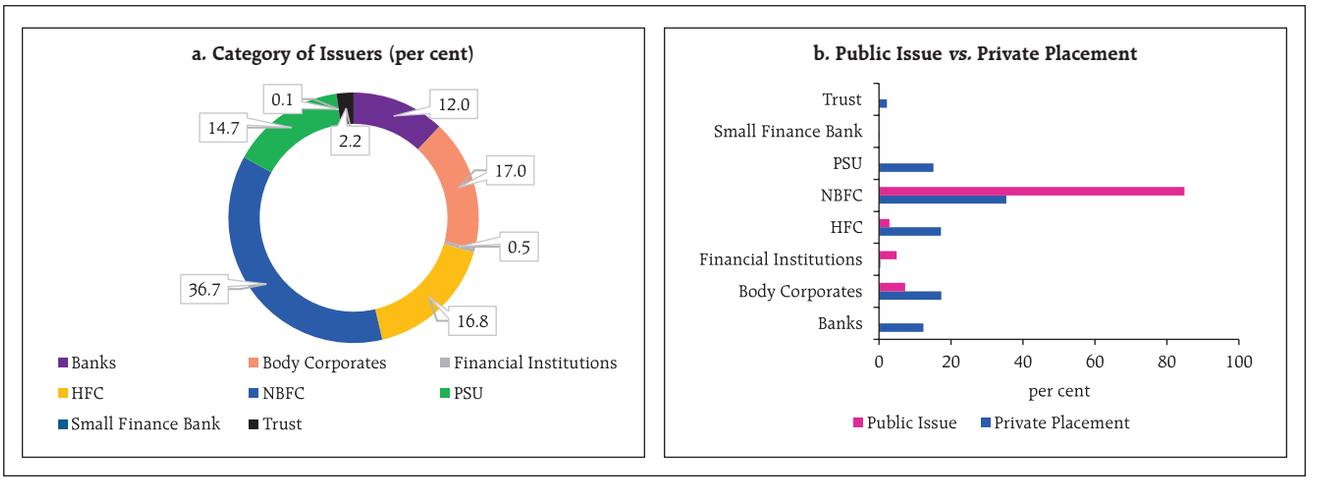
Chart 1.62: Corporate Bond Spreads



Source: Bloomberg, NSDL and CDSL.

[33] Arslanalp, Serkan, Drakopoulos, Dimitris, Goel, Rohit, and Koepke, Robin (2020), "Benchmark-Driven Investments in Emerging Market Bond Markets: Taking Stock", IMF Working Paper, IMF, September.

Chart 1.63: Corporate Bond Issuance between April 2023 and November 2023



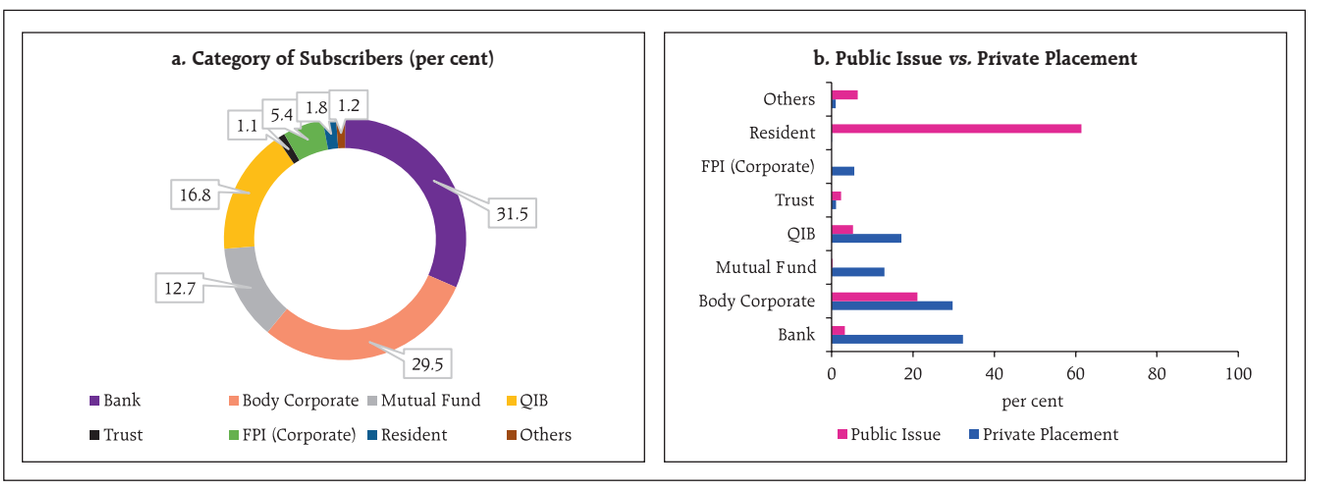
Sources: NSDL and CDSL.

1.85 NBFCs, including housing finance companies (HFCs) and public sector undertakings (PSUs), remained the major corporate bond issuers, forming more than two-thirds of total listed bonds and debentures. Nearly three per cent of the corporate bond issuances were in the form of public issues during Apr-Nov 2023 (Chart 1.63 a and b).

1.86 Banks and body corporates accounted for nearly 61 per cent of total subscription of corporate bonds. Subscription to public issues was dominated by residents (Chart 1.64 a and b).

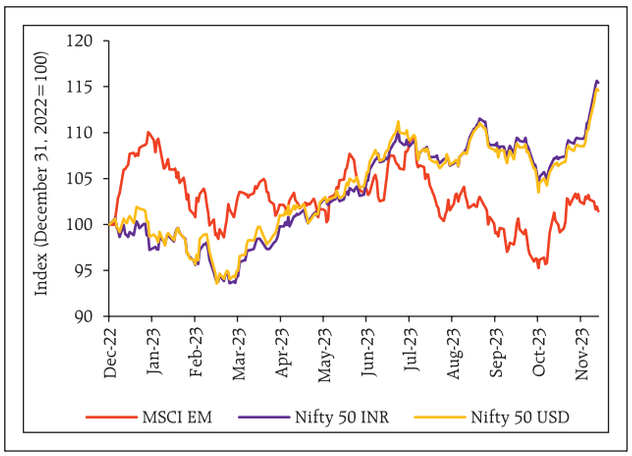
1.87 Domestic equity markets have been outperforming their emerging market peers in both local currency and U.S. dollar terms on the back of improving macroeconomic fundamentals, healthy and profitable corporate balance sheets, robust earnings outlook and stable financial conditions. During the current fiscal year so far (up to December 15, 2023), the benchmark Nifty 50 index posted

Chart 1.64: Corporate Bond Subscription between April 2023 and November 2023



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

Chart 1.65: Nifty 50 and Emerging Market Index



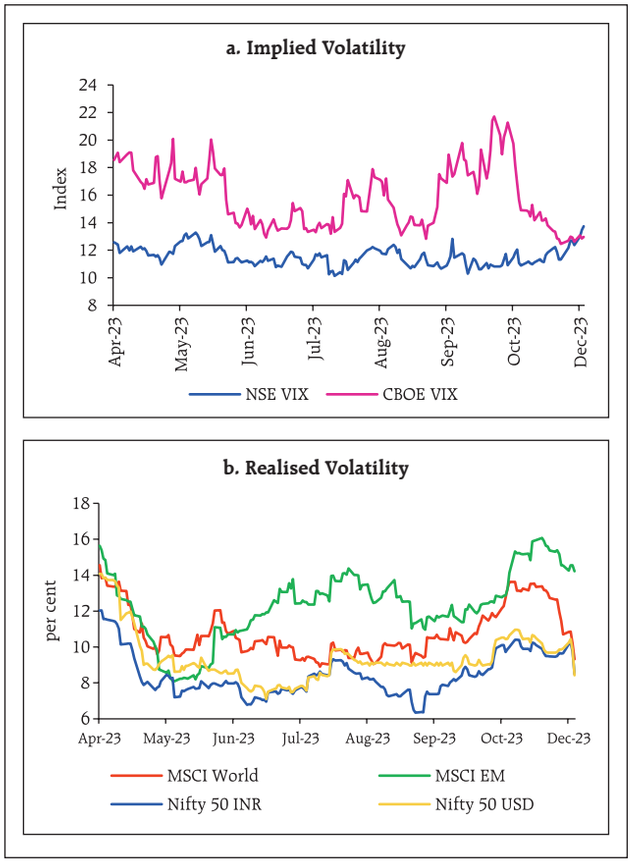
Source: Refinitiv.

returns of 23.5 per cent, with market capitalisation surging to US$ 4 trillion, making India's stock market the fifth biggest in the world (Chart 1.65).

1.88 Higher returns in the domestic equity market have also been associated with low volatility in terms of both implied volatility based on option prices and realised volatility (Chart 1.66 a and b).

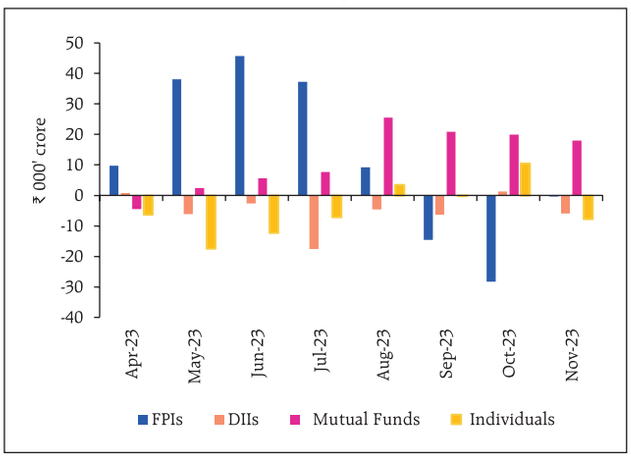
1.89 After being net sellers of Indian equities to the tune of US$ 8.1 billion in 2022-23, foreign institutional investors (FIIs) made net investments of US$ 11.9 billion during April-November 2023, even as domestic institutional investors, including mutual funds, continued to provide support as net buyers (Chart 1.67).

Chart 1.66: Stock 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.
Sources: Refinitiv and NSE.

Chart 1.67: Trend in Equity Investment



Note: FPI – Foreign Portfolio Investors; DII – Domestic Institutional Investors.
Sources: NSDL, NSE, BSE and SEBI.

Table 1.7: Trailing and Forward P/E Ratios

Indices	Trailing P/E		Forward P/E	
	June 2023	September 2023	June 2023	September 2023
Nifty 50	22.4	22.2	20.2	21.9
Nifty 500	23.5	23.5	21.6	23.2
MSCI EM	13.6	14.1	12.1	11.6
MSCI World	20.3	19.5	17.0	16.1

Sources: Bloomberg, Refinitiv and MSCI.

1.90 A higher price-to-earnings (P/E) ratio *vis-à-vis* global markets indicates overvaluation in the Indian equity market; although robust earnings growth in the next 12 months is also being priced in (Table 1.7).

1.91 Three important developments in the Indian equity market performance require close monitoring. First, compared to the rally in the benchmark Nifty 50 index that represents the largest firms, the rallies in the mid-cap, small-cap and micro-cap indices were significantly larger. During April-October 2023, the return on Nifty Microcap Index was more than five times that on Nifty 50 (Chart 1.68). Over a three-year horizon, the performance divergence between Nifty 50 and other indices is even sharper (Table 1.8).

1.92 In addition to the higher valuation among scrips in the mid-cap and small-cap segments relative to the large-cap firms, a substantial share of them (69 per cent in mid-cap and 70 per cent in small-cap) were trading with P/E ratios higher than those of their corresponding benchmark indices (Table 1.9; Charts 1.69 and 1.70 a and b).

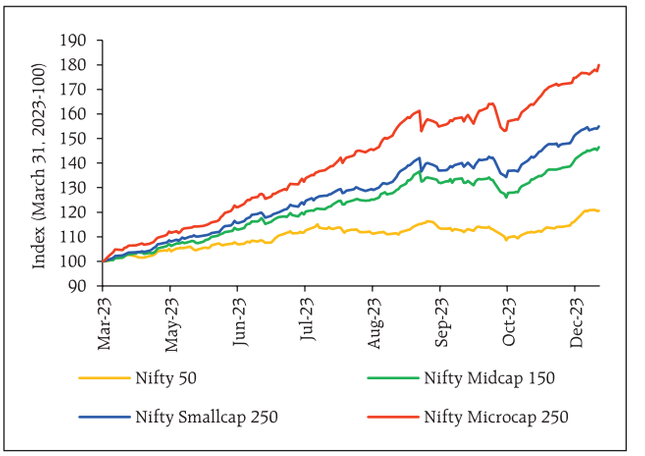
Table 1.8: Nifty Benchmark Indices Return

(per cent)

CAGR	Nifty 50	Nifty Mid-cap 150	Nifty Small-cap 250	Nifty Micro-cap 250
1-year	7	32	37	58
2-years	9	19	18	35
3-years	16	29	33	52

Note: Data as on November 30, 2023.
Source: NSE.

Chart 1.68: Performance of Nifty Benchmark Indices



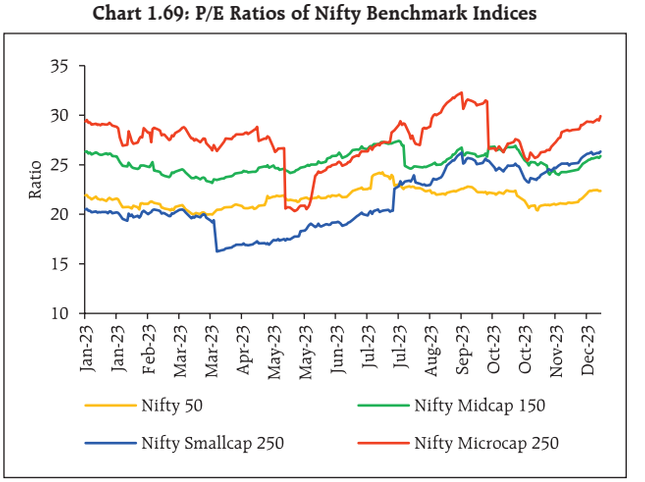
Source: NSE.

Table 1.9: Category-wise Scrip Level P/E Ratio

Category	P/E of Corresponding Benchmark Indices	Scrips with P/E higher than P/E of Benchmark Index (per cent)
Large Cap	22.7	68
Mid Cap	26.8	69
Small Cap	24.5	70
Micro Cap	26.6	61

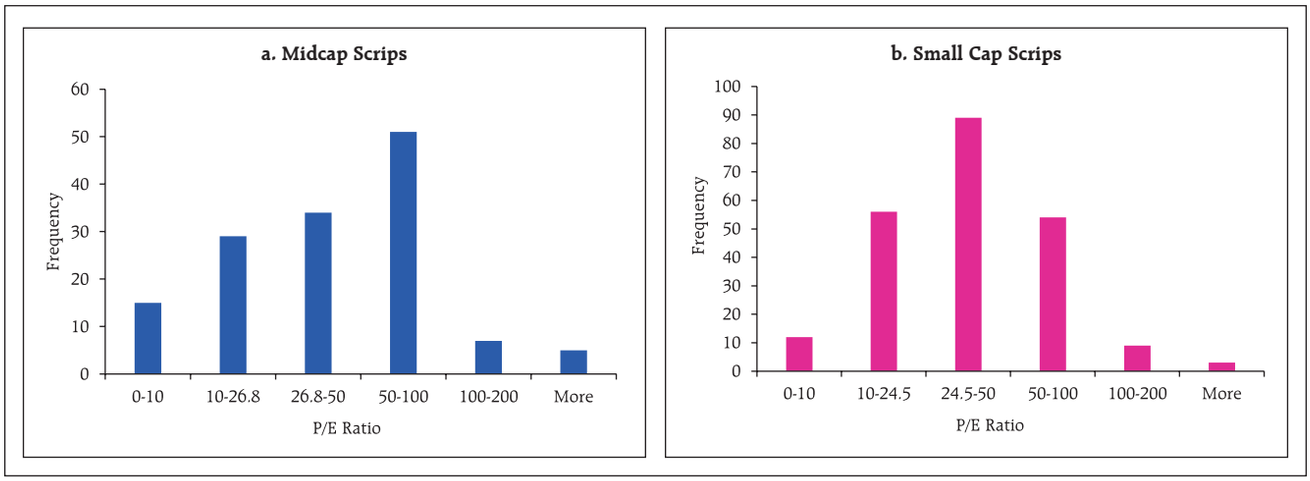
Note: (1) Data as on September 30, 2023.
(2) Categorisation of stocks is based on AMFI classification of stocks as on June 2023 which takes into account Average Market Capitalisation of listed companies across NSE, BSE and MSEI during the six months ended 30 June 2023; Large Cap: Stocks ranking 1st -100th, Mid Cap: Stocks ranking 101st -250th, Small Cap: Stocks ranking 251st -500th, Micro Cap: Stocks ranking 501st -750th;
(3) Scrips having negative/ zero PE have not been considered.
Source: NSE.

Chart 1.69: P/E Ratios of Nifty Benchmark Indices



Source: NSE.

Chart 1.70: Frequency Distribution of P/E Ratios of Mid-cap and Small-Cap Scrips

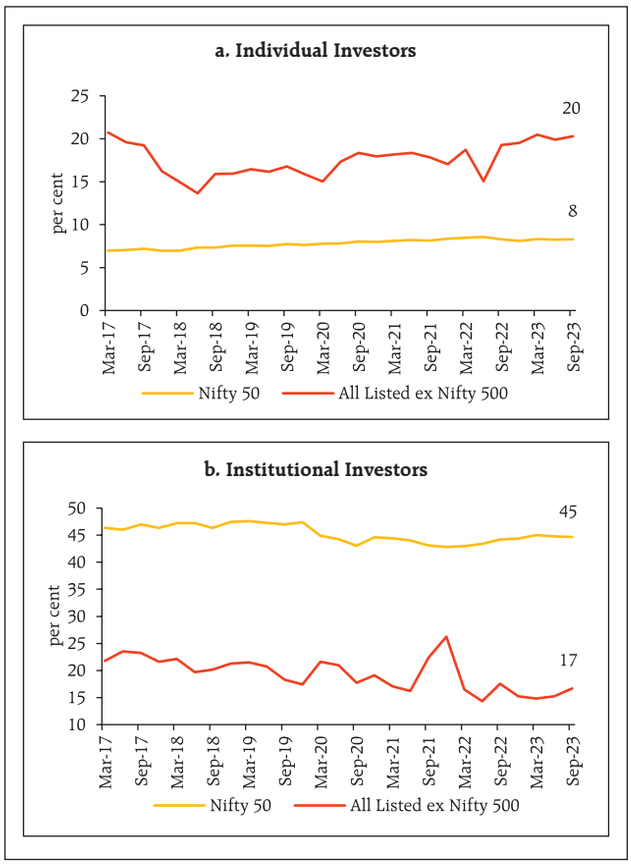


Note: (1) Data as on September 30, 2023.
(2) Categorisation of stocks is based on AMFI classification of stocks as on June 2023; Mid Cap: Stocks ranking 101st -250th, Small Cap: Stocks ranking 251st -500th.
(3) Nifty Midcap 150 and Nifty Small Cap 250 had P/E of 26.8 and 24.5, respectively, as on September 30, 2023.
Source: NSE.

1.93 Second, in recent years there is a sharp rise in individual investors' participation in the equity market, primarily in shares of smaller firms. In contrast to institutional investors, individuals' investments in listed companies excluding Nifty 500 is steadily increasing (Chart 1.71 a and b); at end-September 2023 they owned 48 per cent of the floating stock of these firms.

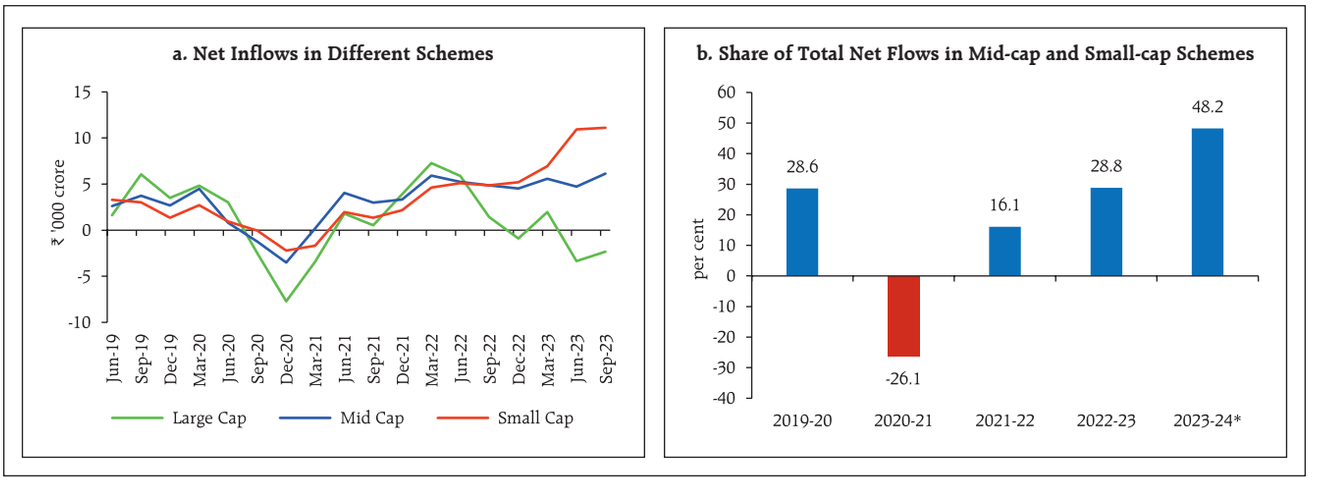
1.94 Individual investors' appetite for investments in smaller firms is also augmented by mutual funds (MFs). Mid-cap and small-cap schemes of MFs have seen rapid increase in net inflows

Chart 1.71: Individual *vs* Institutional Ownership in Market Capitalisation



Note: Institutional investors include Mutual Funds, Foreign Institutional Investors, Banks, Financial Institutions, Insurance Companies and Corporates.
Source: NSE.

Chart 1.72: Flows in Different Schemes of Mutual Funds



Note: * Data up to end-November 2023.
Source: AMFI.

even as large-cap schemes witnessed net outflows (Chart 1.72 a and b).

1.95 Between June 2020 and September 2023, MFs' share in free float market capitalisation of micro-cap stocks went up from 10.7 per cent to 15.9 per cent, which is the highest amongst all categories of shareholders (Table 1.10).

Table 1.10: Category-wise Stock Holdings by Mutual Funds

(per cent)

Stock Ranking*	End-June 2020	End-September 2023
1st -100th	14.9	16.9
101st -250th	22.0	22.0
251st -500th	18.2	19.2
501st -750th	10.7	15.9
751st onwards	3.9	4.6
All Listed	15.1	17.6

Note: (1) * Stock Ranking in terms of NSE Full Market Capitalisation.
(2) Data consists of all NSE listed stocks.
Source: NSE.

1.96 Third, equity derivatives trading volumes are increasing, with a sharp rise in individual investors' participation in that segment. The attractiveness of options as derivatives lies in the embedded leverage, which allows traders to take exposure with little upfront cash. The number of active derivatives traders went up nearly six times from 2018-19 levels to 6.9 million by end of October 2023. Moreover, like derivatives market in other countries, there is a growing interest in shorter-duration options, which enables manifold increase in traders' leverage, as option premiums are relatively low. Nevertheless, the required margins have not shown any significant variation (Table 1.11). Moreover, these margins are

Table 1.11: Margin Requirements for Writing Options at NSE

Date	NIFTY Underlying Value at BOD (Index)	Value (₹)	Strike Price (Index)	Margin Required for Writing 1 Contract for Last Day of Expiry (₹)	Margin Required for Writing 1 Contract for Last Day of Expiry (per cent)	Margin Required for Writing 1 Contract for Monthly Expiry (May/November) as on the Expiry Day of 2nd Week (₹)	Margin Required for Writing 1 Contract for Monthly Expiry (May/November) as on the Expiry Day of 2nd Week (per cent)	Net Option Value (for Last Day of Expiry) for Buyers (₹)	Net Option Value (for Monthly Expiry) for Buyers (₹)
11-Nov-21	18017.2	1351290	18000	107100	8	103900	8	3683	11333
12-May-22	16167.1	1212533	16150	101050	8	100300	8	4983	14313
10-Nov-22	18157.0	907850	18150	104350	11	103050	11	3355	12385
11-May-23	18315.1	915755	18300	103350	11	100650	11	2863	9003
9-Nov-23	19443.5	972175	19400	110900	11	110000	11	3055	11503

Source: NSE.

levied and collected at the client level, which helps in mitigating over-leveraged speculation in the securities market. In addition, margins charged by Indian stock exchanges are higher than those charged by global peers: the initial margin charged by NSE on NIFTY option contracts is 11 per cent (even on the last day of expiry) as against 5 per cent on NIFTY at SGX.

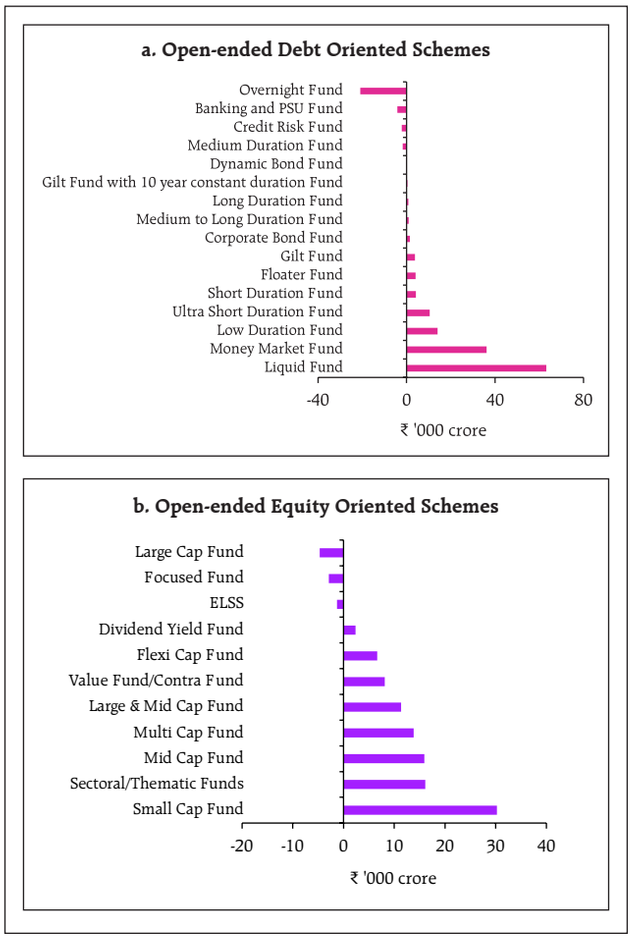
1.97 Empirical evidence shows that 9 out of 10 traders in the derivatives segment incurred losses and the average loss per active trader was ₹50,000 in 2021-22[34]. In this context, the SEBI has introduced "Risk Disclosures" with respect to trading in the equity derivatives segment with a view to empowering the investors with detailed information about the risks associated with trading in equity derivatives segment and, thereby, facilitating informed decision making.

I.2.7 Mutual Funds

1.98 Backed by the rise in households' participation, the domestic mutual fund industry experienced robust growth. Total assets under management (AUM) rose by 21 per cent (y-o-y) in September 2023, when it touched its all-time high (Table 1.12).

1.99 In the current fiscal year till November 2023, both equity-oriented and debt-oriented open-ended schemes received net inflows; the AUM of equity-oriented open-ended schemes grew by 34 per cent, with small-cap funds receiving the highest inflows. Debt-oriented schemes' AUM grew by 15 per cent, with investors preferring liquid and money market funds (Chart 1.73 a and b).

Chart 1.73: Mutual Fund Scheme-wise Net Inflows



Note: Data pertains to April-November, 2023.
Source: SEBI.

Table 1.12: Assets under Management of the Domestic Mutual Fund Industry

(₹ lakh crore)

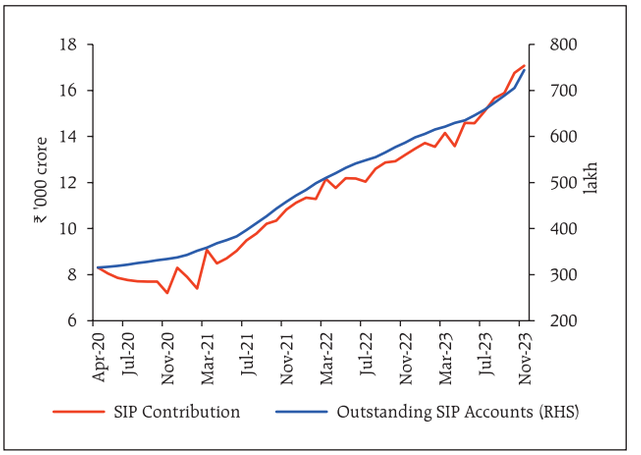
As on	B30 AUM			T30 AUM			Industry AUM		
	Equity	Non-Equity	Total	Equity	Non-Equity	Total	Equity	Non-Equity	Total
Apr 30, 2023	4,47,424	2,93,354	7,40,778	12,44,404	21,76,640	34,21,044	16,91,828	24,69,994	41,61,822
Jun 30, 2023	4,92,805	3,02,406	7,95,211	13,62,612	22,81,365	36,43,976	18,55,417	25,83,771	44,39,187
Sep 30, 2023	5,37,790	3,22,668	8,60,457	14,89,083	23,08,214	37,97,298	20,26,873	26,30,882	46,57,755

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

[34] SEBI (2023), "Analysis of Profit and Loss of Individual Traders dealing in Equity F&O Segment", Department of Economic and Policy Analysis, January.

1.100 Systematic Investment Plans (SIPs) offered by MFs have been contributing to financialisation of savings by encouraging investors to make periodic small-amount investments. As on November 30, 2023, investments made through SIPs formed 19 per cent of the total AUM of the domestic mutual fund industry (Chart 1.74).

Chart 1.74: Growth in Systematic Investment Plans



Source: SEBI.

I.2.8 Alternative Investment Funds

1.101 Globally, AUM of private capital is estimated to have more than doubled from US$ 9.7 trillion in 2012 to US$ 22.6 trillion by the end of 2022[35]. Alternative investment funds (AIFs) – one of the many forms of private capital – have grown consistently in India, raising about ₹3.7 lakh crore of funds by the end of June 2023. Their investments have also risen, with the investments of the three different types of AIFs, *viz.*, Category I, II and III, growing at CAGRs of 25 per cent, 49 per cent and 30 per cent, respectively from 2012. Through their intermediation role they perform a useful economic function by providing alternate sources of funding. AIFs, like other private credit vehicles, however, are, subject to lesser regulation compared to banks and NBFCs.

1.102 The sharp growth in AIFs and the evolving regulatory framework for these entities necessitate a closer look at potential risks they pose for financial stability, including: (a) growing interlinkages of AIFs with traditional segments such as banks, NBFCs and asset management companies (AMCs) in terms of sponsor relationships, exposures to each other and common investor base, entailing spillover risks as well as reputation risk for banks and NBFCs, and loss of confidence; (b) regulatory arbitrage due to gaps in existing regulatory architecture for AIFs *vis-à-vis* banks/ NBFCs, which could potentially give rise to concerns relating *inter alia* to evergreening. In particular, AIFs with 'priority distribution model' are being set up to potentially aid in evergreening of stressed assets of some financial institutions/ regulated lenders. As an interim measure, the SEBI had directed schemes of AIFs, which have adopted aforesaid priority distribution model, not to accept any fresh commitment or make investment in a new investee company; (c) potential for non-residents, through investment in units of AIFs, to invest in domestic markets without adhering to extant laws and regulations for non-resident investment in domestic markets; and (d) limited disclosure requirements, making effective monitoring and identification of risks challenging.

1.103 AIFs currently form a small portion of the Indian financial system, but their rapid growth and growing interlinkages with banks/ NBFCs warrant close monitoring of these entities and development of a sound regulatory framework to reduce spillovers and transmission of risks to the broader financial system. It is in this context that measures have been taken by the Reserve Bank recently (a) to prevent regulated entities (REs) from making investments in any scheme of AIFs with downstream investments either directly or indirectly in a debtor company of the RE; (b) liquidate RE's investment in an AIF

[35] Burke, Ryan (2023), "Are you harnessing the growth and resilience of private capital?", Ernst&Young, August.

scheme, in which RE is already an investor, within 30 days from the date of such downstream investment by the AIFs or make 100 per cent provision on such investments; and (c) subject investment by REs in the subordinated units of any AIF scheme with a 'priority distribution model' to full deduction from RE's capital funds. These are aimed at addressing concerns relating to substitution of direct loan exposures with indirect exposures through investments in AIFs (See section III.3.2 for details).

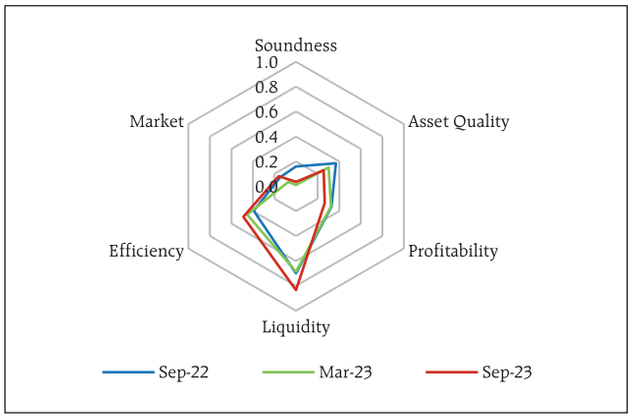
I.2.9 Banking Stability Indicator

1.104 The banking stability indicator (BSI)[36], which provides an overall assessment of the health of the domestic banking system, remained robust during H1:2023-24. Aided by declining levels of NPAs and restructured assets, the asset quality indicator improved further, and record return-on-assets (RoA) and healthy net interest margin (NIM) enhanced the profitability indicator. Efficiency indicator weakened due to increase in cost to income ratio. Although there was a marginal weakening of soundness and liquidity indicators due to increase in risk-weighted assets and a decline in the liquidity coverage ratio (LCR) respectively, the banking system has adequate capital and liquidity relative to the regulatory minimum (Chart 1.75).

I.2.10 Banking System

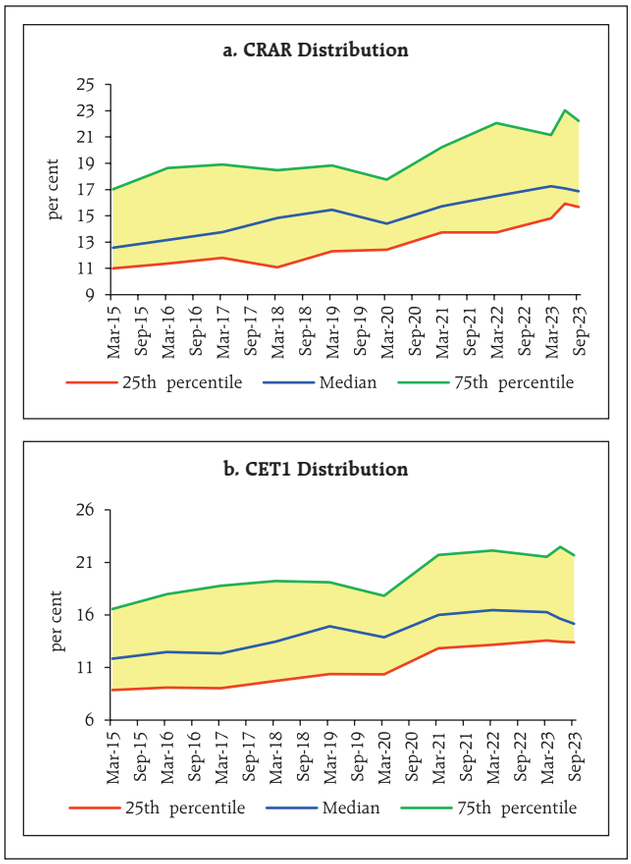
1.105 The domestic banking system remains resilient, bolstered by strong buffers, robust earnings and the ongoing strengthening of balance sheets. The capital to risk-weighted asset ratio (CRAR) at end-September 2023 remained high at 16.8 per cent *vis-à-vis* the regulatory minimum of 11.5 per cent (including capital conservation buffer) while the common equity tier 1 (CET1) ratio, which represents the highest quality of regulatory capital, stood at 13.7 per cent as against the regulatory requirement of 8 per cent (including capital conservation buffer) (Chart 1.76 a and b).

Chart 1.75: Banking Stability Map



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

Chart 1.76: Banking System Capital



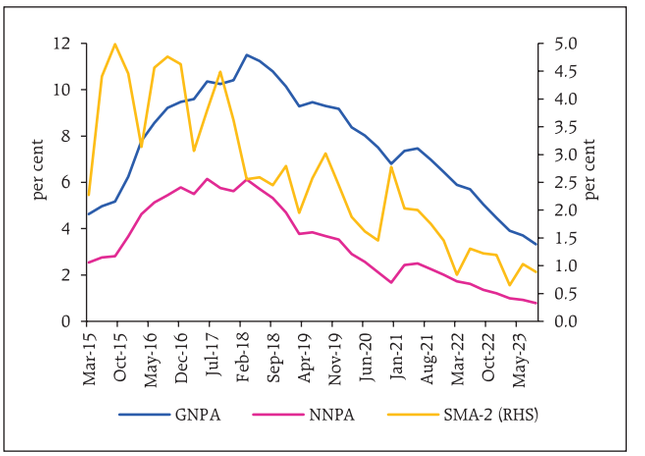
Source: RBI supervisory returns.

[36] See Annex 2 for detailed methodology and the variables used.

1.106 Both coincident and leading indicators of asset quality, *i.e.*, the gross non-performing assets (GNPA) ratio[37] and the special mention accounts - 2 (SMA-2)[38] ratio, respectively, have fallen to multi-year lows of 3.2 per cent and 0.9 per cent, even as improved provisioning drove the net non-performing assets (NNPA) ratio to a multi-decadal low of 0.8 per cent (Chart 1.77).

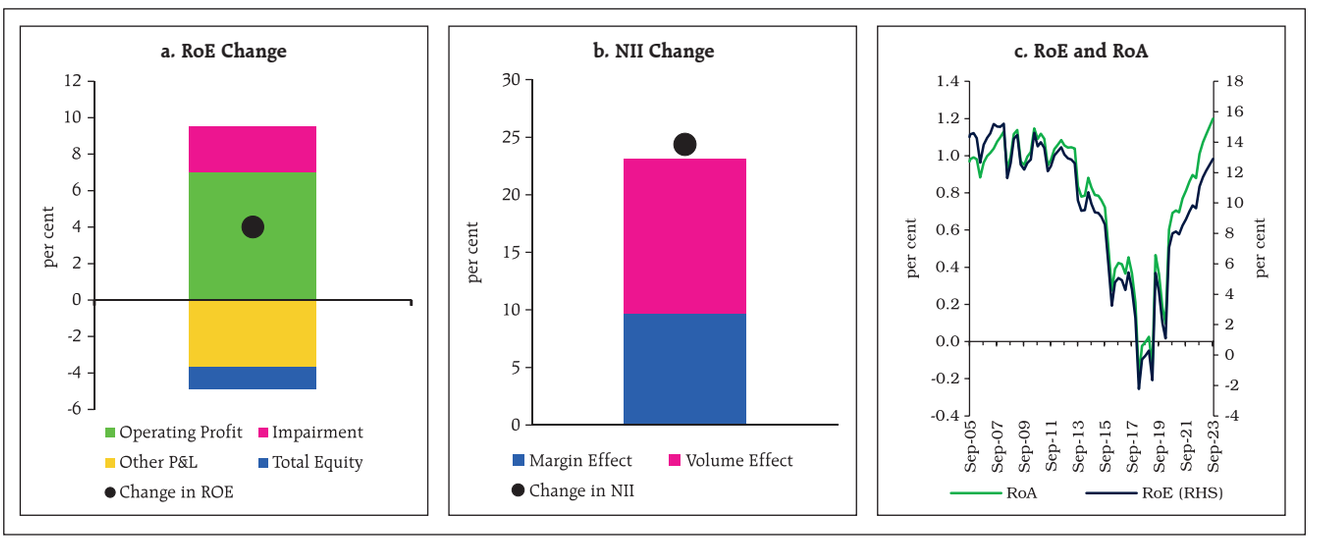
1.107 Healthy interest margins, strong credit demand and lower impairments have boosted net interest income (NII) of the banking system through the course of the current monetary policy tightening cycle, and strengthened earnings as reflected in RoA and RoE, which rose to 1.2 per cent and 12.9 per cent, respectively, in September 2023 from historical lows of (-) 0.2 per cent and (-) 2.2 per cent, respectively, in March 2018 (Chart 1.78 a, b and c).

Chart 1.77: Asset Quality Indicators



Source: RBI supervisory returns.

Chart 1.78: Banking System Profitability Indicators



Notes: (1) RoE change and NII Change from Q1: 2022-23 to Q1:2023-24.

(2) Volume effect is the impact on Net Interest Income (NII) on acccount of increase in Interest Earning Assets and Margin effect is the impact on NII on account of increase in Net Interest Margin (NIM).

Sources: RBI supervisory returns and staff calculations.

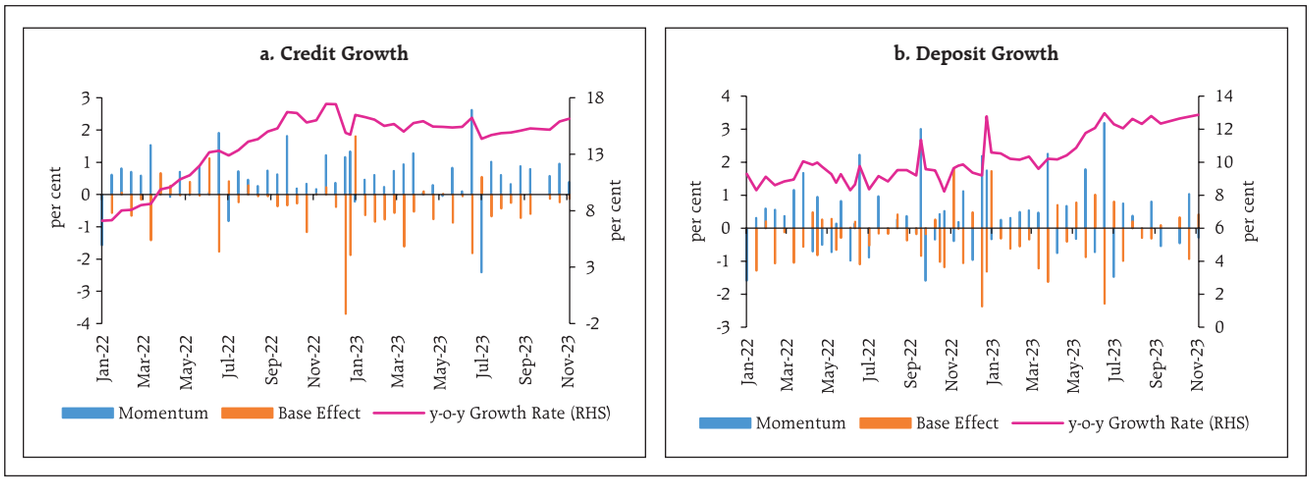
[37] GNPA ratio is the share of gross non-performing assets in gross loans and advances.

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

a) For loans in the nature of revolving facilities (*e.g.*, 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 1.79: Credit and Deposit Growth



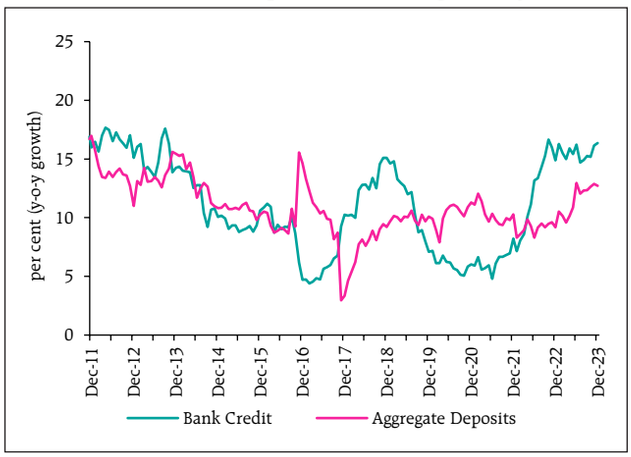
Note: (1) Data does not include the impact of reverse merger of a non-bank with a bank.
(2) Momentum effect is calculated as $[\ln c_t - \ln c_{t-1}]*100$ where c is outstanding credit. While, base effect is calculated as $[\ln c_{t-12} - \ln c_{t-13}]*100$. For more details, see Box I.1 of the Monetary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

1.108 Further gains in earnings could, however, be moderated by rising cost of funds for banks - the average cost of funds[39] of SCBs have risen by 80 basis points (bps) - from 4.4 per cent during Q4:2022-23 to 5.2 per cent in Q2:2023-24.

1.109 Healthier balance sheets have facilitated broad-based expansion in lending by banks. Bank credit growth continues to outpace deposit growth on the back of sustained momentum of demand (Chart 1.79 a and b).

1.110 A longer-term analysis indicates the tendency of bank credit and deposit growth to converge though they diverge frequently in the short-term (Chart 1.80). An error correction model suggests that around 8 per cent of any divergence between credit and deposit growth is eliminated every month[40]. Consequently, the incremental credit-deposit (CD) ratio has fallen to 96.2 per cent by December 01, 2023 from a peak of 133.8 per cent on November 04, 2022.

Chart 1.80: Credit and Deposit Growth - Long Term Dynamics



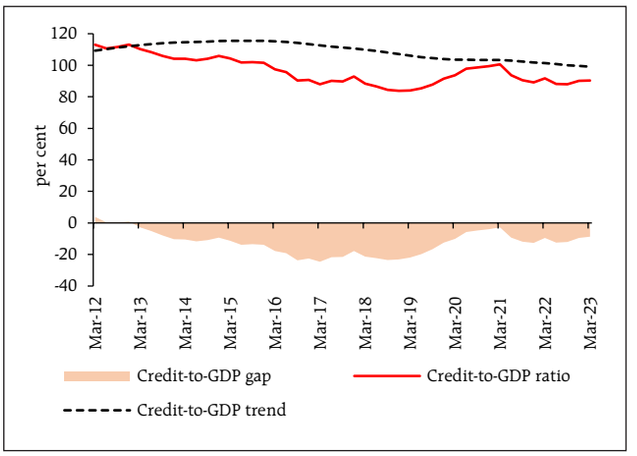
Note: Data does not consider the impact of merger of a non-bank with a bank.
Source: RBI.

1.111 Recent quarters have witnessed some moderation in the build-up of excessive credit momentum as measured by the credit-to-GDP gap (*i.e.*, the difference between the credit-to-GDP ratio and its long-term trend) to (-) 8.8 per cent in Q4:2022-23 from (-) 12.4 per cent in Q1:2022-23. The quarterly

[39] Average Cost of Funds = (Annualised Interest Expenses /Average Interest Bearing Liabilities) x 100

[40] RBI (2023), 'Monetary Policy Report', April.

Chart 1.81: Credit-to-GDP Gap



Note: Credit refers to credit from all sectors to private non-financial sector.
Source: BIS.

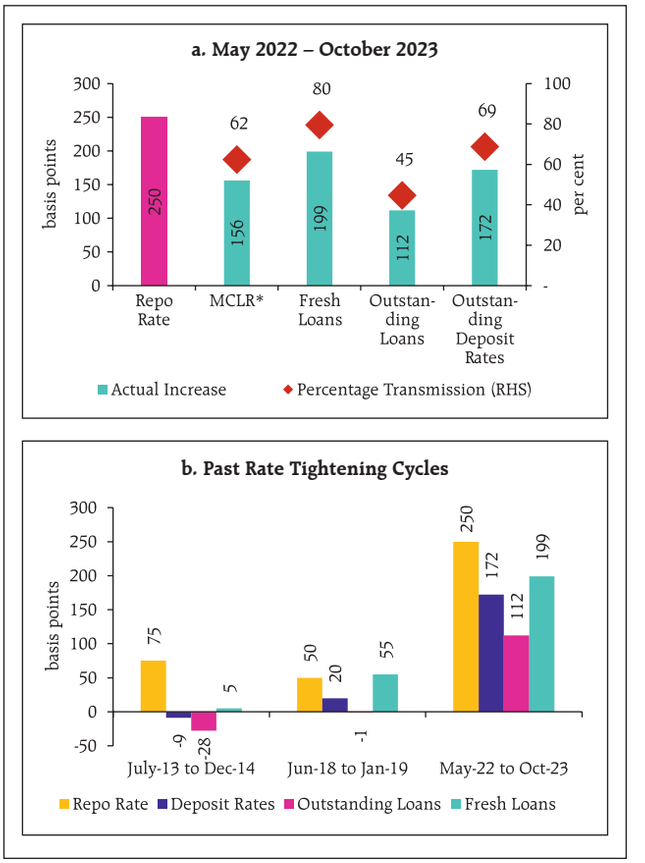
average credit growth at 15.5 per cent is still below the threshold level of 16-18 per cent (Chart 1.81).

1.112 Monetary policy transmission to bank lending and deposit rates has been stronger in this cycle compared to previous cycles (Chart 1.82 a and b).

1.113 The distribution of outstanding loans across interest rates buckets also reflects faster transmission. The share of total outstanding loans in the interest rate range of more than 9 per cent rose from 30.7 per cent in March 2022 to 57.8 per cent in September 2023, whereas outstanding loans with interest rates less than 9 per cent declined from 69.3 per cent to 42.2 per cent (Chart 1.83).

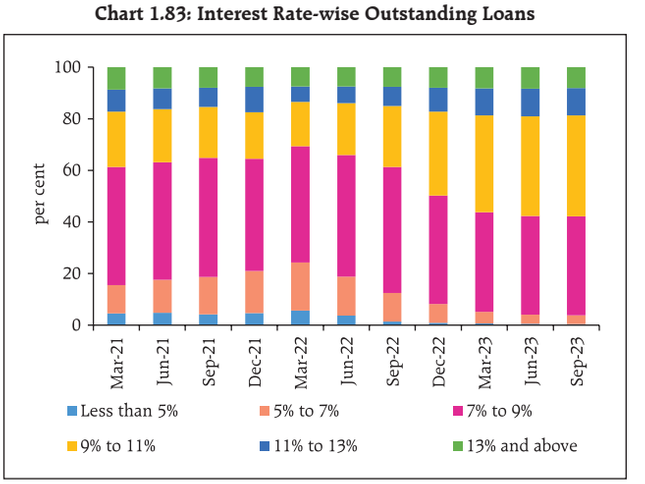
1.114 In recent times, bank credit has undergone compositional shifts, with an increasing proportion of credit going to services and the retail sector. Over the past two years, banks and NBFCs have seen rapid and persistent growth in retail loans[41], especially unsecured lending. Between September 2021 to September 2023, banks' retail loans grew at a compound annual growth rate (CAGR) of 25.5 per cent, which exceeded the headline credit growth

Chart 1.82: Monetary Policy Transmission to Bank Lending and Deposit Rates



Note: * Data on MCLR pertain to November 2023.
Source: RBI.

Chart 1.83: Interest Rate-wise Outstanding Loans



Source: RBI.

[41] Retail loans consist of housing loans, vehicle loans, loans against property, education loans, loans against FD, loans against shares, personal loans, credit cards, consumer durables and other retail loans.

of 18.6 per cent. Consequently, the share of retail lending in gross advances increased from 37.7 per cent in September 2021 to 42.2 per cent in September 2023[42]. Alongside, unsecured retail lending grew by 27.0 per cent during the same period, taking its share in total retail lending to 23.3 per cent (9.83 per cent of total gross advances of the banks).

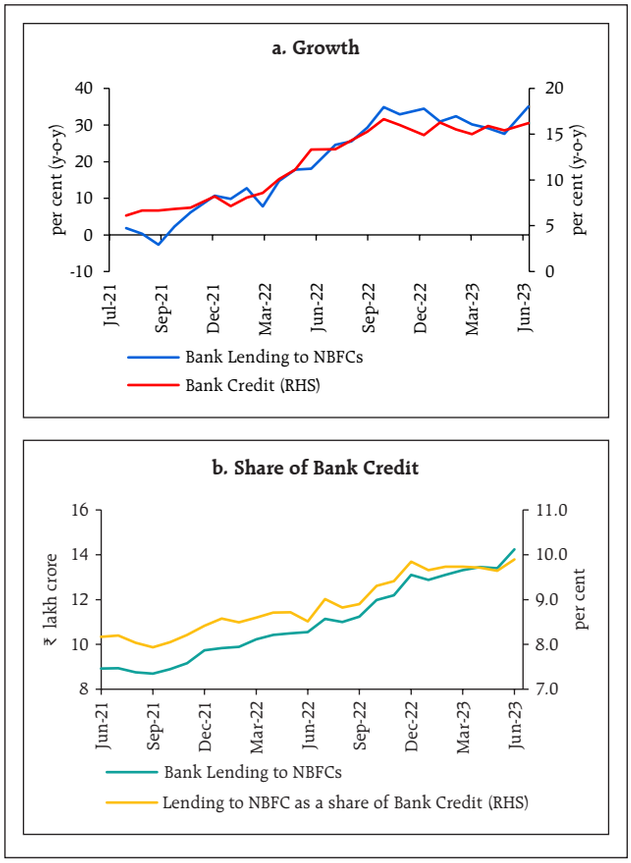
1.115 Despite the sharp growth in retail lending, underlying asset quality has improved. The GNPA ratio of total retail advances improved to 1.6 per cent in September 2023 from 2.0 per cent in September 2022, whereas the SMA (1+2) ratio rose marginally from 2.7 per cent to 2.8 per cent. The GNPA ratio of unsecured retail advances improved to 2.0 per cent in September 2023 from 2.5 per cent a year ago.

1.116 A related development, which has facilitated rapid growth in retail loans, is bank lending to NBFCs, which constituted 9.9 per cent of total bank credit (end-June 2023). Bank lending to NBFCs increased at a CAGR of 26.3 per cent during the past two years (*i.e.*, from June 2021 to June 2023), well above the growth of 14.8 per cent in overall bank credit (Chart 1.84 a and b). Such lending is, however, mostly limited to top-rated NBFCs with close to 80 per cent of credit given to those with AA-rating and above[43].

1.117 Although there are no imminent signs of stress in the retail credit segment, its rapid growth amidst the disinflationary monetary policy stance raises concerns in terms of procyclicality of lending and higher debt servicing costs (Chart 1.85).

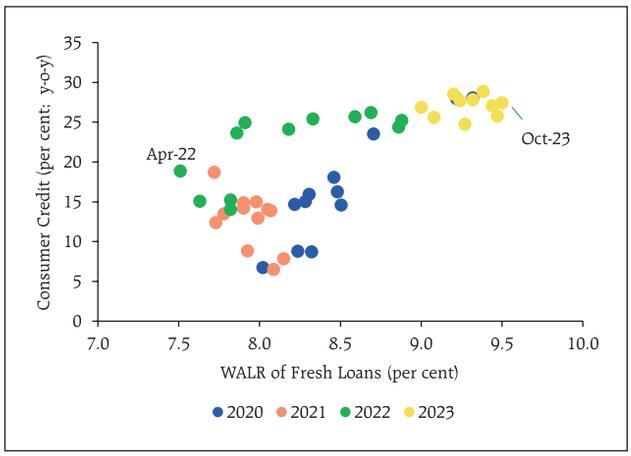
1.118 As banks and NBFCs have entered into various co-lending models with divergent underwriting practices and banks have been the major lender to NBFCs, rising interconnectedness raises risks emanating from cross-sectional dimensions. Furthermore, there are few outlier banks that have substantial SMA (1+2) ratios even

Chart 1.84: Bank Lending to NBFCs



Sources: RBI and staff calculations.

Chart 1.85: Consumer Credit and Interest Rates



Note: (1) Consumer credit includes personal loans excluding housing, education, vehicle and loans against gold jewellery.
(2) Interest rate is weighted average lending rate (WALR) on all fresh rupee loans sanctioned during a particular month.

Sources: RBI and staff calculations.

[42] The merger of a large non-bank with a bank has also contributed to the growth in retail advances of the banking sector.

[43] Based on bank loan data from Central Repository of Information on Large Credits (CRILC) database.

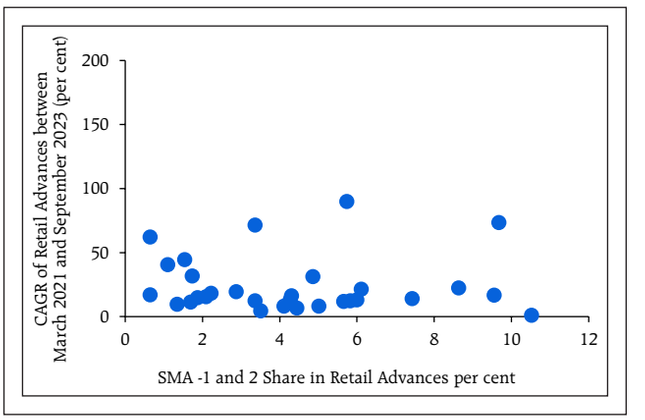
as retail portfolios are witnessing rapid growth (Chart 1.86). Accordingly, the Reserve Bank took proactive regulatory measures, such as increase in risk weights on certain segments of consumer credit by banks and NBFCs as well as bank credit to NBFCs, along with a strengthening of credit standards in respect of various sub-segments under consumer credit, to prevent build-up of risks and spillover to the wider financial system.

1.119 The decision to increase risk weights is both stability enhancing and credit positive. First, banks and NBFCs will be required to allocate higher capital for unsecured retail loans, which will improve their loss-absorbing buffers; and second, it will dampen growth exuberance among lenders and improve credit quality. Adjusting for increase in risk weights, the CRAR of the banking system (PSBs + PVBs) is estimated to decline by 71 bps to 16.0 per cent and CET1 may fall by 58 bps to 13.2 per cent. The impact, however, varies among banks (Chart 1.87).

1.120 A prolonged period of high interest rates could test the resilience of the banking sector, through valuation losses in their investment portfolios. Banks hold 63.6 per cent of their investments in the held-to-maturity (HTM) category[44], which are not marked to market. An assessment of unrealised losses on securities held in the HTM portfolio shows that losses have reduced relative to the March 2023 position, and the impact on their CET1 ratio is limited for most banks[45]. The median impact of unrealised losses on the CET1 ratio of select banks is 62 bps, with 5 per cent of banks registering a sizeable impact of 160 bps or more (Chart 1.88).

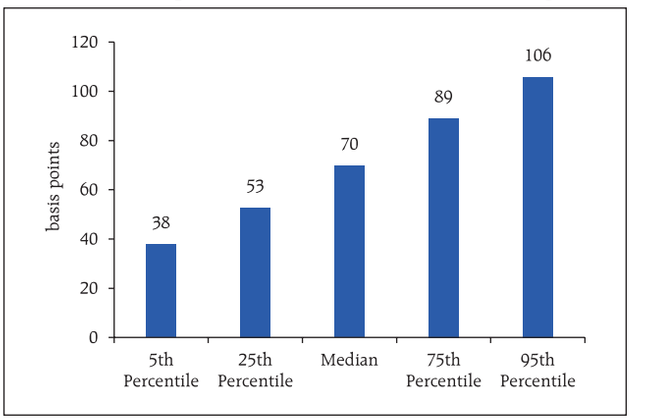
1.121 A key takeaway from the March 2023 banking turmoil in some economies is that banks remain vulnerable to loss of confidence and consequent deposit runs even with high levels of capital and

Chart 1.86: Retail Advances and SMA (1+2) Ratio



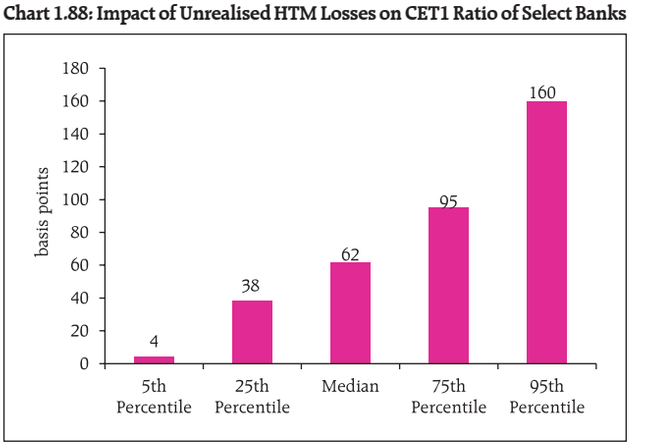
Note: Based on a sample of 30 public, private and small finance banks.
Source: RBI Supervisory Returns.

Chart 1.87: Impact on CRAR due to Increase in Risk Weights



Note: Based on a sample of 33 PSBs and PVBs.
Sources: RBI supervisory returns and staff calculations.

Chart 1.88: Impact of Unrealised HTM Losses on CET1 Ratio of Select Banks



Note: 1. Calculations based on December 11, 2023 position.
2. Based on a sample of 33 banks.
Sources: RBI supervisory returns and staff calculations.

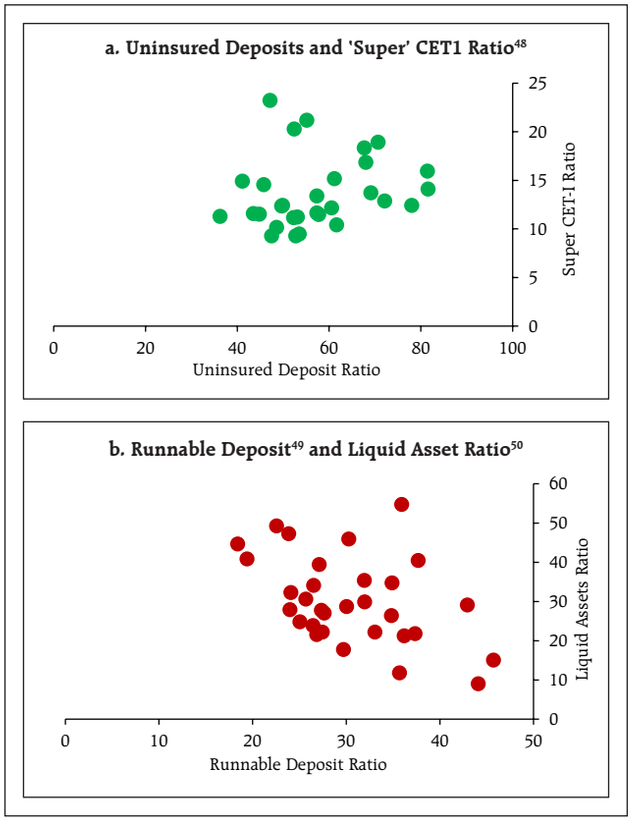
[44] Bank's investments under HTM category is limited to 25 per cent of total investments. However, it can exceed 25 per cent if (i) the excess comprises of SLR securities and (ii) total SLR in HTM does not exceed a certain percentage (currently 23 per cent) of net demand and time liabilities (NDTL).

[45] 33 banks that account for 93.2 per cent of total banking system assets and 99.0 per cent of HTM securities held by the banking system.

liquidity buffers. Accordingly, alternative metrics such as (i) the ratio of uninsured deposits to total deposits; (ii) the 'super' CET1 ratio, which considers the unrealised losses on HTM securities; (iii) the runnable deposit ratio; and (iv) the liquid asset ratio that excludes HTM securities, are useful indicators of banking system vulnerabilities[46]. Application of these metrics on Indian banks shows that (a) banks that have a higher ratio of uninsured deposits also have a sufficiently higher 'super' CET1 ratio; and (b) while the runnable deposit ratio is low compared to banks that failed in March 2023[47], the liquid asset ratio is also low as the share of HTM securities is high (Chart 1.89 a and b).

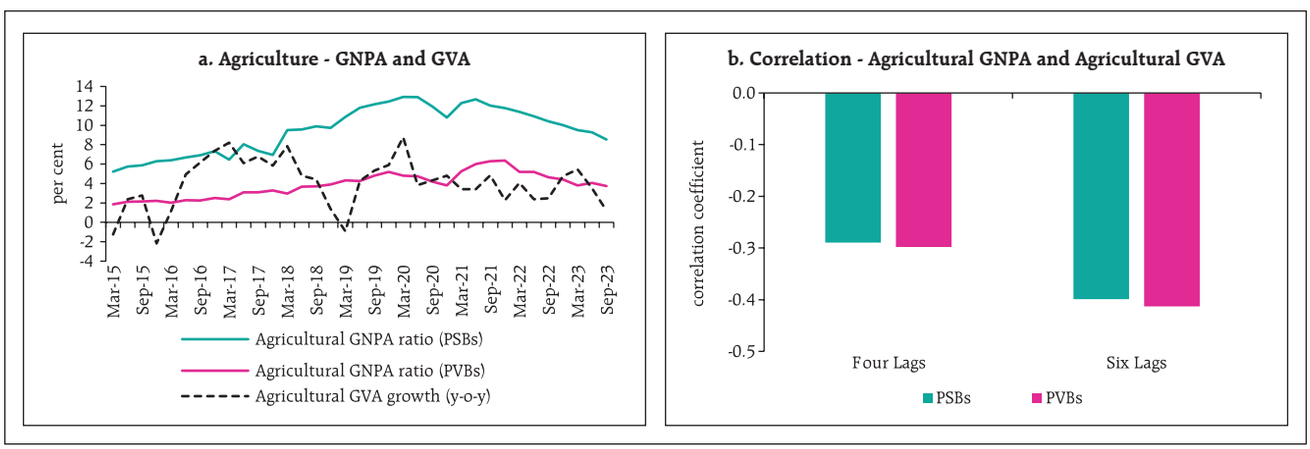
1.122 Historically, movements in bank lending to agricultural activity are found to be strongly related with performance of the sector. Weak growth in agriculture is associated with a rise in non-performing assets (NPAs) in agricultural loans with a lag of 4-6 quarters. NPAs in the agriculture sector remain at elevated levels despite the recent decline (Chart 1.90 a and b).

Chart 1.89: Alternative Indictors of Banking Vulnerabilities



Note: (1) Uninsured deposits are shown relative to total deposits.
(2) Uninsured Deposit Ratio as on March 2023.
(3) The runnable deposit ratio shows runnable deposits as a percentage of adjusted tangible assets.
(4) Based on a sample of 31 public and private banks.
Sources: RBI, DICGC and staff calculations.

Chart 1.90: Agriculture Sector Performance and GNPA



Sources: RBI and staff calculations.

[46] Financial Stability Board (2023), "Vulnerabilities assessment: 2023 H2", September 25.

[47] Silicon Valley Bank, Signature Bank and First Republic Bank, which failed, had runnable deposit ratio above 70 per cent and liquid asset ratio below 30 per cent.

[48] The super CET1 ratio includes unrealised losses on HTM securities in the numerator.

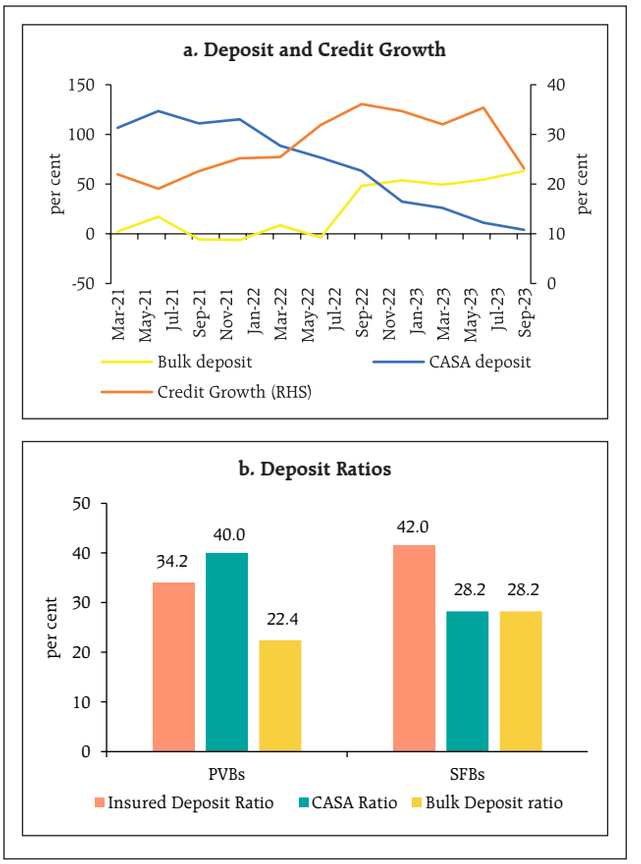
[49] Runnable deposits are non-time deposits.

[50] Liquid assets are cash and cash equivalents, trading securities, and available for sale securities, and are shown relative to runnable deposits.

1.123 The rapid credit expansion among small finance banks (SFBs) - which grew at an annualised rate of 23.2 per cent in September 2023 - is being funded by high reliance on bulk deposits[51]. The growth (y-o-y) in bulk deposits (63.3 per cent) led overall deposit growth (31.3 per cent) in September 2023, whereas current and savings account (CASA) grew only at 4.0 per cent. Their share of bulk deposits is high (Chart 1.91 a and b), even though at the aggregate level, their balance sheet size is relatively small compared to other private sector banks. Accordingly, SFBs' cost of funds and lending rates at 7.1 per cent and 14.3 per cent, respectively, are 1.4 percentage points and 5.0 percentage points higher than their private sector counterparts.

1.124 SFBs are growing their retail loans portfolio at a brisk pace: at double the pace of SCBs, although from a lower base. Though their retail GNPA ratio is low at 2.3 per cent, more than a third of their retail loan portfolio remains unsecured (Chart 1.92 a and b).

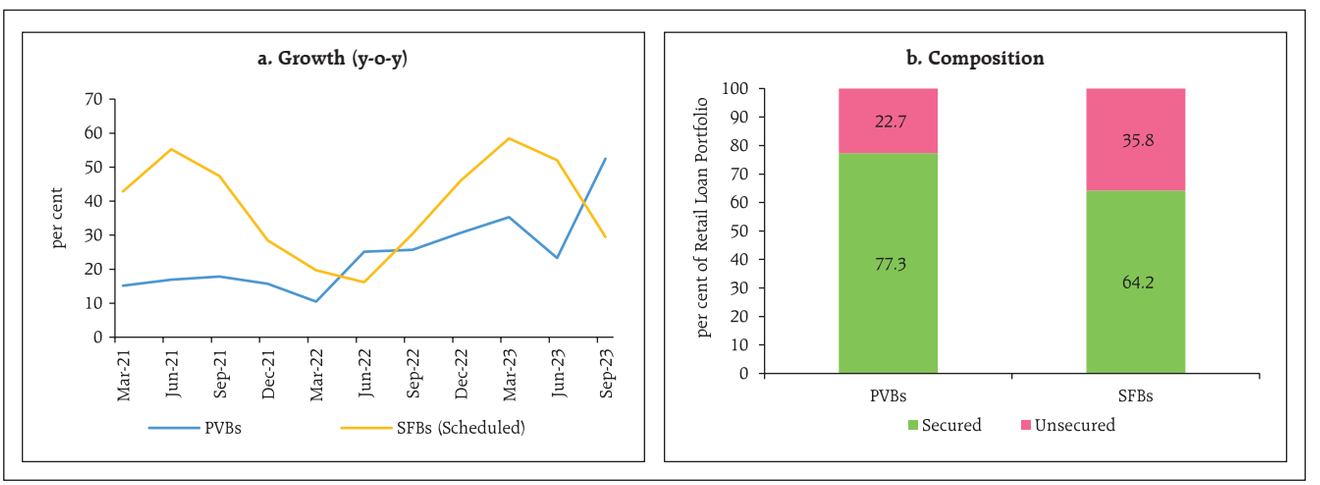
Chart 1.91: SFBs - Deposit Profile



Note: (1) Data as on September 30, 2023.
(2) CASA and bulk deposit ratio as on September-2023.
(3) Data pertains to 10 SFBs at end-March 2021, 11 SFBs at end-June 2021 and 12 SFBs at end-December 2022.

Sources: RBI supervisory returns and DICGC.

Chart 1.92: SFBs – Retail Loans



Sources: RBI supervisory returns.

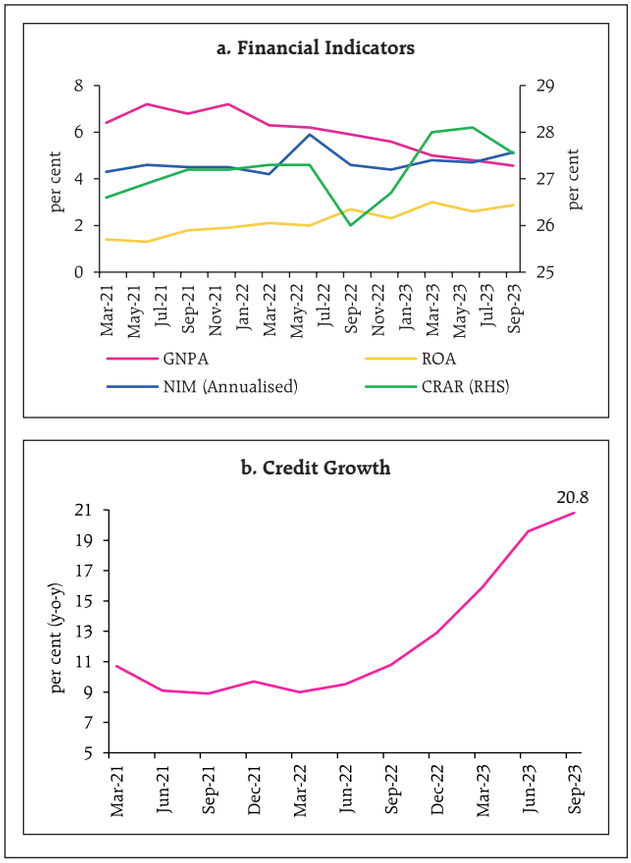
[51] Single Rupee term deposits of ₹2 crore and above.

I.2.11 Non-Banking Financial Companies (NBFCs)

1.125 The NBFC sector has increased its footprint in financial intermediation, and this has been associated with a rise in connectedness with the traditional banking system. Substantial capital buffers, improving asset quality and robust earnings have increased the resilience of the NBFC sector: the CRAR at 27.6 per cent in September 2023 remains well above the regulatory minimum of 15 per cent; the GNPA ratio has declined from a high of 7.2 per cent in December 2021 to 4.6 per cent in September 2023; and NIM and RoA stood at 5.1 per cent and 2.9 per cent, respectively, in September 2023 (Chart 1.93 a). Healthy balance sheets have enabled NBFCs to consistently expand credit, which grew from 8.9 per cent (y-o-y) in September 2021 to 20.8 per cent in September 2023 (y-o-y) (Chart 1.93 b).

1.126 There is significant heterogeneity within the NBFC sector, which makes systemic risk identification and monitoring a challenging task. Broadly, two classifications, *viz.*, NBFC - Investment and Credit Companies (NBFC-ICCs) and NBFC - Infrastructure Finance Companies (NBFC-IFCs), which account for 95 per cent of the NBFC sector's advances, have significant dependence on bank borrowings, which constituted 41.1 per cent of total borrowings {including subscriptions to debentures and commercial papers (CPs)} at the system level as at end-September 2023. The corresponding shares were 48.1 per cent and 29.5 per cent for NBFC-ICCs and NBFC-IFCs, respectively (Table 1.13 and 1.14).

Chart 1.93: NBFCs – Financial Indicators and Growth



Source: RBI supervisory returns.

Table 1.13: Sources of Borrowing – NBFCs (excluding CICs[52])

(percentage share)

	Sep-21	Mar-22	Sep-22	Mar-23	Sep-23
Debentures (excluding portion subscribed by Banks)	35.9	33.4	32.3	31.3	31.0
Borrowings from Banks (including subscription to Debentures and CPs)	37.0	40.1	41.4	41.4	41.1
Borrowings from Financial Institutions	2.3	2.6	2.7	2.9	3.1
Intercorporate Borrowings	3.6	3.4	3.6	3.4	3.3
Commercial Paper (excluding portion subscribed by Banks)	2.6	2.0	2.1	2.1	2.8
Borrowing from Government	0.8	0.7	0.7	0.6	0.6
Subordinated Debts	2.9	2.7	2.6	2.3	2.1
Other Borrowings	14.9	15.0	14.7	15.9	16.0

Source: RBI supervisory returns.

Table 1.14: Share of Bank Borrowing – NBFC-ICC and NBFC-IFC

(per cent)

	Sep-21	Mar-22	Sep-22	Mar-23	Jun-23	Sep-23
NBFC-ICC	44.1	46.2	47.3	47.0	46.0	48.1
NBFC-IFC	27.5	31.3	32.2	31.5	32.9	29.5

Note: Share of bank borrowing as a per cent of their respective total borrowings (including subscription to debentures and CPs).
Source: RBI supervisory returns.

[52] A Core Investment Company (CIC) is a non-banking financial company (NBFC) which invests in equity shares, preference shares, debt or loans of group companies.

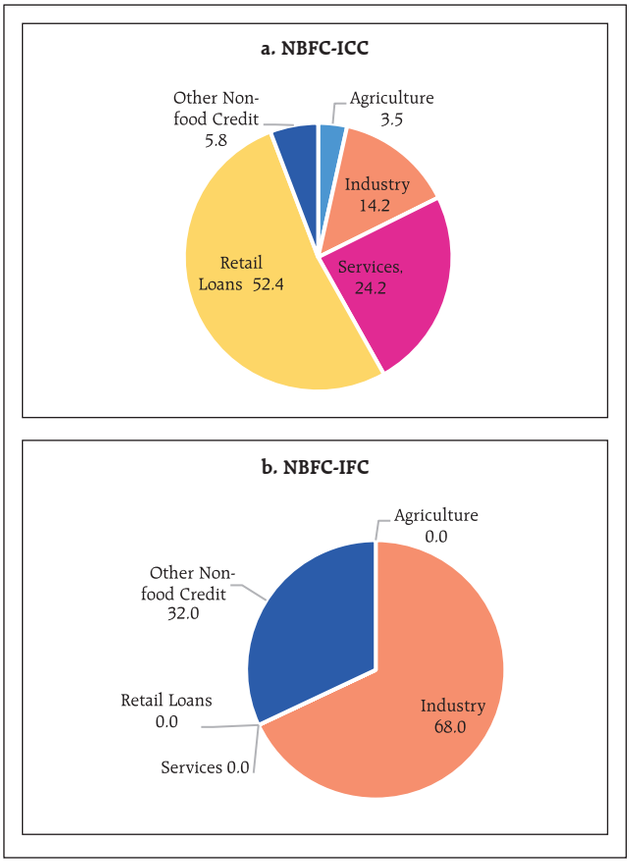
1.127 The asset side of the balance sheets of these two categories of NBFCs present different risk profiles. While NBFC-ICCs focus on retail lending, NBFC-IFCs predominantly lend to the industrial sector (Chart 1.94 a and b).

1.128 Between September 2021 and September 2023, retail lending by NBFCs grew at a CAGR of 25.2 per cent as against a growth of 15.7 per cent in their gross credit. As at end-September 2023, NBFC-ICCs' share was 90.1 per cent of total retail credit, with NBFC-MFIs accounting for the remaining 9.9 per cent. Consumer loans, on which risk weights were increased recently[53], formed 44.7 per cent of the incremental retail loan growth over the last one year (Table 1.15). Moreover, share of unsecured loans in the NBFC sector rose from 24.6 per cent in March 2020 to 31.9 per cent in September 2023 and grew at a CAGR of 20.7 per cent.

1.129 NBFC-IFCs had a share of 75.1 per cent in gross industrial credit by the NBFC sector, with the top ten sectors accounting for 83 per cent of their large loans. NBFC-IFCs have become particularly sensitive to stress in the power sector, which forms two-thirds of their large exposures (electricity

Chart 1.94: NBFC-ICC and NBFC-IFC Lending – Sectoral Distribution

(per cent)



Source: RBI supervisory returns.

Table 1.15: NBFC Retail Lending

(per cent)

	Mar-22	Sep-22	Mar-23	Sep-23	Mar-23	Sep-23	Mar-23	Sep-23
	Share in Retail Lending	Share in Retail Lending	Share in Retail Lending	Share in Retail Lending	Y-o-Y Growth		Weighted Contribution to Growth (percentage share)	
Retail Loans					**25.8**	**32.5**		
Housing Loans	2.8	2.9	3.1	3.3	39.3	46.9	4.2	4.5
Consumer Durables	3.0	3.0	3.0	3.2	27.2	40.1	3.1	3.9
Credit Card Receivables	3.9	4.4	4.2	4.1	34.5	22.6	5.2	3.2
Vehicle/ Auto Loan	40.0	38.5	36.5	36.2	14.6	22.7	22.7	28.7
Education Loan	1.7	2.2	2.4	3.0	79.0	79.9	5.2	5.8
Advances against Shares/ Bonds *etc.*	1.6	1.6	1.3	1.5	7.9	28.7	0.5	1.5
Other Retail Loans	47.1	47.4	49.5	48.6	32.2	33.6	59.1	52.3

Note: Data as on December 15, 2023.
Sources: RBI supervisory returns and staff calculations.

[53] Retail loans (including credit cards receivables), excluding housing loans, educational loans, vehicle loans, loans against gold jewellery and microfinance/SHG loans.

generation at 36.2 per cent; electricity distribution at 25.7 per cent; and others at 3.2 per cent). Overdues of loss-making power distribution companies (DISCOMs), despite recent decline, could also add stress to the electricity general companies.

1.130 Thus, the growing interconnectedness between banks and NBFCs through the funding route and idiosyncratic risks posed by different types of NBFCs could potentially increase contagion risk for banks (Box 1.2). Moreover, as the stress test

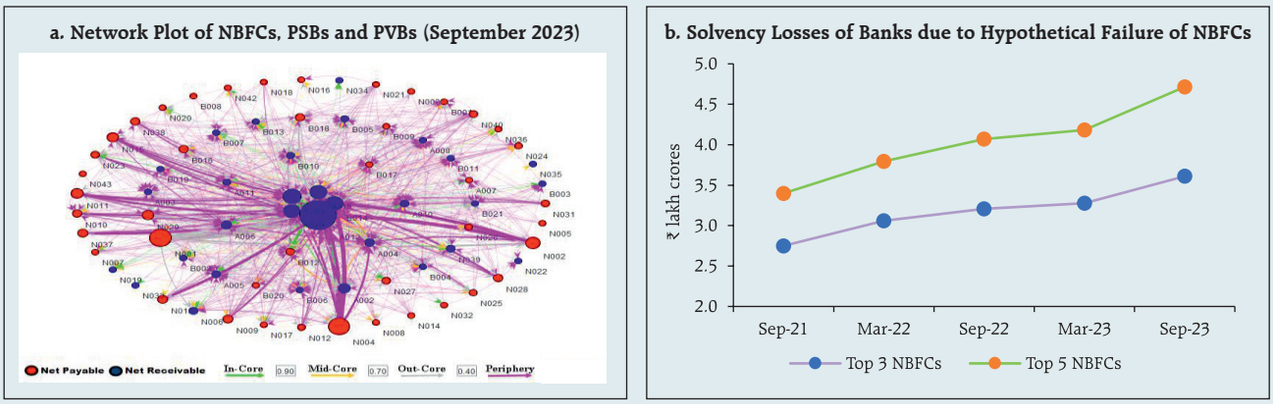
Box 1.2: Resilience of Banking System to Contagion Risk from NBFC Sector

Growing bank-NBFC interlinkages could be a source of systemic risk as vulnerabilities in the NBFC sector could amplify financial system stress and spillovers to the banking system.

Bank lending to NBFCs grew by 70.7 per cent during September 2020 to September 2023, which far exceeded the growth of 50.2 per cent in aggregate bank credit. Moreover, bilateral exposures between banks and NBFCs show that most of the NBFCs have a net borrowing position with banks (Chart 1 a).

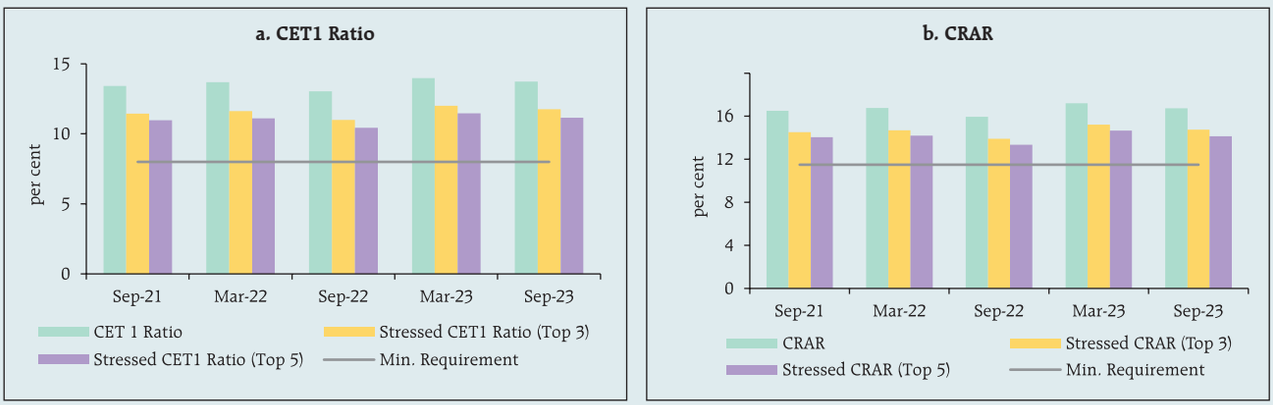
In a simulation exercise, scenarios assume simultaneous default of top 3 and top 5 NBFCs, which have the potential to cause maximum solvency losses to the banking system. The results show that the solvency losses of the banking system under such hypothetical shocks have been on a rising trajectory since September

Chart 1: Network Plot and Solvency Losses of Banks



Sources: RBI supervisory returns and staff calculations.

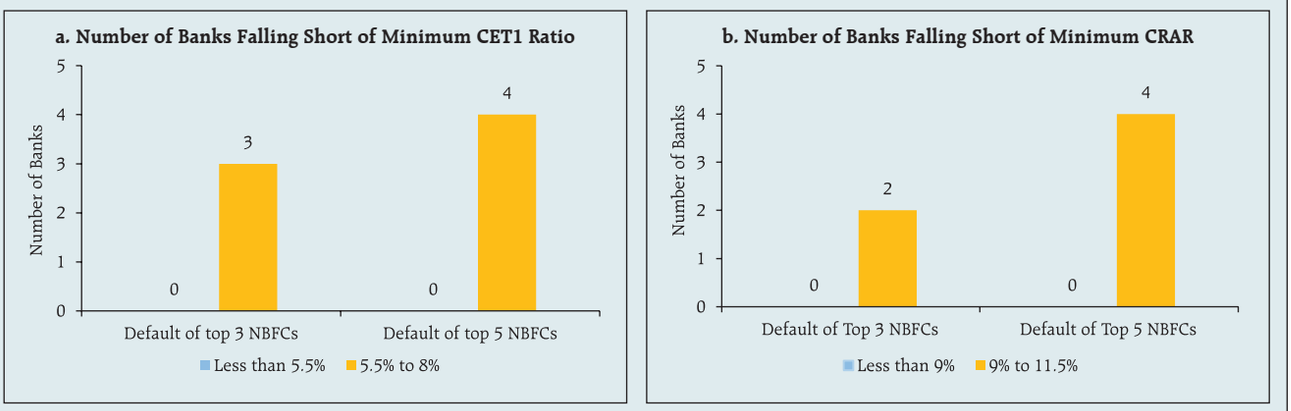
Chart 2: Impact on Capital – Banking System



Sources: RBI supervisory returns and staff calculations.

(Contd.)

Chart 3: Impact on Capital – Individual Banks



Sources: RBI supervisory returns and staff calculations.

2021, co-moving with the increasing exposure of banks to the NBFC sector (Chart 1 b).

The impact of losses on capital was subsequently adjusted by assuming a recovery rate of 20 per cent. The results show that, despite the contagion effect, both CET1 ratio and CRAR of the banking system will remain above the regulatory minimum as there are ample capital buffers (Chart 2 a and b).

A weak tail of banks with lesser buffers could, however, see their capital levels falling below the regulatory minimum (Chart 3 a and b).

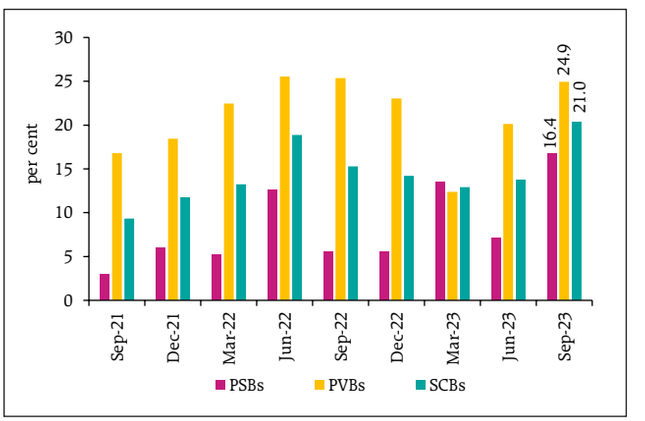
Overall, the banking system remains resilient to contagion risk from the NBFC sector. The presence of weak tail of banks and growing interlinkages between banks and NBFCs, however, necessitate both nimble and proactive regulatory and supervisory monitoring and actions that prevent build-up of systemic risk and shore up capital buffers of weak banks to improve their resilience.

results in Chapter 2 of this report show, a weaker tail of NBFCs remain vulnerable to liquidity risks under hypothetical adverse scenarios.

I.2.12 Micro, Small and Medium Enterprises (MSME)[54]

1.131 Both public and private sector banks increased their lending to the MSME sector in H1:2023-24 (Chart 1.95). The strong growth, despite the expiry of the Emergency Credit Line Guarantee Scheme (ECLGS), introduced during the COVID-19 pandemic, points to the underlying growth momentum of the sector.

Chart 1.95: MSME Sector Credit Growth



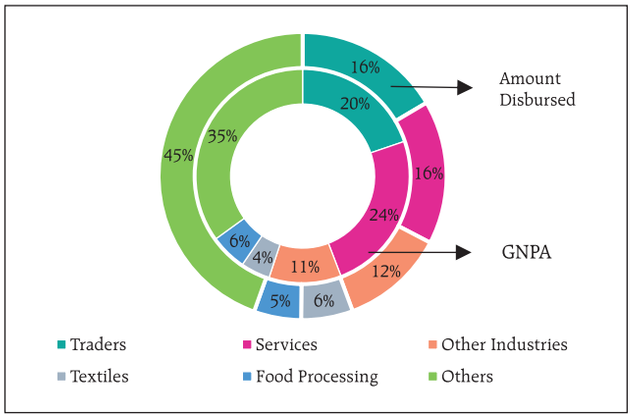
Note: (1) Credit data for previous periods have been revised following the extension in validity of MSME documents by the Ministry of MSME.
(2) All SCBs refers to data of PSBs and PVBs.

Sources: RBI supervisory returns and staff calculations.

[54] Government of India has changed the qualifying criteria and calculation methodology of investment in plant and machinery and turnover for classification of enterprises into Micro, Small and Medium in terms of Circular no RBI/2020-2021/10 FIDD.MSME & NFS.BC.No.3/06.02.31/2020-21 dated July 02, 2020 and its subsequent clarifications.

1.132 The quality of the MSME portfolio of SCBs improved further, with GNPA declining to 4.7 per cent in September 2023 from 6.8 per cent in March 2023 and 7.7 per cent in September 2022. SMA-2 accounts, however, rose slightly to 1.7 per cent in September 2023 from 0.9 per cent in March 2023. Sector-wise analysis of NPAs of loans extended under the ECLGS indicates that services and trade, which formed a third of the ECLGS disbursements, remained stressed and accounted for nearly half of the total delinquencies. The overall GNPA of loans extended under the ECLGS rose to 6.5 per cent in September 2023 from 5.5 per cent in March 2023 (Chart 1.96).

Chart 1.96: ECLGS Sector-wise Distribution (Share in Amount Disbursed and GNPA)

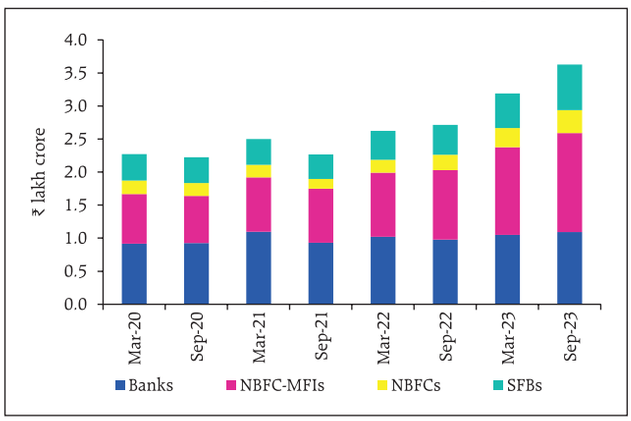


Note: As on September 30, 2023.
Source: NCGTC.

I.2.13 Microfinance

1.133 Credit to the microfinance sector grew rapidly at 33.7 per cent (y-o-y) in quarter-ended September 2023, with both banks and non-bank lenders recording double digit growth. NBFC-MFIs continue to dominate the sector, followed by banks, which together account for 71.5 per cent of total lending to the microfinance segment since the review of microfinance regulatory norms in March 2022[55]. NBFC-MFIs and other NBFCs continue to see robust credit expansion, with their combined lending increasing by 43.8 per cent in the last one year. Alongside, SFBs' lending to the sector also recorded over 50 per cent growth (Chart 1.97).

Chart 1.97: Lending to the Microfinance Segment

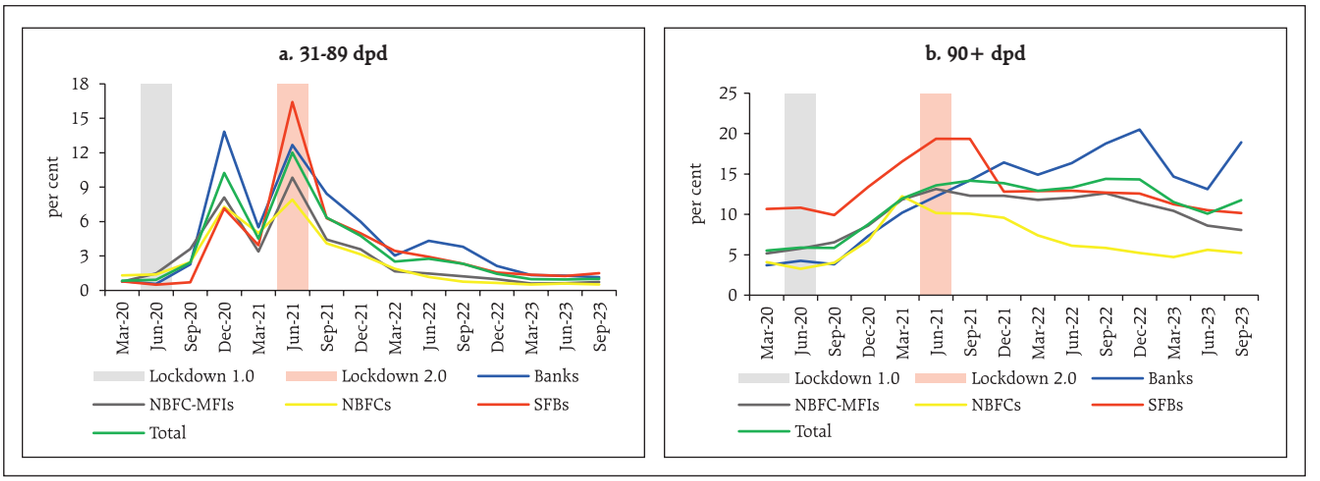


Note: NBFC-MFIs include MFIs which account for 0.2 per cent of total lending to microfinance segment.
Source: Equifax.

1.134 Delinquency in the microfinance segment, measured in terms of 90+ days past due (dpd), presents a mixed picture. While delinquency levels rose for banks, they fell for other lenders. On the other hand, the portfolio at risk of slippage, measured by 31-89 dpd, increased marginally at the

[55] RBI vide circular dated March 14, 2022 has reviewed the definition for assets qualifying as a micro finance asset.

Chart 1.98: Stress in Microfinance Segment



Note: NBFC-MFIs include MFIs which account for 0.2 per cent of total lending to microfinance segment.
Source: Equifax.

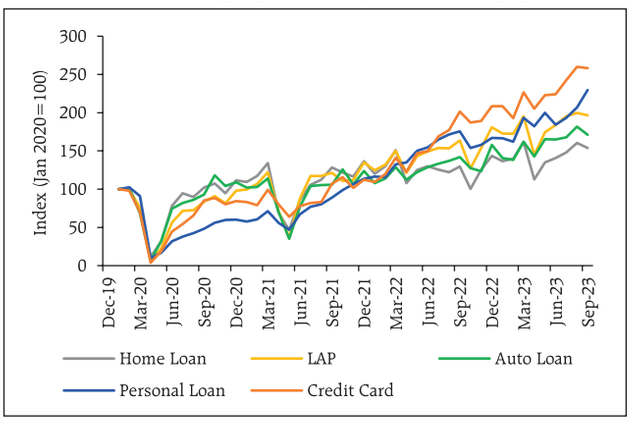
aggregate level, though it improved for banks and NBFCs (Chart 1.98 a and b).

I.2.14 Consumer Credit

1.135 Consumer credit gained momentum in Q2:2023-24, with inquiry volumes increasing across product categories. Credit card and personal loan categories witnessed maximum inquiries (Chart 1.99).

1.136 The quality of incremental credit has improved, with the share of lower-rated borrowers[56] declining at the overall industry level as well as at the bank group level. Similarly, portfolio performance continues to improve, with declining levels of

Chart 1.99: Inquiry Volumes by Product Category



Source: TransUnion CIBIL.

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

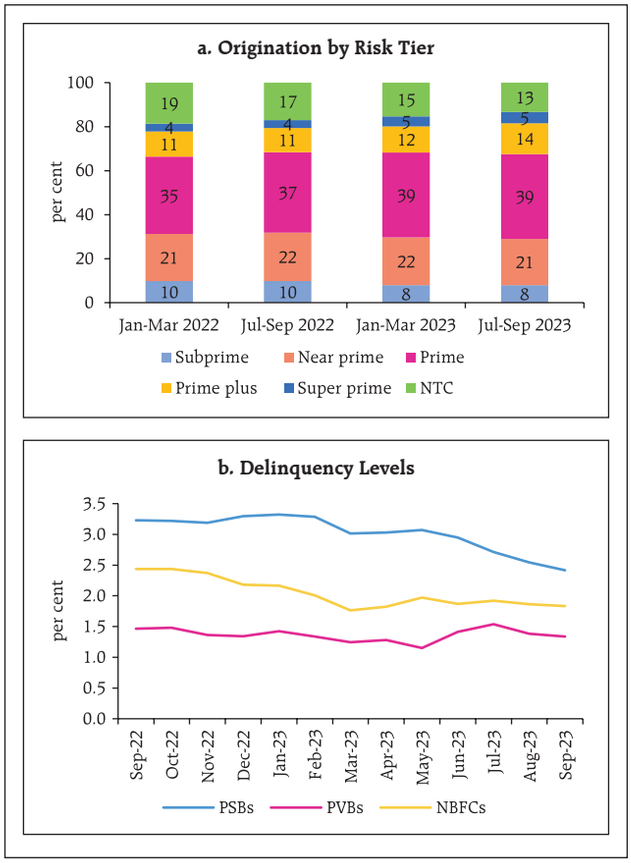
delinquencies across lender groups (Chart 1.100 a and b).

1.137 Notwithstanding the low level of delinquencies, there are some signs of risk build up in consumer credit. First, the transition matrix for consumer loans and personal loans showed an increase in their risk profiling, with downgrades exceeding upgrades. Second, relatively high vintage delinquency[57] of personal loans (8.2 per cent) indicates declining standards of underwriting. Third, 42.7 per cent of customers availing consumption loans[58] already had three live loans at the time of origination and 30.4 per cent of customers have availed more than three loans in the last six months. Fourth, 7.3 per cent of customers availing a personal loan below ₹50,000 had at least one overdue personal loan.

I.2.15 Housing Sector

1.138 The all-India House Price Index (HPI) moderated to 3.4 per cent in Q2:2023-24 from 5.1 per cent in the previous quarter and 4.5 per cent a year ago. On a sequential (q-o-q) basis, the all-India HPI contracted by 1.2 per cent, reflecting some normalisation of prices after the uptick in the post-pandemic period. Moderation in house prices and rentals reflects lower demand pressures in the

Chart 1.100: Incremental Credit Quality and Delinquency Levels

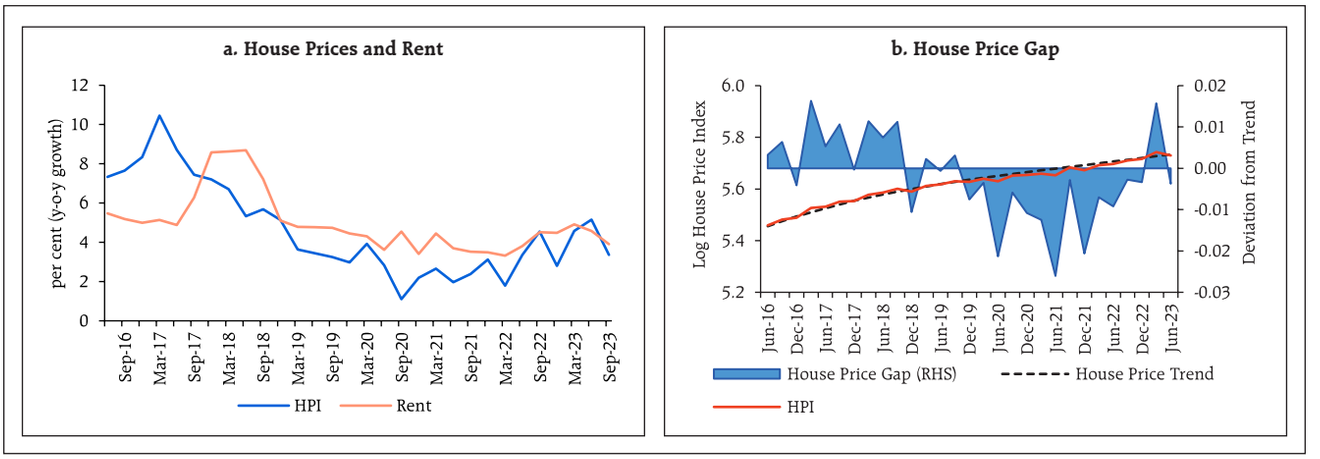


Note: Based on 90 days past due balances; Methodology for computing delinquency has been modified and accordingly previous data has been revised.
Source: TransUnion CIBIL.

[57] Vintage delinquency is defined as the percentage of accounts that have ever 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.

[58] Consumption loan refers to personal loans, credit cards and consumer durable loans.

Chart 1.101: House Prices and House Price Gap



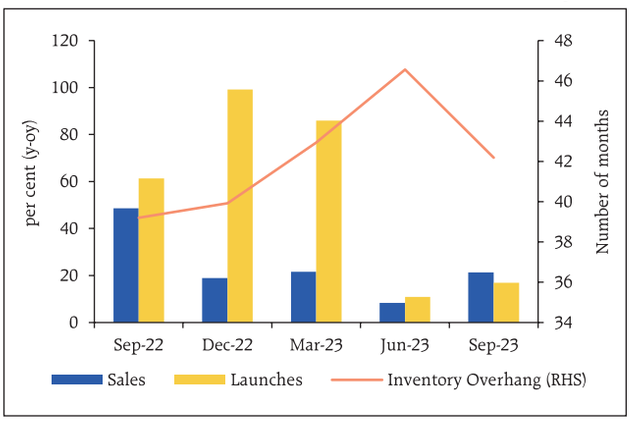
Sources: DBIE, MOSPI, RBI and Staff Calculation.

housing market (Chart 1.101 a). With the slowing momentum in house price growth in Q2:2023-24, prices are moving close to their trend and the house price gap has turned marginally negative (Chart 1.101 b).

1.139 After witnessing deceleration in Q1:2023-24, both sales and new project launches picked up in Q2:2023-24. Consequently, inventory overhang declined during the same quarter (Chart 1.102).

1.140 Housing loan growth remained flat. Commercial real estate (CRE) loans, however, witnessed a pick-up from a low base. Despite the tightening of mortgage rates, NPAs in the housing sector remain relatively stable (Chart 1.103 a and b).

Chart 1.102: House Sales, Launches and Unsold Inventory



Source: PropTiger Datalabs.

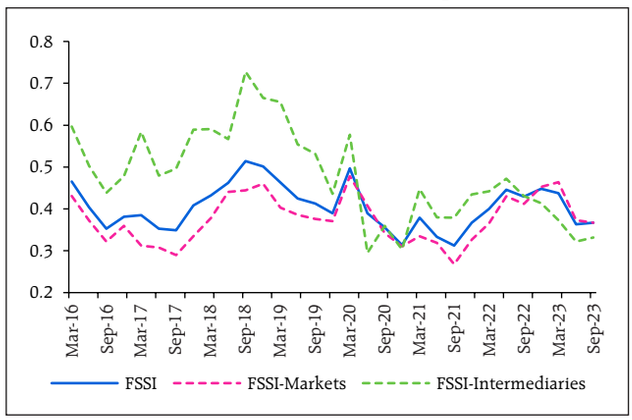
Chart 1.103: Residential and CRE Loans

Sources: DBIE and RBI Supervisory Returns.

I.2.16 Financial System Stress Indicator[59]

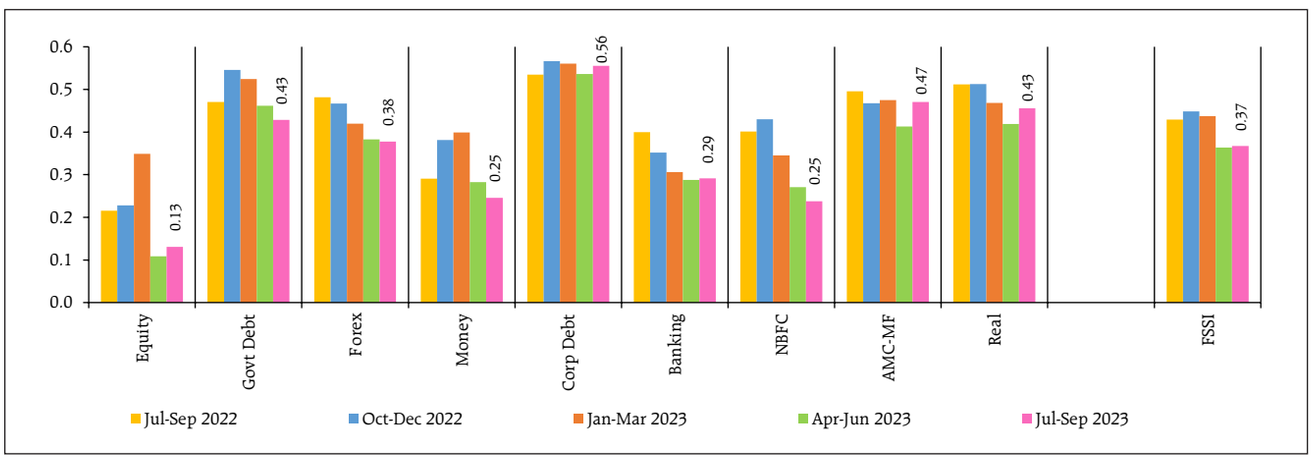
1.141 The Financial System Stress Indicator (FSSI), a comprehensive indicator of the aggregate stress level in the Indian financial system, showed easing of stress in the Indian financial system during the first two quarters of 2023-24. The decline in stress level was broad-based across financial markets and financial institutions. The major contributor to the fall in the FSSI was the equity market, which saw higher net foreign portfolio inflows, better performance, and lower implied volatility. Stress in the government debt market has also receded significantly, driven by fall in yields and volatility. Money market stress reduced as spreads between rates on short-term money market instruments such as CPs, certificates of deposit (CDs) and treasury bill rates narrowed. Low volatility in the exchange rate and forward premia contributed to easing of stress in the forex market. Improving asset quality and profitability contributed to reduction in stress in banking and NBFC sectors, whereas growing mutual fund inflows helped ease stress among AMCs (Chart 1.104 and 1.105).

Chart 1.104: FSSI and its Broad Components



Source: DBIE, Bloomberg, RBI Supervisory Returns and Staff Calculations.

Chart 1.105: Components of FSSI



Sources: DBIE, Bloomberg, RBI Supervisory Returns and Staff Calculations.

[59] See Annex-2 for detailed methodology and variables used.

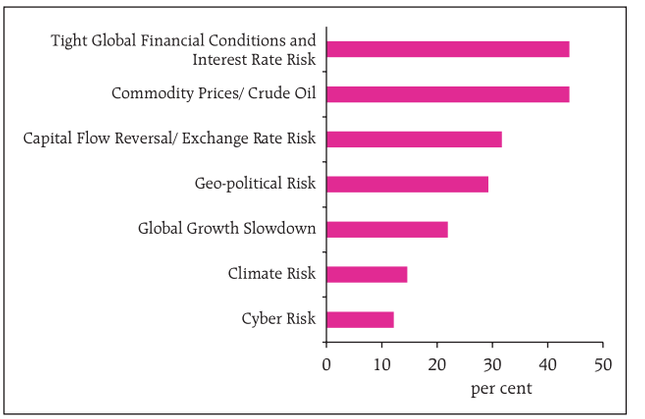
I.2.17 Systemic Risk Survey

1.142 The systemic risk survey conducted among financial sector professionals and academicians in November 2023 showed that risk perceptions across major categories of risk have either receded or remained unchanged, except macroeconomic risks. Risks from global spillovers receded but continued to remain in the 'high' risk category. The major drivers of global risks such as global growth, banking turmoil and risk emanating from monetary tightening in advanced economies were perceived to have moderated, except commodity price risk. Macroeconomic risks witnessed a marginal uptick but remained in the 'medium' risk category. Among drivers of financial market risks, interest rate risk was gauged to have moderated. Cyber risk, a key component of institutional risk, increased marginally and moved up to the 'high' risk category.

1.143 Panelists felt that going forward, tightening of global financial conditions and increase in commodity prices, particularly crude oil, remain major risks (Chart 1.106). About one-fourth of the respondents reported that their confidence in the stability of the global financial system has declined over the last six months. In contrast, for over 95 per cent of the respondents, confidence in the stability of the Indian financial system either increased or remained unchanged. 80 per cent of them perceived that geopolitical events in West Asia will have low to medium impact on the global economy and financial markets and 60 per cent of them perceived that tightening of global financial conditions may have a minor impact on the Indian financial markets.

1.144 Underlining the resilience and strength of the Indian banking sector, about 80 per cent of the respondents assessed that the prospects of the Indian banking sector have either improved or remained unchanged over a one-year horizon. About

Chart 1.106: Potential Risks to Financial Stability



Source: Systemic Risk Survey, November 2023.

83 per cent of them expected either improvement or no change in banking sector asset quality over the next six months due to better growth prospects, improvement in credit profile of corporates and better underwriting standards of banks. Similarly, about 62 per cent of the respondents expected credit demand to either improve or remain unchanged over the next six months due to higher corporate demand, improvement in manufacturing sector activity and higher public investment in infrastructure.

Summary and Outlook

1.145 The global economy is confronting multiple challenges of low growth prospects, large public debt, geo-economic fragmentation, and elevated though receding levels of inflation. Risks to near-term global growth outlook remain tilted to the downside. The global financial system displays more resilience since the March 2023 banking turmoil, but financial stability could be tested if monetary policy remains tight for longer than anticipated and growth slows further.

1.146 Despite a challenging global backdrop, the Indian economy is exhibiting sustained momentum and resilience. The domestic financial system remains sound and is bolstered by the improving health of financial institutions. Pre-emptive regulatory measures taken recently are expected to moderate the build-up of stress emanating from rising unsecured loans and rapid growth in consumer credit. Global spillovers, rising interconnectedness in the domestic financial sector and the increasing role of NBFCs in the provision of financial services remain contingent risks. Banking capital, regulatory prudence and strong balance sheets, however, should ensure that the domestic banking system is well positioned to withstand shocks and support the productive needs of the economy.

Chapter II

Financial Institutions: Soundness and Resilience

India's financial sector has displayed stability and resilience, with ongoing improvement in asset quality, capital position and profitability during H1:2023-24. Macro stress tests for credit risk indicate that even under a severe stress scenario, all banks would be able to comply with minimum capital requirements. Stress in the NBFC sector has been assessed to be higher under a high-risk stress scenario relative to the March 2023 position. Contagion risks may warrant monitoring on account of increased inter-bank exposure.

Introduction

2.1 The soundness and resilience of India's banking sector has been underpinned by ongoing improvement in asset quality, enhanced provisioning for bad loans, sustained capital adequacy and rise in profitability. Credit growth remains robust, mainly driven by lending to services and personal loans. Deposit growth has also gained momentum due to transmission of previous rate increases resulting in repricing of deposits and higher accretion to term deposits. Lending by non-banking financial companies (NBFCs) accelerated, led by personal loans and loans to industry, and their asset quality has improved. Bilateral exposures among entities in the Indian financial system continued to expand.

2.2 This chapter presents stylised facts and analysis relating to recent developments in the domestic financial sector. Section II.1 analyses 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. Their resilience is evaluated through macro stress tests and sensitivity analyses. 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 provide insights into the soundness and resilience of insurance sector, mutual funds, and clearing corporations, respectively. Section II.7 concludes 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][4]

2.3 Mobilisation of deposits by SCBs gathered pace during 2023-24 so far (Chart 2.1 a). Accretions to term deposits rose further, reflective of pass-through of rate hikes alongside efforts to mobilise funds to match credit demand. On the other hand, growth in current account and savings account (CASA) has remained tepid (Chart 2.1 b).

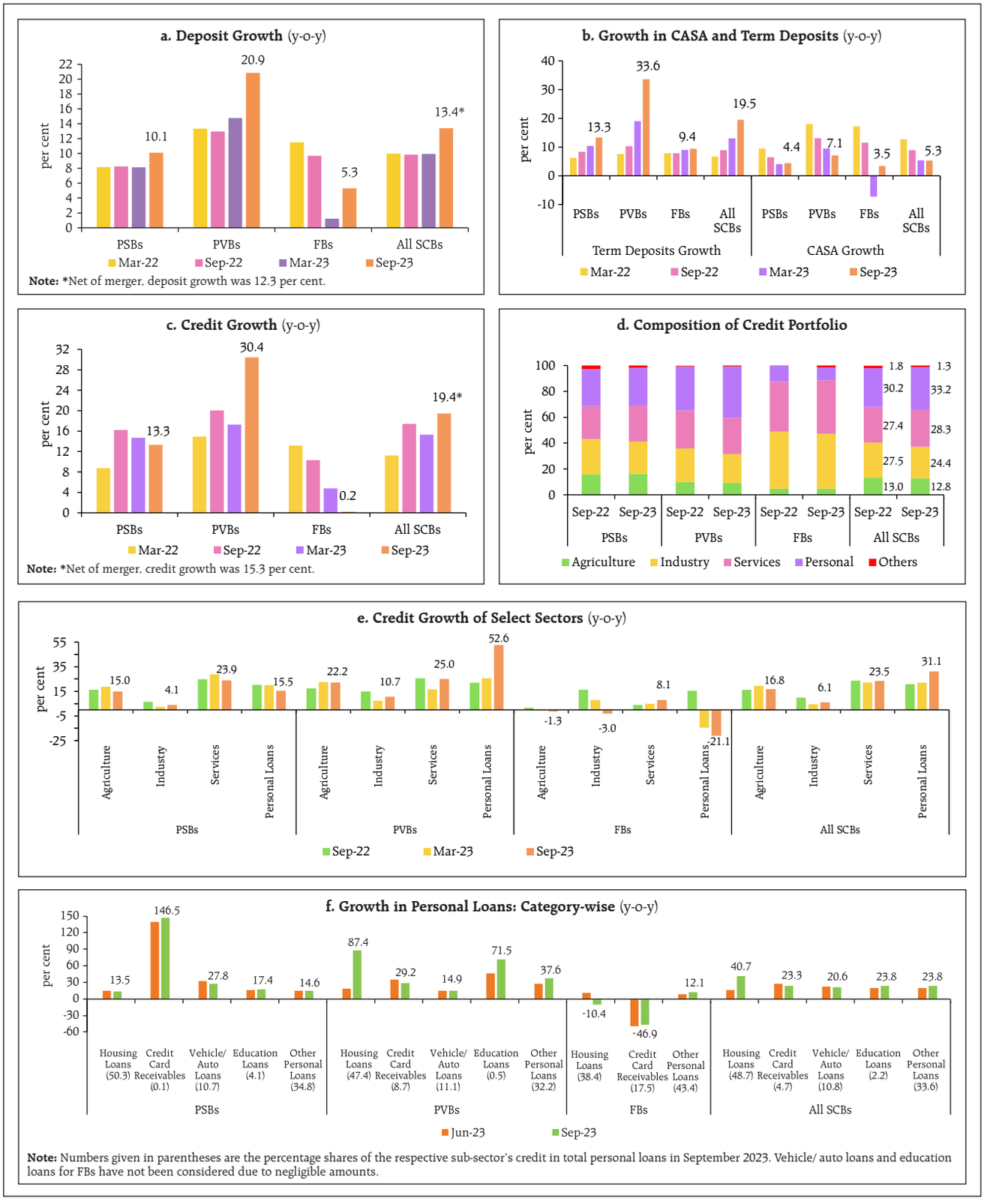
[1] Analyses are mainly based on RBI's supervisory returns which cover only domestic operations of SCBs, except in the case of data on large borrowers, which are based on banks' global operations. For this exercise, SCBs include public sector banks, private sector banks and foreign banks.

[2] The analyses done in the chapter are based on the data available as of December 11, 2023 which are provisional.

[3] 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).

[4] 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.*)

Chart 2.1: Deposit and Credit Profile of SCBs



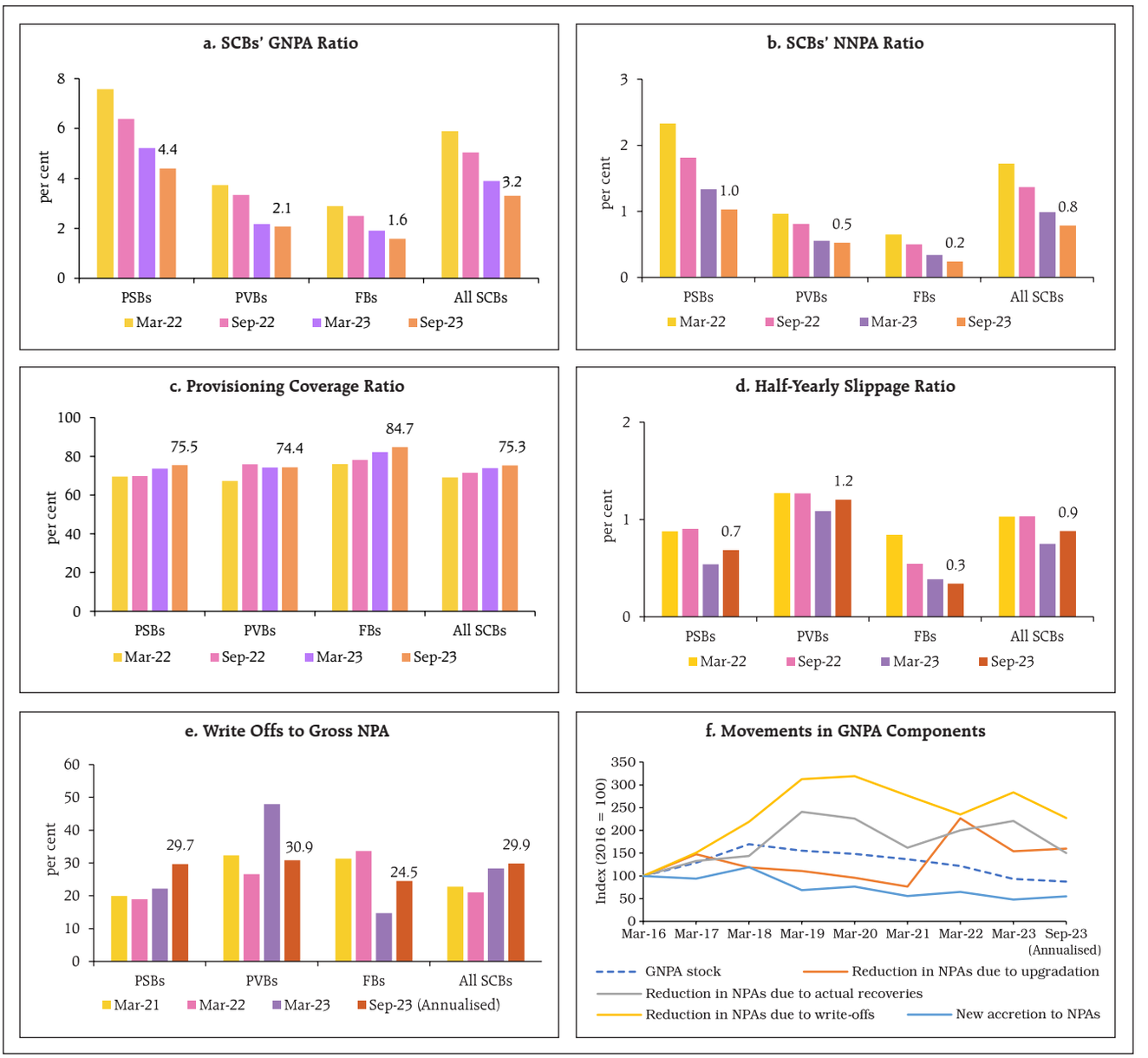
Note: Transfer of retail business of a FB to a PVB in March 2023 has impacted the growth rates of PVBs and FBs.
Source: RBI supervisory returns and staff calculations.

2.4 Bank credit growth has sustained its momentum during 2023-24 so far, *albeit* with some moderation in public sector banks (PSBs) and foreign banks (FBs) (Chart 2.1 c). Lending to services and personal loans grew faster than to industrial and agriculture sectors (Chart 2.1 d and e). Personal loans recorded broad-based growth. In private sector banks (PVBs), education loans emerged as a new lending area, coming from a low base (Chart 2.1 f).

II.1.1 Asset Quality

2.5 The asset quality of SCBs recorded sustained improvement and their GNPA ratio declined in September 2023 to an 11-year low level (Chart 2.2 a). Their NNPA ratio[5] too has improved to a record

Chart 2.2: Select Asset Quality Indicators



Sources: RBI supervisory returns and staff calculations.

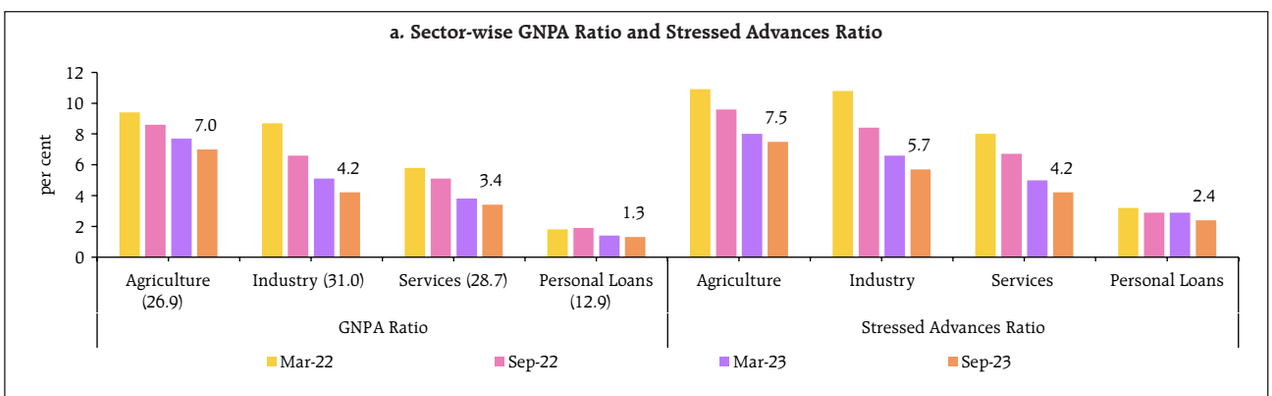
[5] NNPA ratio is the proportion of net non-performing assets in net loans and advances.

low (Chart 2.2 b). Among bank groups, PSBs' GNPA ratio improved the most (82 bps) in H1:2023-24. With the stock of GNPA coming down, requirement of provisions also reduced; however, active and deep provisioning by SCBs was reflected in their improved provisioning coverage ratio (PCR)[6] in September 2023 (Chart 2.2 c). The half-yearly slippage ratio (*viz.*, new NPA accretions as a share of standard advances), however, inched up for both PSBs and PVBs (Chart 2.2 d). The write-off to GNPA ratio[7] increased in H1:2023-24 mostly due to reduction in GNPA stock across bank groups (Chart 2.2 e). Overall, the sustained reduction in the GNPA stock since March 2018 has been mainly on account of persistent fall in new NPA accretions; write-offs and recoveries; and higher upgradation in the post-pandemic period (Chart 2.2 f).

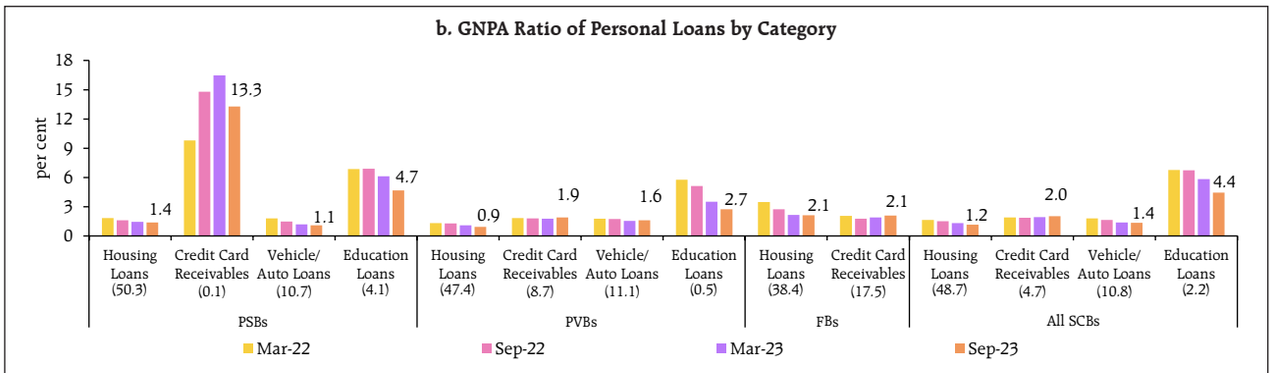
II.1.2 Sectoral Asset Quality

2.6 The improvement in SCBs' asset quality has been broad-based (Chart 2.3 a). The GNPA ratio of the agriculture sector remains high at 7 per cent. At an overall level, asset quality in the personal loans segment has improved, although there has been a marginal impairment in credit card receivables (Chart 2.3 b). Within the industrial sector, asset quality improved across all major sub-sectors barring infrastructure (other than electricity) and petroleum (Chart 2.3 c).

Chart 2.3: Sectoral Asset Quality Indicators *(Contd.)*



Note: Numbers given in parentheses are the percentage shares of the respective sector's GNPA in total GNPA as of September 2023.

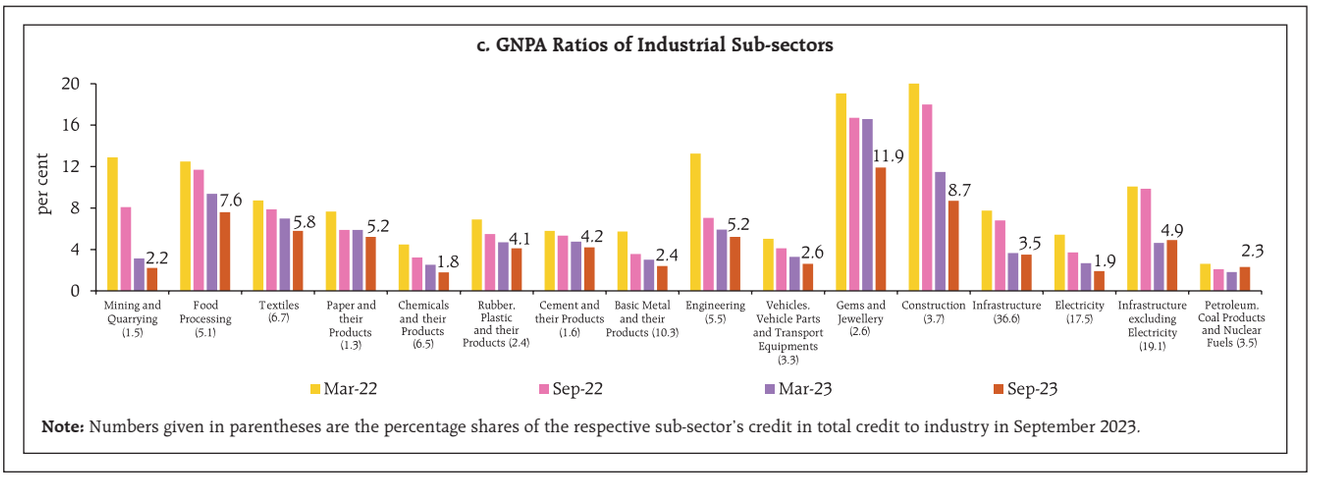


Note: Numbers given in parentheses are the percentage shares of the respective sub-sector's credit in total personal loans in September 2023; residual share pertains to other personal loans. Vehicle/ auto loans and education loans for FBs have not been considered due to negligible amounts.

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

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

Chart 2.3: Sectoral Asset Quality Indicators *(Concld.)*



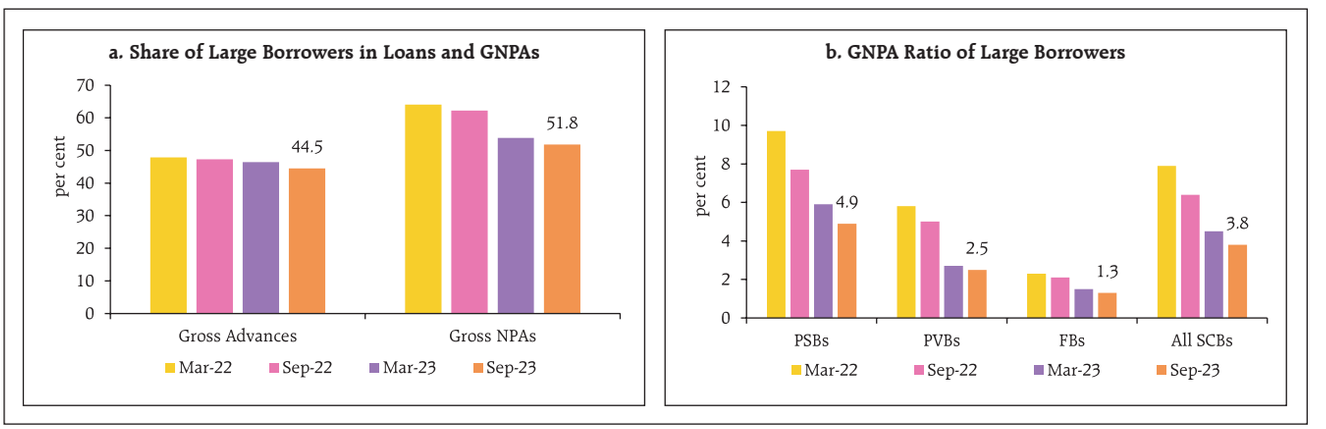
Note: Numbers given in parentheses are the percentage shares of the respective sub-sector's credit in total credit to industry in September 2023.

Source: RBI supervisory returns and staff calculations.

II.1.3 Credit Quality of Large Borrowers[8]

2.7 With retail loan growth outpacing borrowings by large borrowers, the share of the latter in gross advances of SCBs has declined further between March 2020 and September 2023. Asset quality in the large borrower portfolio saw significant improvement, which contributed to lowering of the share of large borrowers in GNPAs of SCBs (Chart 2.4 a and b). SMA-2[9] loans for large borrowers, which saw significant reduction during H2:2022-23, reverted to previous levels during June 2023 and September 2023 (Chart 2.4 c). The same was evident in the SMA-2 ratio also (Chart 2.4 d). In the large borrower accounts, the proportion of standard assets to total funded amount outstanding has been improving over the past three years (Chart 2.4 e), and the share of top 100 borrowers, which was rising for two years until March 2023, witnessed

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



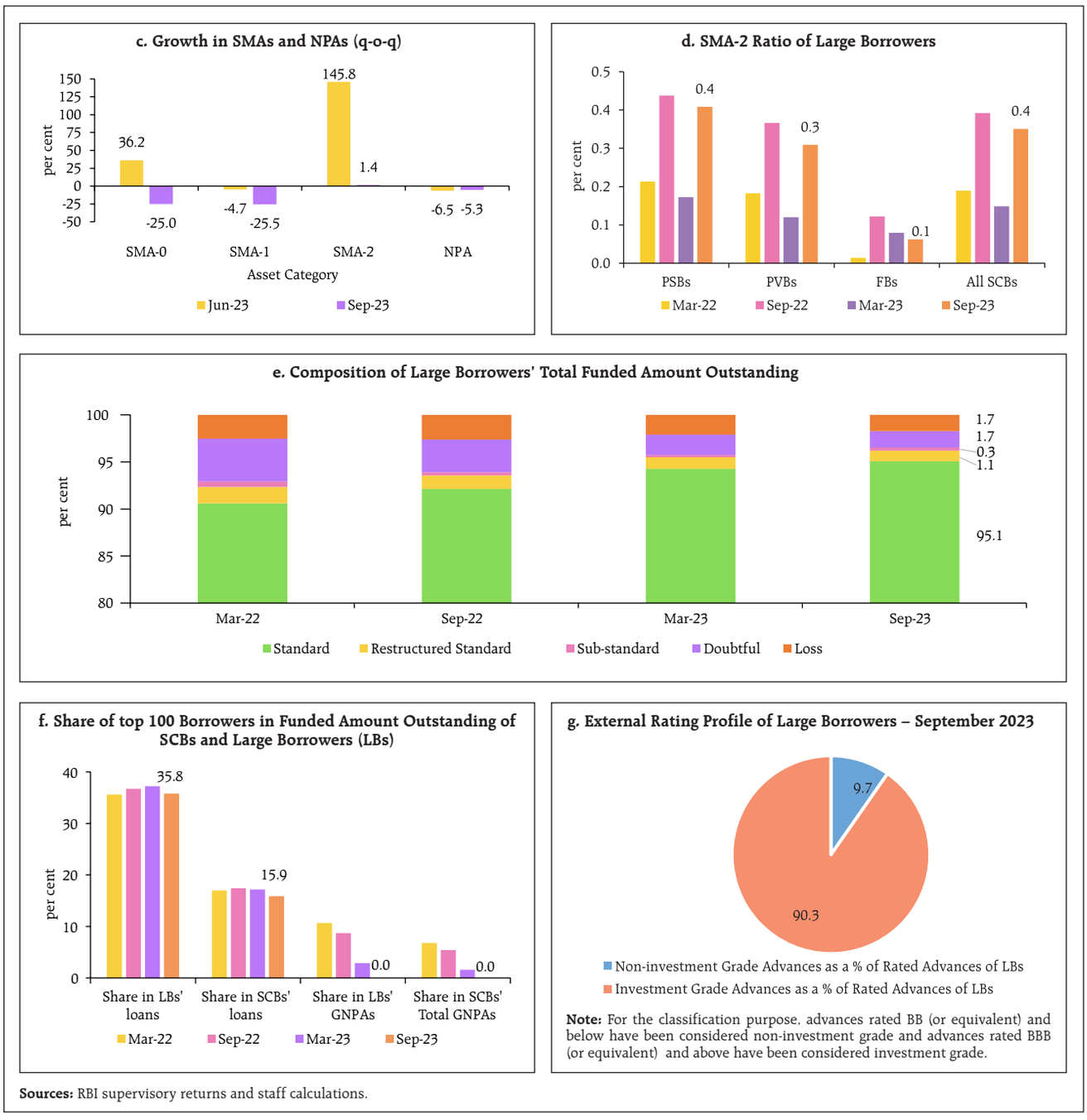
[8] A large borrower is defined as one who has aggregate fund-based and non-fund-based exposure of ₹5 crore and above. This analysis is based on SCBs' global operations.

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

a) For loans in the nature of revolving facilities (*e.g.*, 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.)*



Sources: RBI supervisory returns and staff calculations.

moderation during 2023-24. As at end September 2023, none of the top 100 borrower accounts remain in the NPA category (Chart 2.4 f). In terms of value, investment grade advances (rated BBB and above) constituted 90.3 per cent of total externally rated funded advances of large borrowers (Chart 2.4 g).

II.1.4 Capital Adequacy

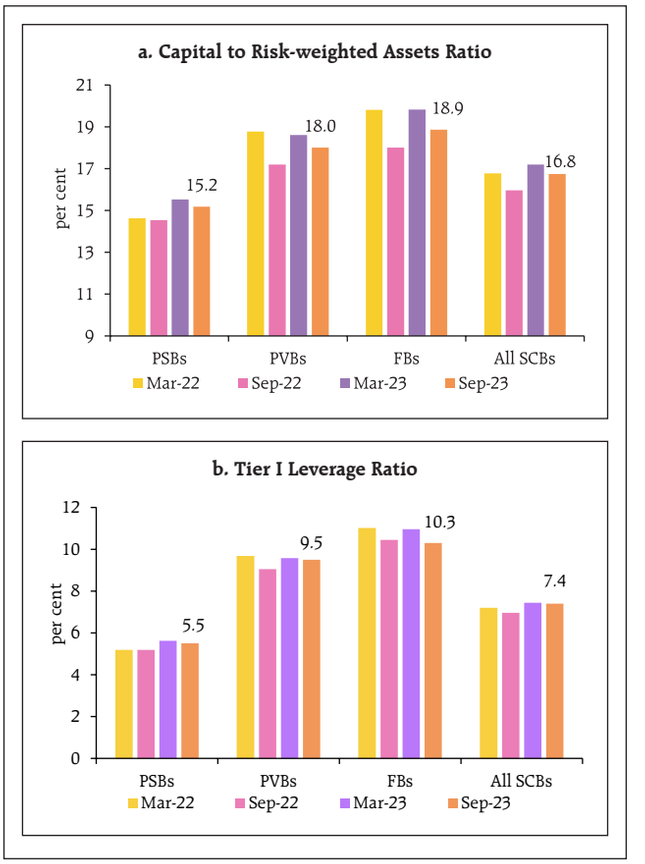
2.8 As SCBs bolstered their capital base through capitalisation of reserves from higher profits and by raising fresh capital, their capital to risk-weighted assets ratio (CRAR) remained robust in September 2023, *albeit* lower than the March 2023 level (17.3 per cent) (Chart 2.5 a). The Tier I leverage ratio[10] sustained its March 2023 level, with additional Tier I capital accretion matching incremental total exposure during H1:2023-24 (Chart 2.5 b).

II.1.5 Earnings and Profitability

2.9 The net interest margin (NIM) of SCBs remained high in September 2023 (Chart 2.6 a). With growing net interest income (NII) and other operating income (OOI) and as the need for additional provisions fell, their profit after tax (PAT) rose by 43.0 per cent (y-o-y) in September 2023. PAT growth of PSBs remained higher than that of PVBs, mainly due to significant reduction in provisioning requirements. PAT of FBs nearly doubled on account of a steep fall in provisioning (Chart 2.6 b).

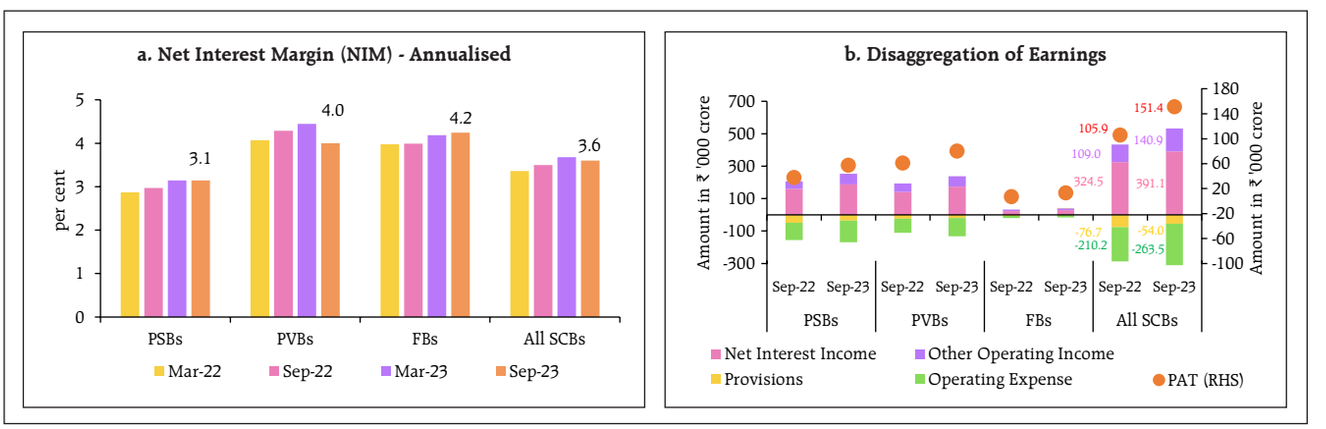
2.10 Profitability indicators remained strong: RoE and RoA ratios touched decadal highs in September 2023 (Chart 2.6 c and d) even as the transmission of past monetary policy rate increases led to a 100 bps rise in cost of funds from September 2022 to September 2023 (Chart 2.6 e). The yield on assets further improved due to rise in interest rates (Chart 2.6 f).

Chart 2.5: Capital Adequacy



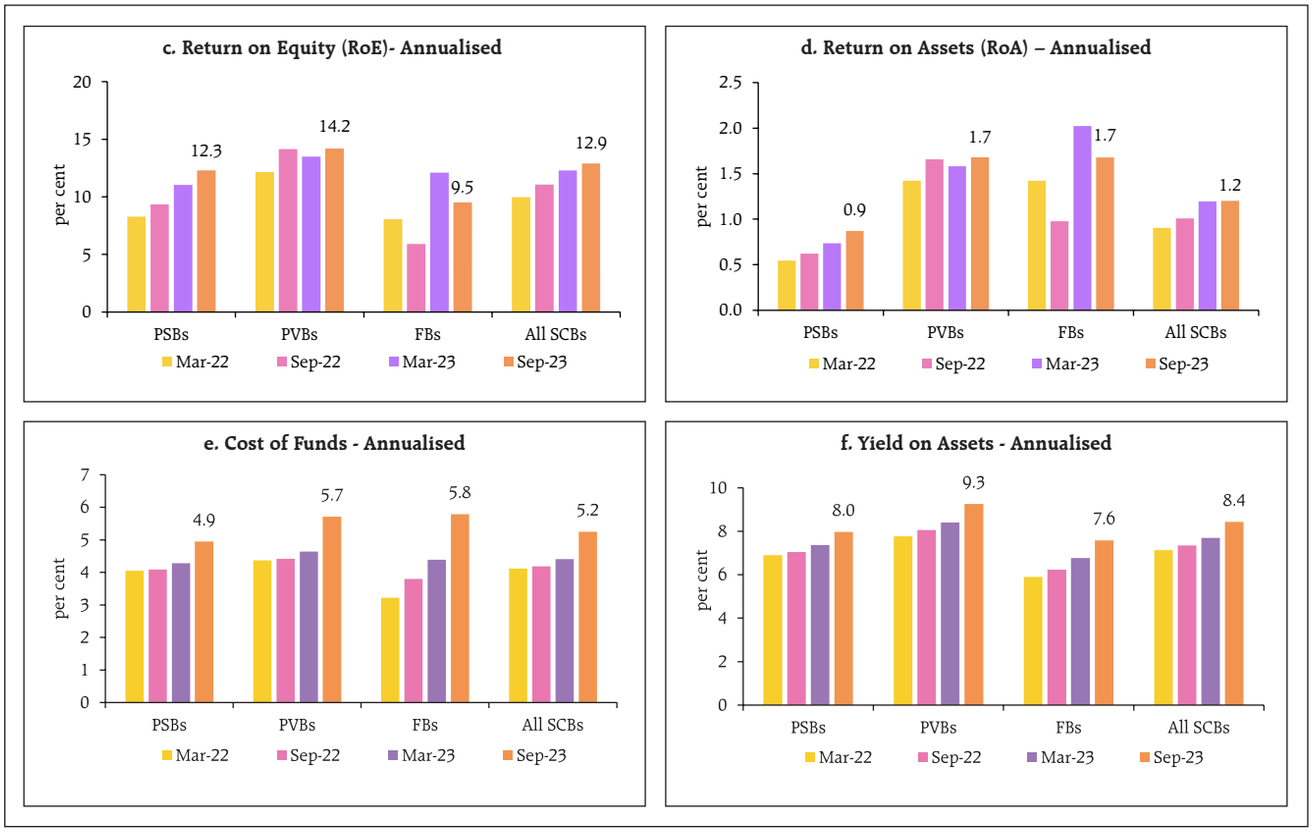
Source: RBI supervisory returns and staff calculations.

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



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

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



Sources: RBI supervisory returns and staff calculations.

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). In this exercise, capital ratio projections factor in the impact of recent regulatory measures prescribing higher risk weights for consumer credit and bank credit to NBFCs[12]. Additionally, to make the assessment more realistic, a transfer of 65 per cent of profit[13] to capital funds is assumed.

2.12 The 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 16.6 per cent in

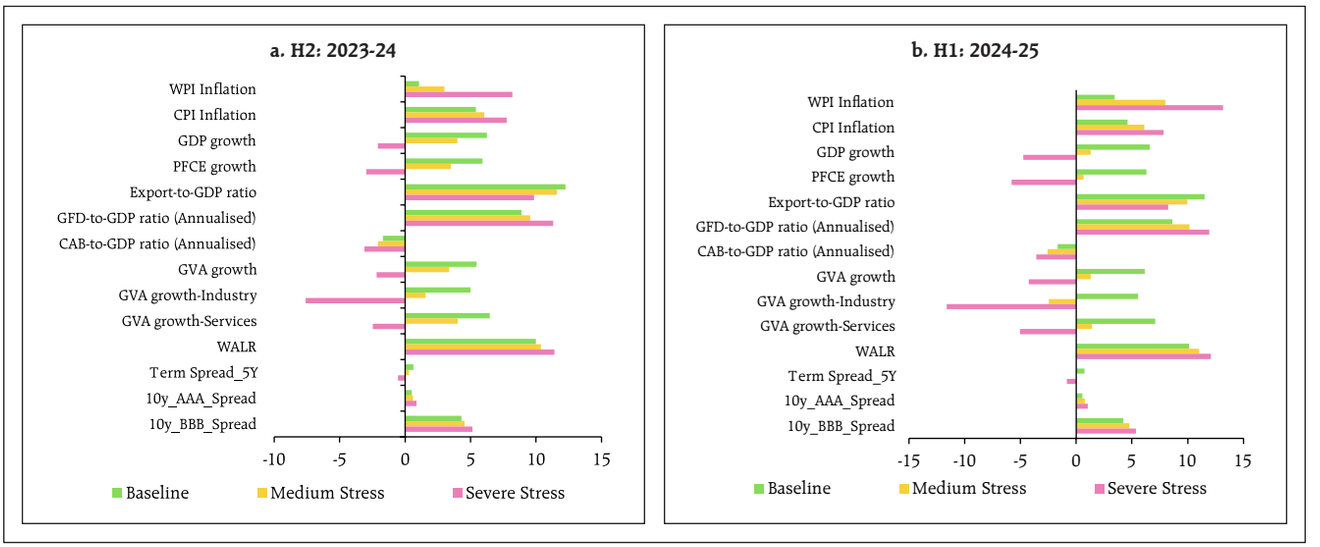
[11] **The adverse scenarios are stringent conservative assessments under hypothetical adverse economic conditions and model outcomes should not be interpreted as forecasts.**

[12] RBI circular No. DoR.STR.REC.57/21.06.001/2023-24 on 'Regulatory measures towards consumer credit and bank credit to NBFCs' dated November 16, 2023.

[13] In terms of RBI circular RBI/2004-05/451 DBOD.NO.BP.BC. 88 / 21.02.067 / 2004-05 dated May 04, 2005. The dividend payout ratio for 10 largest Indian banks in 2022-23 was 18.8 per cent on an average and the maximum was 28.5 per cent.

Chart 2.7: Macro Scenario Assumptions

(per cent)

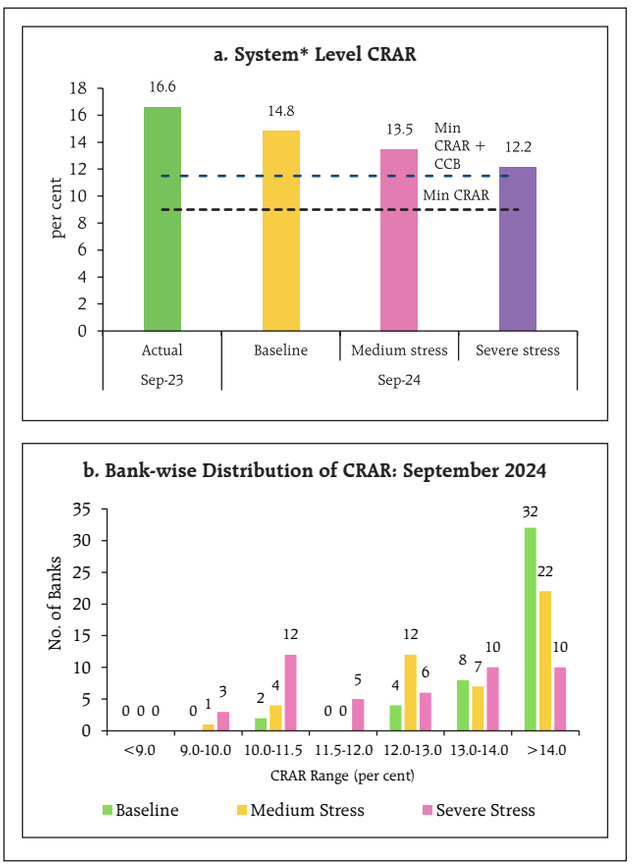


Source: RBI staff calculations.

September 2023 to 14.8 per cent by September 2024. It may go down to 13.5 per cent in the medium stress scenario and to 12.2 per cent under the severe stress scenario by September 2024, which would also remain above the minimum capital requirements (Chart 2.8 a). No SCB would breach the minimum capital requirement of 9 per cent in the next one year (Chart 2.8 b).

2.13 The CET1 ratio of the select 46 SCBs may decline from 13.6 per cent in September 2023 to 12.2 per cent by September 2024 under the

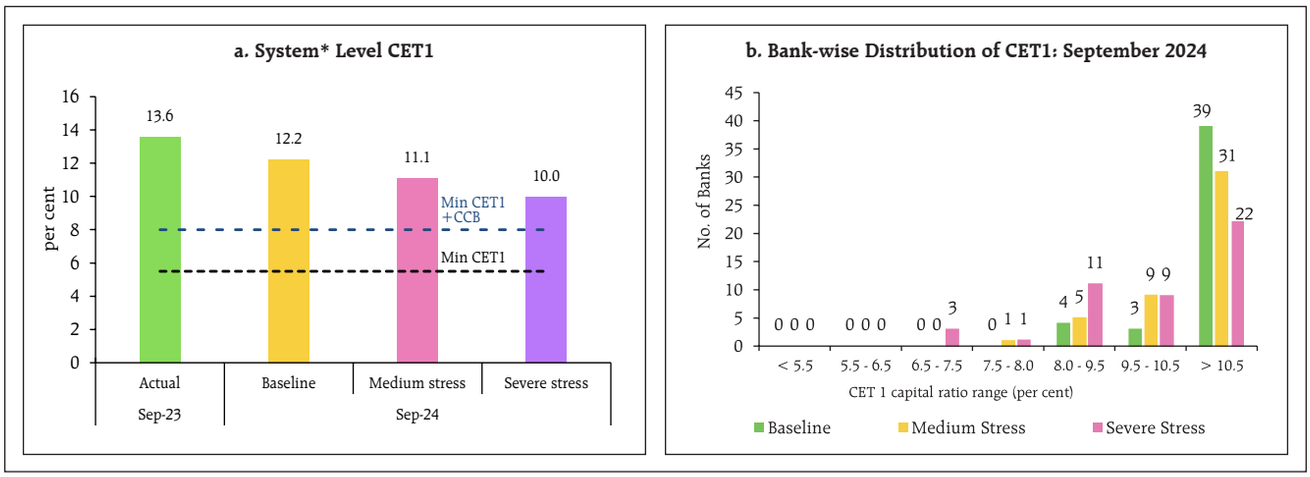
Chart 2.8: CRAR Projections



Note: (1) * For a system of 46 select banks.
(2) Under a conservative assumption of minimum profit transfer to capital reserves at 25 per cent, the projected CRAR would be 14.4 per cent, 13.2 per cent and 12.0 per cent in baseline, medium stress and severe stress scenarios, respectively.
(3) It does not consider any capital infusion by stakeholders.

Sources: RBI supervisory returns and staff calculations.

Chart 2.9: Projection of CET1 Ratio

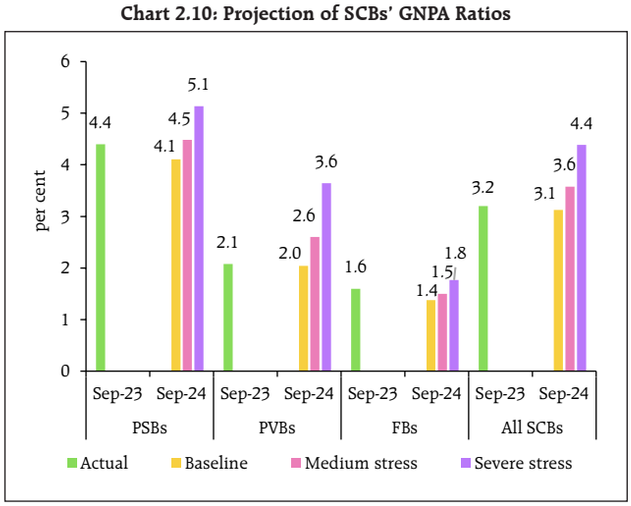


Note: (1) * For a system of 46 select banks.
(2) Under a conservative assumption of minimum profit transfer to capital reserves at 25 per cent, the projected CET1 ratio would be 11.8 per cent, 10.8 per cent and 9.8 per cent in baseline, medium stress and severe stress scenarios, respectively.
(3) It does not consider any capital infusion by stakeholders.
Sources: RBI supervisory returns and staff calculations.

baseline scenario (Chart 2.9 a). In a severely stressed macroeconomic environment, the aggregate CET1 ratio would deplete by 360 basis points, but still remain above 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 Under the baseline scenario, the GNPA ratio of all SCBs may improve to 3.1 per cent by September 2024 from the current level of 3.2 per cent (Chart 2.10). If the macroeconomic environment worsens to a medium or a severe stress scenario, the ratio may rise to 3.6 per cent and 4.4 per cent, respectively. At the bank group level, the GNPA ratios of PSBs may swell from 4.4 per cent in September 2023 to 5.1 per cent in September 2024, whereas it may go up from 2.1 per cent to 3.6 per cent for PVBs and from 1.6 per cent to 1.8 per cent for FBs under the severe stress scenario.

Chart 2.10: Projection of SCBs' GNPA Ratios



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

II.1.7 Sensitivity Analysis[14]

2.15 This sub-section presents the results of top-down[15] sensitivity analysis involving several single-factor shocks to assess the vulnerabilities of SCBs to simulated credit, interest rate, equity and liquidity risks under various stress scenarios[16].

a. Credit Risk

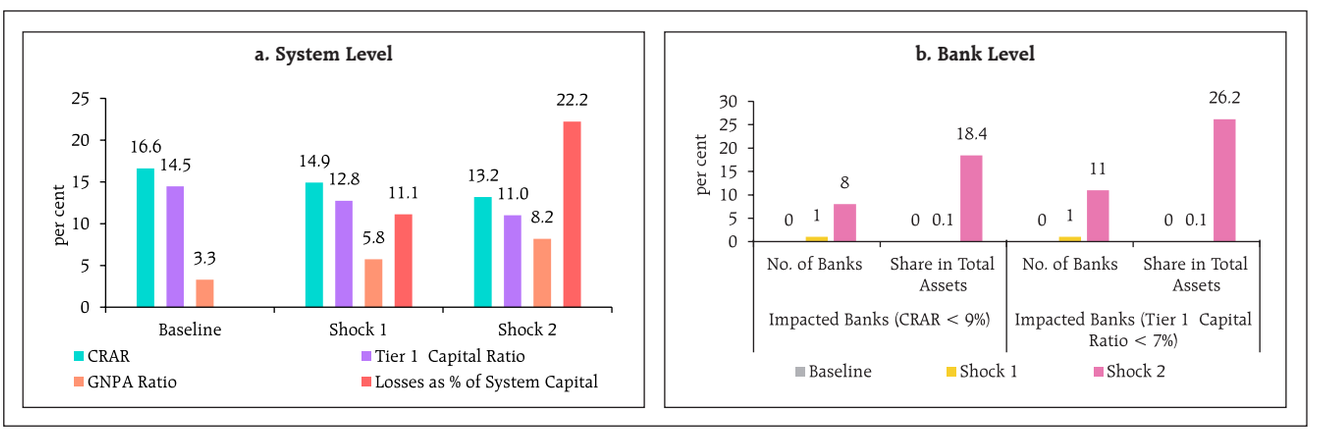
2.16 Credit risk sensitivity has been analysed under two scenarios wherein the system level GNPA ratio is assumed to rise from its prevailing level by (i) one SD[17]; and (ii) two SDs in a quarter. Under a severe shock of two SDs, it is assessed that (a) the aggregate GNPA ratio of 46 select SCBs would move up from 3.3 per cent to 8.2 per cent; (b) the system-level CRAR would deplete by 340 bps from 16.6 per cent to 13.2 per cent; and (c) the Tier 1 capital ratio would go down from 14.5 per cent to 11.0 per cent, well above the respective regulatory minimum levels. The system level capital impairment could be 22.2 per cent in this case (Chart 2.11 a). The reverse stress test shows that a shock of 5.3 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 (two SD) shock scenario, eight banks with a share of 18.4 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 fall below 7 per cent in case of three banks (Chart 2.11 c) and six 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

Chart 2.11: Credit Risk - Shocks and Outcomes *(Contd.)*



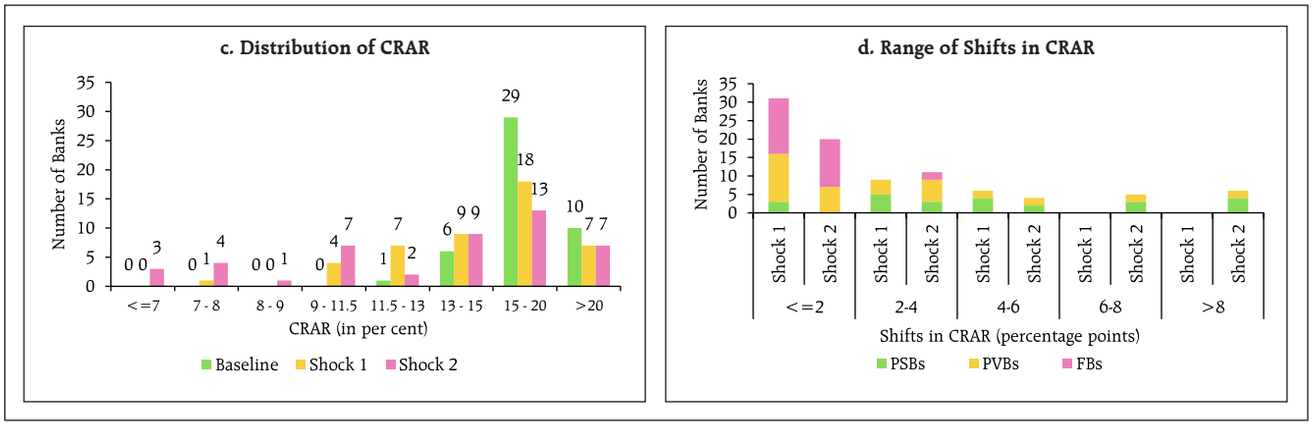
[14] Under macro stress tests, the shocks are in terms of adverse macroeconomic conditions, while in sensitivity analyses, shocks are applied to single factors like GNPA, interest rate, equity prices, deposits, and the like, one at a time. Also, macro stress tests for GNPA ratios are applied at the system and major bank-group levels, whereas the sensitivity analyses are conducted at system and individual bank levels.

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

[16] 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.

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

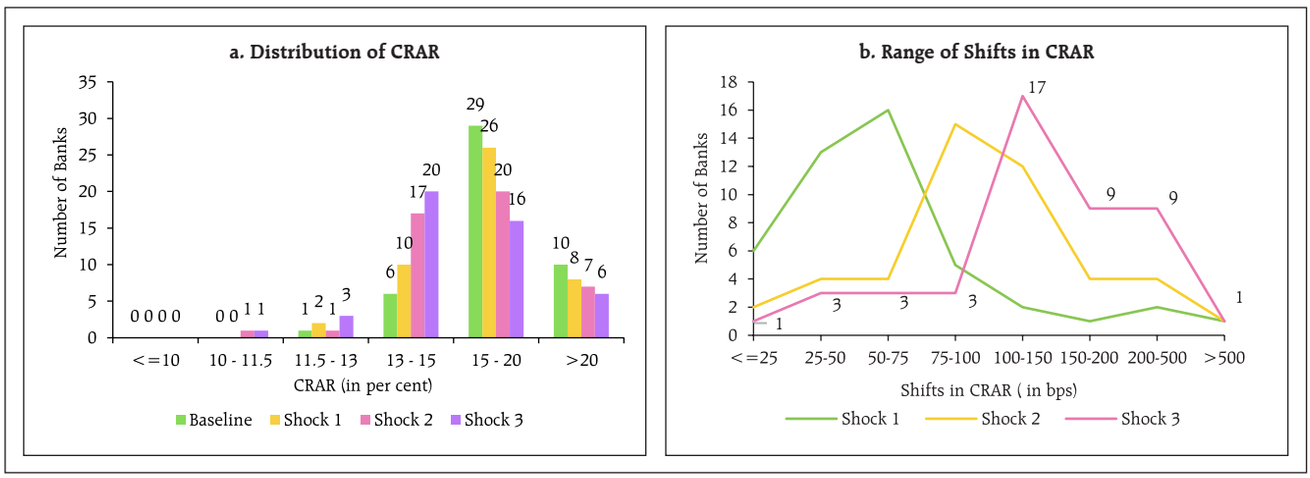
Chart 2.11: Credit Risk - Shocks and Outcomes *(Concld.)*



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.

scenario of the top three individual borrowers of respective banks failing to repay[18], no bank would face a situation of a drop in CRAR below the regulatory minimum of 9 per cent (Chart 2.12 a). In this extreme stress case, ten banks would experience a fall of more than two percentage points in their CRARs (Chart 2.12 b).

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.

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

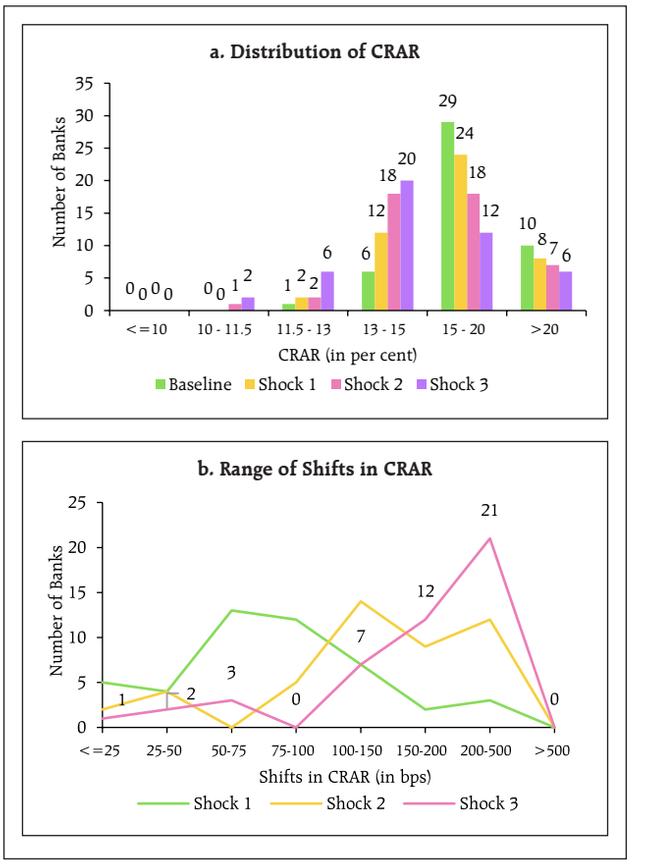
2.19 Under the extreme scenario of the top three group borrowers in the standard category failing to repay[19], the CRAR of all banks would remain above 9 per cent (Chart 2.13 a). None of the banks would face a decline of more than five percentage points in their CRARs (Chart 2.13 b).

2.20 In the extreme scenario of the top three individual stressed borrowers of respective banks failing to repay[20], the majority of the banks would remain resilient, with their CRARs depleting by a mere 25 bps or lower (Chart 2.14 a and b).

c. Sectoral Credit Risk

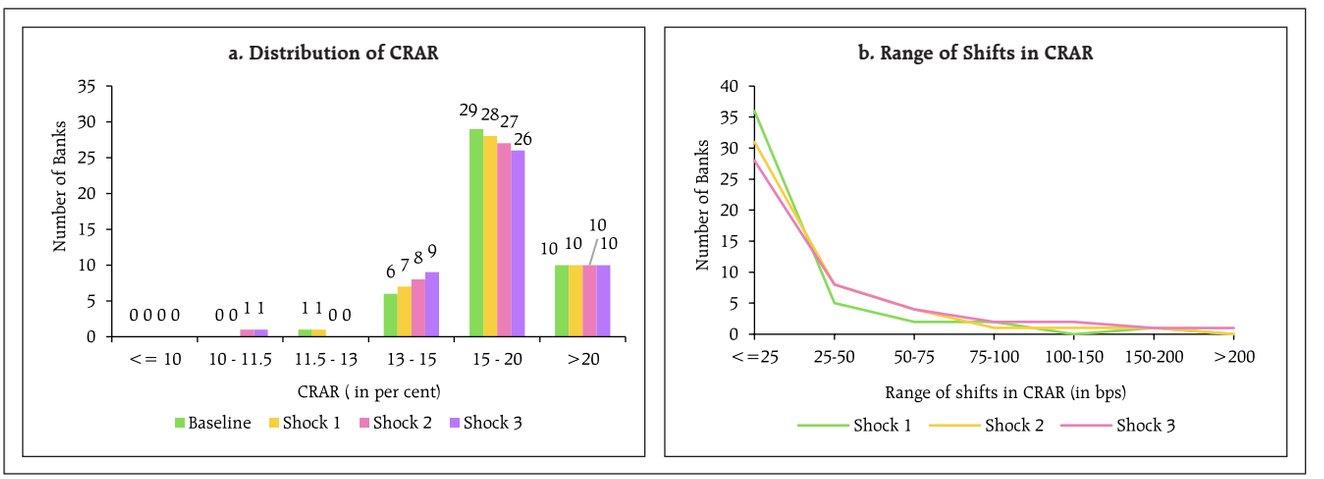
2.21 Shocks applied on the basis of volatility of industry sub-sector-wise GNPA ratios indicate varying magnitudes of rise in GNPAs. By and large, sectoral credit risk remains muted - a two SD shock to basic metals and energy sub-sectors would reduce the system-level CRAR by merely 16 bps and 14 bps

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: Reserve Bank's supervisory returns and staff calculations.

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: Reserve Bank's supervisory returns and staff calculations.

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

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

respectively, whereas the impact of shocks on the rest of the sub-sectors is negligible (Table 2.1).

d. Interest Rate Risk

2.22 The market value of investments subject to fair value for the sample of SCBs under assessment in September 2023 was ₹22.4 lakh crore (Chart 2.15), of which, 94.5 per cent was categorised as 'available for sale (AFS)' and the remainder was classified as 'held for trading (HFT)'. The share of the trading book portfolio in total investments of SCBs has been tapering for PSBs since June 2022, whereas it has risen for PVBs and FBs.

2.23 The AFS portfolio's sensitivity (PV01[21]) increased for all categories of banks since June 2023. In terms of PV01 curve positioning, the tenor-wise distribution of PSBs' portfolio indicates a higher allocation in the 5-10 year bucket. Around four-fifths of PSBs' AFS portfolio remains in the 1-5 year and 5-10 year buckets. PVBs have built up positions in the more than 10-year bucket, with 1-5 year and over 10-year buckets predominating their portfolio. FBs continue to prefer the more than 10-year bucket and have reduced their holding in the other buckets. Although PV01 exposure of FBs in the highest maturity segment remains substantial, it may not be an active contributor to risk as some positioning involves bonds being held as cover for hedging purposes (Table 2.2).

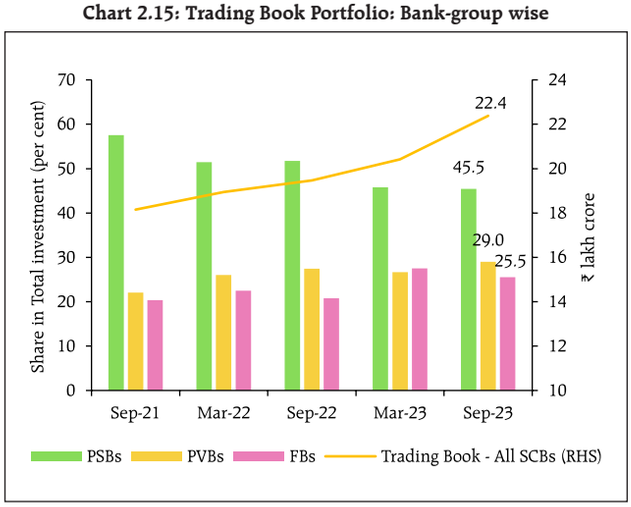
2.24 The sensitivity (PV01) of PSBs and FBs in their HFT portfolios grew in H1:2023-24, whereas it decreased for PVBs. The interest rate exposure of FBs remained much higher than that of the other two bank groups. PVBs have predominantly built up their position in the greater than 10-year bucket in H1:2023-24, with around three-fourth of their portfolio in the 5-10 year and greater than 10-year buckets. The sensitivity of FBs' portfolio has

Table 2.1: Decline in System Level CRAR
(basis points, in descending order for top 10 most sensitive sectors)

	1 SD	2 SD
Basic Metal and Metal Products (614 per cent)	9	16
Infrastructure - Energy (347 per cent)	7	14
Infrastructure - Transport (111 per cent)	3	6
All Engineering (151 per cent)	3	5
Textiles (87 per cent)	2	4
Construction (68 per cent)	1	3
Vehicles, Vehicle Parts and Transport Equipment (289 per cent)	1	3
Food Processing (46 per cent)	1	2
Infrastructure - Communication (216 per cent)	1	2
Chemicals (128 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.

Chart 2.15: Trading Book Portfolio: Bank-group wise



Sources: Individual bank submissions and staff calculations.

Table 2.2: Tenor-wise PV01 Distribution of AFS Portfolio

	Total (₹ crore)	Share (in per cent)			
		<1 year	1-5 year	5-10 year	>10 years
PSBs	227.2 (213.5)	5.6 (7.4)	33.3 (34.7)	48.7 (45.2)	12.4 (12.7)
PVBs	109.8 (99.8)	12.4 (14.9)	29.9 (32.1)	15.5 (15.8)	42.1 (37.3)
FBs	205.4 (182.4)	3.0 (4.2)	15.0 (17.2)	11.8 (13.5)	70.2 (65.1)

Note: Values in the parentheses indicate June 2023 figures.
Sources: Individual bank submissions and staff calculations.

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

increased because of higher allocation to the 5-10 year and more than 10-year buckets (Table 2.3). The increased preference for longer dated securities can exacerbate the impact of interest rate shocks for such banks.

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 101 bps and 102 bps, respectively (Table 2.4). At a disaggregated level, one bank would face a situation in which the CRAR will fall below the regulatory minimum.

2.26 As on December 11, 2023, yields hardened across the yield curve with the shorter end rising because of tight domestic liquidity conditions, and fuller transmission of the monetary policy tightening cycle. Since February 2023 when the pause in rate hikes began, the yield curve has reverted to an upward sloping position.

2.27 Robust demand from long-term investors (insurance companies and pension funds) assisted in compressing the yield of longer dated securities even as the maturity profile of outstanding Government debt elongated. Scenario analysis indicates that there is a shallower increase in borrowing costs when non-banks absorb all new government debt as compared to when it is absorbed entirely by banks[22] (Chart 2.16).

2.28 The yield curve provides vital information about the future direction of the economy. Since June 2023, the curvature has fallen further, indicating that inflation expectations remain anchored (Table 2.5). In the Indian context, empirical analysis shows that curvature[23] of the yield curve has more information

Table 2.3: Tenor-wise PV01 Distribution of HFT portfolio

	Total (₹ crore)	Share (in per cent)			
		<1 year	1-5 year	5-10 year	>10 years
PSBs	4.6 (3.3)	2.9 (0.8)	11.0 (14.8)	45.7 (47.4)	40.4 (37.0)
PVBs	8.5 (8.8)	7.6 (4.3)	19.7 (36.0)	49.0 (46.6)	23.6 (13.1)
FBs	44.1 (37.2)	0.7 (1.2)	11.8 (23.6)	13.7 (6.2)	73.8 (69.1)

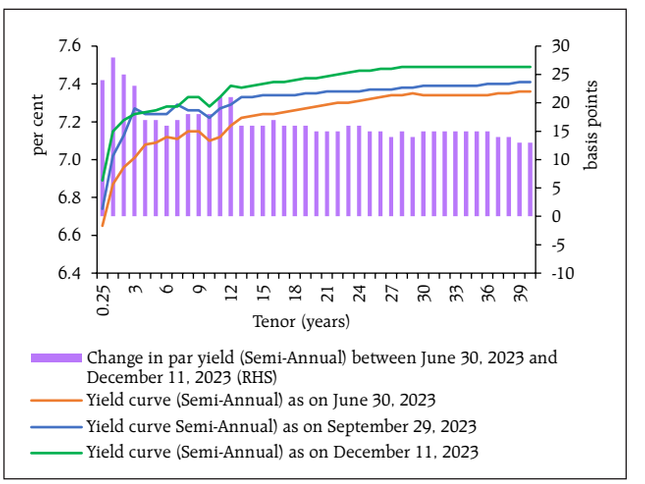
Note: Values in the brackets indicate June 2023 figures.
Source: Individual bank submissions and staff calculations.

Table 2.4: 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)	2.3	2.7	1.8	2.5	4.1	6.1	2.6	4.6
Share in total Investments (per cent)	27.9	0.40	31.3	2.2	83.1	11.3	34.1	2.0
Reduction in CRAR (bps)	80		47		507		101	
Reduction in CET1 (bps)	82		47		509		102	

Source: Individual bank submissions and staff calculations.

Chart 2.16: Yield Curves and Shift in Yields across Tenors



Source: FBIL.

Table 2.5: Curvature of Yield Curve

	June 30, 2023	September 29, 2023	December 11, 2023
Curvature	0.47	0.53	0.40

Sources: FBIL and RBI staff calculations.

[22] Amit Pawar *et al* (2023), "Shifting Tides: Growing Influence of Non-Bank Investors in G-Sec Market in India", Reserve Bank of India Bulletin, August.

[23] The curvature is calculated as twice the 14-year yield minus the sum of 30-year and 3-month yields.

content on future macroeconomic outcomes than the slope of the curve[24].

2.29 During Q1:2023-24, trading profits surged for all major bank groups on a sequential (q-o-q) basis, but they came down during Q2:2023-24. Losses recurred for FBs in Q2:2023-24 after recording profit in the previous quarter, which had followed losses in nine consecutive quarters. The share of trading profits in net operating income declined from June levels for PSBs and PVBs (Table 2.6).

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

2.31 After a rapid upward movement during 2022-23, the yield curve as of end September 2023 remained largely in line with its March 2023 position. Accordingly, the notional loss in the HTM book of SCBs (PSBs and PVBs) declined marginally to ₹70,497 crore as at end September 2023 as compared to a notional loss of ₹71,817 crore as at end March 2023.

2.32 The distribution of unrealised losses across PSBs and PVBs indicates a contrasting picture across bank cohorts. Unrealised losses of PSBs are predominantly in G-Secs, although the proportion of Central and State government securities held by them in the HTM portfolio are by and large equal but for PVBs, the losses were distributed largely in line with their proportion of holdings (Chart 2.18).

2.33 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

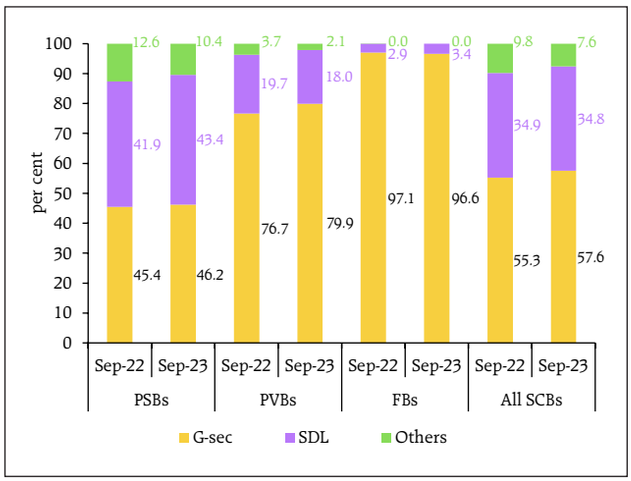
Table 2.6: OOI - Profit/ (Loss) on Securities Trading – All Banks

(in ₹ crore)

	Q2: 2022-23	Q3: 2022-23	Q4: 2022-23	Q1: 2023-24	Q2: 2023-24
PSBs	2594 (4.6)	4128 (6.8)	4084 (6.5)	6394 (10.2)	3914 (6.9)
PVBs	471 (0.9)	796 (1.3)	358 (0.7)	2042 (3.3)	903 (1.4)
FBs	-241 (-2.6)	-778 (-8.4)	-599 (-2.6)	215 (1.9)	-623 (-5.2)

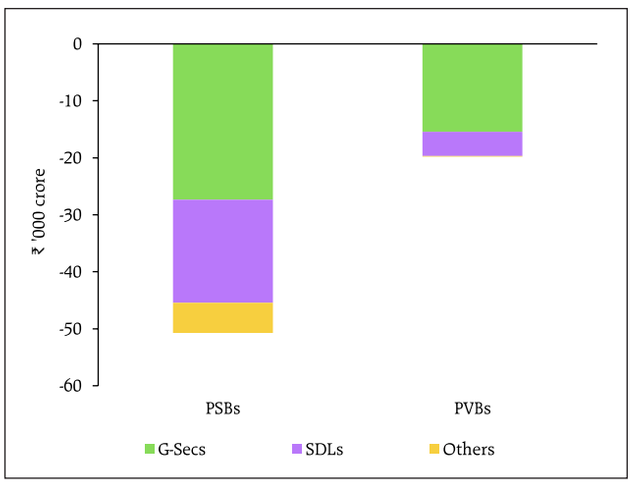
Note: Figures in parentheses represent OOI-Profit/ (Loss) on Securities Trading as a percentage of Net Operating Income.
Source: RBI Supervisory Returns.

Chart 2.17: HTM Portfolio – Composition



Sources: Individual bank submissions and staff calculations.

Chart 2.18: HTM Portfolio – Unrealised Gain/ Loss as on September 30, 2023



Sources: Individual bank submissions and staff calculations.

[24] Patra, M.D., Joice, J., Kushwaha, K.M., and I. Bhattacharyya (2022), "What is the Yield Curve telling us about the Economy?", Reserve Bank of India Bulletin, June.

losses would reduce the system level CRAR by 347 bps. In respect of four banks, the CRAR would fall below 9 per cent (regulatory minimum).

2.34 In September 2023, holdings of statutory liquidity ratio (SLR) securities by PSBs and PVBs in the HTM category amounted to 21.6 per cent and 19.2 per cent, respectively, of their net demand and time liabilities (NDTL), while it stood at 3.7 per cent for FBs. PVBs have decreased their holdings of SLR securities in the HTM portfolio. Nevertheless, most banks have increased their HTM holdings during H1:2023-24. Under the revised investment guidelines that will be effective from April 2024, the ceiling on the HTM portfolio of banks will be removed and reclassification of investments between different categories (HTM, AFS and FVTPL) will not be allowed without the prior approval of the Reserve Bank. The new guidelines could, therefore, impact the size of banks' HTM portfolio going forward.

2.35 An assessment of the interest rate risk of banks[25] using traditional gap analysis (TGA) and duration gap analysis (DGA) is undertaken for rate sensitive global assets, liabilities and off-balance sheet items of banks. TGA for time buckets up to one year places earnings at risk (EAR) at 11.7 per cent and 8.5 per cent of NII for PSBs and PVBs, respectively, for a 200 bps increase in the interest rate. The impact would be marginal for FBs and SFBs in case of a similar shock (Table 2.7). The impact of the interest rate rise on earnings is positive as the cumulative gap[26] at bank group level was positive as of September 2023.

2.36 As per the DGA[27] assessment, PVBs' and FBs' market value of equity (MVE) would reduce marginally 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 2.8).

Table 2.7: 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	5.9	11.7
PVBs	4.2	8.5
FBs	1.1	2.1
SFBs	1.0	2.0

Sources: RBI Supervisory Returns and Staff Calculations.

Table 2.8: 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	0.3	0.6
PVBs	-0.5	-1.1
FBs	-1.2	-2.4
SFBs	-5.4	-10.8

Source: RBI Supervisory Returns and Staff Calculations.

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

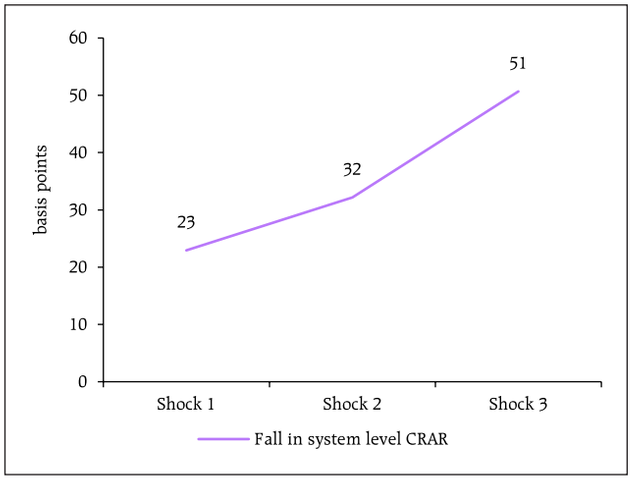
[26] Gap refers to Rate Sensitive Assets (RSA) minus Rate Sensitive Liabilities (RSL). Advances, HTM investments, swaps/ forex swaps, reverse repos are major contributors to RSA whereas deposits, swaps/ forex swaps and repos are observed to be the main elements under RSL.

[27] 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).

e. Equity Price Risk

2.37 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 overall system of 46 banks. Under the scenarios of 25 per cent, 35 per cent and 55 per cent drop 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



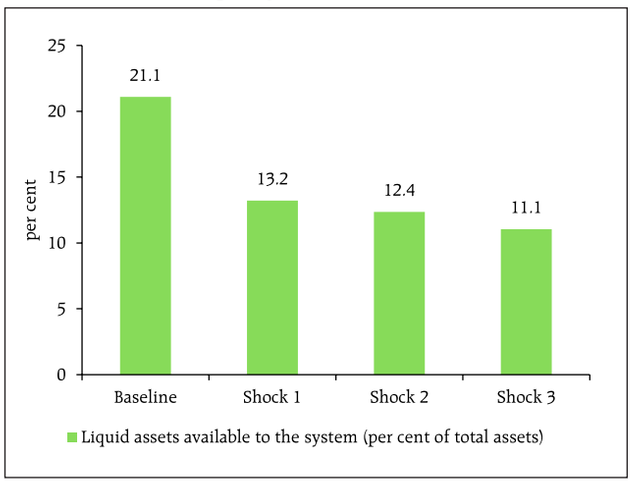
Note: For a system of select 46 SCBs.
Shock 1: Equity prices drop by 25 per cent
Shock 2: Equity prices drop by 35 per cent
Shock 3: Equity prices drop by 55 per cent
Source: RBI Supervisory Returns and staff calculations.

f. Liquidity Risk

2.38 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 withdrawals of around 15 per cent of un-insured deposits along with the utilisation of 75 per cent of unutilised portion of committed credit lines, liquid assets[28] at the system level would decrease from 21.1 per cent of total assets to 11.1 per cent (Chart 2.20).

2.39 The results of a reverse stress test performed to examine the extent of un-insured deposit run-offs required to exhaust the liquid assets of banks, while assuming utilisation of 75 per cent of unutilised portion of committed credit lines, reveal that for majority of the banks, an un-insured deposit run-

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.

[28] 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).

off of over 30 per cent is required to knock off their liquid resources completely (Chart 2.21).

II.1.8 Bottom-up Stress Tests: Derivatives Portfolio

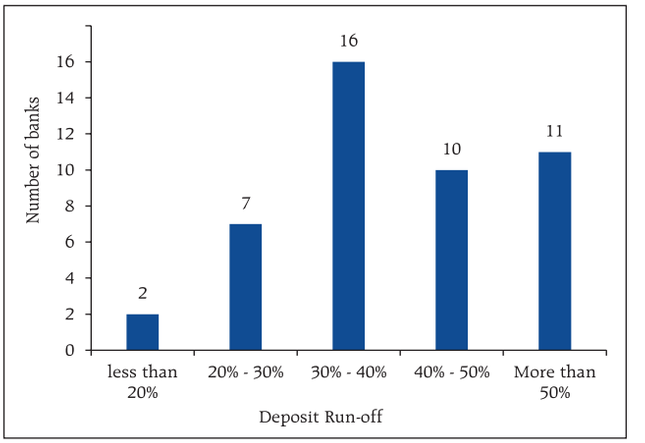
2.40 A series of bottom-up stress tests (sensitivity analyses) on derivative portfolios have been conducted by select banks[29] with the reference date of end-September 2023. The derivative portfolios of the banks in the sample are subjected to four separate shocks on interest and foreign exchange rates. While the shocks on interest rates 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 recent developments, most of the FBs maintained a significantly negative net mark-to-market (MTM) position as a proportion to CET1 capital in September 2023. The MTM impact is, by and large, muted for PSBs and PVBs. For the overall system, the extent of the negative MTM position is the highest in the last one year (Chart 2.22).

2.42 It has been observed that the realised income of foreign banks from derivatives portfolios forms a substantial portion of their net operating income despite many of them consistently reporting negative MTM positions in their derivatives portfolios (Chart 2.23). The income of PVBs remains under 10 per cent, while PSBs' income is muted around the zero mark. FBs have more diversified counterparties while most of the positions taken by PVBs and PSBs are with other banks.

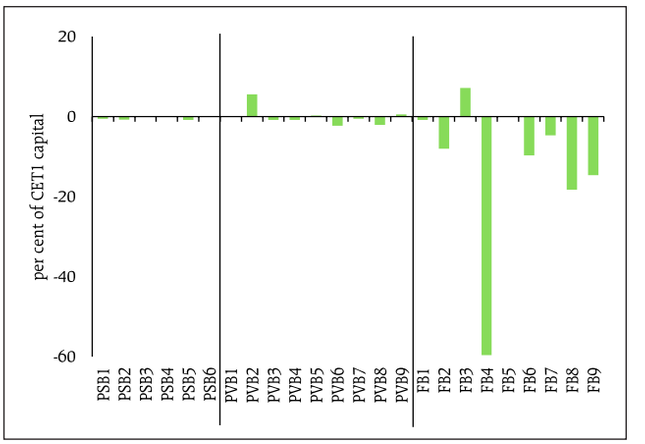
2.43 The stress test results show that the select set of banks would gain, on an average, from an interest rate rise, which is akin to the recent trend. As regards exposures to forex derivatives, they stand

Chart 2.21: Liquidity Risk- Reverse Stress Test Results



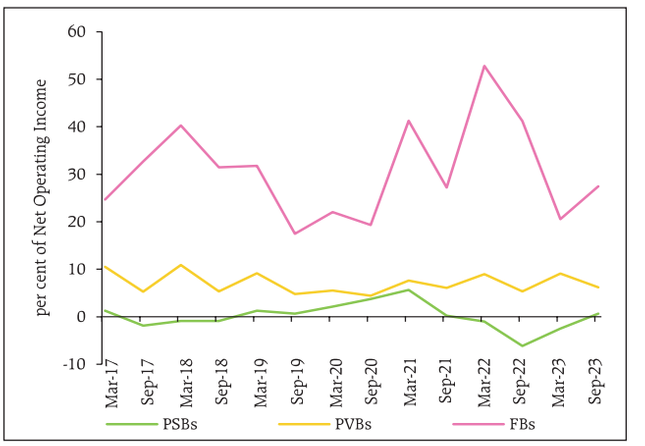
Source: RBI Supervisory Returns and Staff Calculations.

Chart 2.22: MTM of Total Derivatives Portfolio of Select Banks – September 2023



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: Income from the Derivatives Portfolio



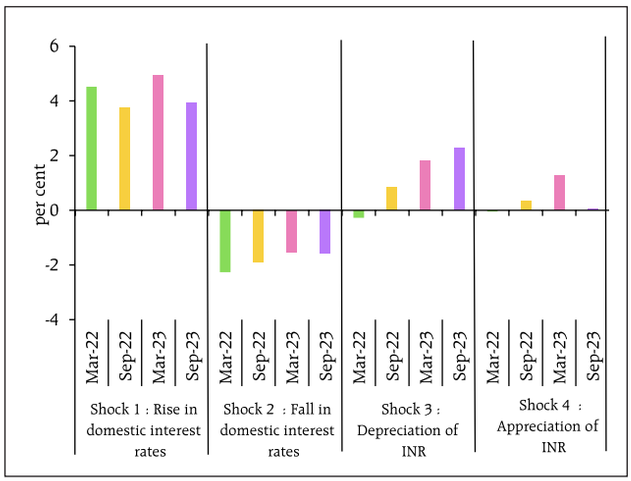
Note: PSB: Public sector bank, PVB: Private sector bank, FB: Foreign bank.
Source: Sample banks (Bottom-up stress tests on derivatives portfolio).

[29] 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.

to benefit from INR depreciation. Potential gains from interest rate increases dipped in September 2023 as compared with March 2023, while it has been rising for INR depreciation (Chart 2.24). The pay-off profile in respect of both interest rate risk and foreign exchange risk remains asymmetric, with gains being significantly large relative to losses. This could be reflecting their views on the future interest rate and exchange rate movement.

Chart 2.24: Impact of Shocks on Derivatives Portfolio of Select Banks (change in net MTM on application of a shock)

(per cent to total capital funds)



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).

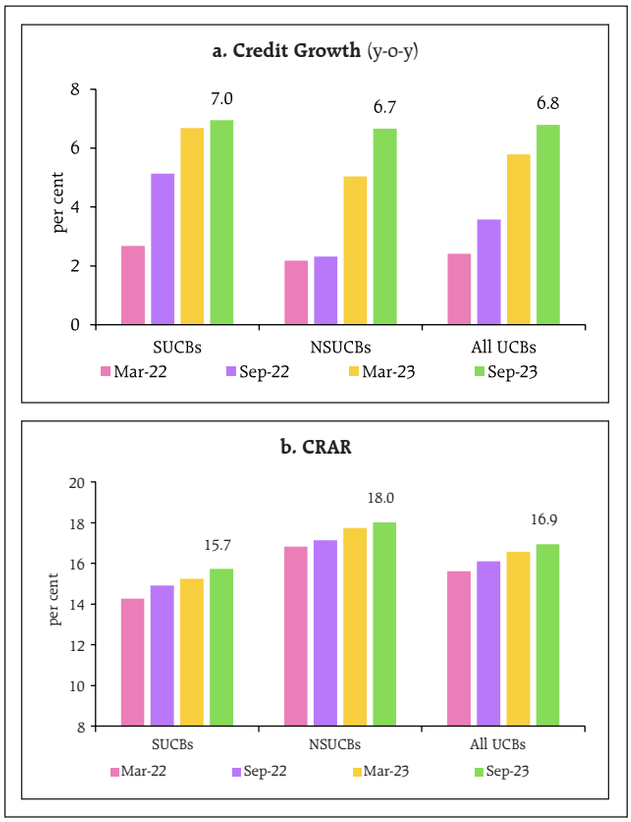
II.2 Primary (Urban) Cooperative Banks[30]

2.44 Primary urban cooperative banks (UCBs)[31] recorded a pick up in credit growth (Chart 2.25 a). Larger UCBs led the credit growth: the share of Tier 4 UCBs[32] (with deposits of more than ₹10,000 crore) in total gross loans of UCBs increased from 23.9 per cent to 25.7 per cent during H1:2023-24, mainly at the cost of Tier 3 UCBs (having deposits in the range ₹1,000 crore to ₹10,000 crore), whose share declined from 34.2 per cent to 31.8 per cent during the period.

2.45 The capital position of UCBs improved further during H1:2023-24 with their CRAR increasing in September 2023 (Chart 2.25 b) across all tiers of UCBs to well above the minimum requirement[33] (Chart 2.25 c).

2.46 Although the GNPA and NNPA ratios of UCBs increased in H1:2023-24, they have exhibited a downward movement in the post-pandemic period (Charts 2.25 d and e). Similarly, the provisioning coverage ratio (PCR) also showed improvement (Chart 2.25 f). A decline in asset quality in H1:2023-24 was observed in Tier 1, Tier 2 and Tier 3 UCBs, while the largest UCBs (Tier 4) showed improvement (Chart 2.25 g).

Chart 2.25: Credit Profile and Asset Quality Indicators of UCBs *(Contd.)*



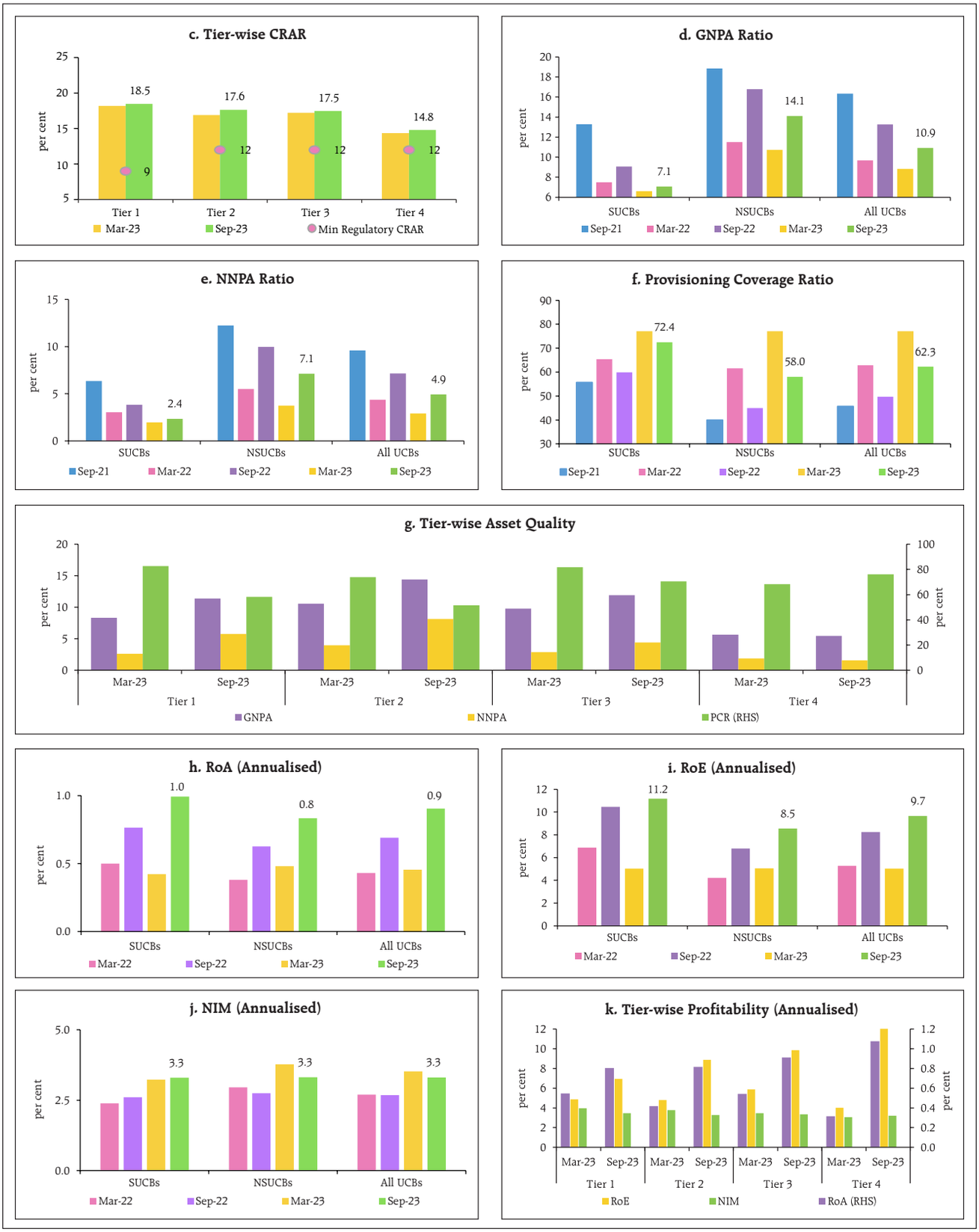
[30] Data are provisional and based on off-site surveillance (OSS) returns.

[31] Based on common sample of 1464 UCBs covering over 90 per cent of gross loans extended by UCBs.

[32] Under the four-tiered regulatory framework for categorisation of UCBs as per the Circular DOR. REG. No.84/07.01.000/2022-23 dated December 01, 2022 on 'Revised Regulatory Framework - Categorisation of Urban Co-operative Banks (UCBs) for Regulatory Purposes

[33] 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 2.25: Credit Profile and Asset Quality Indicators of UCBs *(Contd.)*



Source: RBI supervisory returns and staff calculations.

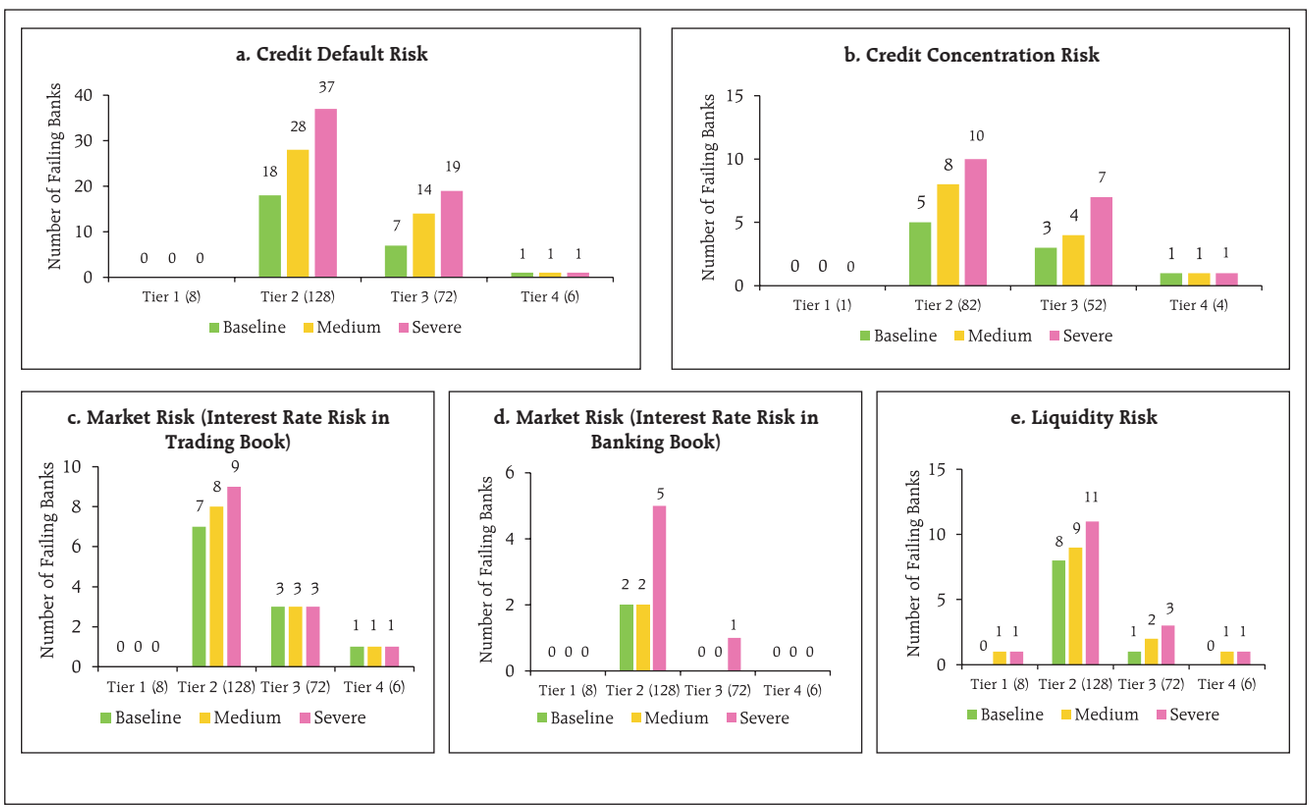
2.47 Profitability of UCBs improved in terms of RoA and RoE ratios in H1:2023-24 (Chart 2.25 h and i). scheduled UCBs (SUCBs) and Tier 4 UCBs witnessed an improvement across all their profit parameters though the net interest margin (NIM) of non-scheduled UCBs (NSUCBs) declined in September 2023 (Chart 2.25 j and k). From having the lowest RoA and RoE in March 2023, Tier 4 UCBs now have the highest RoA and RoE amongst all the Tiers.

II.2.1 Stress Testing

2.48 Stress tests were conducted on a select set of major UCBs[34] 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 September 2023.

2.49 One bank in the Tier 4 UCB cohort would fail to meet the minimum regulatory CRAR requirement under both types of credit risk and interest rate risk in the trading book. In the case of liquidity risk, one Tier 4 UCB would have liquidity mismatch exceeding 20 per cent under medium and severe stress scenarios. The number of banks in Tier 2 and Tier 3 cohorts is large and the impact of credit default risk is higher than other types of risk for both these cohorts. UCBs in the small-sized cohort (*i.e.*, Tier 1) would pass all stress tests, except one bank which fails in the liquidity stress test. In general, the impact of interest rate shock on the UCBs' banking book would be low (Chart 2.26).

Chart 2.26: Stress Test of UCBs



Notes: (i) Figures in brackets represent sample size of the Tier.
(ii) Sample considered for credit concentration risk is smaller (139) than other tests (214) because of data availability issue.
Sources: RBI supervisory returns and staff calculations.

[34] The stress test is conducted with reference to the financial position of September 2023 for select 214 UCBs with asset size of more than ₹500 crore, excluding banks under the Reserve Bank's All Inclusive Directions (AID). These 214 UCBs together cover 68 per cent of the total assets of the UCB sector. The detailed methodology used for stress test is given in Annex 2.

2.50 Under the severe stress scenario, the consolidated CRAR of 214 UCBs diminishes by 324 bps and 120 bps for credit default risk and interest rate risk in trading book, respectively. The consolidated CRAR of 139 UCBs diminishes by 334 bps for credit concentration risk under the severe stress scenario. The application of interest rate shock to the banking book indicates a decline in net interest income (NII) of 214 UCBs by 5.8 per cent under the severe stress scenario. System level liquidity mismatch remains positive (*i.e.*, no liquidity gap) for liquidity risk even under the severe stress scenario.

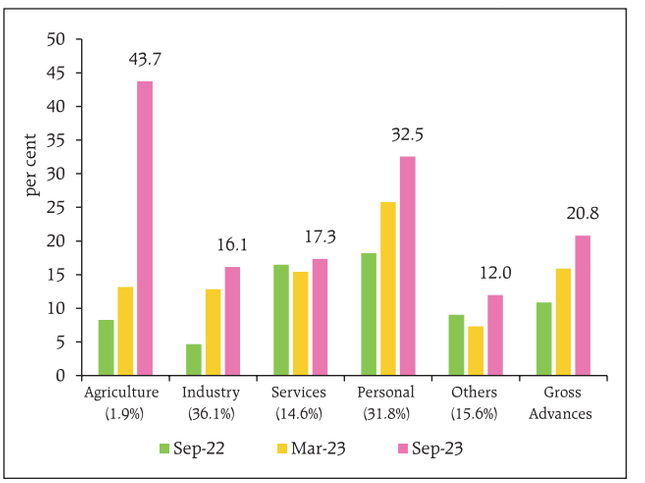
II.3 Non-Banking Financial Companies (NBFCs)[35]

2.51 Aggregate lending by NBFCs rose by 20.8 per cent (y-o-y) in September 2023 from 10.8 per cent a year ago, primarily led by personal loans and loans to industry (Chart 2.27). Growth in industrial advances was largely contributed by the Government NBFCs (18.3 per cent y-o-y), that account for 43 per cent of total credit by NBFCs. During the last four years, the compound annual growth rate (CAGR) for personal loans (nearly 33 per cent) has far exceeded that for overall credit growth (nearly 15 per cent) for the NBFC sector. Going forward, the recent increase in risk weights of select retail loan categories may have implications for NBFC credit growth at the overall, sectoral and sub-sectoral levels.

2.52 Credit growth by the NBFC sector in the post-pandemic period has accelerated for investment and credit companies (NBFC-ICCs), moving to double digits for infrastructure finance companies (NBFC-IFCs), and exceeding 30 per cent for micro-finance institutions (NBFC-MFI) (Chart 2.28).

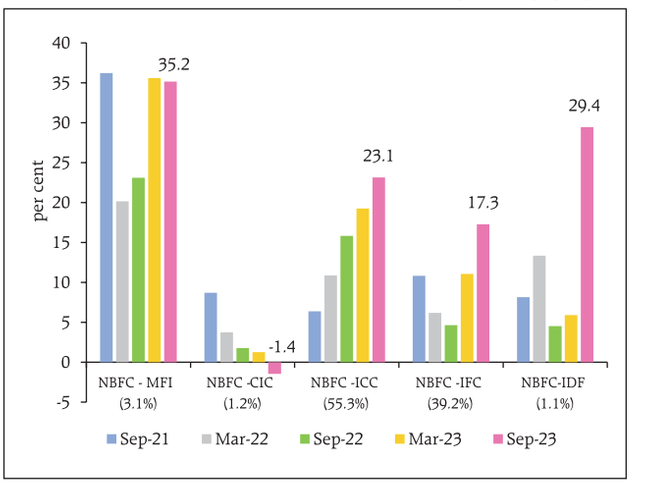
2.53 The GNPA ratio of NBFCs continued on its downward trajectory with improvement across sectors. Among major sectors, the personal loans

Chart 2.27: Sectoral Credit Growth of NBFCs (y-o-y)



Note: Figures in bracket represent shares in outstanding loans in Sep-23.
Sources: RBI supervisory returns and staff calculations.

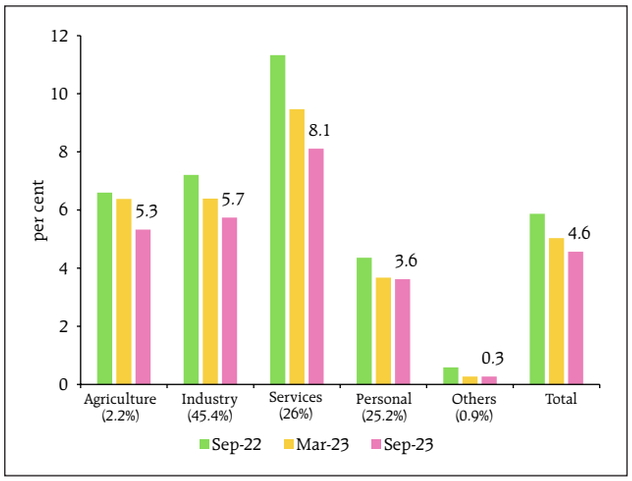
Chart 2.28: Credit Growth of NBFCs Classified by Activity (y-o-y)



Note: Figures in bracket represent shares in outstanding loans in Sep-23.
Sources: RBI supervisory returns and staff calculations.

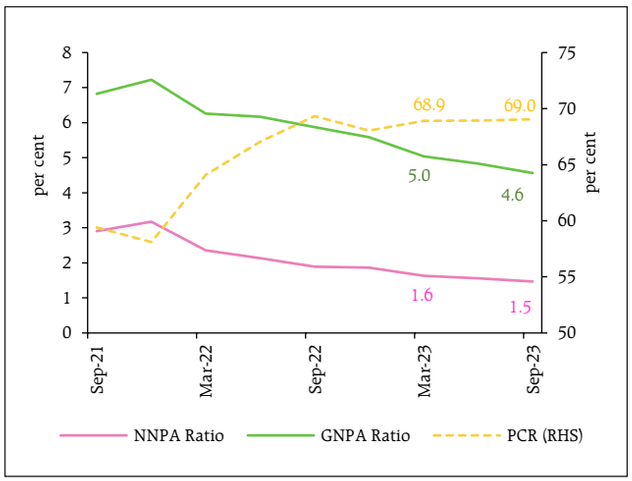
[35] The analyses done in this section are based on deposit taking and non-deposit taking systemically important NBFCs' (including CICs) data available as of December 08, 2023 which are provisional.

Chart 2.29: Sectoral GNPA Ratio of NBFCs



Note: Figures in brackets represent sectoral shares in GNPA in Sep-23.
Sources: RBI supervisory returns and staff calculations.

Chart 2.30: Asset Quality of NBFCs

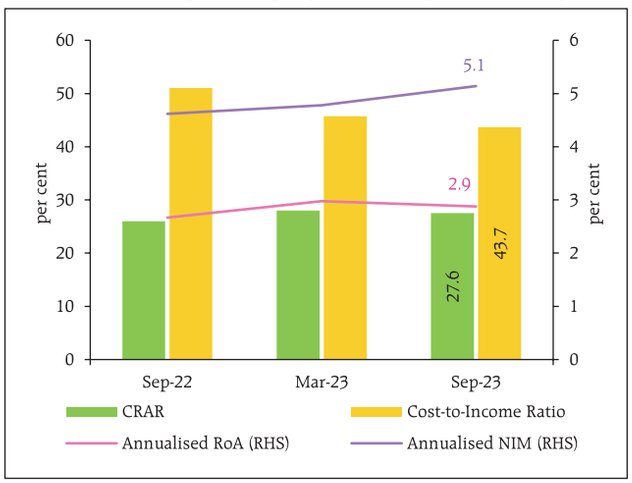


Sources: RBI supervisory returns and staff calculations.

segment, which had grown rapidly in the last few years, continues to have the lowest GNPA ratio in September 2023 (3.6 per cent) (Chart 2.29). The GNPA ratio relating to Government and private NBFCs moderated further to 2.5 per cent and 6.1 per cent, respectively, but that of private NBFCs' industrial advances remains high at 12.5 per cent, despite a recent fall and constitutes 21.6 per cent of overall GNPA of the NBFC sector. The aggregate NNPA ratio of NBFCs continued to improve with PCR remaining at a robust level (Chart 2.30).

2.54 The capital position of NBFCs remained healthy, with CRAR at 27.6 per cent in September 2023, much above the regulatory minimum requirement of 15 per cent. The RoA ratio and net interest margin (NIM) stood strong and the cost-to-income ratio[36] has improved gradually (Chart 2.31).

Chart 2.31: Capital Adequacy, Profitability and Efficiency



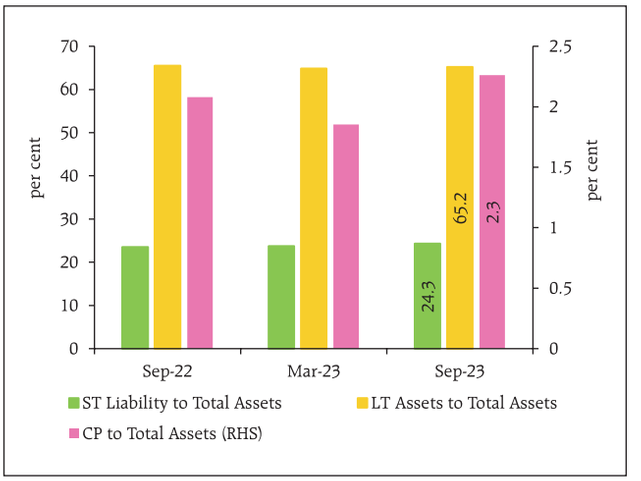
Sources: RBI supervisory returns and staff calculations.

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

2.55 Various liquidity stock measures for NBFCs show a stable position (Chart 2.32). Based on past 5-year data, an analysis of the ALM profile of top 50 NBFCs (accounting for about 70 per cent of the assets of the NBFC sector) shows that 88 per cent of the bonds issued by these NBFCs had residual maturity of up to 5 years in September 2018 which reduced to 76 per cent in September 2023, indicating elongation in tenor of bonds. There has also been a shift away from short-term borrowing for these top 50 NBFCs as the share of short-term borrowings in total borrowings came down from 47.7 per cent in September 2018 to 37.3 per cent over this period. Together with their increasing preference for longer term sources of funds, there has also been a shift towards long-term uses of funds. On the asset side, about 80 per cent of loans and advances for these top 50 NBFCs had a maturity of less than three years in September 2018, which reduced to 67 per cent in September 2023.

2.56 Share capital, reserves and surplus of NBFCs decreased during H1:2023-24 to constitute 27.9 per cent of their total liabilities. Mobilisation of resources through debentures also declined. The reliance on funding from banks has gradually risen over the years (Table 2.9). Over three fourth of resources mobilised from banks were secured in nature and more than 85 per cent of such borrowings were by highly rated NBFCs (AA- and above) (Chart 2.33). Large NBFCs (*viz.*, asset size above ₹25,000

Chart 2.32: Liquidity Stock Measures



Sources: RBI supervisory returns and staff calculations.

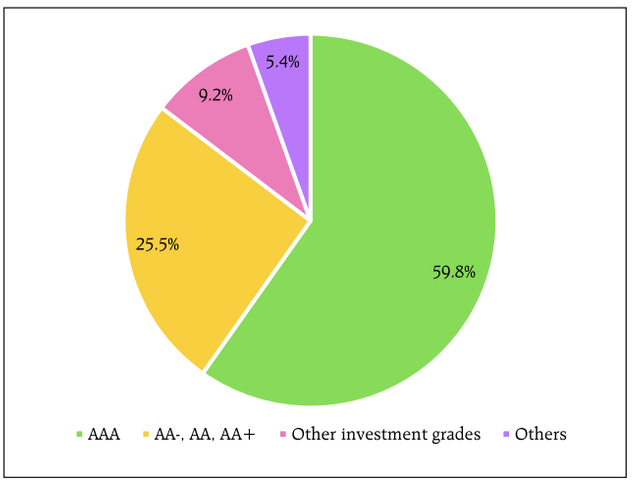
Table 2.9: NBFCs' Sources of Funds

(per cent)

Item Description	Mar-21	Mar-22	Mar-23	Sep-23
1. Share Capital, Reserves and Surplus	26.7	29.4	29.1	27.9
2. Total Borrowings	63.0	60.6	61.5	62.1
Of which:				
2(i) Borrowing from banks	19.8	20.6	21.9	22.2
2(ii) CPs subscribed by banks	0.4	0.4	0.3	0.4
2(iii) Debentures subscribed by banks	3.0	2.9	2.7	2.4
Total from banks [2(i)+2(ii)+2(iii)]	**23.2**	**23.8**	**25.0**	**25.0**
2(iv) CPs excluding 2(ii)	1.6	1.4	1.5	1.9
2(v) Debentures excluding 2(iii)	22.8	20.4	19.5	19.6
3. Others	10.2	10.0	9.5	10.0
Total	**100.0**	**100.0**	**100.0**	**100.0**

Source: RBI supervisory returns and staff calculations.

Chart 2.33: Rating-wise Distribution of NBFCs Resources Mobilised from Banks

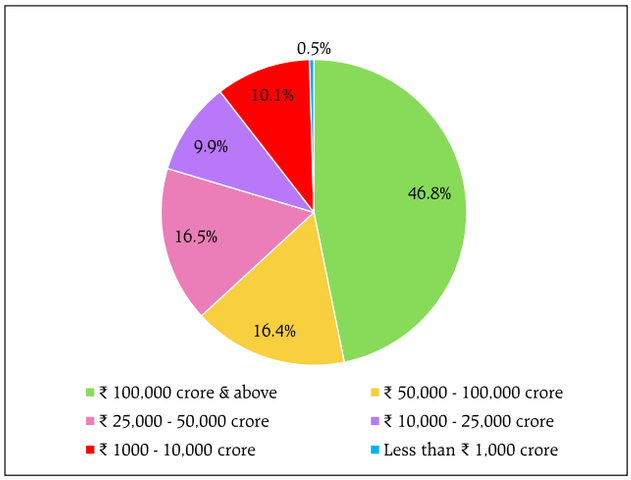


Sources: RBI supervisory returns and staff calculations.

crore) accounted for nearly 80 per cent of resources mobilised from banks by the sector (Chart 2.34).

2.57 The scale based regulatory structure of NBFCs comprises of four layers based on their size, activity and perceived riskiness. As of September 2023, NBFCs in the base, middle and upper layers had shares of 6.0 per cent, 71.0 per cent and 23.0 per cent, respectively, in total assets of NBFCs, while the top layer is empty. NBFCs in the upper layer recorded a healthy growth in H1:2023-24 and their GNPA ratio gradually improved while capital position remained robust (Table 2.10).

Chart 2.34: Asset Size-wise Distribution of NBFCs Resources Mobilised from Banks



Sources: RBI supervisory returns and staff calculations.

Table 2.10: Select Indicators of NBFC – Upper Layer

(per cent)

Parameter	Mar-22	Sep-22	Mar-23	Sep-23^
Growth Rate of Assets (y-o-y)	11.8	14.1	14.7	13.1
Growth Rate of Credit (y-o-y)	11.2	16.4	18.8	21.9
CRAR*	22.9	22.3	22.2	21.9
GNPA Ratio	**4.5**	**4.2**	**3.7**	**3.4**

Note: * CRAR computation excludes the CIC which is in upper layer.
^ Sep-23 figures are computed based on the current set of NBFCs in upper layer.
Sources: NHB and RBI supervisory returns and staff calculations.

II.3.1 Stress Test[37] - Credit Risk

2.58 System level stress tests for assessing the resilience of NBFC sector to shocks in credit risk were conducted for a sample of 146[38] NBFCs. The tests were carried out under a baseline and two stress scenarios – medium and high risk – with increase in GNPA by 1 SD and 2 SDs, respectively. The capital adequacy ratio of the sample NBFCs stood at 24.4 per cent and the GNPA ratio at 3.1 per cent in September 2023. The one year ahead baseline scenario is built on the assumption of business continuing under usual conditions.

2.59 Under the baseline scenario, the one-year ahead GNPA ratio is estimated to be 3.8 per cent and CRAR at 22.0 per cent. Under a medium risk shock of 1 SD increase in GNPAs, the GNPA ratio increases to 5.0 per cent and the resultant income loss and additional provision requirements reduce the CRAR by around 70 bps relative to the baseline. Under the high-risk shock of 2 SDs, the capital adequacy ratio of the sector declines by 101 bps relative to the baseline, to 21.0 per cent. The number of

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

[38] The sample comprised of 9 NBFCs in Upper Layer and 137 NBFCs in Middle Layer with total advances of ₹19.63 lakh crore as of September 2023, which forms around 95 per cent of total advances of non-Government NBFCs in the sector. The sample for stress test excluded Government NBFCs, companies presently under resolution, stand-alone primary dealers and investment focused companies to ensure better representation of credit risk of the sector.

NBFCs from the sample that would fail to meet the minimum regulatory capital requirement of 15 per cent increases from 9 under baseline scenario to 15 under medium and 21 under severe stress scenarios (Chart 2.35).

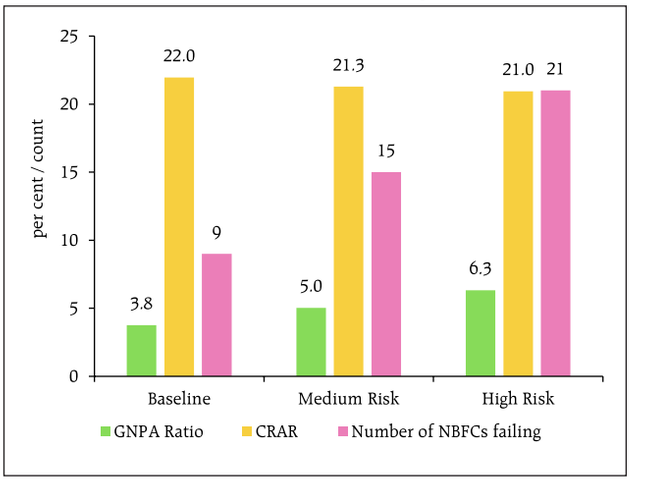
II.3.2 Stress Test - Liquidity Risk

2.60 The resilience of the NBFC sector to liquidity shocks has been assessed by capturing the impact of a combination of assumed increase in cash outflows and decrease in cash inflows[39]. The baseline scenario uses the projected outflows and inflows as of September 2023. One baseline and two stress scenarios are applied – a medium risk scenario involving 5 per cent contraction in inflows and 5 per cent rise in outflows; and a high risk scenario entailing a shock of 10 per cent decline in inflows and 10 per cent surge in outflows. The results indicate that the number of NBFCs which would face negative cumulative mismatch in liquidity over the next one year in the baseline, medium and high-risk scenarios stood at 6 (representing 1.3 per cent of asset size of the sample), 17 (10.4 per cent) and 34 (15.0 per cent), respectively (Table 2.11).

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 the 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 uncertainties of the future.

Chart 2.35: Credit Risk in NBFCs - System Level



Sources: RBI supervisory returns and staff calculations.

Table 2.11: Liquidity Risk in NBFCs

Cumulative Mismatch as a percentage of Outflows over Next One Year	No. of NBFCs having Liquidity Mismatch		
	Baseline	Medium	High
Over 50 per cent	1 (0.1)	2 (0.3)	3 (0.8)
Between 20 and 50 per cent	3 (0.8)	3 (1.3)	3 (1.2)
20 per cent and below	2 (0.4)	12 (8.8)	28 (13.0)

Note: Figures in parenthesis represent percentage share in asset size of the sample.
Source: RBI supervisory returns and staff calculations.

[39] Stress testing based on liquidity risk was performed on a sample of 198 NBFCs – which includes 9 NBFCs in Upper Layer and 189 NBFCs in Middle Layer. The total asset size of the sample was ₹23.41 lakh crore, comprising 80 per cent of total assets of non-government NBFCs in the sector.

2.62 The solvency ratio for life insurance companies has been above the prescribed threshold for both public sector and private sector at an aggregate level (Table 2.12). The solvency ratio for public sector non-life insurers' group is sub-optimal with three of the four PSU insurers recording the ratio below the baseline prescription (Table 2.13).

Table 2.12: Solvency Ratio of Life Insurance Sector

(per cent)

	Public Sector	Private Sector	Industry
Dec-22	185	235	197
Mar-23	187	227	197
Jun-23	189	222	197
Sep-23	190	220	197

Source: IRDAI.

Table 2.13: Solvency Ratio of Non-Life Insurance Sector

(per cent)

	PSU Insurers	Private Insurers	Stand Alone Health Insurers	Specialised Insurers	Total General Insurers
Dec-22	62	225	212	612	169
Mar-23	44	225	203	642	163
Jun-23	38	227	203	677	162
Sep-23	39	228	195	688	164

Source: IRDAI.

II.5 Stress Testing of Mutual Funds

2.63 As mandated by the Securities and Exchange Board of India (SEBI), stress testing[40] of all open-ended debt schemes (except overnight schemes) is carried out by asset management companies (AMCs) every month to evaluate the impact of various risk parameters, *viz.*, interest rate risk, credit risk, liquidity risk and redemption risk faced by such schemes on their net asset values (NAVs).

2.64 The analysis revealed stress (credit risk, interest rate risk, and liquidity risk) in the case of 17 mutual funds. In terms of schemes, however, only 24 out of a total of 299 schemes exhibited stress. The assets under management (AUM) of the open-ended debt schemes, which were found to have experienced stress, amounted to ₹1.7 lakh crore as against the total AUM of ₹12.4 lakh crore for all schemes for which the stress testing was conducted (Table 2.14).

Table 2.14: Stress Testing of Open-Ended Debt Schemes of Mutual Funds – Summary Findings

(As of September 2023)

Particulars	Stress	No Stress	Total
No. of AMCs	17	25	42
No. of Schemes	24	275	299
AUM (₹ crore)	1,70,080	10,73,556	12,43,636

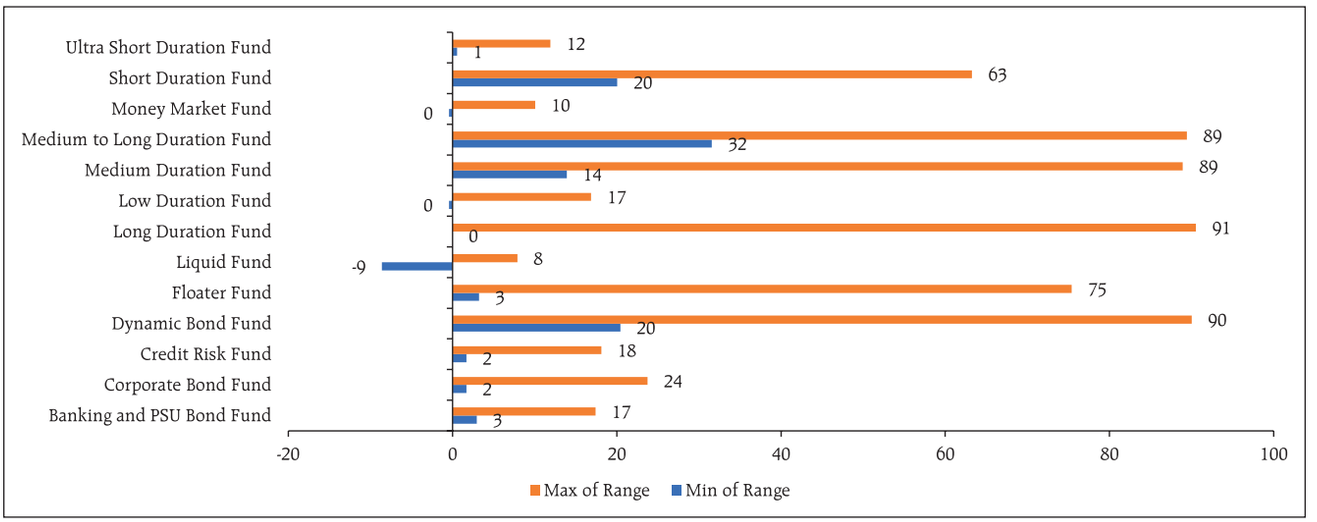
Source: Association of Mutual Funds in India (AMFI).

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 the AMCs have been mandated to maintain these liquidity ratios (LR-RaR and LR-CRaR) above the threshold limits, which are derived from scheme type, scheme asset composition and potential

[40] 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)



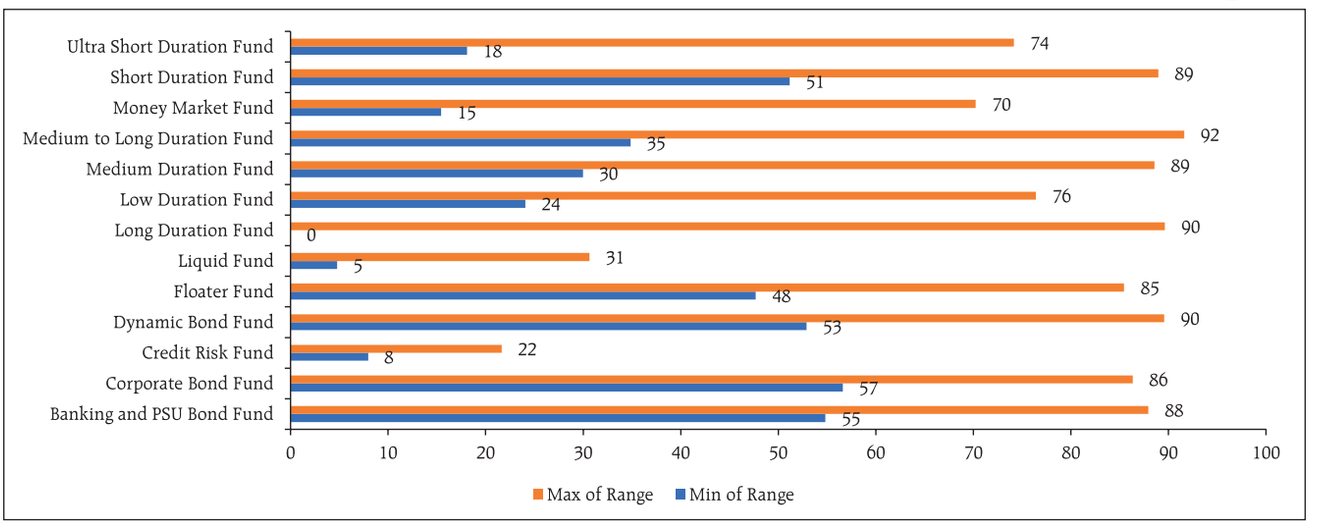
Note: Data pertains to Top 10 AMCs based on AUM as on October 31, 2023.
Source: SEBI.

outflows (modelled from investor concentration in the scheme). Mutual funds are required to carry out backtesting 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.

2.66 The LR-RaR and LR-CRaR computed by top 10 mutual funds (based on AUM) for 13 categories of open-ended debt schemes for October 2023 were well above the respective threshold limits for most of the mutual funds. 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 October 31, 2023.
Source: SEBI.

II.6 Stress Testing Analysis at Clearing Corporations

2.67 Stress testing[41] is carried out at clearing corporations (CC) to determine the minimum required corpus (MRC), which needs to be contributed by clearing members (CMs) to the core settlement guarantee fund (SGF). The MRC is determined for each segment (*viz.*, cash market, equity derivatives, currency derivatives, commodity derivatives, debt and tri-party repo segment) every month based on stress testing.

2.68 Stress testing analysis undertaken during April-September 2023 indicates that though the monthly calculated amounts of MRC at clearing corporations varied, the actual MRC requirement for most of the segments remained the same during the period in line with SEBI stipulation. The MRC requirement of one of the CCs in the equity derivatives segment and that of another CC in the commodity derivatives segment increased during the period (Table 2.15).

II.7 Interconnectedness

2.69 Interconnections among financial institutions involve funding gaps arising due to liquidity mismatch and maturity transformation, payments, and risk transfer processes. A financial system can be visualised as a network with financial institutions as nodes and bilateral exposures as links joining these nodes. These links could be in the form of loans to, investments in, or 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 crisis. Understanding the nuances in propagation of risk through networks is useful for devising appropriate policy responses for safeguarding financial and macroeconomic stability.

Table 2.15: Minimum Required Corpus of Core SGF Based on Stress Testing Analysis at Clearing Corporations

(Amount in ₹ crore)

Segment	April 2023	May 2023	June 2023	July 2023	August 2023	September 2023
Clearing Corporation 1						
Average Stress Test Loss						
Cash Market	49	57	42	46	127	67
Equity Derivatives Segment	458	470	354	336	305	522
Currency Derivatives Segment	124	116	118	153	164	158
Debt Segment	4	4	4	4	4	4
Tri-Party Repo Segment	17	17	17	17	17	17
Commodity Derivatives Segment	0.1	0	0.1	6	5.1	0.7
Total	652	664	535	562	622	769
Actual MRC requirement						
Cash Market	348	348	348	348	348	348
Equity Derivatives Segment	2,335	2,423	2,423	2,423	2,423	2,423
Currency Derivatives Segment	242	242	242	242	242	242
Debt Segment	4	4	4	4	4	4
Tri-Party Repo Segment	17	17	17	17	17	17
Commodity Derivatives Segment	10	10	10	10	10	10
Total	2,956	3,044	3,044	3,044	3,044	3,044
Clearing Corporation 2						
Average Stress Test Loss						
Cash Market	7	9	11	15	12	15
Equity Derivatives Segment	62	23	18	22	16	17
Currency Derivatives Segment	53	39	49	55	42	42
Commodity Derivatives Segment	0.1	0	0	0	0	0
Total	122	71	78	92	70	74
Actual MRC requirement						
Cash Market	194	194	194	194	194	194
Equity Derivatives Segment	74	74	74	74	74	74
Currency Derivatives Segment	235	235	235	235	235	235
Commodity Derivatives Segment	14	14	14	14	14	14
Total	517	517	517	517	517	517
Clearing Corporation 3 (Commodity Derivatives Segment)						
Average Stress Test Loss	52	46	30	24	23	38
Actual MRC requirement	124	124	124	124	124	124
Clearing Corporation 4 (Commodity Derivatives Segment)						
Average Stress Test Loss	391	401	500	493	485	562
Actual MRC requirement	417	417	500	500	500	562
Clearing Corporation 5 (Tri-Party Repo Segment)						
Average Stress Test Loss	-	-	-	-	-	42
Actual MRC requirement	-	-	-	-	-	42

Source: SEBI.

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

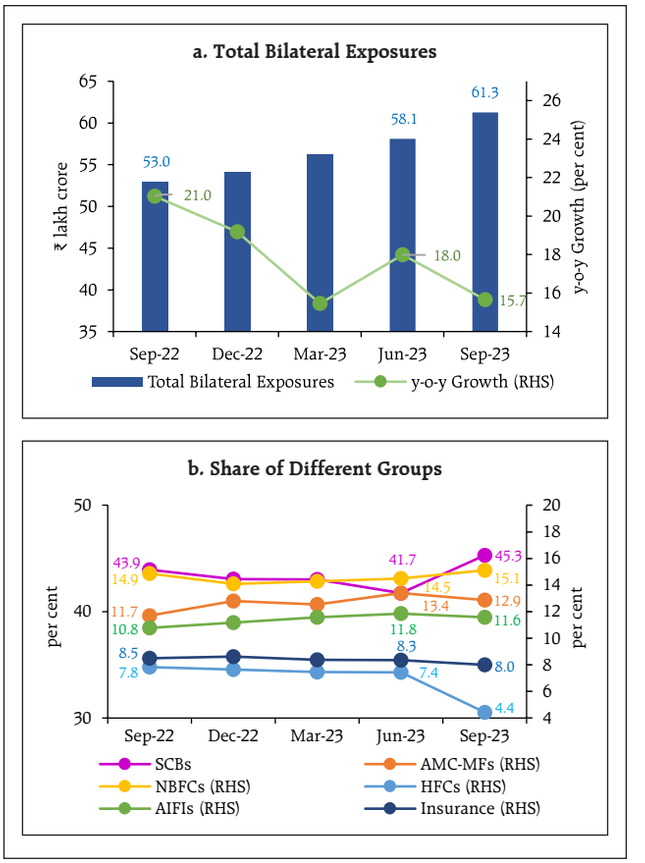
II.7.1 Financial System Network[42] [43]

2.70 The total outstanding bilateral exposures[44] among the entities in the Indian financial system expanded during H1:2023-24. A surge during September 2023 was primarily driven by growth in inter-bank exposure, higher borrowing of NBFCs in the form of long-term (LT) loans from SCBs and increasing exposure of AMC-MFs with SCBs and NBFCs. The growth (y-o-y) of bilateral exposures moderated to 15.7 per cent after large fluctuations witnessed since the onset of the pandemic (Chart 2.38 a).

2.71 There was a pronounced diversion of exposure in the financial network from housing financial companies (HFCs) to SCBs due to merger of a large HFC with a private bank during Q2:2023-24, which led to shrinkage of exposure of HFCs to the financial system while contributing to an increase in the exposure of SCBs (Chart 2.38 b).

2.72 The funding mix of the financial system shows that long-term funding, primarily loans and advances, equity and LT debt instruments play a major role in the financial system. A segment wise analysis indicates that in general (a) LT loans are mainly advanced by SCBs to NBFCs; (b) AMC-MFs are major investors in the equities issued by PVBs and NBFCs; (c) in the LT debt market, insurance companies hold a majority of instruments issued by PVBs, NBFCs and HFCs. In the short-term (ST) funding mix, apart from the inter-bank ST loans and

Chart 2.38: Bilateral Exposures between Entities in the Financial System



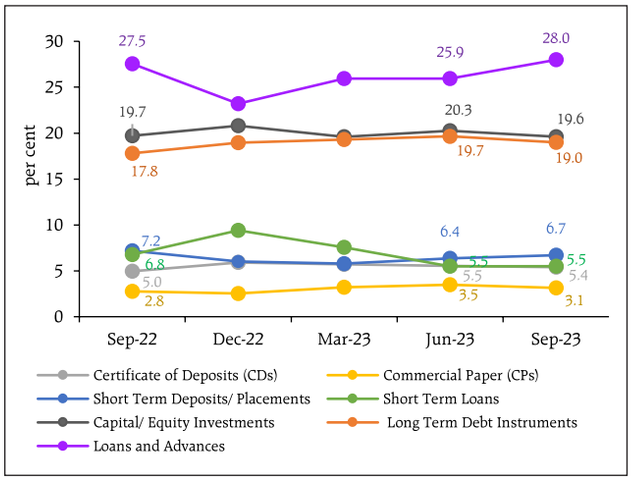
Note: Exposures between entities of the same group are included.
Sources: RBI supervisory returns and staff calculations.

[42] 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.

[43] 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).

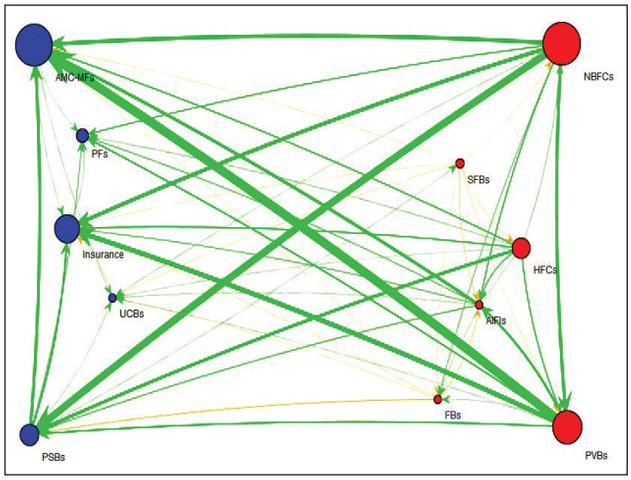
[44] Includes exposures between entities of the same group. Exposures are outstanding position as on September 30, 2023 and are broadly divided into fund-based and non-fund-based exposure. Fund-based exposure includes money market instruments, deposits, loans and advances, long-term debt instruments 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.
Sources: RBI supervisory returns and staff calculations.

Chart 2.40: Network Plot of the Financial System - September 2023



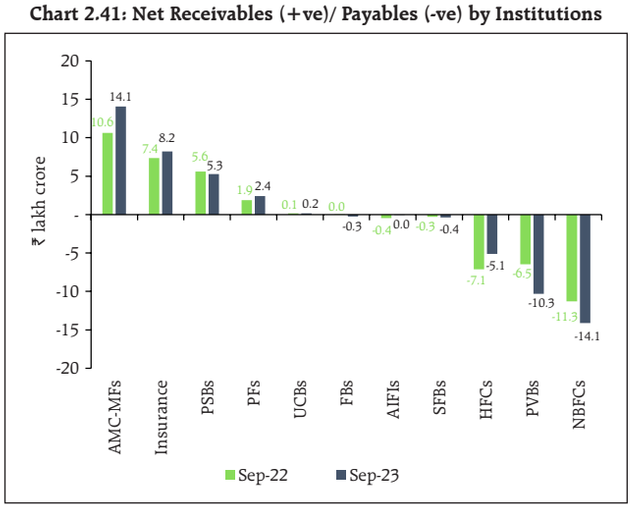
Note: Receivables and payable do not include transactions among entities of the same group. Red circles are net payable institutions and the blue ones are net receivable institutions.
Sources: RBI supervisory returns and staff calculations.

deposits, CPs and CDs play a significant role. In the CP market, AIFIs, NBFCs and HFCs are the largest receivers of fund and AMC-MFs are the largest investor group, whereas PSBs, PVBs and AIFIs are the major fund receivers in the CD market, with AMC-MFs being the largest fund provider (Chart 2.39).

2.73 In terms of inter-sectoral exposures[45], 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).

2.74 Movements in the net receivables/ payables position from September 2022 to September 2023 indicate that the declining share of PSBs in providing funds to borrowing institutions in the system (primarily NBFCs, PVBs and HFCs) is being taken up by AMC-MFs and insurance companies. Net payables of PVBs and NBFCs continued to rise while those of HFCs reduced due to the HFC-PVB merger mentioned earlier (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.
Sources: RBI supervisory returns and staff calculations.

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

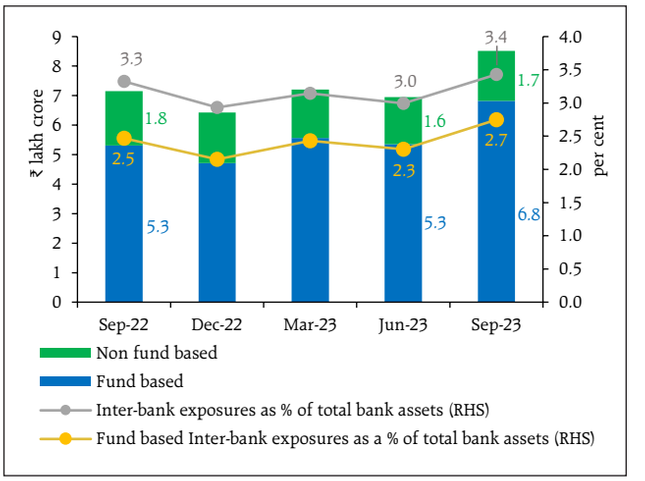
a. Inter-Bank Market

2.75 Inter-bank exposures increased to 3.4 per cent of the total assets of the banking system in September 2023 – the highest level since June 2020 – mainly on account of the merger. The increase was due to fund-based exposure[46] while non-fund-based exposures[47] remained almost unchanged (Chart 2.42).

2.76 PSBs continued to dominate the inter-bank market, (similar to their share in total bank assets), followed by PVBs (lower than their share of 38.5 per cent in total bank assets) and FBs (higher than their share in total bank assets of 6.5 per cent). The rise in borrowing and lending by PVBs (partly due to the merger) led to increase in the share of PVBs during Q2:2023-24 (Chart 2.43).

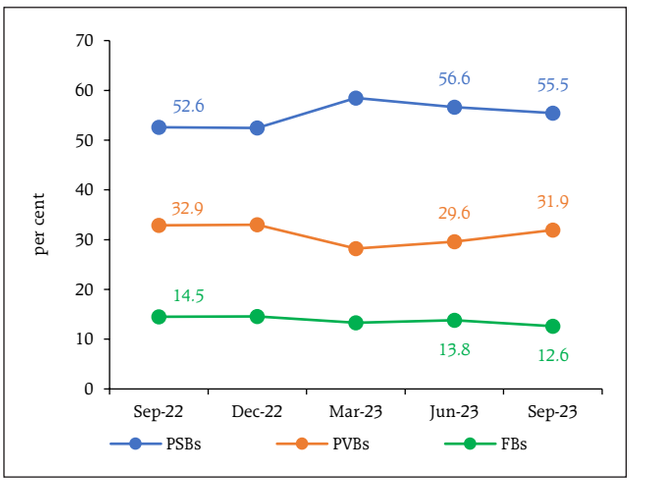
2.77 Unlike in the overall financial network in which LT fund-based exposure forms a major part, ST funding plays a critical role in the inter-bank market. As at end-September 2023, 71 per cent of the fund-based inter-bank market was short-term in nature in which ST deposits and ST loans constituted about 70 per cent, followed by CDs and call money market exposure. As deposit growth lagged credit growth, banks' recourse to CDs raised their share in the inter-bank market. The share of long-term funding in the fund-based inter-bank market increased over the last one year. Although LT loans predominated in LT fund-based inter-bank exposures, their share reduced as banks have shored up funds through LT

Chart 2.42: Inter-Bank Market



Sources: RBI supervisory returns and staff calculations.

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

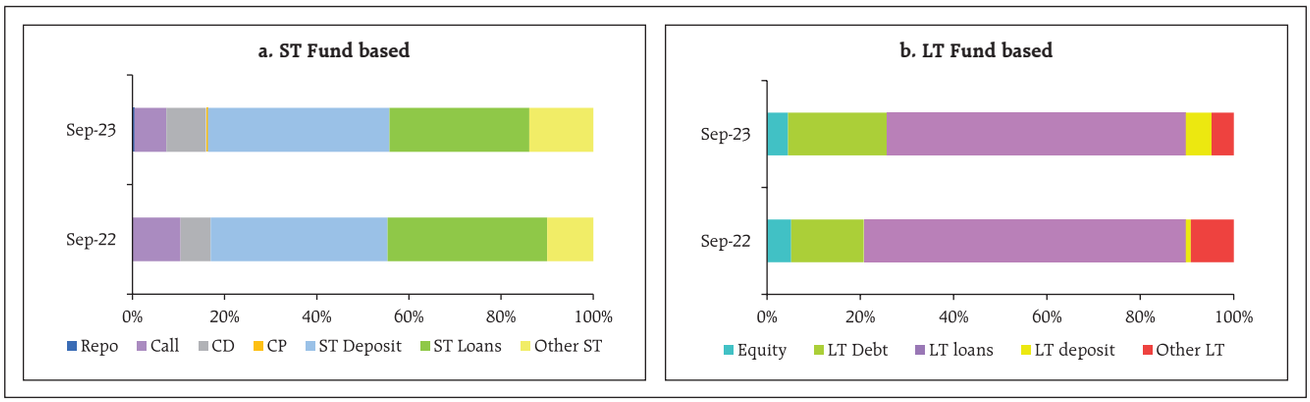


Sources: RBI supervisory returns and staff calculations.

[46] Fund-based exposures include 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.

[47] 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).

Chart 2.44: Composition of Fund based Inter-Bank Market



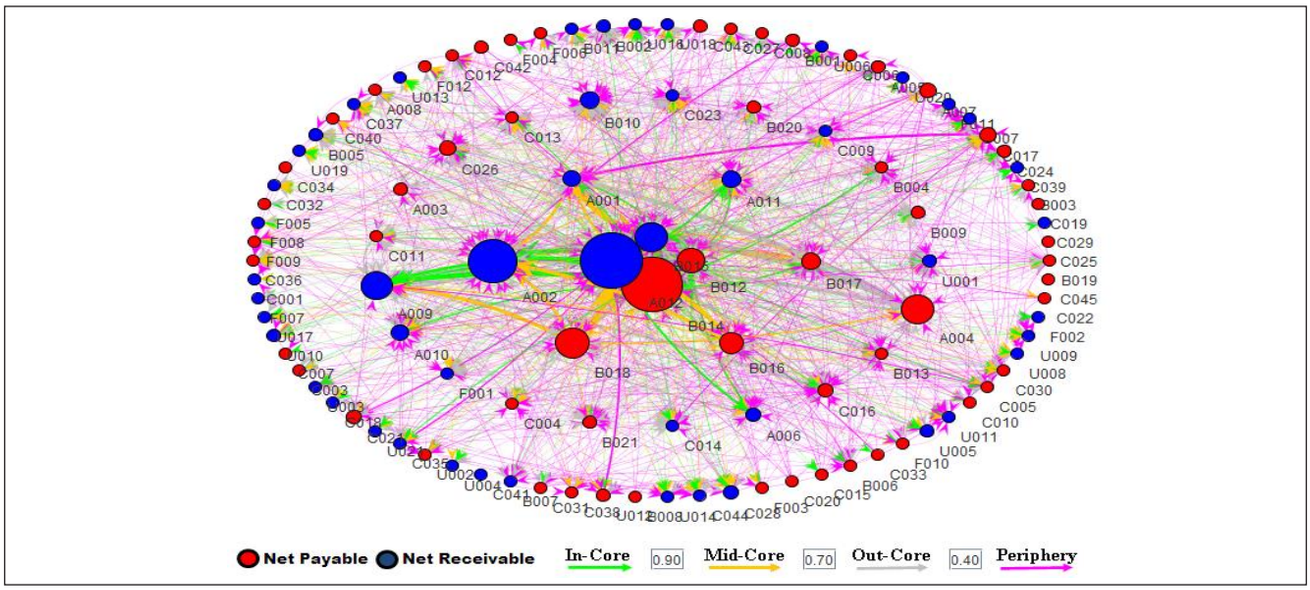
Sources: RBI supervisory returns and staff calculations.

deposits and LT debt during the period (Chart 2.44).

b. Inter-Bank Market: Network Structure and Connectivity

2.78 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 resulted into a typical core-periphery network structure[48] [49]. As of end-September 2023, four banks were in the inner-most core and six banks in the mid-core circle. The four banks in the inner-most core included one large PSB and three 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) – September 2023



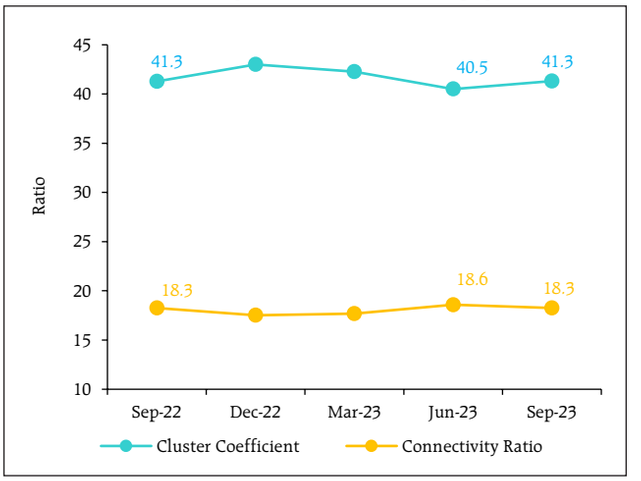
Source: RBI supervisory returns and staff calculations.

[48] 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.

[49] 77 SCBs, 12 SFBs and 20 SUCBs were considered for this analysis.

2.79 The degree of interconnectedness among SCBs, measured by the connectivity ratio[50], increased partly due to the number of banks coming down during H1:2023-24 as one foreign bank went out of the sample due to closure, but the cluster coefficient[51] declined marginally (Chart 2.46).

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



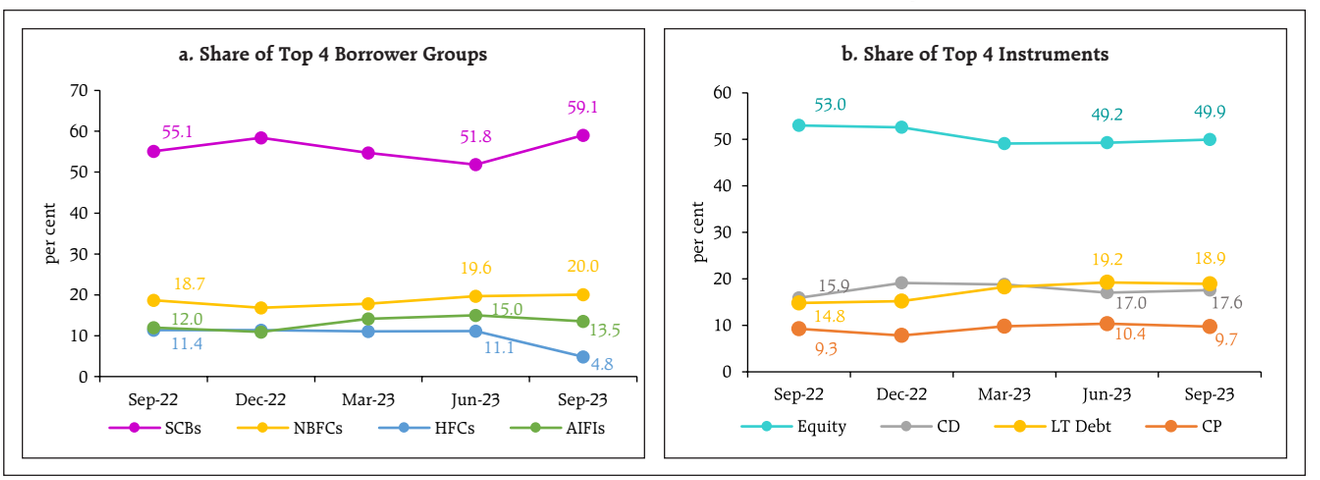
Sources: RBI supervisory returns and staff calculations.

c. Exposure of AMCs-MFs

2.80 Gross receivables of AMC-MFs stood at ₹14.84 lakh crore (around 33 per cent of their average AUM) whereas their gross payables were ₹0.76 lakh crore as at end-September 2023. SCBs (primarily PVBs) remained the major recipients of their funding, followed by NBFCs, AIFIs and HFCs (Chart 2.47 a).

2.81 The share of equity holdings in total assets of AMC-MFs, which had moderated in March 2023, rose in September 2023. Equity continued to maintain a dominant position, while the share of LT debt increased over the last year (Chart 2.47 b).

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



Sources: RBI supervisory returns and staff calculations.

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

[51] 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.

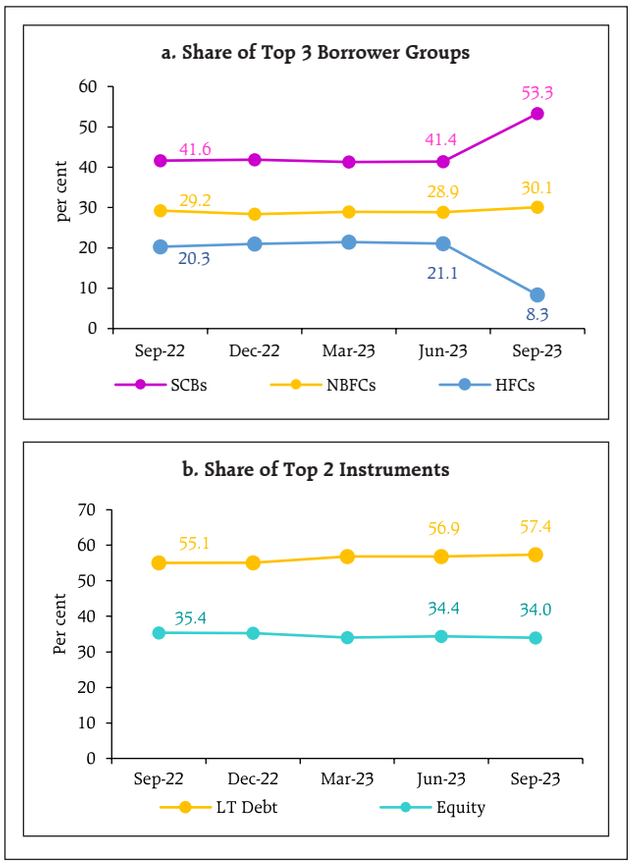
d. Exposure of Insurance Companies

2.82 With gross receivables at ₹8.81 lakh crore and gross payables at ₹0.58 lakh crore, insurance companies were the second largest net providers of funds to the financial system as at end-September 2023. SCBs (primarily PVBs) were the largest recipients of their funds, followed by NBFCs and HFCs. LT debt and equity accounted for 91 per cent of receivables of insurance companies with limited exposure to ST instruments (Charts 2.48 a and b). While the share of LT debt has been increasing gradually, the share of equity has been falling.

e. Exposure to NBFCs

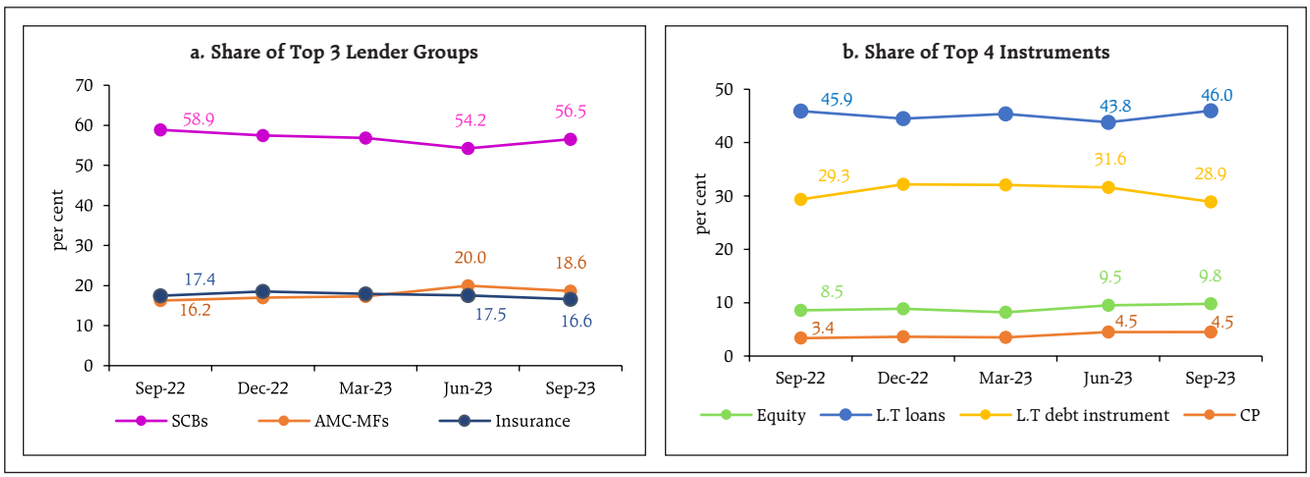
2.83 NBFCs were the largest net borrowers of funds from the financial system, with gross payables of ₹15.97 lakh crore and gross receivables of ₹1.87 lakh crore as at end-September 2023. A breakup of their gross payables reveals that the bulk of funds were sourced from SCBs, followed by AMC-MFs and insurance companies. The declining share of SCBs' in total payables of NBFCs was arrested, whereas the shares of borrowings from AMC-MFs and insurance companies reduced during Q2:2023-24 (Chart 2.49 a).

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



Sources: RBI supervisory returns and staff calculations.

Chart 2.49: Gross Payables of NBFCs to the Financial System



Sources: RBI supervisory returns and staff calculations.

2.84 The choice of instruments in the funding mix of NBFCs shows reliance on LT funds. The share of LT loans (borrowed from SCBs and AIFIs) increased while that of LT debt instruments (held by insurance companies and AMC-MFs) continued to moderate. AMC-MFs were the main investors in the equity capital of NBFCs, with an increased share in H1:2023-24 (Chart 2.49 b).

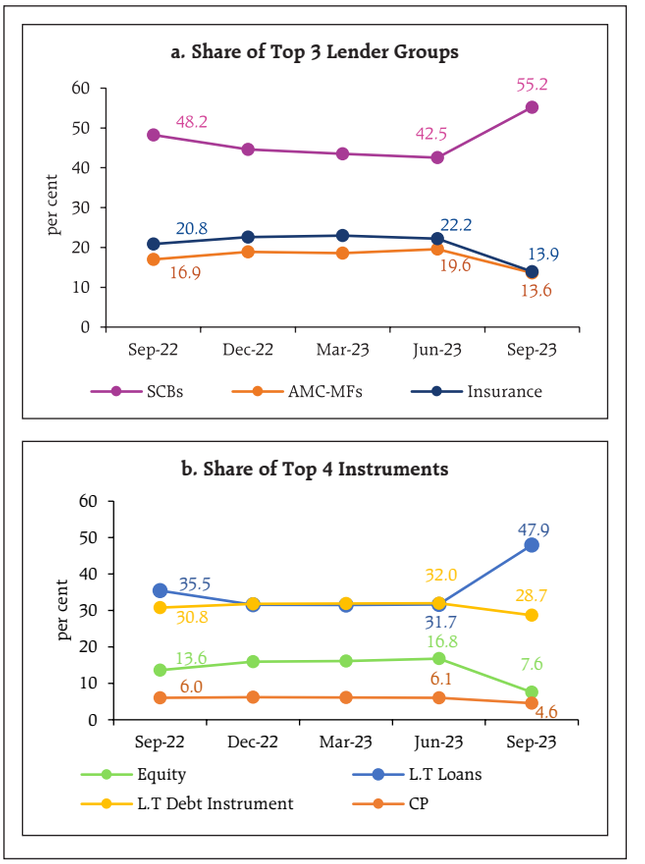
f. Exposure to HFCs

2.85 HFCs remained net borrowers and had gross payables of ₹5.28 lakh crore against gross receivables of ₹0.15 lakh crore in September 2023. The large variation in exposure of HFCs in Q2:2023-24 reflected the impact of the merger with a PVB (Chart 2.50 a). Over 75 per cent of HFCs' resource mobilisation was through LT loans and LT debt instruments (Chart 2.50 b).

g. Exposure of AIFIs

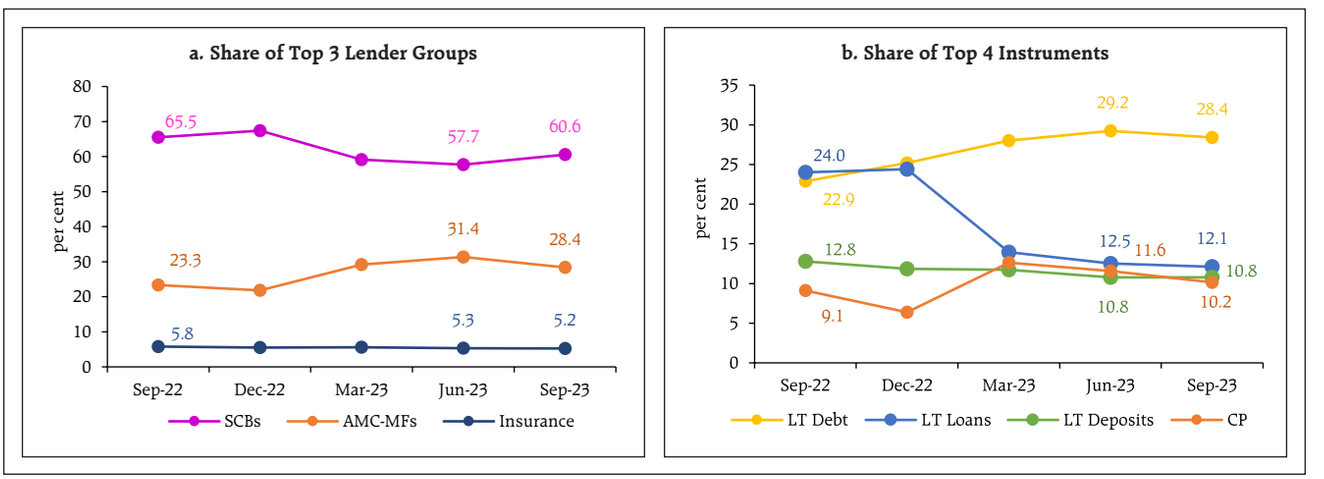
2.86 With gross payables and receivables at ₹7.08 lakh crore and ₹7.05 lakh crore, respectively, AIFIs were net receiver of funds from the financial system in September 2023 at the margin. They raised funds mainly from SCBs (primarily PVBs), AMC-MFs and insurance companies (Chart 2.51 a). Given their nature of operations, LT Loans, LT debt and LT

Chart 2.50: Gross Payables of HFCs to the Financial System



Sources: RBI supervisory returns and staff calculations.

Chart 2.51: Gross Payables of AIFIs to the Financial System



Sources: RBI supervisory returns and staff calculations.

deposits remained their preferred instruments for resource mobilisation, though the combined share of these instruments came down to 51.3 per cent from 59.7 per cent a year ago. AIFIs' recourse to CPs in raising funds has waned after a surge during Q4:2022-23 (Chart 2.51 b).

II.7.2 Contagion Analysis

2.87 Contagion analysis uses network technology to estimate the systemic importance of different financial institutions. The failure of a systemically important bank entails greater 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[52]- Liquidity[53] Contagion Impact on SCBs due to Bank Failure

2.88 A contagion analysis of the banking network on the end-September 2023 position indicates that if the bank with the maximum capacity to cause contagion losses fails, it will cause a solvency loss of 3.63 per cent (as compared to 2.22 per cent in March 2023) of total Tier 1 capital of SCBs and liquidity loss of 0.33 per cent (as compared with 0.25 per cent in March 2023) of total high quality liquid assets (HQLAs) of the banking system. Contagion risk increased in September 2023 *vis-à-vis* March 2023 due to the expansion in inter-bank market following the merger of a large HFC with a bank (Table 2.16) but it would not lead to failure of any additional bank.

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

2.89 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.

2.90 By end-September 2023, hypothetical failure of the NBFC with the maximum capacity to cause solvency losses to the banking system would have knocked off 2.72 per cent (2.51 per cent in March 2023) of the latter's total Tier 1 capital but it would not lead to failure of any bank. Similarly, failure of the HFC with the maximum capacity to cause solvency losses to the banking system would have knocked off 4.34 per cent (4.42 per cent in March

Table 2.16: Contagion Losses due to Bank Failure – September 2023

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 Bank Defaulting due to Solvency	Number of Bank Defaulting due to Liquidity
Bank 1	3.63	0.33	0	0
Bank 2	2.19	0.18	0	0
Bank 3	2.04	0.09	0	0
Bank 4	1.47	0.34	0	0
Bank 5	1.42	0.04	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.

[52] 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.

[53] 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 2.17: Contagion Losses due to NBFC Failure – September 2023

Name	Solvency Losses as per cent of Tier 1 Capital of the Banking System	Number of Banks Defaulting due to Solvency
NBFC 1	2.72	0
NBFC 2	2.48	0
NBFC 3	2.30	0
NBFC 4	1.60	0
NBFC 5	1.57	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.
Sources: RBI supervisory returns and staff calculations.

Table 2.18: Contagion Losses due to HFC Failure – September 2023

Name	Solvency Losses as per cent of Tier 1 Capital of the Banking System	Number of Banks Defaulting due to Solvency
HFC 1	4.34	0
HFC 2	1.51	0
HFC 3	1.29	0
HFC 4	1.24	0
HFC 5	0.77	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.

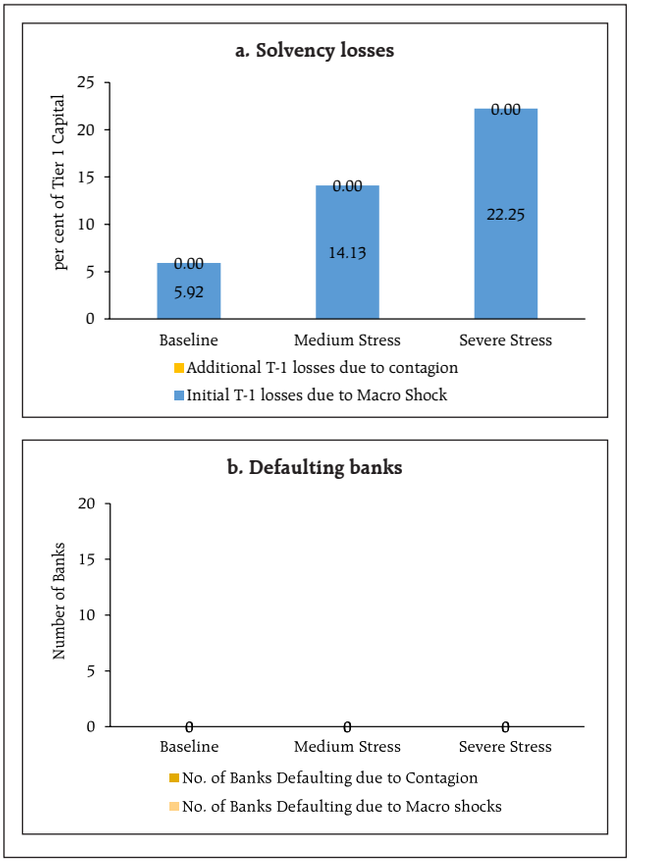
2023) of the latter's total Tier 1 capital but without failure of any bank (Tables 2.17 and 2.18).

c. Solvency Contagion Impact[54] after Macroeconomic Shocks to SCBs

2.91 The contagion from failure of a bank is likely to get magnified if shocks result in banking system distress. In such a situation, similar shocks may cause some SCBs to fail the solvency criterion, which then act as a trigger for further solvency losses.

2.92 In the previous iteration, a shock was applied to the entity that could cause the maximum contagion causing solvency 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[55], the initial capital loss due to macroeconomic shocks stood at 5.92 per cent, 14.13 per cent and 22.25 per cent of Tier I capital for baseline, medium and severe stress scenarios, respectively. No bank fails to maintain the Tier I capital adequacy ratio of 7 per cent in any of the stress scenario. 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 a and b).

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



Sources: RBI supervisory returns and staff calculations.

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

[55] 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 September 2024 with respect to the actual value in September 2023) were applied to the September 2023 capital position assuming proportionally similar balance sheet structures for both September 2023 and September 2024

(b) Bilateral exposures between financial entities are assumed to be similar for September 2023 and September 2024.

Summary and Outlook

2.93 Strong balance sheets, improved profits and stable financial conditions have enabled banking and NBFC sectors to engage in efficient financial intermediation in consonance with productive credit needs of the economy in H1:2023-24. The asset quality indicators of SCBs, UCBs and NBFCs continued to improve. Capital ratios remain robust for all three segments.

2.94 Macro stress tests show that SCBs are well-capitalised and capable of absorbing macroeconomic shocks under the severe stress scenario. An extreme scenario of a 250 bps upward movement in the yield curve may bring down the CRAR of a few banks below the regulatory minimum level. Although NBFCs have increased their reliance on banks for funding, the majority of such borrowing is secured in nature. Furthermore, most of the borrower NBFCs have high credit rating and are large in size.

2.95 The total outstanding bilateral exposures among the entities in the Indian financial system continued to expand, and the share of inter-bank exposures in the total assets of banking system reached a 3-year peak in September 2023. Though contagion risk and consequent additional solvency losses to the banking system have increased marginally, it would not lead to failure of any bank.

2.96 The Indian financial system is confronted with heightened global uncertainty and spillovers. Hence, close and continuous monitoring is warranted to detect any undue risk build up in the system. This has to be supported by prudent management of exposures and building of financial buffers.

Chapter III

Regulatory Initiatives in the Financial Sector

Global regulatory efforts continued to focus on risks to financial stability associated with non-bank financial intermediation, crypto-assets and decentralised finance (DeFi), climate change, cyber risk and emerging technologies. Domestic regulatory measures were aimed at improving the resilience of financial intermediaries, easing compliance, reducing regulatory arbitrage, expanding secure digitalisation, development of derivative markets, ensuring customer protection and expanding access to finance while mitigating systemic risk. The Financial Stability and Development Council (FSDC) and its Sub-Committee remain committed to preserving the stability of the Indian financial system.

Introduction

3.1 Stress in banking systems in some jurisdictions during early 2023 subsided with forceful resolutions but a sizable tail of banks remains vulnerable to valuation loss in investment portfolios. As the global economy reconfigures after multiple shocks, regulators are refocusing on buttressing financial system resilience. Global regulatory initiatives specifically aim to address fragilities in non-bank financial intermediaries and certain segments of financial markets, leveraged lending, cyber risks, crypto-assets and DeFi. Several efforts are being made to integrate climate risk into existing regulatory and supervisory frameworks.

3.2 Against this backdrop, this chapter reviews recent regulatory efforts, international and domestic, to strengthen financial system stability and resilience.

III.1 Global Regulatory Developments and Assessment

III.1.1 Crypto-assets and Financial Stability

3.3 The focus of the G20 discussions on regulation of crypto-assets so far was on the potential risks associated with crypto-assets and limited to addressing concerns related to financial stability and integrity. The Indian G20 Presidency, however, laid the groundwork for formulating a globally consistent and coordinated policy and regulatory framework for crypto-assets. At the request of India under its G20 Presidency, the IMF and the Financial Stability Board (FSB) prepared a synthesis paper on crypto-assets[1], which combines policy recommendations of the IMF and the FSB {alongside SSBs (Standard Setting Bodies)}. Risks to financial stability emanating from cryptocurrencies are recognised in the synthesis paper in that the widespread adoption of crypto-assets could undermine the effectiveness of monetary policy, circumvent capital flow management measures, exacerbate fiscal risks, divert resources available for financing the real economy, and threaten global financial stability. It provides guidance for authorities to address macroeconomic and financial stability risks posed by crypto-asset activities and markets, including those associated with stablecoins and DeFi.

3.4 The paper suggests that regulation and supervision of licensed crypto-asset issuers and service providers can support the functioning of capital flow measures, tax policies with respect to crypto-assets, and financial integrity requirements.

[1] Financial Stability Board (2023), 'IMF-FSB Synthesis Paper: Policies for Crypto-Assets', September.

Regulation and appropriate reporting requirements can reduce data gaps, which are particularly important for capital flow measures that rely on monitoring of cross-border transactions and capital flows. Furthermore, it recommends that jurisdictions should implement the Financial Action Task Force (FATF) anti-money laundering and counter-terrorist financing (AML/ CFT) standards that apply to virtual assets and virtual asset service providers.

3.5 In July 2023, the FSB came out with a global regulatory framework for crypto-asset activities[2], based on the principle of 'same activity, same risk, same regulation'. It consists of: (i) high-level recommendations for the regulation, supervision and oversight of crypto-asset activities and markets; and (ii) revised high-level recommendations for the regulation, supervision, and oversight of global stablecoin arrangements (GSC). The recommendations establish a global regulatory baseline, but some jurisdictions (especially EMDEs) may also decide to take more restrictive regulatory measures. The aim is to promote a regulatory, supervisory and oversight framework that is technology-neutral and focuses on underlying activities and risks while fostering safe innovation. A broad approach to GSCs is envisaged that is intended to be flexible so that they can be incorporated into wider regulatory frameworks potentially applicable to GSCs around the world.

3.6 The Basel Committee on Banking Supervision (BCBS) published a consultation paper on disclosure of banks' crypto-asset exposures[3] with a proposed implementation date of January 1, 2025. Banks would be required to disclose qualitative information on their activities related to crypto-assets and quantitative information on exposures to crypto-assets with related capital and liquidity requirements according to their prudential and liquidity risk classification. Banks would also be required to provide details of accounting classifications relating to their exposures to crypto-assets. It is expected that a common format for disclosures will support the exercise of market discipline and help reduce information asymmetry between banks and market participants. The Basel Committee on Banking Supervision has also issued a public consultation document[4] on proposed amendments to its standards on banks' exposures to crypto-assets. The proposed changes elaborate the criteria on the composition of the reserve assets that back stablecoins and put in place a due diligence requirement to ensure that banks have an adequate understanding of their stabilisation mechanisms.

3.7 The International Organisation of Securities Commissions (IOSCO), the global standard setter for the securities markets, finalised its policy recommendations for crypto and digital asset markets[5]. The recommendations set a clear and robust international regulatory baseline to ensure that crypto-asset service providers (CASPs) meet the standards of business conduct that apply in traditional financial markets. They are aimed at addressing concerns related to market integrity and investor protection arising from crypto-asset activities. The recommendations are principle and activity based, and follow a 'lifecycle' approach in addressing the key issues and risks in crypto-asset markets. The recommendations cover six key areas: conflict of interest arising from vertical integration of activities and functions; market manipulation,

[2] Financial Stability Board (2023), 'FSB Global Regulatory Framework for Crypto-Asset Activities', July.

[3] Basel Committee on Banking Supervision (2023), 'Disclosure of Crypto-asset Exposures - Consultative Document', October.

[4] Basel Committee on Banking Supervision (2023), 'Crypto-asset Standard Amendments - Consultative Document', December.

[5] International Organization of Securities Commissions (2023), 'Policy Recommendations for Crypto and Digital Asset Markets – Final Report', November.

insider trading and fraud; custody and client asset protection; cross-border risks and regulatory cooperation; operational and technological risk; and retail distribution.

3.8 The IOSCO has also finalised its policy recommendations for Decentralised Finance (DeFi)[6] which aims to address market integrity and investor protection concerns arising from DeFi by supporting greater consistency of regulatory frameworks and oversight in member jurisdictions. They are complementary and interoperable to the policy recommendations for crypto and digital assets markets[7]. The recommendations are principle-based and outcome-focused, and aimed at DeFi products, services, activities, and arrangements that self-identify as decentralised, by applying IOSCO's widely accepted global standards for securities markets regulation. The report emphasises the need for enhanced cooperation among regulators to coordinate and respond to cross-border challenges in enforcement and supervision, and to address regulatory arbitrage concerns arising from the cross-border nature of global crypto-asset activities conducted by DeFi participants. The recommendations cover six key areas: understanding DeFi arrangements and structures; achieving common standards of regulatory outcomes; identification and management of key risks; clear, accurate and comprehensive disclosures; enforcement of applicable laws, and cross-border cooperation.

3.9 The BIS report[8] on the crypto ecosystem highlights congestion, fragmentation due to high fees, de-facto centralisation and the potential to amplify risks, as structural flaws in the crypto ecosystem. The report concludes that crypto has so far failed to harness innovation to the benefit of society, and several inherent limitations related to stability, efficiency, accountability, and integrity make it unsuitable to play a significant role in the monetary system.

3.10 The Financial Action Task Force (FATF), in June 2023, published its fourth targeted review of implementation of the FATF's Standards on virtual assets (VAs) and virtual asset service providers (VASPs), including the Travel Rule, and updates on emerging risks and market developments in this area. The report[9] notes that jurisdictions continue to struggle with fundamental requirements, such as, undertaking a risk assessment, enacting legislation to regulate VASPs, and conducting a supervisory inspection. Based on the FATF mutual evaluation and follow-up reports since the revised Recommendation 15 and its Interpretative Note (R.15/INR.15) were adopted, 75 per cent of jurisdictions are only partially or not compliant with the FATF's requirements. In addition, jurisdictions have made insufficient progress on implementing the Travel Rule, which is a key AML/CFT measure. This is a concern as the risks posed by VAs and VASPs continue to increase, necessitating appropriate risk identification and mitigation measures, and rapid implementation of FATF's standards on VAs and VASPs by all countries.

III.1.2 Markets and Financial Stability

3.11 Given the importance of central counterparties (CCPs) in financial systems for managing counter-party risk, especially since the introduction of clearing obligations for standardised over-the-counter (OTC) derivatives following the

[6] International Organization of Securities Commissions (2023), 'Policy Recommendations for Decentralised Finance (DeFi) – Final Report', December.

[7] International Organization of Securities Commissions (2023), 'Policy Recommendations for Crypto and Digital Asset Markets – Consultation Report', May.

[8] Bank for International Settlements (2023), 'The crypto ecosystem key elements and risks', July.

[9] Financial Action Task Force (2023), 'Virtual Assets: Targeted Update on Implementation of the FATF Standards on Virtual Assets and Virtual Asset Service Providers', June 27.

global financial crisis (GFC), their financial resilience in the face of losses and liquidity shortfalls has become important for financial stability. While the potential for losses arising from clearing member defaults is widely understood and recognised, there is limited common understanding of how CCPs should manage and address non-default losses (NDLs) that can even threaten a CCP's viability and its ability to continue providing services to the participants and the markets it serves. This is also enshrined in the Principles for Financial Market Infrastructures (PFMI). The Committee on Payments and Market Infrastructure (CPMI) of the Bank for International Settlements (BIS) and the IOSCO published a report[10] on current CCP practices highlighting the need for CCPs to have adequate resources and appropriate tools to address NDLs arising, for example, from investment risk or cyberattacks.

3.12 The leveraged loan market has evolved over time, shifting from traditional industrial sectors towards technology and healthcare. On average, the credit quality of corporate borrowers has deteriorated. Meanwhile, the investor base has moved from banks to non-banks especially collateralised loan obligations (CLOs)[11]. These changes, combined with a prolonged borrower-friendly environment, have led to rise in covenant-lite leveraged loans, increasing complexity of leveraged loan documentation and the use of earnings before interest, taxes, depreciation and amortisation (EBITDA) adjustments, which are often overly optimistic. Against this backdrop, the IOSCO published two reports calling for an improvement in practices in the leveraged loan market and highlighting lack of transparency in private finance with the objectives of protecting investors, ensuring that markets are fair and efficient, and reducing systemic risk. It identified vulnerabilities such as in the leveraged loan and CLO markets which may be exacerbated by the behaviour of certain participants and market practices.

3.13 The European Systemic Risk Board (ESRB) published a note describing the European Union (EU) regulatory framework for investment funds[12] and the prevention and mitigation of systemic risks related mainly to investment funds with large exposures to corporate debt and real estate. The policy options could apply to other fund types with vulnerabilities similar to those present in corporate debt funds and real estate funds. The note concluded that the resilience of investment funds with large exposures to corporate debt and real estate could be improved by adapting some of the policy tools already present in the regulatory framework. They include closer alignment between fund redemption terms and investment strategies, the use of anti-dilution liquidity management tools, and better preparedness for cash needs stemming from margins and/ or collateral calls in derivative and repo transactions.

III.1.3 Banking Supervision and Financial Stability

3.14 The BCBS issued a consultative document on revisions to the Core Principles for Effective Banking Supervision[13]. The review has incorporated several thematic topics reflecting developments in: (i) financial risks; (ii) operational resilience; (iii) systemic risk and macroprudential aspects of supervision; (iv) new risks, including climate-related financial risks and the digitalisation of finance; (v) non-bank financial intermediation; and (vi) risk management practices.

[10] Bank for International Settlements (2023), 'Report on Current Central Counterparty Practices to Address Non-default Losses' August.

[11] International Organisation of Securities Commissions (2023), 'Leveraged Loans and CLOs Good Practices for Consideration - Consultation Report', September.

[12] European Systemic Risk Board (2023), 'Issues Note on Policy Options to Address Risks in Corporate Debt and Real Estate Investment Funds from a Financial Stability Perspective, September.

[13] Basel Committee on Banking Supervision (2023), 'Consultative Document on Core Principles for Effective Banking Supervision', July.

3.15 The BIS-CPMI published a consultative report[14] issued as part of the G20 cross-border payments programme on linking fast payment systems across borders. It describes initial considerations (a) on governance and oversight for fast payment system (FPS) interlinking across borders and (b) to understand sensitivities, complexities and experiences in this area.

III.1.4 Artificial Intelligence and Financial Stability

3.16 Artificial Intelligence (AI) is rapidly changing how financial institutions are operated and regulated. While AI could bring considerable economic benefits, it also poses specific threats to financial stability. Taking these considerations into account, some jurisdictions such as the European Union, Canada and China are in the process of bringing out legislations on the development and use of AI.

3.17 The Artificial Intelligence Act passed by the European Union in December 2023 focuses on (a) ensuring that AI systems follow existing laws; (b) prescribing transparency requirements for large language model generative AI systems with stronger requirements for advanced models with systemic impact; (c) providing legal certainty to facilitate investment and innovations in AI; (d) safeguarding the use of AI and banning its exploitation of vulnerable sections of society; (e) emphasising the need for human oversight; and (f) enhancing governance on utilisation of AI systems and associated risks. It also aims to address ethical questions and implementation challenges in various sectors ranging from healthcare and education to finance and energy.

III.1.5 Cyber Risk and Financial Stability

3.18 Enhancing third-party cyber risk management has been an integral part of the work programme of the G7 Cyber Expert Group and the FSB. The use of third parties generally introduces additional risks which, if not properly managed, can lead to disruption in critical services of service providers. In response to concerns over risks related to outsourcing and third-party service relationships, the FSB has developed a toolkit[15] for third-party risk management and oversight that aims to reduce fragmentation in regulatory and supervisory approaches across jurisdictions and different areas of the financial services sector. The toolkit aims to strengthen the ability to manage third-party risks and facilitate coordination among relevant stakeholders.

3.19 In view of the rising instances of digital frauds, the BCBS has issued a discussion paper[16] regarding definitional issues, supervisory and financial stability implications for the global banking system (including existing data availability) and measures to mitigate such risks.

III.1.6 Climate Related Risks and Financial Stability

3.20 The International Sustainability Standards Board (ISSB) issued its inaugural standards — International Financial Reporting Standards (IFRS) S1 and IFRS S2 — on sustainability-related disclosures in capital markets worldwide[17] intended to improve trust and confidence in company disclosures. The Standards create a common language for disclosing the effects of climate-related risks and opportunities on a company's prospects. IFRS S1 provides a set of

[14] Committee on Payments and Market Infrastructures (2023), 'Linking Fast Payment Systems across Borders: Considerations for Governance and Oversight', October.

[15] Financial Stability Board (2023), 'Enhancing Third-Party Risk Management and Oversight - A toolkit for financial institutions and financial authorities - Consultative document', June.

[16] Basel Committee on Banking Supervision (2023), 'Discussion Paper on Digital fraud and Banking: Supervisory and Financial Stability Implications', November.

[17] https://www.ifrs.org/news-and-events/news/2023/06/issb-issues-ifrs-s1-ifrs-s2/ accessed on November 21, 2023.

disclosure requirements regarding sustainability-related risks and opportunities. IFRS S2 sets out specific climate-related disclosures and is designed to be used with IFRS S1. Both fully incorporate the recommendations of the Task Force on Climate-related Financial Disclosures.

III.2 Domestic Regulatory Developments

3.21 Since the release of the previous issue of the FSR, the Sub Committee of the Financial Stability and Development Council (FSDC-SC) chaired by the Governor, Reserve Bank of India met once on August 28, 2023. The Sub-Committee reviewed major global and domestic macroeconomic and financial developments, issues of inter-regulatory coordination relating to the Indian financial sector, activities of various technical groups under its purview, and the functioning of State Level Coordination Committees (SLCCs) in various States/ UTs.

3.22 The FSDC-SC resolved to remain vigilant against any build-up of vulnerabilities in all segments of the Indian financial system as well as in the broader economy, especially from global spillovers, and to preserve financial system stability for attaining strong, sustainable and inclusive growth.

III.3 Initiatives from Regulators/ Authorities

3.23 During the period under review, regulators in India undertook several initiatives to improve the robustness and resilience of the domestic financial system (Annex 3).

III.3.1 Regulatory Measures towards Consumer Credit and Bank Credit to NBFCs

3.24 Bank credit offtake in the retail segment, especially in the form of unsecured loans, registered strong and sustained growth. In view of concerns regarding exuberance and the potential build-up of stress in this segment, the Reserve Bank raised the risk weights on consumer credit exposure of commercial banks and NBFCs, and also on bank credit to NBFCs. The risk weights have been increased to 125 per cent from 100 per cent for consumer credit exposure (outstanding as well as new) of commercial banks and NBFCs, including personal loans, but excluding housing loans, education loans, vehicle loans, and loans secured by gold and gold jewellery. Additionally, microfinance/ SHG loans provided by NBFCs have also been excluded. The risk weights on credit card receivables of SCBs and NBFCs were also increased by 25 percentage points to 125 and 150 per cent, respectively.

3.25 The risk weight on exposure of SCBs to NBFCs, excluding loans to HFCs and loans to NBFCs which are eligible for classification as priority sector, were also increased by 25 percentage points (over and above the risk weight associated with the given external rating) in all cases where the extant risk weight as per external rating of NBFCs is below 100 per cent. Furthermore, regulated entities (REs) have been asked to review their extant sectoral exposure limits for consumer credit and put in place Board-approved limits in respect of various sub-segments under consumer credit.

III.3.2 Investments in Alternative Investment Funds (AIFs)

3.26 To address concerns relating to possible evergreening by regulated entities (REs) through AIFs by substitution of their direct loan exposure to borrowers with indirect exposure through investments in units of AIFs, the Reserve Bank issued guidelines on investments by REs in AIFs. Under these guidelines, REs have been advised not to make investments in any scheme of AIFs which has downstream investments either directly or indirectly in a debtor company of the RE[18].

[18] The debtor company of the RE, for this purpose, shall mean any company to which the RE currently has or previously had a loan or investment exposure anytime during the preceding 12 months.

3.27 It is further advised that if an AIF scheme, in which RE is already an investor, makes a downstream investment in any such debtor company, then the RE shall liquidate its investment in the scheme within 30 days from the date of such downstream investment by the AIF. In case REs are not able to liquidate their investments within the above-prescribed time limit, they shall make 100 per cent provision on such investments. In addition, investment by REs in the subordinated units of any AIF scheme with a 'priority distribution model'[19] shall be subject to full deduction from RE's capital funds.

III.3.3 Master Direction on Classification, Valuation and Operation of Investment Portfolio of Commercial Banks

3.28 The Reserve Bank issued Master Direction on classification, valuation and operation of the investment portfolios of commercial banks in view of significant developments in global standards on classification, measurement and valuation of investments, the linkages with the capital adequacy framework as well as progress in the development and functioning of the domestic financial markets. The directions require REs to classify investments into held to maturity (HTM), available for sale (AFS) and fair value through profit and loss (FVTPL) categories. Securities that do not qualify for inclusion in HTM or AFS categories shall be classified under the FVTPL category, while those held for trading (HFT) would be in a sub-category under FVTPL.

3.29 These principle-based norms for classification and reclassification of the investment portfolio are expected to bring in transparency in accounting and financial reporting. Under the revised directions, the symmetric recognition of gains/ losses for the MTM investment portfolio is expected to facilitate the use of derivatives for hedging and strengthening risk management. The enhanced disclosure requirements would give the granular position of the investment portfolio (including its fair value). The revised directions also allow non-SLR bonds to be held under the HTM category, which may provide fillip to the corporate bond market and align the accounting norms for banks' investment portfolios with global financial reporting standards.

III.3.4 Master Direction on Prudential Regulations for All India Financial Institutions (AIFIs)

3.30 With AIFIs increasingly being seen as key institutions to promote the flow of credit to productive sectors of the economy, the Reserve Bank has decided to implement a revised regulatory framework (including Basel III Regulations) for them {*viz.*, the National Bank for Agriculture and Rural Development (NABARD); the Export Import Bank of India (EXIM Bank); the Small Industries Development Bank of India (SIDBI); the National Housing Bank (NHB); and National Bank for Financing Infrastructure and Development (NaBFID)} to strengthen applicable prudential regulations and make their risk management systems more robust.

3.31 The revised regulatory framework entails extending the Basel III capital regulations applicable to banks, to AIFIs, replacing the currently applicable Basel I standards. The applicability of Basel III to AIFIs will *inter alia:* (i) raise capital standards; (ii) enable better recognition of credit risk, based on external ratings; (iii) allow the broad-based capturing of market risk instead of the simplified approach followed currently, and the recognition of operational risks; (iv) facilitate more efficient capturing of off-balance sheet exposures, under the leverage ratio framework; and (v) bring about the applicability of the large exposure framework (LEF) as in case of banks, thus setting prudential limits thereon. It also consolidates and updates the exposure norms, significant investments, classification, valuation

[19] 'Priority distribution model' shall have the same meaning as specified in the SEBI circular SEBI/HO/AFD-1/PoD/P/CIR/2022/157 dated November 23, 2022.

and operation of investment portfolio norms and resource raising norms.

III.3.5 Master Direction on Minimum Capital Requirements for Operational Risk

3.32 As part of the convergence with the revised BCBS standards on operational risk, the Reserve Bank issued Master Direction on minimum capital requirements for operational risk that are applicable to all commercial banks (excluding local area banks, payments banks, regional rural banks, and small finance banks). The directions require commercial banks to hold sufficient regulatory capital against exposures arising from operational risk.

3.33 The directions introduce the Basel III Standardised Approach for measuring minimum operational risk capital (ORC) requirements. Accordingly, banks are required to consider (a) a financial statement-based Business Indicator Component (BIC), and (b) bank-specific, loss data-based Internal Loss Multiplier (ILM) (for larger banks) in the calculation of ORC.

III.3.6 Regulation of Payment Aggregator – Cross Border (PA - Cross Border)

3.34 Entities facilitating cross-border transactions were carrying out their activities as online payment gateway service providers (OPGSPs) through a tie-up with Authorised Dealer (AD) banks. As activities of OPGSPs are more aligned with those of payment aggregators (PAs) that fall under the purview of Payment and Settlement Systems Act, 2007, fresh guidelines governing these entities have been issued in terms of the provisions of the Act.

3.35 The erstwhile OPGSPs have been renamed as Payment Aggregators – Cross Border (PA–CB). The inclusion of the PA–CBs within the direct regulatory ambit of the Reserve Bank has brought about regulatory harmonisation between domestic PAs and erstwhile OPGSPs while also safeguarding merchant (exporter/ importer) interest by introducing governance, risk management, cyber-security and customer grievance redressal standards for these entities. Non-bank PA–CBs, existing or new, have to seek authorisation for carrying out their activities from the Reserve Bank. The introduction of these instructions is expected to help in the orderly development of the sector while increasing options available to Indian exporters to showcase their products/ services to the world.

III.3.7 Corporate Debt Market Development Fund (CDMDF) - the Backstop Facility for Mutual Funds

3.36 In the light of disruptions in the corporate bond market due to the impact of the COVID-19 pandemic, an announcement in the Union Budget 2021-22 was made with regard to creation of a backstop facility for the corporate bond market that would purchase investment grade debt securities, both in stressed and normal times, and help in the development of the bond market. Accordingly, Department of Economic Affairs, Ministry of Finance, Government of India notified the establishment of Guarantee Scheme for Corporate Debt (GSCD) for the purpose of providing guarantee cover against debt to be raised by CDMDF which will act as a backstop in the corporate debt market in times of market dislocation. The GSCD is envisaged to be managed by the Guarantee Fund for Corporate Debt (GFCD), a Trust Fund formed by DEA with a corpus of ₹310 crore. The GFCD will be managed by National Credit Guarantee Trustee Company Ltd. (NCGTC).

3.37 The CDMDF is notified as an Alternative Investment Fund (AIF) in the form of a Trust under SEBI (AIF) Regulations. The units of CDMDF shall be subscribed to by asset management companies (AMCs) of mutual funds (MFs) and specified debt-oriented MF Schemes. Contribution to the Fund is mandatory for these AMCs and specified debt-oriented schemes, which would contribute a corpus of 0.25 per cent and 0.02 per cent of their AUM (one time), respectively (and subsequently, every six months on incremental AUM). The Fund is eligible to avail credit, based on guarantee of 10 times of the corpus (subject to maximum of ₹30,000 crore), backed by the NCGTC.

3.38 Activation of the backstop facility would be declared by the SEBI, which would allow the CDMDF to borrow funds and buy corporate debt securities from specified debt-oriented mutual fund schemes. In this regard, the SEBI has developed Financial Stress Indices (FSIs) to identify signals of extreme stress in the Indian corporate bond market for the consequent triggering of CDMDF. The SEBI would consider triggers generated by FSIs, along with qualitative factors for declaration of market dislocation.

III.3.8 Limited Purpose Clearing Corporation to Develop Repo Market in Corporate Bonds

3.39 A well-functioning repo market in corporate bonds can provide a short-term avenue to borrow funds against the holdings of corporate bonds in times of crisis rather than be forced to liquidate holdings at distress prices. The repo market in corporate bonds would require a clearing corporation with a robust risk management framework, including a Settlement Guarantee Fund (SGF), to manage and mitigate credit and counterparty risk.

3.40 In 2020, the SEBI proposed to set up a Limited Purpose Clearing Corporation (LPCC) through an amendment to the Securities Contracts (Regulation) (Stock Exchanges and Clearing Corporations) Regulations, 2018. Following various regulatory measures including specification of contribution by issuers of debt securities to Core SGF and enabling direct participation by entities *viz.* body corporates, NBFCs, insurance companies, mutual funds in LPCC for transacting in triparty repo for corporate bonds, the AMC Repo Clearing Limited (ARCL) has been operationalised in July 2023 as a LPCC. Presently, 1924 securities rated AA and above are eligible for triparty repo. 162 trades amounting to ₹15,810 crore have been undertaken till December 13, 2023.

3.41 The acceptance of debt securities as eligible collateral under repo transactions will impart more liquidity in the debt securities of such issuers which will, in turn, help issuers raise funds at relatively low cost. As the repo market benefits the issuers of debt securities, they are expected to have skin in the game in the case of failure of the underlying issuer. Keeping this in mind, all corporate bond issuers are mandated to contribute to the SGF at 0.50 basis points of the issuance value of debt securities per annum, based on the maturity of debt securities, to be collected upfront.

III.3.9 Customer Protection

3.42 The number of complaints received by the Offices of the Reserve Bank of India Ombudsman (ORBIOs) for the previous two quarters indicates that complaints pertaining to loans and advances and digital complaints (*i.e.*, complaints pertaining to mobile/ electronic banking, credit card and ATM/ CDM/ debit card) continued to constitute over 60 per cent during Q1 and Q2 of 2023-24 (Table 3.1).

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

Sr. No.	Grounds of Complaint	RB-IOS (April-June 2023)		RB-IOS (July-Sept 2023)	
		Number	Share in per cent	Number	Share in per cent
1	Loans and Advances and Non-adherence to Fair Practices Code	16,607	24.03	17,732	23.55
2	Mobile/ Electronic Banking	12,604	18.23	12,588	16.72
3	Other Products and Services*	10,154	14.69	13,129	17.44
4	Credit Card	10,040	14.53	10,193	13.54
5	Opening/ Operation of Deposit accounts	9,081	13.14	9,371	12.45
6	ATM/ CDM/ Debit card	6,651	9.62	7,686	10.21
7	Others	1,342	1.94	1,959	2.60
8	Pension	1,084	1.57	928	1.23
9	Para-Banking	735	1.06	849	1.13
10	Remittance and Collection of instruments	822	1.19	845	1.12
Total		**69,120**	**100.00**	**75,280**	**100.00**

Note: * includes bank guarantee/ letter of credit, customer confidentiality, premises and staff, grievance redressal, death/ missing claims, among other things.
Source: RBI.

3.43 The total number of complaints received recorded around 9 per cent sequential (q-o-q) growth during Q2:2023-24.

III.3.10 Enforcement

3.44 During June 2023 – November 2023, the Reserve Bank undertook enforcement action against 146 REs (nine PSBs; six PVBs; one FB; one payments bank; one regional rural bank; 111 co-operative banks; 11 NBFCs; two HFCs and four credit information companies) and imposed an aggregate penalty of ₹57.07 crore for non-compliance with statutory provisions and/ or directions issued by the Reserve Bank.

III.4 Other Developments

III.4.1 Deposit Insurance

3.45 The Deposit Insurance and Credit Guarantee Corporation (DICGC) covers all banks operating in India and extends insurance to bank depositors with the objective of maintaining confidence in the banking system and promoting financial stability. As on September 30, 2023, the number of registered banks was 2,009, comprising 140 commercial banks (including 43 RRBs, two local area banks, six payments banks and 12 small finance banks) and 1,869 co-operative banks. The Deposit Insurance Fund (DIF) with the Corporation recorded a growth (y-o-y) of 17.5 per cent to reach ₹1,82,701 crore at end-September 2023.

3.46 With a deposit insurance limit of ₹5 lakh, 97.9 per cent of the total number of deposit accounts (287.1 crore) are fully protected. Of the total assessable deposits of ₹204.2 lakh crore, 44.2 per cent amounting to ₹90.3 lakh crore were insured as on September 30, 2023[20]. (Table 3.2).

Table-3.2. Coverage of Deposits

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

Sr. No.	Item	Quarter-ended			Percentage Variation	
		Sep-2022	Mar-2023	Sep-2023 (P)	H-o-H	Y-o-Y
	(1)	(2)	(3)	(4)	(5) = (4) over (3)	(6) = (4) over (2)
(A)	Number of Registered Banks	2,034	2,026	2,009	-	-
(B)	Total Number of Accounts	300.1	304.9	287.1	-5.8	-4.3
(C)	Number of Fully Protected Accounts	294.5	299.1	281.0	-6.1	-4.6
(D)	**Percentage coverage of accounts (C)/(B)**	**98.1**	**98.1**	**97.9**	-	-
(E)	Total Assessable Deposits	1,81,14,550	1,94,58,915	2,04,18,718	4.9	12.7
(F)	Insured Deposits	83,89,470	86,31,259	90,32,231	4.6	7.7
(G)	**Percentage coverage of amount (F)/(E)**	**46.3**	**44.4**	**44.2**	-	-

Note: P – Provisional.
Source: DICGC.

3.47 Due to the difference in average deposit size, the insured deposits ratio (*i.e.*, the ratio of insured deposits to assessable deposits) was higher for cooperative banks (63.9 per cent) than commercial banks (43.1 per cent) (Table 3.3).

3.48 Deposit insurance premium received by the DICGC grew by 10.6 per cent (y-o-y) to ₹11,628 crore during H1:2023-24, with 94.3 per cent contributed by commercial banks (Table 3.4).

3.49 The DIF with the DICGC is primarily built out of the premium paid by insured banks, recoveries from settled claims and investment incomes, net of income tax. DIF recorded an increase of 17.5 per cent (y-o-y) to reach ₹1.83 lakh crore in September 2023. The reserve ratio (*i.e.*, ratio of DIF to insured deposits) increased to 2.02 per cent from 1.85 per cent a year ago. (Table 3.5).

Table-3.3. Bank Group-wise Deposit Protection Coverage (As on September 30, 2023)

(₹ crore)

Bank Groups	No. of Insured Banks	Insured Deposits (ID)	Assessable Deposits (AD)	Insured Deposit Ratio (per cent)
(1)	(2)	(3)	(4)	(5) = (3) over (4)
I. Commercial Banks	**140**	**83,18,764**	**1,93,02,931**	**43.1**
i) Public Sector Banks	12	54,50,562	1,09,87,647	49.6
ii) Private Sector Banks	21	22,59,204	66,08,656	34.2
iii) Foreign Banks	44	51,562	9,31,135	5.5
iv) Small Finance Banks	12	77,667	1,84,714	42.0
v) Payments Banks	6	14,252	14,321	99.5
vi) Regional Rural Banks	43	4,64,626	5,75,228	80.8
vii) Local Area Banks	2	891	1,229	72.4
II. Cooperative Banks	**1,869**	**7,13,467**	**11,15,786**	**63.9**
i) Urban Cooperative Banks	1,484	3,64,573	5,33,501	68.3
ii) State Cooperative Banks	33	65,375	1,49,476	43.7
iii) District Central Cooperative Banks	352	2,83,520	4,32,810	65.5
Total	**2,009**	**90,32,231**	**2,04,18,718**	**44.2**

Source: DICGC.

Table 3.4: Deposit Insurance Premium

(₹ crore)

Period	Commercial Banks	Co-operative Banks	Total
2021-22	**18,248**	**1,242**	**19,490**
2021-22:H1	8,939	622	9,561
2021-22:H2	9,308	621	9,929
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:H1 (P)	10,962	666	11,628

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)
September 30, 2022	1,55,459	83,89,470	1.85
March 31, 2023	1,69,602	86,31,259	1.96
September 30, 2023	1,82,701	90,32,231	2.02

Source: DICGC.

III.4.2 Corporate Insolvency Resolution Process (CIRP)

3.50 Since the inception of the Insolvency and Bankruptcy Code (hereinafter referred to as "the Code"), a total of 2,808 corporate debtors (CDs) have been rescued (808 through resolution plans; 1,053 through appeal or review or settlement; and 947 through withdrawal) and 2,249 corporate debtors have been referred for liquidation till end-September 2023 (Table 3.6 and 3.7).

Table-3.6. CIRP: Status as on September 30, 2023

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	155	97	77	304	1,062
2019 - 20	1,062	1,989	343	216	133	540	1,819
2020 - 21	1,819	537	89	162	121	350	1,634
2021 - 22	1,634	891	116	184	147	342	1,736
2022 - 23	1,736	1,261	172	200	184	409	2,032
Apr - Jun, 2023	2,032	247	36	44	42	96	2,061
Jul - Sep, 2023	2,061	232	46	44	85	117	2,001
Total	**NA**	**7,058**	**1,053**	**947**	**808**	**2,249**	**2,001**

Note: 1. These CIRPs are in respect of 6,784 corporate debtors.
2. The data excludes one corporate debtor, which moved directly from BIFR to resolution.
Source: Compilation from website of the NCLT and filing by IPs.

Table-3.7. Sectoral Distribution of CIRPs as on September 30, 2023

Sector	Number of CIRPs						
	Admitted	Closed					Ongoing
		Appeal/ Review/ Settled	Withdrawal under Section 12 A	Approval of Resolution Plan	Commencement of Liquidation	Total	
Manufacturing	**2,708**	**363**	**370**	**388**	**928**	**2,049**	**659**
Food, Beverages and Tobacco Products	355	44	46	45	125	260	95
Chemicals and Chemical Products	289	47	50	41	82	220	69
Electrical Machinery and Apparatus	192	23	21	14	82	140	52
Fabricated Metal Products	143	20	26	18	48	112	31
Machinery and Equipment	292	53	47	30	94	224	68
Textiles, Leather and Apparel Products	466	56	66	52	187	361	105
Wood, Rubber, Plastic and Paper Products	314	40	45	52	105	242	72
Basic Metals	458	53	39	107	146	345	113
Others	199	27	30	29	59	145	54
Real Estate, Renting and Business Activities	**1,508**	**282**	**230**	**118**	**414**	**1,044**	**464**
Real Estate Activities	414	89	55	35	68	247	167
Computer and related activities	204	25	35	13	73	146	58
Research and Development	9	2	2	1	1	6	3
Other Business Activities	881	166	138	69	272	645	236
Construction	**811**	**152**	**120**	**89**	**166**	**527**	**284**
Wholesale and Retail Trade	**698**	**91**	**68**	**57**	**292**	**508**	**190**
Hotels and Restaurants	**149**	**26**	**24**	**21**	**39**	**110**	**39**
Electricity and Others	**199**	**26**	**18**	**41**	**74**	**159**	**40**
Transport, Storage and Communications	**195**	**21**	**22**	**15**	**78**	**136**	**59**
Others	**790**	**92**	**95**	**79**	**258**	**524**	**266**
Total	**7,058**	**1,053**	**947**	**808**	**2,249**	**5,057**	**2,001**

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

[20] September 2023 numbers are provisional.

Table-3.8. Outcome of CIRPs, Initiated Stakeholder-wise, as on September 30, 2023

Outcome	Description	CIRPs initiated by/for				
		Financial Creditor	Operational Creditor	Corporate Debtor	Financial Service Providers	Total
Status of CIRPs	Closure by Appeal/Review/Settled	320	725	8	0	1053
	Closure by Withdrawal u/s 12A	260	679	8	0	947
	Closure by Approval of Resolution Plan	462	281	62	3	808
	Closure by Commencement of Liquidation	1042	979	228	0	2249
	Ongoing	1057	827	116	1	2001
	Total	**3141**	**3491**	**422**	**4**	**7058**
CIRPs yielding Resolution Plans	Realisation by FCs as per cent of Liquidation Value	177.5	129.4	148.1	160.4	168.5
	Realisation by FCs as per cent of their Claims	33.8	18.3	18.4	42.4	31.9
	Average time taken for Closure of CIRP (days)	659	662	563	632	653
CIRPs yielding Liquidations	Liquidation Value as per cent of Claims	5.8	9.3	8.6	-	6.5
	Average time taken for Closure of CIRP (days)	493	468	394	-	472

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

3.51 The end-September 2023 position for outcome of CIRPs indicates that of the operational creditor initiated CIRPs that were closed, nearly 53 per cent were closed on appeal, review, or withdrawal (Table 3.8). Such closures accounted for around 70 per cent of all such closures.

3.52 Several initiatives are being taken to improve the outcomes under the Code, including amendments in the regulations, increasing the effective strength of National Company Law Tribunal (NCLT), setting up of an integrated IT platform and regular interactions with the stakeholders including NCLT. Some of these initiatives have started yielding results with a rise in the admitted number of cases, the resolution plans approved and the realisable value (Table 3.9).

3.53 The primary objective of the Code is rescuing lives of CDs in distress. Through the resolution plans, the creditors have realised 168.5 per cent of the liquidation value and 86.3 per cent of the fair value (in CDs where fair value has been estimated). Furthermore, this realisation does not include the CIRP cost, and many probable future realisations such as equity, realisation from corporate and personal guarantees, funds infused into the CD including capital expenditure by the resolution applicants, and recovery from avoidance applications. Furthermore, as a result of behavioural change effectuated by the Code, many debtors are settling their dues even before the start of insolvency proceedings. Till end-August 2023, 26,518 applications for the initiation of CIRPs of corporate debtors having underlying default of ₹9.33 lakh crore were withdrawn before their admission.

3.54 As at end-September 2023, 2,249 CIRPs ended in liquidation of which nearly 77 per cent (1,713 out of 2,229 for which data are available) were with the Board for Industrial and Financial Reconstruction (BIFR) and/ or defunct. Even before they were admitted into CIRP, the economic value had almost eroded for most of these corporate

Table-3.9. Performance Trend of the Insolvency and Bankruptcy Code

Year	Number of Cases Admitted into CIRP	Number of Resolution Plans Approved	Realisable Value to the Creditors as a per cent of Admitted Claims under Resolution Plans (per cent)
2020-21	537	121	16.9
2021-22	891	147	22.4
2022-23	1261	184	37.1

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

debtors and their assets, on an average were valued at only 7 per cent of the outstanding debt amount. Till end-September 2023, 597 corporate debtors have been completely liquidated with combined claims of ₹1.32 lakh crore against asset valuation of ₹0.06 lakh crore. The liquidation of these companies resulted in 90 per cent realisation of the liquidation value (Table 3.10).

Table-3.10. Liquidations where Final Report has been Submitted, till September 30, 2023

Number of Liquidations where Final Report submitted	Amount of Claims Admitted (₹ crore)	Liquidation Value (₹ crore)	Amount Realised (₹ crore)	Amount Distributed (₹ crore)
597	1,32,888	5,842	5,251#	5,244

Note: #Inclusive of unclaimed proceeds of ₹6.95 crore under liquidation.
Source: Insolvency and Bankruptcy Board of India (IBBI).

3.55 The Code endeavours to close the various processes at the earliest. The 808 CIRPs that have yielded resolution plans by September 2023 took an average of 541 days {after excluding the time excluded by the AA (Adjudicating Authority)} for conclusion of processes, while incurring an average cost of 1.23 per cent of liquidation value and 0.73 per cent of resolution value. Similarly, the 2,249 CIRPs that ended up in orders for liquidation took on an average 472 days for conclusion. Further, 597 liquidation processes, which have been closed by submission of final reports took on an average 536 days for closure. The 1,179 voluntary liquidation processes, which were closed by submission of final reports, took on an average of 408 days for closure.

III.4.3 National Stock Exchange IFSC[21] - Singapore Exchange Connect

3.56 The NSE IFSC-SGX Connect is a collaborative effort between the National Stock Exchange of India (NSE) and the Singapore Exchange (SGX). The NSE IFSC-SGX Connect presents an innovative pathway for international investors to gain exposure to the Indian equities market. It unifies both international and domestic participants, creating a deeper liquidity pool and an expanded shelf of Nifty products for investors. SGX has set up a subsidiary [*viz.*, SGX India Connect IFSC Private Limited (SGX-ICI)] in the GIFT-IFSC to act as a pass-through entity for orders routed through SGX.

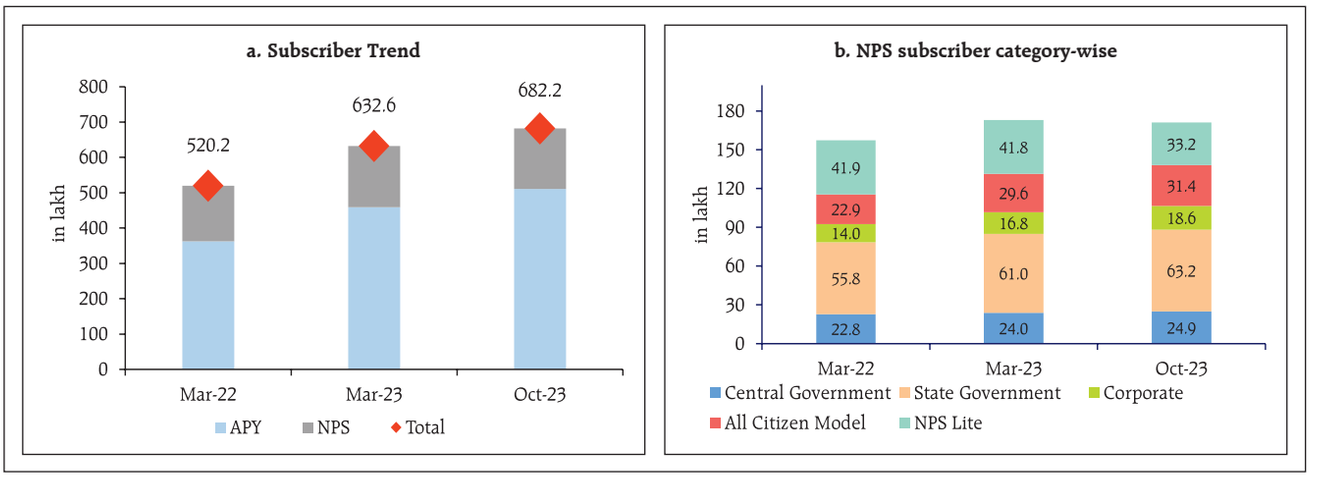
3.57 Full scale operations of the NSE IFSC-SGX Connect commenced in July 2023 with US$ 8.05 billion open interest in Nifty futures and over US$ 1.04 billion open interest in Nifty Options. Following the transition, all US dollar-denominated Nifty derivatives contracts are being exclusively traded on NSE IFSC. The average daily turnover of Nifty Derivative contracts on NSE International Exchange (NSE IX) (Oct 2023) was US$ 3.02 billion. Index Futures and Options of Nifty 50, Bank Nifty, Nifty IT and Nifty Financial Services contracts are available for trading for almost 21 hours daily in the GIFT-IFSC which overlaps Asia, Europe, and US trading hours. The NSE IFSC-SGX Connect is intended to give a boost to GIFT-IFSC as a global hub for international financial products and services.

III.4.4 Pension Funds

3.58 As at end-October 2023, the number of subscribers of the National Pension System (NPS) and Atal Pension Yojana (APY) have shown a growth of 7.8 per cent since March 2023 whereas the AUM has recorded a growth of 14.1 per cent during the same period. The number of subscribers under NPS and APY together has reached 6.82 crore and AUM

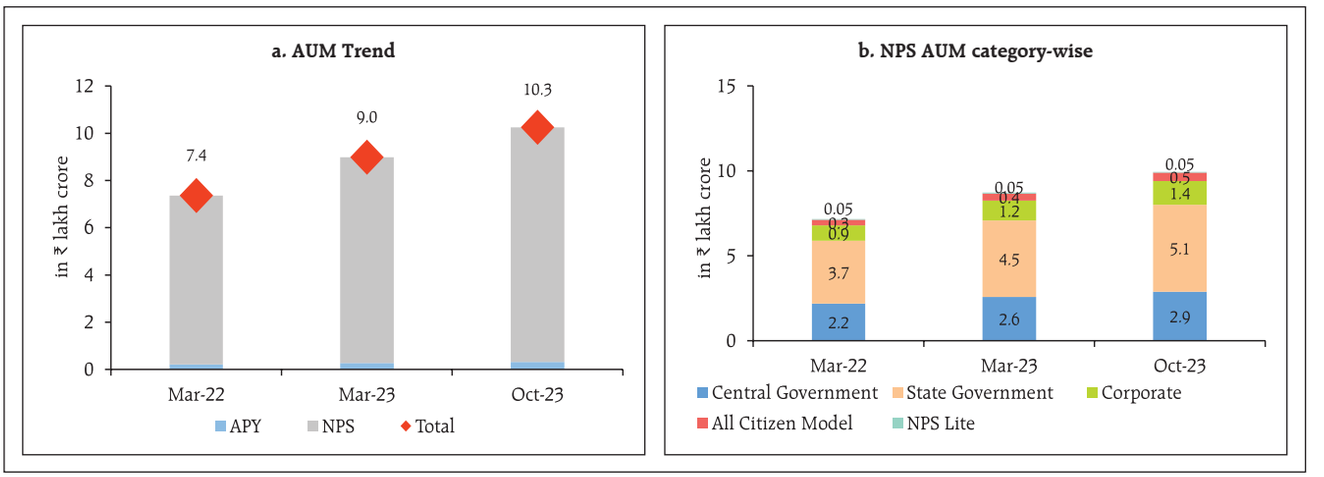
[21] International Financial Services Centre.

Chart 3.1: NPS and APY Subscribers



Source: Pension Fund Regulatory and Development Authority (PFRDA).

Chart 3.2: NPS and APY AUM



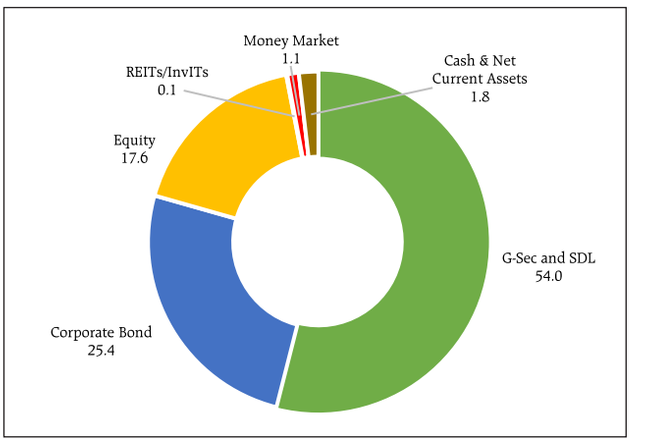
Source: PFRDA.

has touched ₹10.25 lakh crore (Chart 3.1 and 3.2), a majority of which is deployed in the Central and State government securities (Chart 3.3).

3.59 To boost the enrolments and expand the coverage under NPS and APY, the following initiatives were taken: (i) increase of entry age up to 70 years under NPS, (ii) online APY subscription through Aadhaar e-KYC, (iii) eNPS for government sector enrolment, (iv) use of Central KYC Records Registry (CKYCR), and (v) integration of NPS with Digilocker.

Chart 3.3: Asset Class-wise Bifurcation of AUM under All Products

(per cent)



Source: PFRDA.

III.4.5 Insurance

3.60 The Indian insurance industry, encompassing both life and general (including health) insurance has experienced consistent annual growth over the past years. Rising disposable income and awareness of the need for insurance and evolving customer preferences have contributed to the industry's growth. In the current fiscal year till October 2023, general and stand-alone health insurers recorded 14.7 per cent y-o-y increase in the premiums underwritten; however, the first-year new business premium witnessed a decline of 10.5 per cent for the life insurance sector.

3.61 To enhance insurance penetration in the country and to address existing protection gaps, IRDAI has been bringing in reforms in the regulatory framework governing the Indian insurance sector. To empower policyholders with deeper understanding of their insurance coverage, IRDAI mandated issuance of a concise and updated Customer Information Sheet (CIS) to the policyholders. The CIS is designed to provide policyholders all important information about their health insurance policy in simple language in a snapshot which, among others, includes details such as policy name, coverage, waiting periods, limits, exclusions, and key concepts. To accelerate the last-mile delivery of insurance services, the State Insurance Plan has been introduced with the objective of identifying the focus areas for insurance inclusion in each state in collaboration with insurers, state governments, and district-level administrators. In this direction, life, general and health Insurers have been allocated State(s) and Union Territories designating them as the Lead Insurers for allocated State/ UT. State Level Insurers' Committees and District Level Insurers' Committees are being constituted for seamless implementation of the Plan in the States.

3.62 To achieve the objective of "Insurance for all', a women-centric distribution model has been proposed due to its effectiveness in building trust and explaining the importance of insurance. The IRDAI has issued guidelines on Bima Vahaks[22], a women-centric dedicated distribution channel for enhancing insurance inclusion and awareness with a focus on rural areas, with each gram panchayat having a 'Vahak' to sell and service simple insurance products. Bima Vahaks will have a key role in taking Bima Vistaar, an all-in-one affordable insurance product offering life, health, and property cover for rural households with the aim of financial inclusion and social security.

3.63 To enhance the reinsurance business and streamline regulatory provisions for Indian Insurers, including Foreign Reinsurance Branches (FRBs) and IFSCA Insurance Offices (IIOs), the IRDAI (Re-insurance) (Amendment) Regulations 2023 have been issued. The key changes introduced include *inter alia* (i) Indian Reinsurers (including FRBs) to maintain a minimum retention of 50 per cent within India of the Indian reinsurance business underwritten, (ii) a new and simplified Order of Preference (from six levels to four levels) which Cedant insurers are required to follow for all reinsurance placements, (iii) relaxing certain compliance and reporting requirements, and (iv) reducing minimum capital requirement for opening new FRBs from ₹100 Crore to ₹50 Crore, with the provision to repatriate any excess assigned capital. The amendment regulations signify a major shift in India's reinsurance landscape, fostering a more favourable business environment and positioning the country as a leading global reinsurance hub.

[22] A 'Bima Vahak' means an individual or a legal person (*i.e.*, Corporate Bima Vahak) who will act on behalf of its partner insurers to solicit business of 'Bima Vistaar', issue and service insurance policies, and assist the policyholders with claims.

3.64 To align the insurance sector with global needs and industry dynamics, the IRDAI formed mission mode teams to implement a Risk Based Supervisory (RBS) framework and a Risk Based Capital (RBC) regime. The IRDAI has been engaging with various stakeholders towards developing and implementing 'Risk Based Supervision' (RBS) framework for insurance sector in India. In this direction, the first phase of pilots for RBS has commenced from July 2023. With respect to RBC, IRDAI issued Technical Guidance Document in respect of Indian Risk Based Capital Framework – Quantitative Impact Study-1 (QIS-1). The QIS-1 shall be the first major step towards desired transformation and shall help in assessing the likely impact on the Indian insurance industry of the proposed framework for quantification of capital and solvency requirements following a risk-based approach.

Summary and Outlook

3.65 Global regulatory efforts remain focused on addressing vulnerabilities in non-bank financial intermediation, given the growing size and intermediation capacity of the NBFI sector. The ongoing endeavour is to ensure that NBFIs better manage risks through timely and granular public data disclosures and governance requirements. Management and mitigation of NDLs by CCPs, which is critical in view of implications for financial market services, is getting increasing attention. Ongoing challenges emanating from cyber risk and climate-related risk are the two other major focus areas for policy makers. Wider adoption of technology in the financial system amidst a new wave of innovations also poses new challenges for financial stability that would require suitable risk mitigating regulatory and supervisory actions.

3.66 Domestic regulatory initiatives have been conditioned by changes in the macro-financial environment, alignment with evolving global standards and consolidation of past gains. Initiatives have been aimed at convergence of domestic regulatory standards on valuation of banks' investment portfolio valuation and operational risk capital requirements with global standards. Macro-prudential measures are being strengthened to address systemic risk emerging from banks' and NBFCs' unsecured retail credit portfolios. In addition, other regulatory measures are aimed at improving the resilience of financial intermediaries, easing compliance, reducing regulatory arbitrage, expanding secure digitalisation, taking forward the development of derivative markets, improving efficiency of the markets, ensuring customer protection and expanding access to finance. Regulators remain vigilant to the rapidly changing economic environment in order to ensure the efficiency and soundness of the financial system, preserve financial stability and secure efficient functioning of markets.

Annexure 1

Systemic Risk Survey

In the latest round of the Systemic Risk Survey, risk perception from global spillovers receded while remaining in the 'high' risk category. Macroeconomic risks witnessed a marginal uptick. Risks emanating from financial markets and institutional risks remained unchanged. Going forward, respondents' perception of risks to financial stability included: tightening of global financial conditions; rise in oil prices; reversal of capital flows; rise in geopolitical risks; global growth slowdown; and increase in climate risks.

The 25th round of the Reserve Bank's Systemic Risk Survey (SRS) was conducted in November 2023 to solicit perceptions of experts, including market participants, on major risks faced by the Indian financial system. In addition to its regular format, this round of the survey also captured (i) respondents' views on impact of the recent geopolitical events in West Asia on the global economy and financial markets; and (ii) likely impact of tightening of global financial conditions due to rising US treasury yield and strengthening US dollar on Indian financial markets.

The feedback from 49 respondents is presented below:

- Risks from global spillovers receded though it remained in the 'high' risk category. Macroeconomic risks witnessed a marginal uptick within the 'medium' risk category. Assessment of risks emerging from financial markets and institutional risks remained unchanged (Figure 1).
- Major drivers of global risks, such as, global growth, funding risk, banking turmoil and risk emanating from monetary tightening in advanced economies were perceived to have moderated but the risk perception on commodity price has gone up (Figure 2).
- Increase in risk perception attributable to domestic inflation, current account deficit, capital flows, household savings and climate change contributed to uptick in macroeconomic risks, even as domestic growth conditions, consumption demand and corporate sector prospects provided more comfort (Figure 2).

Figure 1: Systemic Risk Survey: Major Risk Groups

Major Risk Groups	May-23	November-23	Change in Risk Perception[1]
A. Global Risks	6.2	6.0	Decline
B. Macroeconomic Risks	5.3	5.4	Increase
C. Financial Market Risks	5.8	5.8	Unchanged
D. Institutional Risks	5.4	5.4	Unchanged

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

Note:

Risk Category

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

[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.

Figure 2: Systemic Risk Survey: Risks Identified

Risk items		May-23	November-23	Change in Risk Perception
A. Global Risks	Global growth	7.1	6.7	Decline
	Funding risk (External borrowings)	5.6	5.4	Decline
	Commodity price risk (including crude oil prices)	5.7	6.4	Increase
	Banking turmoil	6.1	5.2	Decline
	Monetary tightening in advanced economies	6.5	6.3	Decline
B. Macroeconomic Risks	Domestic growth	5.3	4.5	Decline
	Domestic inflation	4.9	5.5	Increase
	Current account deficit	4.8	5.2	Increase
	Capital inflows/ outflows (Reversal of FIIs, Slowdown in FDI)	5.7	5.9	Increase
	Fiscal deficit	5.3	5.3	Unchanged
	Corporate sector risk	4.8	4.7	Decline
	Real estate prices	5.0	5.0	Unchanged
	Consumption Demand	5.5	5.3	Decline
	Investment Growth	5.6	5.3	Decline
	Household savings	5.2	5.8	Increase
	Climate risks	6.3	6.4	Increase
C. Financial Market Risks	Foreign exchange rate risk	5.6	5.8	Increase
	Equity price volatility	5.8	6.0	Increase
	Interest rate risk	5.9	5.6	Decline
	Liquidity Risk	5.8	5.8	Unchanged
D. Institutional Risks	Asset quality deterioration	5.1	5.1	Unchanged
	Banks' exposure to interest rate risk	5.5	5.4	Decline
	Cyber risk	6.0	6.2	Increase
	Operational risk	5.3	5.3	Unchanged
	Profitability	5.0	5.0	Unchanged

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

Note:

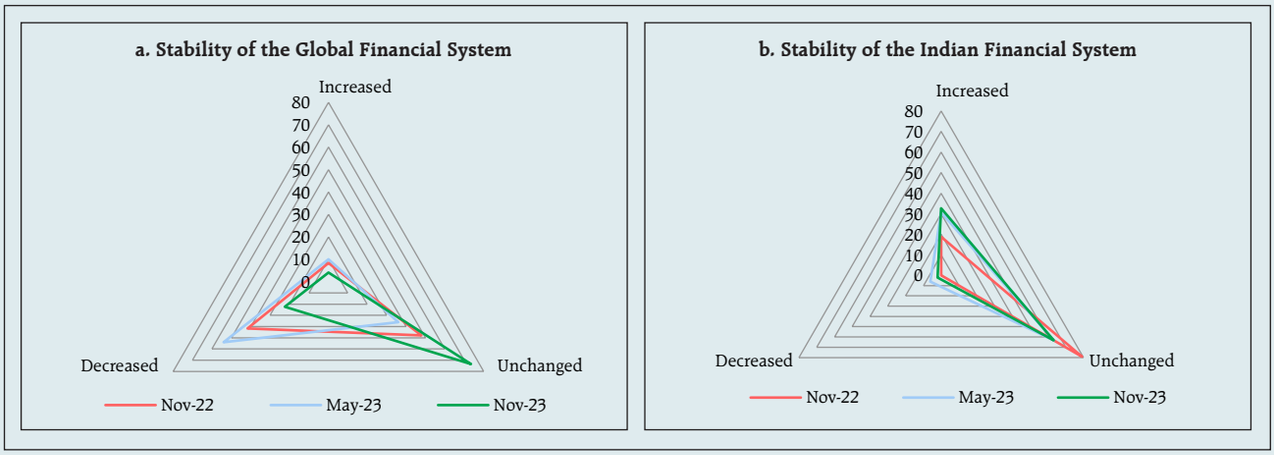
Risk Category

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

- Among drivers of financial market risk, interest rate risk was gauged to have moderated while risk emanating from equity price volatility and foreign exchange rate risk picked up marginally (Figure 2).
- Among drivers of institutional risk, cyber risk moved up to the 'high' risk category. Risk emanating from banks' exposure to interest rate risk receded (Figure 2).
- About one fourth of the respondents reported lower confidence in the stability of the global financial system from the previous survey round (Chart 1a) but over 95 per cent of them placed higher or similar confidence in the Indian financial system (Chart 1b).

Chart 1: Confidence in the Stability of the Financial System

(share of respondents, per cent)



- Over 70 per cent of the panellists expected that the Indian economy will be impacted somewhat/to a limited extent from global spillovers (Chart 2).
- Nearly 80 per cent of the respondents assessed better or similar prospects for the Indian banking sector over one-year horizon (Chart 3).
- Over 30 per cent of the respondents expected marginal to considerable improvement in banking sector asset quality over the next six months, attributable to factors, such as, improved growth prospects, revival in private capex, improvement in credit profile of corporates and better underwriting standards; another 53.3 per cent expected it to remain unchanged (Chart 4a).
- About one fourth of the respondents expected the prevailing credit demand momentum to continue over the next six months whereas a higher share expected marginal to considerable improvement owing to factors, such as, pickup in corporate demand and manufacturing sector activity and higher public investment in infrastructure sector (Chart 4b).

Chart 2: Expectation of Instability in Global Financial System affecting Indian Economy

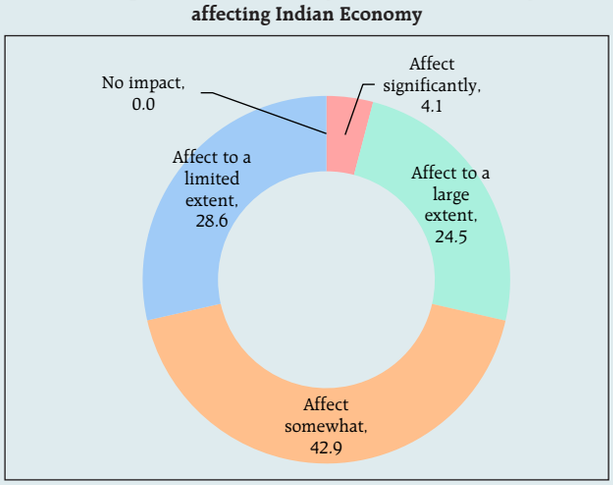


Chart 3: Prospects of Indian Banking Sector- Next One Year

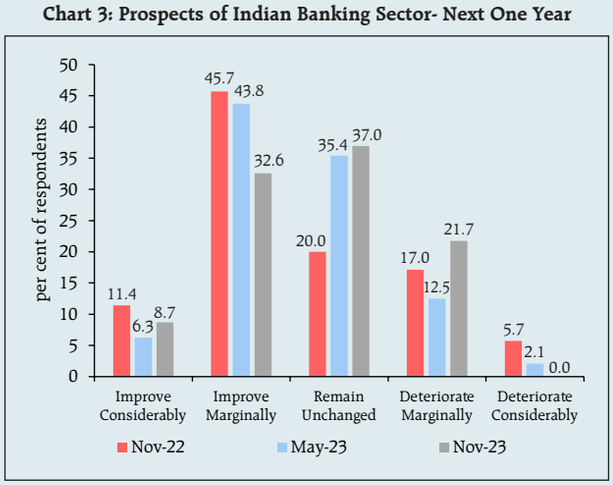
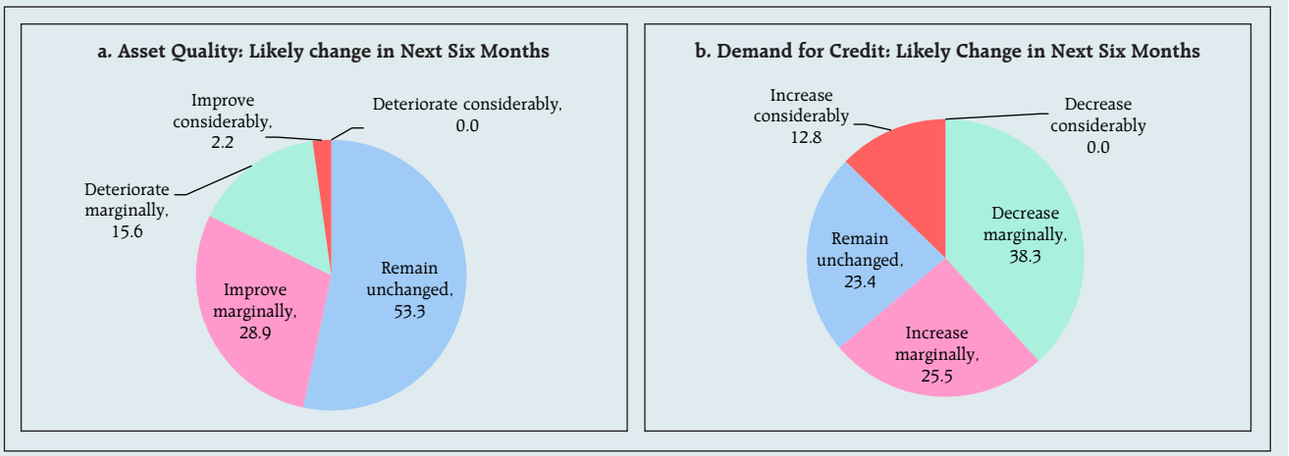


Chart 4: Indian Banking Sector – Outlook



- About 80 per cent of the respondents perceived that geopolitical events in West Asia will have only low to medium impact on global economy and financial markets (Chart 5).
- Nearly 60 per cent of the panellists perceived that tightening of global financial conditions due to rising US treasury yield and strengthening US dollar may have only minor impact on Indian financial markets (Chart 6).

Chart 5: Risk of Geopolitical Events in West Asia

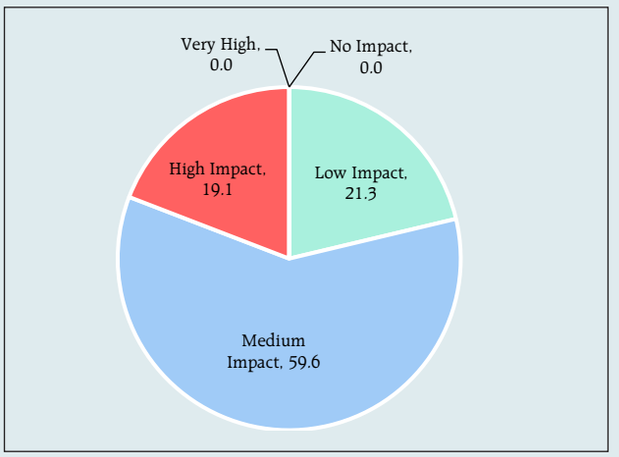
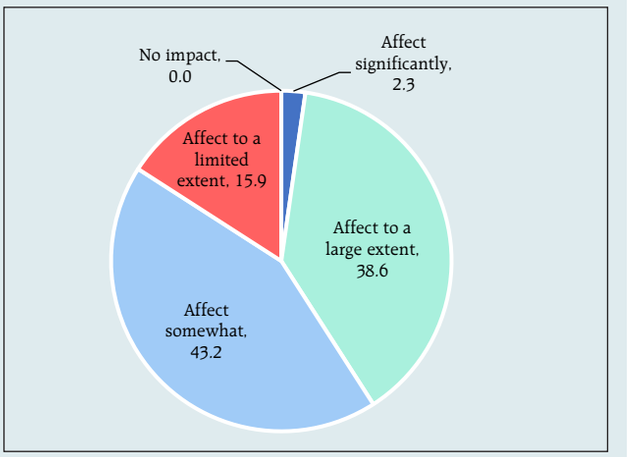


Chart 6: Impact of Tightening of Global Financial Conditions



Risks to Financial Stability

Going forward, respondents identified the following major risks to financial stability:

- Tightening of global financial conditions and interest rate risk;
- Rise in commodity (including oil) prices;
- Reversal of FII flows and exchange rate risk;
- Geopolitical risks;
- Global growth slowdown; and
- Increase in climate risks.

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 #	Nonperforming Loans net of Provisions-to-Capital	Tier 1 Capital-to-Assets #	
Asset Quality	Gross NPAs-to-Total Advances	Provisions-to-Nonperforming Loans #	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 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:

$$OOI_t = \alpha_1 + \beta_1\, OOI_{t-1} + \beta_2\, 10y\_AAASpread_{t-1} + \beta_3\, \Delta GDP_{t-2} + \beta_4 \left(\frac{CAB}{GDP}\right)_{t-1}$$

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 ratios are 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 ratios are 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 ratios are 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*

$$PD_t = \alpha + \beta_1 PD_{t-1} - \beta_2 \Delta PD_{t-2} - \beta_3 \left(\frac{CAB}{GDP}\right)_{t-3} + \beta_4 Dummy_t$$

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*

$$PD_t = \beta_1 PD_{t-1} - \beta_2 PD_{t-2} - \beta_3 \Delta GVA(Industry)_{t-3} + \beta_4 REER_{t-3} - \beta_5 \left(\frac{Exp}{GDP}\right)_{t-1} + \beta_6 \Delta WALR_t + \beta_7 Dummy_t$$

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*

$$PD_t = -\alpha + \beta_1 PD_{t-1} + \beta_2 (House\ price\text{-}to\text{-}Income)_{t-1} - \beta_3 NGDP_{t-4} + \beta_4 \Delta WALR_t$$

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, EADi 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 a 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 the 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: Derivatives portfolio of select banks

The stress testing is carried out on the derivatives portfolio of a representative sample of top 24 banks in terms of notional value of the derivatives portfolio. 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 September 2023. The methodology for conducting the stress tests remains broadly similar to that in the June 2023 FSR, but it is now applied on the tier-wise classification of UCBs, as against the scheduled / non-scheduled classification followed earlier. 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 rate of NPAs 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 similar period of the year (September-December 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

Methodology for assessing the resilience of NBFC sector to shocks in credit risk has been revised to enhance the model's accuracy in predicting CRAR under baseline and two stress scenarios. Based on the revised model, assets, advances to total assets ratio, EBPT to total assets ratio, risk-weight density and slippage ratio were projected over the next one year. Thereafter, new slippages, provisions, EBPT, risk-weighted assets and capital were calculated for the baseline scenario. For the medium and high risk scenarios, GNPAs 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 September 2023 over the next one year were considered for calculating the liquidity mismatch under baseline scenario. Outflows and inflows of the sample NBFCs were applied a shock of 5 per cent and 10 per cent for various 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

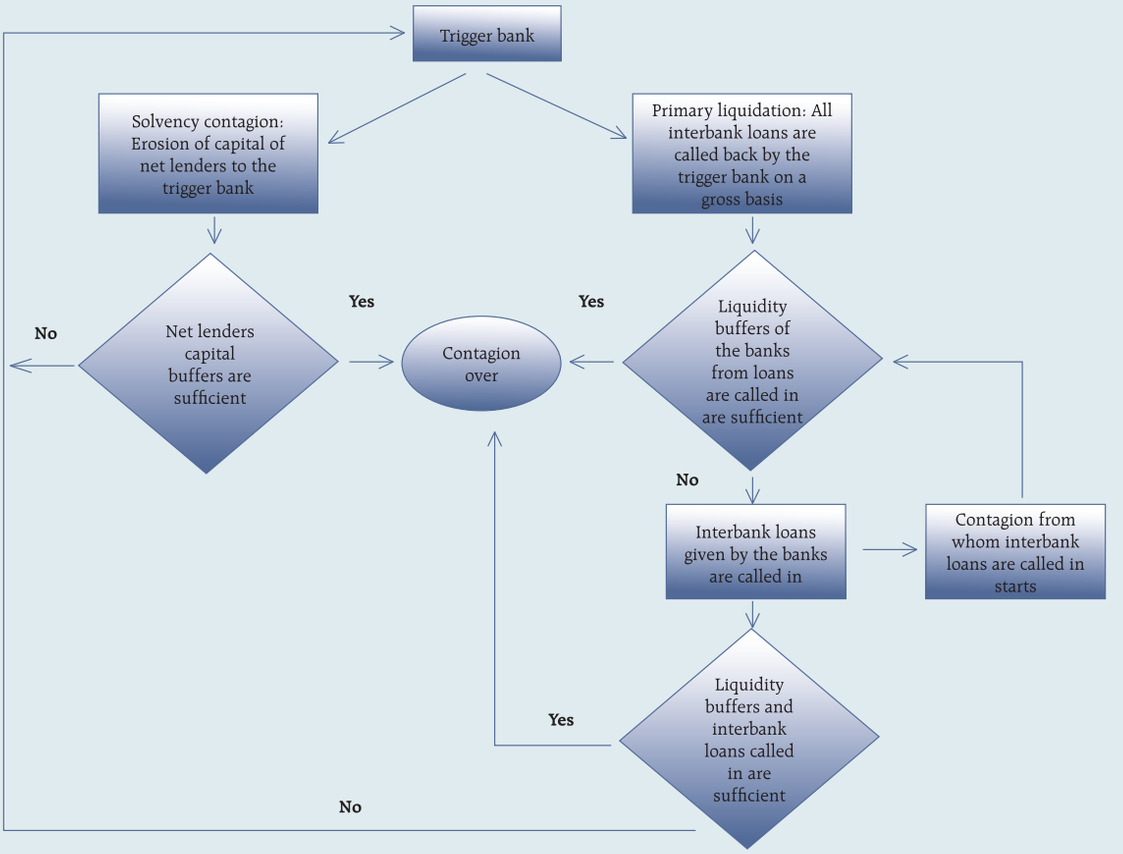
While the solvency contagion analysis assesses potential loss to the system owing to failure of a net borrower, liquidity contagion estimates potential loss to the system due to the failure of a net lender. The analysis is conducted on gross exposures between banks. The exposures include fund based ones 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 Regulatory Measures

1. Reserve Bank of India (RBI)

Date	Regulation	Rationale
June 23, 2023	**Status of Mumbai Interbank Forward Outright Rate (MIFOR) as a Significant Benchmark:** Considering the cessation of the publication/ non-representativeness of US Dollar London Interbank Offered Rate (USD LIBOR) settings after June 30, 2023, Financial Benchmarks India Pvt. Ltd. (FBIL) has been accorded approval to cease the publication of the MIFOR after June 30, 2023.	To shift to alternative reference rates.
August 17, 2023	**RBI launches उद्गम – 'UDGAM' - Centralised Web Portal for searching Unclaimed Deposits:** The centralised web portal will aid users to search for their unclaimed deposits across banks at one place and enable them to either claim the deposit amount or make their deposit accounts operative at their respective banks.	To facilitate members of public to claim their unclaimed deposits.
August 18, 2023	**Reset of Floating Interest Rate on Equated Monthly Instalments (EMI) based Personal Loans:** Regulated Entities (REs) shall clearly communicate to the borrowers about the possible impact of change in benchmark interest rate on the loan leading to changes in EMI and/or tenor, or both, at the time of sanction. At the time of reset of interest rates, the borrowers shall also be given the choice to opt for (i) enhancement in EMI or elongation of tenor or a combination of both options; and (ii) to prepay, either in part or in full, at any point of time during the tenor of the loan.	To address consumer grievances related to elongation of loan tenor and/or increase in EMI amount without proper communication and/or consent of the borrowers.

Date	Regulation	Rationale
August 18, 2023	**Fair Lending Practice – Penal Charges in Loan Accounts:** Any penalty, if charged, for non-compliance of material terms and conditions of loan contract by the borrower shall be treated as 'penal charges' and shall not be levied in the form of 'penal interest' that is added to the rate of interest charged on the advances. There shall be no capitalisation of penal charges *i.e.*, no further interest computed on such charges. The REs shall not introduce any additional component to the rate of interest and shall formulate a Board approved policy on the same.	To alleviate customer grievances and disputes regarding levy of penal interest/charges and align divergent practices amongst the REs on the same.
August 18, 2023	**Review of Regulatory Framework for Infrastructure Debt Fund – Non-Banking Financial Companies (IDF-NBFCs):** The revised regulatory framework for IDF-NBFCs (i) withdraws the requirement of a sponsor for the IDF-NBFCs; (ii) allows IDF-NBFCs to finance Toll-Operate-Transfer (TOT) projects as direct lenders, (iii) provides them access to funds through loan route also under external commercial borrowing (ECB) route; and (iv) makes tri-partite agreement optional for public private partnership (PPP) projects.	To enable the IDF-NBFCs to play a greater role in financing of the infrastructure sector and to move towards the regulatory objective of harmonisation of regulations applicable to various categories of NBFCs.
August 24, 2023	**Enhancing transaction limits for Small Value Digital Payments in Offline Mode:** The upper limit of an offline payment transaction has been increased to ₹500 from ₹200.	To encourage wider adoption of digital payments in even in offline mode.
September 04, 2023	**Operation of Pre-Sanctioned Credit Lines at Banks through Unified Payments Interface (UPI):** Payments through a pre-sanctioned credit line issued by a Scheduled Commercial Bank to individuals, with prior consent of the individual customer, are now enabled for transactions using the UPI System. Banks may, as per their Board approved policy, stipulate terms and conditions of use of such credit lines which may include, among other items, credit limit, period of credit and rate of interest.	To expand the scope of UPI by inclusion of credit lines as a funding account.

Date	Regulation	Rationale
September 13, 2023	**Responsible Lending Conduct – Release of Movable/Immovable Property Documents on Repayment/Settlement of Personal Loans:** The REs shall release all the original movable/ immovable property documents and remove charges registered with any registry within a period of 30 days after full repayment/ settlement of the loan account. In case of delay in releasing of original movable/immovable property documents, the RE shall communicate to the borrower reasons for such delay and in case the delay is attributable to the RE, it shall compensate the borrower at the rate of ₹5,000 for each day of delay.	To address the issues faced by the borrowers and towards promoting responsible lending conduct among the REs.
October 06, 2023	**Gold Loan – Bullet Repayment – Primary (Urban) Co-operative Banks (UCBs):** In the light of perceived business opportunities and general increase in prices, the monetary ceiling of the Gold loans under bullet repayment scheme' has been raised from ₹2 lakh to ₹4 lakh for UCBs who have met Priority Sector Lending (PSL) targets/ sub-targets for 2023 and continue to meet the targets/ sub-targets as per glide path delineated vide instructions issued on June 08, 2023.	To serve as an incentive to UCBs who have complied with PSL requirements.
October 25, 2023	**Appointment of Whole-Time Director(s):** All PVBs and wholly owned subsidiaries FBs were advised to ensure the presence of at least two whole time directors (WTDs), including managing director and chief executive officer, on their Boards. The number of WTDs shall be decided by the Board of the bank by considering factors such as the size of operations, business complexity, and other relevant aspects.	To establish an effective senior management team in the banks to navigate ongoing and emerging challenges and facilitate succession planning.

Date	Regulation	Rationale
October 26, 2023	**Strengthening of customer service rendered by Credit Information Companies and Credit Institutions (CI):** The Reserve Bank issued directions pertaining to (i) framework for compensation to customers for delayed updation/rectification of credit information, and (ii) measures to strengthen customer service rendered by CIs and credit information companies. Amongst other things, the directions also provide for compensating the customer in case of delay in resolving complaints, notifying customers regarding access of their credit information reports (CIRs).	To address the increase in customer complaints regarding credit information reporting and the functioning of credit information companies.
October 26, 2023	**Joining the Account Aggregator (AA) ecosystem as Financial Information User (FIU):** The Reserve Bank has issued guidelines stating that all regulated entities joining the NBFC-AA ecosystem as FIU shall necessarily join as Financial Information Providers (FIPs) also, if they hold the specified financial information and fall under the definition of FIPs.	To ensure optimum utilisation and efficient functioning of the AA ecosystem.
November 07, 2023	**Master Direction on Information Technology (IT) Governance, Risk, Controls and Assurance Practices:** The Directions include guidelines on IT governance framework, infrastructure and services management, information security risk management framework including cyber security policy and conduct of vulnerability assessment/ penetration testing, business continuity and disaster recovery management, information systems (IS) audit, repeal and other provisions.	To strengthen the operational resilience of REs.

2. Securities and Exchange Board of India (SEBI)

Date	Regulation	Rationale
May 03, 2023	**Introduction of Legal Entity Identifier (LEI) in the Capital Debt Market.**	To enhance transparency and track the financial exposure of an entity, as LEI serves as a common identifier across all financial services.

Date	Regulation	Rationale
June 08, 2023	**Participation of Mutual funds in repo transactions on Corporate Debt Securities.**	To ensure uniformity in investment norms for repo transactions by mutual funds.
June 23, 2023	**Trading Supported by Blocked Amount in Secondary Market.**	To protect investors from default of trading members/ clearing members, to protect client collateral from misuse or wrongful withdrawal and to mitigate the risk of non-settlement of pay-out by trading members to clients.
July 04, 2023	**Introduction of regulatory framework for ESG Rating Providers (ERPs).**	To standardise methodologies, enhance transparency and credibility, prevent greenwashing and ensure that investors have reliable information for decision making.
July 05, 2023	**Amendments to guidelines for preferential issue and institutional placement of units by a listed Real Estate Investment Trust (REIT) and listed Infrastructure Investment Trust (InvIT).**	To align the pricing guidelines for institutional placement of units of a REIT/InvIT in line with qualified institutional placement of equity shares of listed companies.
July 06, 2023	**Introduction of General Information Document (GID) and Key Information Document (KID) and review of disclosures in placement memorandum, with respect to private placement of non-convertible securities and commercial papers proposed to be listed.**	To facilitate ease of doing business by dispensing the need to file repetitive disclosures and to bridge the information gap between the public issues and private placement issuances.
July 07, 2023	**Roles and responsibilities of Trustees and board of directors of Asset Management Companies (AMCs) of Mutual Funds.**	To streamline the responsibilities at the level of the Trustees and AMCs while ensuring that Trustees devote their attention to the fiduciary obligations and supervisory role cast upon them.

Date	Regulation	Rationale
Jul 07, 2023	**Regulatory Framework for Sponsors of a Mutual Fund.**	To facilitate fresh flow of capital into the industry, foster innovation and encourage competition.
July 20, 2023	**New category of Mutual Fund schemes for Environmental, Social and Governance (ESG) investing and related disclosures by Mutual Funds.**	To permit more schemes based on ESG theme and to put in place disclosure requirements and investment criteria to address the risk of greenwashing.
July 27, 2023	**Mandating Legal Entity Identifier (LEI) for all non-individual foreign portfolio investors.**	To improve quality and accuracy of financial data systems for better risk management and to obtain a globally accepted identity number.
July 31, 2023	**Online Resolution of Disputes in the Indian Securities Market by establishing a common Online Dispute Resolution Portal which harnesses online conciliation and online arbitration for resolution of disputes arising in the Indian securities market.**	To streamline the existing dispute resolution mechanism in the Indian securities market under the aegis of stock exchanges and depositories.
August 07, 2023	**Mandating transaction in Corporate Bonds through Request for Quote (RFQ) for foreign portfolio investors (at least 10 per cent of their secondary market trades in corporate bonds by value by placing/seeking quotes on RFQ platform of Stock Exchanges, on a quarterly basis).**	To increase liquidity on RFQ platform and to enhance transparency in secondary market in corporate bonds.
August 02, 2023	**Audit of firm-level performance data of Portfolio Managers {standard terms of reference as specified by Association of Portfolio Managers in India (APMI)}**	To ensure uniformity in audit of performance data of portfolio managers.
August 23, 2023	**Introduction of provisions for voluntary delisting of non-convertible debt securities/ non-convertible redeemable preference shares and obligations of the listed entity on such delisting.**	To provide for a framework for voluntary delisting for debt listed entities.

Date	Regulation	Rationale
August 24, 2023	**Mandating additional disclosures by foreign portfolio investors that fulfil certain objective criteria (additional granular level disclosures of all persons holding ownership, economic interest, and control, in the foreign portfolio investor, on a full look through basis).**	To alleviate concerns regarding possible circumvention of requirements under the Substantial Acquisition of Shares and Takeovers Regulations, 2011, Minimum Public Shareholding requirements and Press Note 3 issued by the Government.
August 24, 2023	**Modification in cyber security and cyber resilience framework of Stock Exchanges, Clearing Corporations and Depositories.**	To implement the recommendation of National Critical Information Infrastructure Centre (NCIIPC) and to strengthen the existing cyber security governance.
August 29, 2023	**Guidelines for Market Infrastructure Institutions (MIIs) regarding cyber security and cyber resilience.**	To strengthen the existing cyber security and cyber resilience framework of MIIs, considering the interconnectedness and interdependency of the MIIs to carry out their functions.
September 11, 2023	**Introduction of Board nomination rights to unit holders of Infrastructure Investment Trusts (InvITs) and Real Estate Investment Trusts (REITs).**	To enhance the governance of InvITs and REITs.
September 21, 2023	**Introduction of provisions requiring issuers having outstanding listed non-convertible debt (NCD) securities to list all subsequent issuances of non-convertible debt securities.**	To facilitate transparency in price discovery of NCDs, better disclosures to investors and to avoid ISIN[1] level confusion and possible mis-selling of unlisted bonds.
October 19, 2023	**Revision in the framework for fund raising by issuance of debt securities by large corporates.**	To facilitate ease of doing business by removal of penal provision and introduction of incentives and disincentives.

[1] ISIN = International Securities Identification Numbering system.

Date	Regulation	Rationale
October 31, 2023	**Revision in manner of achieving minimum public unitholding requirement for InvITs and REITs.**	To ensure that the regulatory framework for REITs and InvITs remain robust and in line with evolving market and regulatory expectations.

3. Insurance Regulatory and Development Authority of India (IRDAI)

Date	Regulation	Rationale
June 05, 2023	**Investments in National Bank for Financing Infrastructure and Development (NaBFID):** Investments in the NaBFID will be treated in line with the limits prescribed for Public Limited Infrastructure Investee Company under note 3 of the Regulation 9 of IRDAI(Investment) Regulations, 2016.	To support the development of long-term non-recourse infrastructure financing in India.
June 08, 2023	**Creation of facility to capture Ayushman Bharat Health Account (ABHA) number of proposers:** Insurers are advised to capture ABHA (Ayushman Bharat Health Account) number of all the persons seeking insurance cover (both new applicants and existing policyholders) and to obtain their consent for sharing medical records with insurers/ third party administrators (TPAs) through ABHA number.	To identify the insured in a digital environment and facilitate seamless healthcare and insurance service delivery.
June 08, 2023	**Testing and adoption of Health Claims Exchange (HCX) Specifications and e-claim standards:** Insurers are advised to get on-boarded to the National Health Claims Exchange (NHCX), a gateway for exchanging claims-related information among stakeholders present in the healthcare and health insurance ecosystem including *inter alia* insurers, TPAs, claimants, beneficiaries, healthcare providers.	To enable seamless interoperability of health claims processing.

Date	Regulation	Rationale
June 20, 2023	**Use and File Procedure for Life Insurance Products:** IRDAI introduced modifications to the existing 'use and file' procedure for life insurance products and expanded the scope of 'Use & File' with inclusion of additional categories of life insurance products to the procedure.	To facilitate the insurance industry in promoting penetration and improving the accessibility of life insurance products.
June 28, 2023	**Monitoring of Investments in Alternative investment Fund (AIF):** IRDAI stipulated a few requirements to the insurers to help closely monitor their exposure to AIFs, including requirement of board approval for rollover of investments in AIFs. Insurers are instructed that the net asset value (NAV) of the AIFs should be declared on a quarterly basis. Further, insurers are advised to submit quarterly return for investments in AIFs, as per the specified format, within 15 days from the end of each quarter.	To monitor the exposure of insurers to AIFs.
June 30, 2023	**IRDAI (Remuneration of Key Managerial Persons of Insurers) Guidelines, 2023**	To ensure effective governance of compensation, align compensation with prudent risk-taking, provide effective supervisory oversight and stakeholder engagement, and safeguard the interests of policyholders and other stakeholders.
October 09, 2023	**Trade Credit Insurance Guidelines, 2021 - Modification to Guideline 5.3A – allowing "reverse factoring" on Tred Receivables electronic Discounting System (TReDS) platforms.**	To facilitate reverse factoring to allow financiers to take exposure on low rated or unrated buyers provided the default risk is hedged with insurers by taking trade credit insurance cover.
October 18, 2023	**Mandating of coverage (payment of premium under India Motor Tariff-29 compulsory as an inbuilt coverage in a private car policy)**	To mandate compulsory inbuilt coverage for employees while issuing private car policy for such vehicles.

Date	Regulation	Rationale
October 27, 2023	**Amendment of Arbitration Clause in General Insurance policies**	To keep retail/individual policyholders out of the provisions of the arbitration clause in all general insurers' policy documents.

4. Pension Fund Regulatory and Development Authority (PFRDA)

Date	Regulation	Rationale
April 17, 2023	**Amendment in National Pension System (NPS) Trust Regulations, 2023:** The amendments encompass, *inter alia*, (i) including assets under e-NPS as "Assets of the National Pension System Trust", (ii) allowing the NPS Trust greater autonomy to appoint its own officers and other staff for implementation or administration of the functions of the trust, and (iii) arrangement for a suitable indemnity policy for the trustees of NPS Trust for any legal disputes which may arise on account of any *bona fide* actions taken by them.	To further develop the NPS trust in the interest of subscribers.
April 20, 2023	**Permission for keeping of securities as margin with the Clearing Corporation of India Limited (CCIL) for margin requirements**	To allow pension funds to keep securities as margins with the CCIL to meet margin requirements for investments in government securities and Tri Party Repo Dealing System (TREPS).
May 10, 2023	**Retirement income optimisation through multiple annuities:** At present, the subscribers are allowed to buy one annuity scheme from the Annuity Service Provider (ASP) at the time of exit under the enabling provisions of Exit Regulations of PFRDA. The option of multiple annuities has been made available to the subscribers from the same ASP for those subscribers who earmark the annuity corpus more than ₹10 lakhs wherein ₹5 lakhs is utilised to buy each annuity scheme.	To provide subscribers with a wider range of annuity options in the interest of subscribers' retirement income optimisation.

Date	Regulation	Rationale
June 14, 2023	**Experience the ease and convenience of accessing NPS Statement of Transactions through DigiLocker-reg**	To enable subscribers to download their NPS Account Transaction Statement to DigiLocker for easy access and view their pension wealth.
July 25, 2023	**e-KYC Setu**	To provide REs guidelines for the use of e-KYC Setu for verification of identity.
August 07, 2023	**Guidelines on Know Your Customer/Anti-Money Laundering/Combating the Financing of Terrorism (KYC/AML/CFT)**	To mandate entities registered as Points of Presence (PoP) to comply with the requirements of the extant AML guidelines.
August 10, 2023	**Simplified and Secured way to stay informed on NPS investments through Consolidated Account Statement**	To provide NPS subscribers with the option to include NPS transactions in Consolidated Account Statement (CAS) to view their pension corpus under NPS in CAS.
September 23, 2023	**NPS Tier II through Default scheme for Government Sector Subscribers**: Government sector subscribers under NPS will be given additional investment option of Default Scheme along with the existing active choice investment options.	To introduce the NPS Tier II default scheme exclusively for government sector subscribers.
October 25, 2023	**Mandatory Penny drop verification - Instant Bank Account Verification for enhanced Due diligence with respect to exit / withdrawal requests and for modifying the subscriber's bank account details:** PFRDA has issued guidelines that the penny drop verification has to be necessarily successful with name matching, for processing the exit / withdrawal requests, and also for modifying the subscriber's bank account details.	To resolve the issue of return of remittances, to protect the interest of subscribers with timely credit of amount and for additional due diligence to identify the rightful beneficiary.

Date	Regulation	Rationale
October 27, 2023	**Facility of systematic lump sum withdrawal (SLW) for NPS Subscribers:** PFRDA has provided the option of phased withdrawal of the lump sum through SLW facility. The subscribers are allowed to withdraw up to 60 per cent of their pension corpus, through the SLW on a periodical basis *viz.* monthly, quarterly, half-yearly or annually for a period till 75 years of age as per the choice at the time of their normal exit.	To provide subscribers with more options of lumpsum withdrawal in terms of frequency.

5. Insolvency and Bankruptcy Board of India (IBBI)

Date	Regulation	Rationale
June 14, 2023	**Exemption of oil exploration contracts from moratorium:** The Central Government issued notification to exempt application of provisions of section 14(1) *viz.* moratorium under the Insolvency and Bankruptcy Code (IBC) in situations where the corporate debtor (CD) has entered into production or revenue sharing contracts, exploration licenses, mining leases and related transactions under the Oilfields (Regulation and Development) Act, 1948 or rules made thereunder.	To enable the government to exercise its rights and remedies under such contracts and allow termination/withdrawal of licence, permit *etc.* granted under such contracts.
June 16, 2023	**Circular regarding production of Information Utility (IU) record:** The IBBI issued a circular advising as a matter of general guidance to creditors filing applications under section 7 and 9 of the Code, to append record of default issued by the IU along with their application.	To facilitate the Adjudicating Authority to expedite admission of applications for initiation of CIRP.
July 20, 2023	**Amendment to CIRP Regulations:** The IBBI notified the Insolvency and Bankruptcy Board of India (Insolvency Resolution Process for Corporate Persons) (Amendment) Regulations, 2023.	To clarify that the regulatory fee under Regulation 31A(1) of the CIRP Regulations shall not be payable in cases where the approved resolution plan in respect of a real estate project is from an association or group of allottees in such a real estate project.

Date	Regulation	Rationale
September 18, 2023	**Amendment to CIRP Regulations:** The IBBI notified the Insolvency and Bankruptcy Board of India (Insolvency Resolution Process for Corporate Persons) (Second Amendment) Regulations, 2023.	To facilitate the resolution professional in taking custody and control of assets of the CD and provide for replacement of the authorised representative of a class of creditors, including provisions for his duties and fees.
September 18, 2023	**The Insolvency and Bankruptcy Board of India (Insolvency Professionals) (Second Amendment) Regulations, 2023**	To introduce a unified application form to enable submission of a common application form for both enrolment and registration processes of an insolvency professional and reduce the timelines for approval of registration or communicating *prima facie* refusal to grant registration to the applicant.
September 18, 2023	**Amendment to Insolvency Professional Agency (IPA) Model Bye-Laws Regulations:** The IBBI notified the Insolvency and Bankruptcy Board of India (Model Bye-Laws and Governing Board of Insolvency Professional Agencies) (Amendment) Regulations, 2023.	To introduce a timeline of 60 days for approval of a unified application (for enrolment) by the IPA and of 30 days for forwarding the same (for registration) to the Board.
September 28, 2023	**Circular regarding Liquidator's fee:** The IBBI issued a circular to explain the terms 'Amount realised', 'Other liquidation cost', 'Amount distributed to stakeholders' and 'Amount of Realisation/ Distribution' for the purpose of calculation of fee of the Liquidator.	To clarify the calculation of Liquidator's fee under Regulation 4(2)(b) of IBBI (Liquidation Process) Regulations, 2016.

Date	Regulation	Rationale
October 03, 2023	**Exemption to aircraft, aircraft engines, airframes and helicopters from moratorium:** The Central Government issued a notification to exempt the applicability of moratorium under section 14(1) of the IBC to transactions, arrangements or agreements entered into under the Cape Town Convention on International Interests in Mobile Equipment and the Protocol to the Convention on International Interests in Mobile Equipment on Matters Specific to Aircraft Equipment.	To enable aircraft lessors to exercise their rights and remedies under such agreements during moratorium.

6. International Financial Services Centres Authority (IFSCA)

Date	Regulation	Rationale
May 01, 2023	**IFSCA (Management Control, Administrative Control and Market Conduct of Insurance business) Regulations, 2023:** The regulations provide a framework for, *inter alia*, (i) capital related issues and management control; (ii) minimum Limits for annuities and other benefits; (iii) acquisition of surrender and paid up values; (iv) expenses of management of IFSC Insurance Offices (IIOs), (v) payment of commission or remuneration or reward to insurance intermediaries, (vi) protection of policyholders' interests, and (vii) insurance advertisements and disclosure.	To put in place the regulatory framework related to management control, administrative control and market conduct of insurance business carried out by an IIO.
May 22, 2023	**Circular on Clarification on 'Guidelines on Factoring and Forfaiting of Receivables'**	To clarify that the date applicable for the recognition of NPA shall be 90 days from the specified due date of payment.

Date	Regulation	Rationale
June 21, 2023	**Direct Market Access (DMA) facility:** Direct Market Access (DMA) is a facility which allows broker-dealers to offer their clients direct access to the trading system of the stock exchange, through the broker-dealer's trading systems, without any manual intervention by the broker-dealer. The issued circular also provides detail guidelines and responsibilities for broker dealers, operational flexibility for stock exchange to put in place the necessary measures, procedures and guidelines for DMA orders and trades, and introduces Sponsored Access Facilty, a form of DMA, which allow clients to directly access the exchange trading system without routing to Broker Dealer trading system.	To provide DMA facility for all broker-dealers in IFSC.
June 23, 2023	**Co-location facility offered by the Stock Exchanges:** The circular covers comprehensive instructions covering the major aspects such as (i) fair and equitable co-location services, (ii) connectivity at the co-location facility, (iii) disclosure of information pertaining to co-location services, (iv) third party co-location services, (v) integrity and security of co-location services, (vi) measurement of latency, and (vii) managed co-location services.	To allow co-location facility to eligible market participants such as broker-dealers and data vendors.
July 04, 2023	**IFSCA (Capital Market Intermediaries) (Amendment) Regulations, 2023:** As part of the amendment, following definitions have been included in the principal regulations: (i) "capital market intermediaries" means an intermediary referred in regulation 3 and is registered with IFSCA under these Regulations. (ii) "distributor" means a person who for remuneration engages with clients on behalf of an issuer or a service provider to facilitate investment or subscription into "capital market products" or "capital market services", and (iii) "registered distributor" means a distributor registered with IFSCA under Regulation 2.	To provide for regulatory requirements on registration, obligations and responsibilities, inspection, and enforcement in respect of various types of capital market intermediaries.

Date	Regulation	Rationale
July 07, 2023	**IFSCA (Banking) (Amendment) Regulations, 2023:** The amendment to the IFSCA (Banking) Regulations, 2020 includes *inter alia* (i) permission to banks to set up a Banking Unit in IFSC as a Subsidiary Company (IFSC Banking Company), in addition to existing Branch model, (ii) minimum capital requirement for setting up IFSC Banking Company has been set as US$ 50 million or such other level of capital that may be specified by the Authority, (iii) deposits of a Banking Unit may be insured subject to applicability of and to the extent provided under the Deposit Insurance and Credit Guarantee Corporation Act, 1961, and (iv) first schedule specifying permissible foreign currencies have been added to the principal regulations under powers conferred under Sec. 20 of IFSCA Act 2019.	To give further impetus and strengthen the regulatory framework for banking in the IFSC.
July 10, 2023	**IFSCA Banking Handbook General Directions-Version 4.0:** These directions specify appointment of governing body, role and responsibilities of governing body, controls and systems, etc. In addition to changes in certain definitions, version 4.0 incorporates requirement of statutory audits for IFSC banking units (IBUs) under relevant laws.	To lay down governance framework for IBUs in IFSC.
July 10, 2023	**IFSCA Banking Handbook Prudential Directions-Version 4.0:** In the revised version, provisions related to guidance on stress testing have been strengthened and reporting requirements for IBUs of foreign banks have been modified in accordance with Banking Regulation Act. 1949.	To provide prudential requirements in respect of maintenance of capital, managing credit and market risks.

Date	Regulation	Rationale
July 10, 2023	**IFSCA Banking Handbook Conduct of Business Directions- Version 5.0:** The permitted activities of IBUs have been expanded to include distribution of capital market products, participation in authorised payment system and offering payment services. Additionally, IBUs have been mandated to comply with IFSCA AML, CFT and KYC Guidelines 2022. In accordance with the amended banking regulations, IBUs have been permitted to transact in 11 specified foreign currencies.	To provide the list of permissible activities for IBUs and lay down minimum standard of conduct, especially regarding the treatment of their clients, their dealings with counterparties and other market participants.
August 07, 2023	**Extension of time duration to meet minimum net worth requirement and base capital requirement for bullion trading members and clearing members.**	To provide extension to bullion trading members and clearing members by 6 months to meet their minimum capital and net worth requirement.
August 31, 2023	**Additional AML measures under the IFSCA (Anti Money Laundering, Counter-Terrorist Financing and Know Your Customer) Guidelines, 2022:** These guidelines prescribe that every IBU engaging in cross-wire transfer, where the amount to be transferred is greater than USD 1000, must also comply with Clause 7.7.3 (a), Clause 7.7.3 (b) of the Guidelines.	To further strengthen AML framework at IBUs.
September 15, 2023	**Authorisation of Scheme file under IFSCA (Fund Management) Regulations 2022:** All fund management entities should seek authorisation from IFSCA for each scheme filed under Chapter III, IV and V of the regulations.	To provide operational clarity for fund management entities.

Date	Regulation	Rationale
October 12, 2023	**Modifications under the IFSCA (Anti Money Laundering, Counter Terrorist Financing and Know Your Customer) Guidelines, 2022 for specifying additional AML/CFT/KYC measures and clarifications:** Modification/additions include *inter alia* (i) explanation of 'physical presence' regarding effective supervision in the guidelines; (ii) additional stipulations regarding life insurance policies, especially for ascertaining beneficiaries at the time of pay out of policy proceeds; (iii) enhanced due diligence measures for REs having business relationships and transaction with natural and legal persons (including financial institutions) from countries which is required to do so by the FATF; and (iv) verifying information of customers under suspicion of money laundering/ terrorist financing.	To clarify and strengthen the AML/CFT and KYC guidelines for regulated entities.
November 02, 2023	**Amendments to conditions for opening a Global Administrative Office (GAO) or Representative Office (RO):** The IFSCA will evaluate the Banking Company's track record in complying with the AML/CFT guidelines in its home jurisdiction, in case such a Banking Company is applying from a foreign jurisdiction which is designated as a Jurisdictions Under Increased Monitoring by FATF.	To specify the conditions for the opening of GAO and RO in IFSC.
November 28, 2023	**Allocation of Indian Financial System (IFS) Code to IBUs:** The IFSCA has issued a circular to allocate IFS Code to all IBUs. The IFS Code issued to the IBUs shall be used only for the remitters to undertake cross border remittances to IBUs by mentioning in the relevant field of cross border payment systems message where IFS Code is a mandatory requirement. The IFS Codes issued to the IBUs shall not be used in domestic payment systems.	To facilitate cross border remittances through IBUs for remitters.