Financial Stability Report
Issue No. 25

Reserve Bank of India
June 2022

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

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

Published by Financial Stability Unit, Reserve Bank of India, Mumbai 400 001 and designed and printed at ACME Packs & Prints (I) Pvt. Ltd., A Wing, Gala No.73, Virwani Industrial Estate, Goregaon - East, Mumbai - 400 063.

Foreword

The prospects for the global economy are overcast by the war in Europe even as they continue to be shaped by the evolution of the COVID-19 pandemic. Global recovery, which was navigating multiple waves of infections and new mutations, is once again being tested by a stormy environment of military conflict and retaliatory sanctions. The risks of stagflation are rising. With no resolution visible in the near future, the need of the hour for every economy is to combat mounting inflation while factoring in the growth requirements of the economy. The balancing game has become even more delicate. Amidst all these, central banks need to remain focussed on their perennial responsibility of maintaining financial stability.

Like most other emerging market economies (EMEs) and even some advanced economies (AEs), the Indian economy is facing significant spillovers from the evolving global conditions. The innate strength and resilience of our macro fundamentals is catalysing a steady recovery. The financial system is well-capitalised and returning to profitability. The corporate sector is deleveraged with stronger bottom lines. The external sector is well-buffered to withstand the ongoing terms of trade shocks and portfolio outflows.

In a dynamic environment with considerable uncertainty, we have been proactive and nimble footed in our policy responses. We have been calibrating our actions to the need of the hour and striving to preserve macroeconomic and financial stability to ensure sustainable and inclusive growth.

A noteworthy feature of the current situation is the overall resilience of Indian financial institutions, which should stand the economy in good stead as it strengthens its prospects. This reflects a combination of good governance and risk management practices, as highlighted in this issue of the Financial Stability Report (FSR). Stress test results presented in this FSR demonstrate that banks are well positioned to withstand even severe stress scenarios without falling below the minimum capital requirement.

Even so, we must be mindful of the emerging risks on the horizon. Cryptocurrencies are a clear danger. Anything that derives value based on make believe, without any underlying, is just speculation under a sophisticated name. While technology has supported the reach of the financial sector and its benefits must be fully harnessed, its potential to disrupt financial stability has to be guarded against. As the financial system gets increasingly digitalised, cyber risks are growing and need special attention.

Overall, the financial stability risks to the Indian economy are skewed towards global spillovers and geopolitical tensions. Nevertheless, the Indian financial system exhibits underlying robustness and resilience to withstand these shocks.

Our endeavour is to face all challenges, external and internal, with strength and innovative solutions for the Indian financial system. The Reserve Bank and other financial sector regulators stand firm in their commitment to ensure financial stability and promote inclusive economic growth.

Shaktikanta Das
Governor

June 30, 2022

Contents

Page No.

LIST OF BOXES

LIST OF CHARTS

Chapter I

LIST OF TABLES

Chapter I

Chapter II

List of Select Abbreviations

AANA	Average Aggregate Notional Amount
AEs	Advanced Economies
AFA	Additional Factor of Authentication
AFS	Available for Sale
AID	All Inclusive Direction
AIFIs	All-India Financial Institutions
AMC-MFs	Asset Management Companies-Mutual Funds
AMFI	Association of Mutual Funds in India
AML	Anti Money Laundering
APY	Atal Pension Yojana
ARDL	Autoregressive Distributed Lag
AUM	Assets Under Management
BCBS	Basel Committee on Banking Supervision
BEER	Bond-Equity-Earnings-Yield Ratio
BIFR	Board for Industrial and Financial Reconstruction
BIS	Bank for International Settlements
BOS	Banking Ombudsman Scheme
CAB	Current Account Balance
CASA	Current Account Savings Account
CBDCs	Central Bank Digital Currencies
CBLO	Collateralized Borrowings & Lending Obligation
CCIL	Clearing Corporation of India Limited
CCPs	Central Counterparties
CD	Certificate of Deposit
CDS	Credit Default Swap
CDSL	Central Depository Services Limited
CERT-In	Indian Computer Emergency Response Team
CET-1	Common Equity Tier 1
CFT	Combating of Financing of Terrorism
CIRP	Corporate Insolvency Resolution Process
CLT	Central Ledger Technology
CNAV	Constant Net Asset Value
CPs	Commercial Papers
CPI	Consumer Price Index
CRAR	Capital to Risk-Weighted Assets Ratio
CRAs	Credit Rating Agencies
CRE-RH	Commercial Real Estate – Residential Housing
CRILC	Central Repository of Information on Large Credits
CRR	Cash Reserve Ratio
CSIRT-FIN	Computer Security Incident Response Team – Finance Sector
CSK	Cyber Swachhta Kendra
DBU	Digital Banking Unit
DCCBs	District Central Cooperative Banks
DeFi	Decentralised Finance
DICGC	Deposit Insurance and Credit Guarantee Corporation
DIF	Deposit Insurance Fund
DIIs	Domestic Institutional Investors
DPD	Days Past Due
DLT	Distributed Ledger Technology
EBLR	External Benchmark Linked Lending Rate
ECBs	External Commercial Borrowings
ECLGS	Emergency Credit Line Guarantee Scheme
e-KYC	e-Know Your Customer
EMDEs	Emerging Market and Developing Economies

EMEs	Emerging Market Economies
EMI	Equated Monthly Instalment
ESG	Environmental, Social, and Governance
ESMA	European Securities and Market Authority
ESRB	European Systemic Risk Board
EVE	Economic Value of Equity
FAO	Food and Agricultural Organisation
FBIL	Financial Benchmark India Pvt Ltd
FBs	Foreign Banks
FCNR(B)	Foreign Currency Non-Resident (Banks)
FCs	Financial Creditors
FDI	Foreign Direct Investment
FIIs	Foreign Institutional Investors
FinTech	Financial Technology
FMEs	Fund Management Entities
FoF	Fund-of-Funds
FPI	Food Price Index
FPIs	Foreign Portfolio Investors
FRA-OIS	Forward Rate Agreement – Overnight Interest Swap
FSB	Financial Stability Board
FSDC	Financial Stability & Development Council
FSDC-SC	Financial Stability and Development Council - Sub Committee
FSR	Financial Stability Report
GDP	Gross Domestic Product
GFC	Global Financial Crisis
GFD	Gross Fiscal Deficit
GNPA	Gross Non-Performing Asset
G-SIBs	Global Systemically Important Banks
GVA	Gross Value Added
HFCs	Housing Finance Companies
HFT	Held for Trading
HNIs	High Net Worth Individuals
HPI	House Price Index
HQLAs	High Quality Liquid Assets
HTM	Held-to-Maturity
IBC	Insolvency and Bankruptcy Code
ICEX	Indian Commodity Exchange Ltd
IFSC	International Financial Service Centre
IFSCA	International Financial Services Centres Authority
IMD	Indian Meteorological Department
IMF	International Monetary Fund
InvITs	Infrastructure Investment Trusts
IORS	Inter-Operable Regulatory Sandbox
IOSCO	International Organisation of Securities Commissions
IPO	Initial Public Offering
IRB	Internal Rating Based
IRDAI	Insurance Regulatory and Development Authority of India
JPY	Japanese Yen
KMPs	Key Management Personnel
KYC	Know Your Customer
LABs	Local Area Banks
LCR	Liquidity-Coverage Ratio
LEI	Legal Entity Identifier
LT	Long-term
LTV	Loan-to-Value
MCLR	Marginal Cost of Funds Based Landing Rate
MCX	Multi-Commodity Exchange of India Limited
MCX BULLDEX	MCX iCOMDEX Bullion Index
MCX METLDEX	MCX iCOMDEX Base Metal Index
MMFs	Money Market Funds

mPoS	Mobile PoS
MSME	Micro, Small and Medium Enterprises
MST	Macro Stress Test
MTM	Mark-To-Market
NaBFID	National Bank for Financing Infrastructure and Development
NBFC	Non-Banking Financial Company
NBFC-ICC	NBFC-Investment and Credit Company
NBFC-IDF	NBFC- Infrastructure Debt Fund
NBFC-IFC	NBFC- Infrastructure Finance Company
NBFC-MFI	NBFC-Micro Finance Institutions
NBFIs	Non-Banking Financial Intermediaries
NCCDs	Non-Centrally Cleared Derivatives
NCDEX	National Commodity and Derivatives Exchange Limited
NCGTC	National Credit Guarantee Trustee Company Limited
NCLT	National Company Law Tribunal
NDS-OM	Negotiated Dealing System – Order Matching
NDTL	Net Demand & Time Liabilities
NIIs	Non-Institutional Investors
NII	Net Interest Income
NIM	Net Interest Margin
NNPA	Net Non Performing Asset
NOF	Net Owned Funds
NPA	Non-Performing Asset
NPL	Non-Performing Loans
NPS	National Pension System
NPV	Net Present Value
NRIs	Non-Resident Indians
NSDL	National Securities Depository Limited
NSE	National Stock Exchange
NSO	National Statistical Office
NSUCBs	Non-Scheduled Urban Cooperative Banks
OCs	Operational Creditors
OEFs	Open-Ended Funds
OFS	Offer for Sale
OIS	Overnight Indexed Swap
OOI	Other Operating Income
OTC	Over-the-Counter
PAT	Profit After Tax
PFCE	Private Final Consumption Expenditure
PCR	Provisioning Coverage Ratio
PDs	Primary Dealers
PE	Price to Earning
PFRDA	Pension Fund Regulatory and Development Authority
PIDF	Payments Infrastructure Development Fund
PMCBL	Punjab and Maharashtra Co-operative Bank Ltd
PMS	Portfolio Management Services
POA	Power of Attorney
PoS	Point of Sale
PRA	Prudential Regulation Authority
PSBs	Public Sector Banks
PSL	Priority Sector Lending
PSPs	Payments Service Providers
PSUs	Public Sector Undertakings
PVBs	Private Sector Banks
QE	Quantitative Easing
QR	Quick Response
QT	Quantitative Tightening
RAPMS	Residential Asset Price Monitoring Survey

RB-IOS	Reserve Bank - Integrated Ombudsman Scheme
RCBs	Rural Cooperative Banks
RDG	Retail Direct Gilt
RDGAHs	Retail Direct Gilt Account Holders
REITs	Real Estate Investment Trusts
REs	Regulated Entities
RF	Resolution Framework
RFQ	Request for Quotes
RoA	Return on Asset
RoE	Return on Equity
RR	Risk Reversal
RRBs	Regional Rural Banks
RWA	Risk-Weighted Assets
SCBs	Scheduled Commercial Banks
SD	Standard Deviation
SDF	Standing Deposit Facility
SDLs	State Development Loans
SEBI	Securities and Exchange Board of India
SFBs	Small Finance Banks
SIPs	Systematic Investment Plans
SLR	Statutory Liquidity Ratio
SMARTs	Securities Market Trainers
SMAs	Special Mention Accounts
SPDs	Standalone Primary Dealers
SRS	Systemic Risk Survey
StCBs	State Cooperative Banks
SUCBs	Scheduled Urban Cooperative Banks
UCB	Urban Cooperative Bank
UPI	Unified Payment Interface
USFB	Unity Small Finance Bank
VAR	Vector Auto Regression
VRRR	Variable Rate Reverse Repo
WALR	Weighted Average Lending Rate
WPI	Wholesale Price Index
YTM	Yield to Maturity

Overview

The Financial Stability Report (FSR) is published biannually and includes contributions from all the financial sector regulators. Accordingly, it reflects the collective assessment of the Sub Committee of the Financial Stability and Development Council (FSDC-SC) on risks to stability of the Indian financial system.

Macrofinancial Risks

The outlook for the global economy is shrouded by considerable uncertainty on account of the war in Ukraine, elevated commodity prices, supply chain disruptions and darkening growth prospects. In tandem, front-loaded monetary policy normalisation in response to persistently high inflation is imparting high volatility to global financial markets. The evolving outlook is particularly challenging for emerging market economies (EMEs) that face rising indebtedness, currency depreciations, capital outflows and reserve losses, even as they grapple with the ravages of the pandemic. Stagflation risks are mounting for EMEs and advanced economies (AEs) alike as tightening financial conditions threaten to restrain the pace of growth with inflationary pressures.

Domestic Economy and Markets

In the Indian economy, high-frequency indicators point to a gradual but unevenly strengthening recovery in the first quarter of 2022-23, in spite of headwinds from the geopolitical situation, elevated commodity prices, especially of crude oil, and volatile financial conditions, as global spillovers endeavour to unsettle domestic financial markets with bouts of turbulence.

While corporate sales and profitability have risen, a durable commencement of the capex cycle remains elusive. Bank credit growth is picking up steadily, already clocking double digits. Banks have also bolstered capital and liquidity positions while asset quality has improved. Non-banking financial companies (NBFCs) remain well capitalised. Market risks are rising as spells of volatility are unleashed by foreign portfolio investment outflows and the sharp appreciation of the US dollar.

Financial Institutions: Soundness and Resilience

Scheduled commercial banks (SCBs) maintained robust capital positions, with the Capital to Risk Weighted Assets Ratio (CRAR) and Common Equity Tier 1 (CET-1) Ratio of SCBs as high as 16.7 per cent and 13.6 per cent, respectively, in March 2022, and improving returns on assets (RoA) and returns on equity (RoE). SCBs' gross non-performing assets (GNPA) ratio slipped to a six-year low of 5.9 per cent and net non-performing assets (NNPA) ratio fell to 1.7 per cent in March 2022. The provisioning coverage ratio (PCR) increased to 70.9 per cent in March 2022 from 67.6 per cent in March 2021.

Macro-stress tests for credit risk reveal that SCBs are well-capitalised and all banks would be able to comply with the minimum capital requirements even under adverse stress scenarios.

The CRAR of urban co-operative banks (UCBs) rose to 15.8 per cent in March 2022 while that of NBFCs stood at 26.9 per cent.

Network analysis indicates that the total outstanding bilateral exposures among constituents of the financial system continued to grow. The share of SCBs in bilateral exposure remain the largest, although, it is lower than pre-pandemic levels. A simulated contagion analysis shows that even though losses due to failure of five banks with the maximum capacity to cause contagion increased in March 2022 *vis-à-vis* their September 2021 position, this would not lead to failure of any additional bank.

Regulatory Initiatives and Other Developments in the Financial Sector

Regulators across the globe are focusing their attention on reprioritising regulatory initiatives even as they learn from the lessons gleaned during the pandemic. Strengthening the regulation of non-bank financial intermediation remains a priority. Developments in the crypto ecosystem and the broader role of technology in financial services are also receiving increased attention. Domestically, efforts continue to fortify the financial system against sudden shocks and to improve the credit environment to support the recovery while ensuring macroeconomic and financial stability.

Assessment of Systemic Risk

In the latest systemic risk survey (SRS) conducted by the Reserve Bank in May 2022, global spillovers and financial market volatility moved to the 'high' risk category. Global growth uncertainty, commodity price movements, geopolitical conditions and monetary tightening in AEs were perceived to be the major drivers of global risks. Macroeconomic, institutional and general risks were perceived as 'medium'. Nearly eighty per cent of the respondents judged that the prospects of the Indian banking sector are likely to improve or remain unchanged over a one-year horizon.

Chapter I
Macrofinancial Risks

The global economic outlook is clouded by the ongoing war in Europe and the pace of monetary policy tightening by central banks in response to mounting inflationary pressures. The Indian economy is facing spillovers from global conditions but remains on the path of recovery. The financial system remains resilient and supportive of economic revival. Banks as well as non-banking institutions have sufficient capital buffers to withstand sudden shocks. High inflationary pressures, external spillovers and geopolitical risks warrant careful handling and close monitoring.

Introduction

1.1 Shock waves from the war in Ukraine and retaliatory economic and financial sanctions have jolted the global economy, already beleaguered by successive waves of the COVID-19 pandemic, the quickening pace of monetary policy normalisation and the associated surges of volatility in global financial markets. Global growth is slowing, and downside risks weigh on the outlook. As the fallout of the war reverberates through commodity markets, price pressures have soared from elevated levels and broadened, threatening to unhinge inflation expectations and trigger second order effects, disrupt international trades and dent consumer and business confidence. Meanwhile, the resurgence of COVID-19 infections in several parts of the world is likely to prolong supply chain bottlenecks, exacerbating the strains that have been persisting over the past two years. Overall, for the global economy, stagflation concerns seem to be transitioning from a risk scenario to a baseline scenario.

1.2 Adverse macrofinancial loops are surfacing with the tightening of financial conditions and spikes in volatility. Across emerging and developing economies, debt distress is rising as external funding conditions turn austere, compounded by currency depreciation and drainage of reserves as investors shun them as an asset class and fly to the safe haven of the relentlessly strengthening US dollar (USD). In financial markets, volatility has risen in bond markets and patches of illiquidity are evident amidst hardening of yields and instances of inversion of yield curves. Corporate bond spreads are also rising, approaching median levels seen during the global financial crisis. In commodity markets too, dollar funding shortages and liquidity mismatches rose in response to margin requirements by central counterparties (CCPs) as commodity prices head north.

1.3 The Indian economy appears to have weathered the third wave of the pandemic associated with the Omicron variant, although the war in Ukraine is now casting a long shadow on the outlook. While the end-May 2022 data release of the National Statistical Office (NSO) points to real GDP and major supply side categories in 2021-22 exceeding their pre-pandemic 2019-20 levels, high-frequency indicators present a mix picture. Urban demand appears to be on a firmer footing than rural demand, although the outlook for the latter is brightening with the prospects of a normal south-west monsoon predicted by Indian Meteorological Department (IMD) and Skymet. Consumption demand is gradually recovering, with some evidence of the demand for contact intensive services regaining traction, especially transportation and hospitality. Investment activity is also picking

up but remains incipient at this stage. Exports of merchandise and services are robust and the sustained increase in non-oil, non-gold imports attest to the strength of underlying demand.

1.4 Turning to domestic financial developments, equity markets have seen some recent corrections, although valuations remain stretched. The amount of foreign portfolio outflows has been offset by investments from domestic institutional investors. Domestic bond markets are experiencing global spillovers from hardening bond yields abroad and volatile international crude prices, besides rise in policy rates and bearish sentiment driven by a large government borrowing programme. While the Indian rupee (INR) has been subjected to bouts of downward pressure, it has emerged among the better performing currencies relative to peers. Among financial institutions, banks have reduced gross non-performing asset (GNPA) ratio through recoveries, write-offs and reduction in slippages. Capital and liquidity buffers have been built up well above regulatory requirements, including by accessing markets, and SCBs taken together are seeing a modest return to profitability. These developments have catalysed the growth of bank credit to double digits, tracking nominal GDP growth. Non-banking financial companies (NBFCs) have also benefited from regulatory dispensations, including the congenial financial conditions engendered by the Reserve Bank's monetary and liquidity operations.

1.5 Overall, global financial stability risks have risen since the publication of the December 2021 Financial Stability Report (FSR), while domestic macroeconomic and financial developments appear to have decoupled and posted a modest improvement. The near-term outlook remains uncertain, overcast with the overwhelming geopolitical conditions and their highly uncertain evolution. Against this backdrop, this chapter analyses macrofinancial risks arising from global developments in Section I.1 and possible spillovers to the domestic economy in Section I.2. The chapter concludes with important findings of the Reserve Bank's latest Systemic Risk Survey conducted in May 2022.

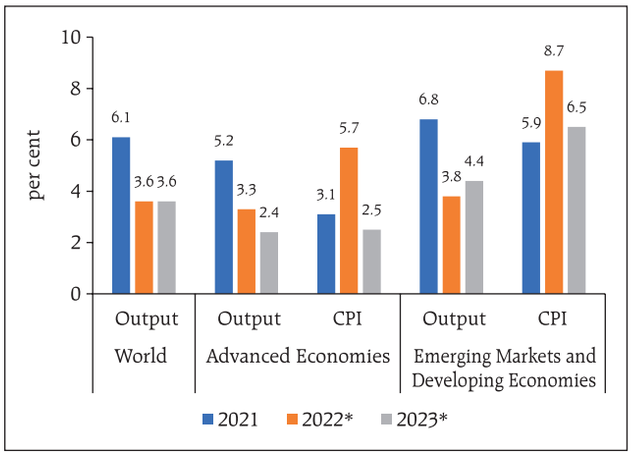
I.1 Global Backdrop

I.1.1 Macrofinancial Developments and Outlook

1.6 Global economic prospects have deteriorated markedly since the December 2021 issue of FSR as the economic and financial ramifications of the war and sanctions take their toll. As recently as January 2022, the International Monetary Fund (IMF) had projected global growth at 4.4 per cent in 2022, half a percentage point lower than its October 2021 forecast. In April 2022, it expected the shock of the war to interact with the monetary tightening, financial market volatility, the pandemic, and unequal vaccine access to cause global growth to decline to 3.6 per cent in 2022 from 6.1 per cent in 2021. Both AEs and emerging market and developing economies (EMDEs) are expected to lose pace by 1.9 percentage points and 3.0 percentage points, respectively[1]. Global trade volume is now expected to slow down from 10.1 per cent in 2021 to 5.0 per cent in 2022, mainly because of moderation in merchandise trade, since services trade is likely to remain subdued. Inflation would be pushed up in the range of 2.6 percentage points for AEs and 2.8 percentage points for EMEs (Charts 1.1 and 1.2). Inflation all around is now expected to stay elevated for longer than earlier anticipated. In most EMDEs, rising food prices and shortages of essential commodities have exposed vulnerable sections of society to food insecurity and erosion of livelihood.

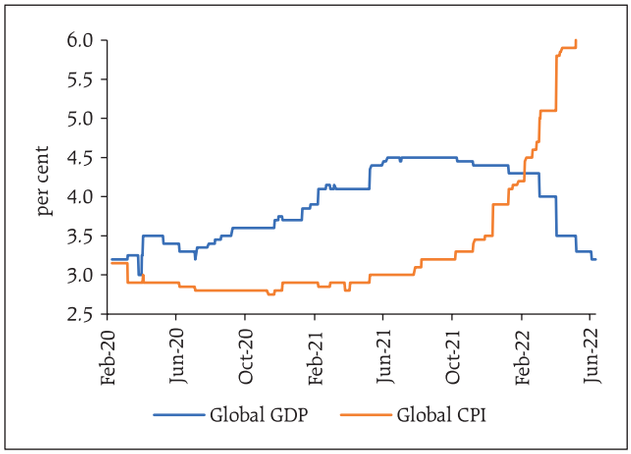
[1] International Monetary Fund (2022), *World Economic Outlook: War Sets Back the Global Recovery*, Washington, DC, April

Chart 1.1: IMF Forecasts for Growth and Inflation



Note *: Projections.
Source: IMF's World Economic Outlook Database (April 2022).

Chart 1.2: Consensus Expectations of Global GDP Growth and CPI Inflation

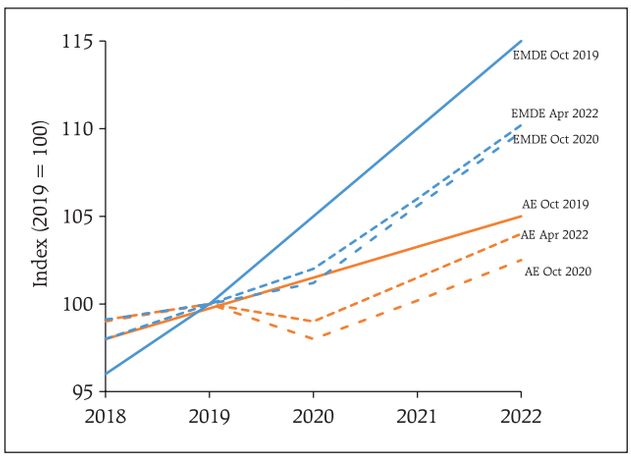


Note: Forecasts derived from the latest monthly and quarterly surveys conducted by Bloomberg and from forecasts submitted by various banks.
Source: Bloomberg

1.7 EMDEs are likely to be at the receiving end of geopolitical spillovers, in spite of being bystanders. Worryingly, rising interest rates will tighten external financing conditions heterogeneously, but all of them remain vulnerable to a generalised flight of capital to safety. Those with large debt overhang will face pressure on budgets and debt servicing. Scarring effects are large for EMDEs due to human capital and investment losses that will keep output below the pre-pandemic trend till 2026 (Chart 1.3).

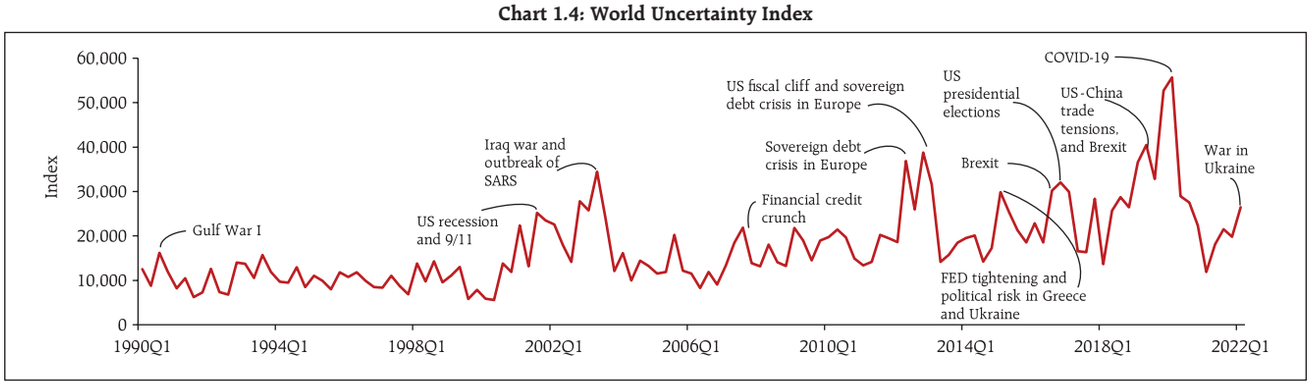
1.8 Reflecting the uncertainty surrounding the course of the war, persistence of inflation and the future path of the pandemic, global uncertainty has surged (Chart 1.4), which by itself, could reduce global growth by 0.35 percentage points[2].

Chart 1.3: Potential GDP: IMF Projections for AEs and EMDEs



Source: IMF.

Chart 1.4: World Uncertainty Index



Note: The chart is prepared by counting the percent of the word "uncertain" (or its variant) in the Economist Intelligence Unit country reports. The index is rescaled by multiplying by 1,000,000. A higher number means higher uncertainty and *vice versa*.
Sources: Ahir, Bloom, and Furceri (2022), IMF.

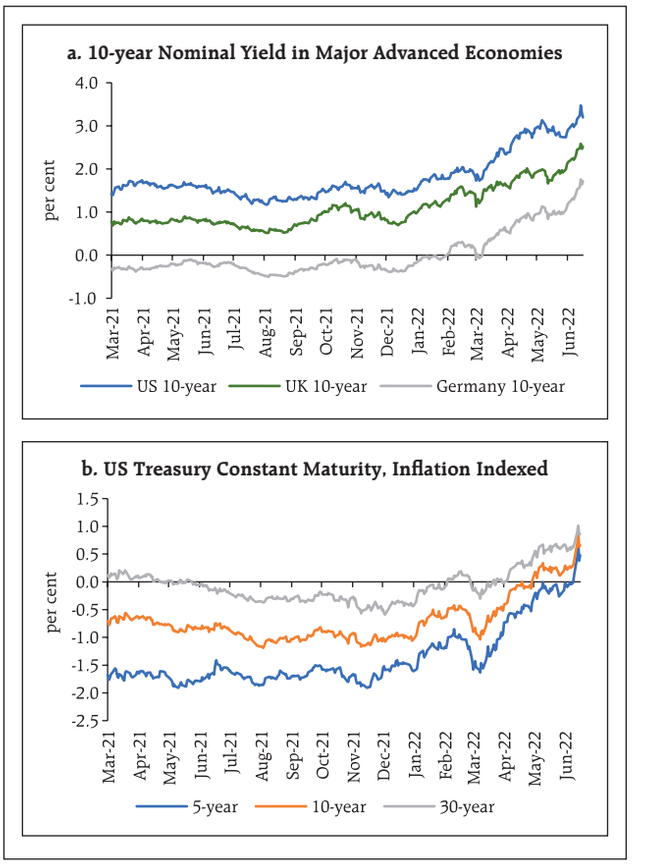
[2] Ahir, Bloom, and Furceri (2022), IMFBlog, *Global Economic Uncertainty, Surging Amid War, May Slow Growth*, April

1.9 In addition to the humanitarian crisis, multiple headwinds are impacting the global economy and the international financial system: a terms-of-trade shock that is deleterious for commodity importers; tightening of global financial conditions; repricing of EME assets and consequent flight of capital; and pressures on exchange rates that amplify already persistent inflation. Going forward, the risks are large and to the downside – the possible escalation of war; social unrest due to shortages; resurgence of the pandemic; slowdown in growth in one of the major economies and climate conditions overshooting the Paris Agreement goals.

1.10 As the normalisation of monetary policy, *i.e.*, rate hikes and quantitative tightening (QT) in response to hardening inflationary pressures get synchronised, global financial conditions are likely to tighten significantly, as already being seen in yields across the US and other major AEs. In particular, the US 10-year treasury yield rose by 168 bps (as on June 16, 2022) since end-December 2021 (Chart 1.5).

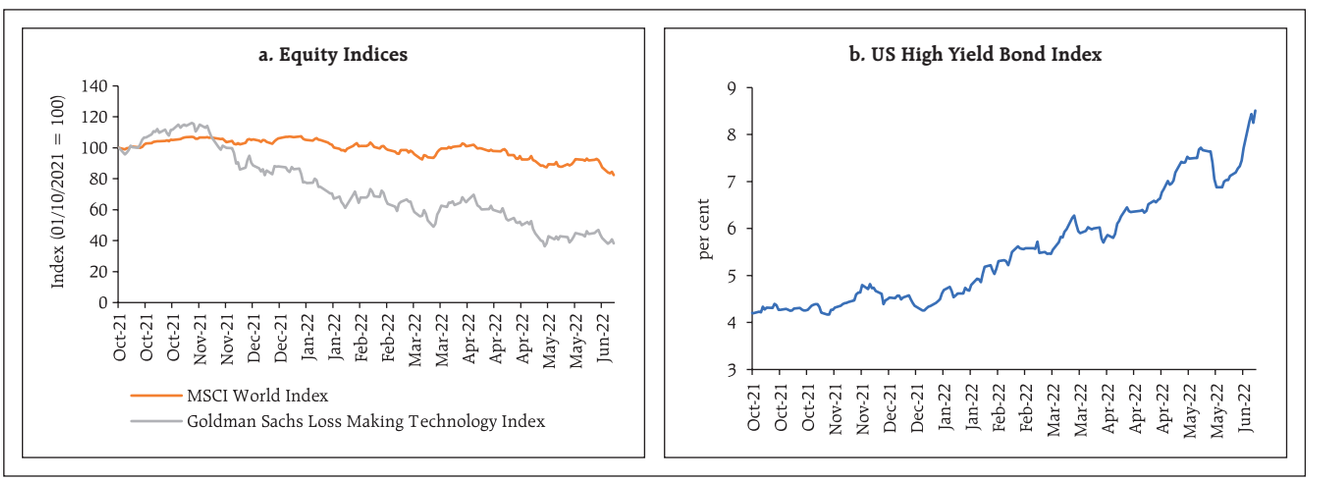
1.11 The rise in nominal and real yields have resulted in a sell-off in equity markets - technology stocks taking the biggest hit - with concomitant widening of spread on high-yield bonds (Charts 1.6 a and b).

Chart 1.5: G-Sec Yields



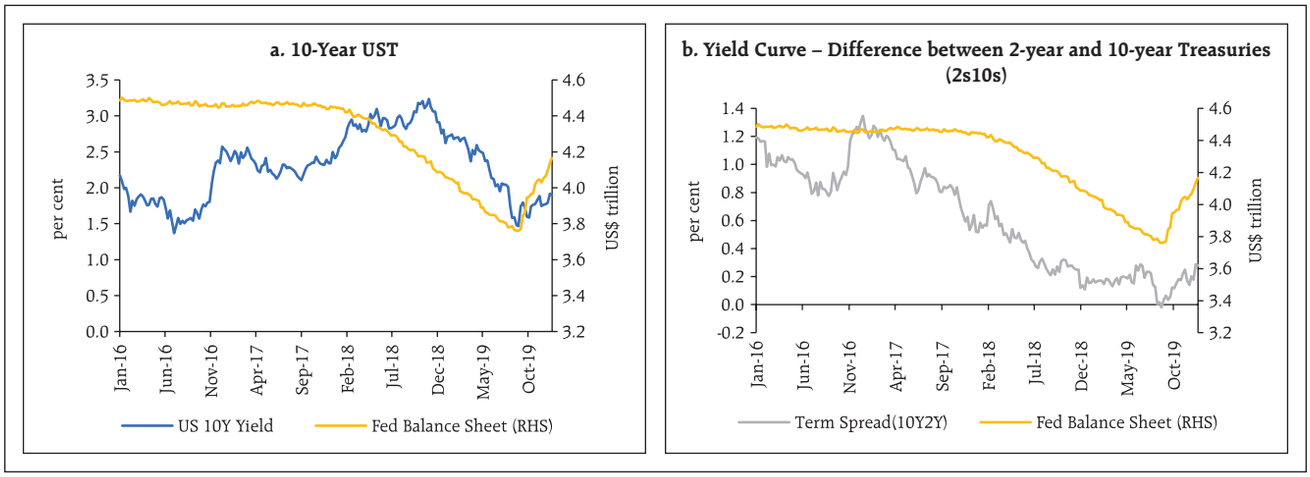
Source: Bloomberg and FRED.

Chart 1.6: Equity and Bond Indices



Source: Bloomberg and FRED.

Chart 1.7: Impact of QT in 2017-18

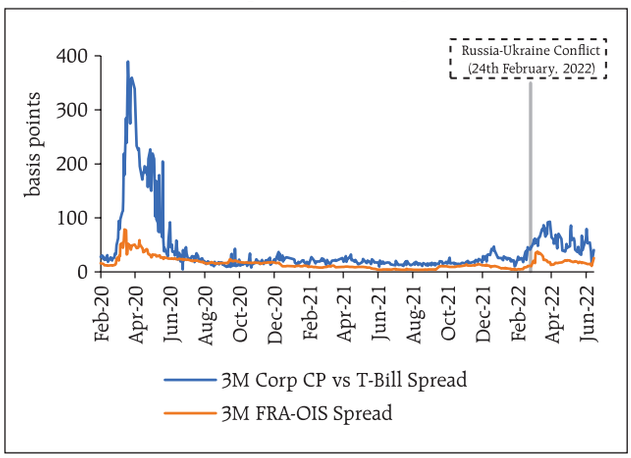


Source: Bloomberg.

1.12 The impact of QT on financial markets and the economy at large is still unfolding. While policymakers have a handle on the implications of interest rate changes, there is less precision on the effects of increase or decrease in asset holdings by central banks, especially when thresholds are less precisely defined. Traditionally, central bank balance sheet policies influence the economy through three channels: signalling, duration risk and portfolio rebalance. The signalling channel influences the future path of interest rates while the duration risk channel influences term premia and the portfolio rebalance channel affects the supply of securities, which, in turn, impact the yields on close substitutes. Just as Quantitative Easing (QE) increases liquidity in the hands of investors and reduces the liquidity premium on the most liquid bonds, QT would decrease reserves and increase demand for safe assets in a period of increased risk aversion, which may partly offset the supply of treasuries, as witnessed in 2018-19 (Chart 1.7). The scale of QT envisaged now has no precedent and its working through the financial system is uncertain, with the possibility that it may induce further volatility in securities markets.

1.13 Signs of stress in short-term dollar funding are also emerging. With the announcement of sanctions, the Forward Rate Agreement – Overnight Indexed Swap (FRA-OIS) spread – a measure of how expensive or cheap it will be for banks to borrow in the interbank market relative to the risk-free rate – has widened, along with spreads on non-financial commercial paper (Chart 1.8).

Chart 1.8: Spreads in Funding Markets



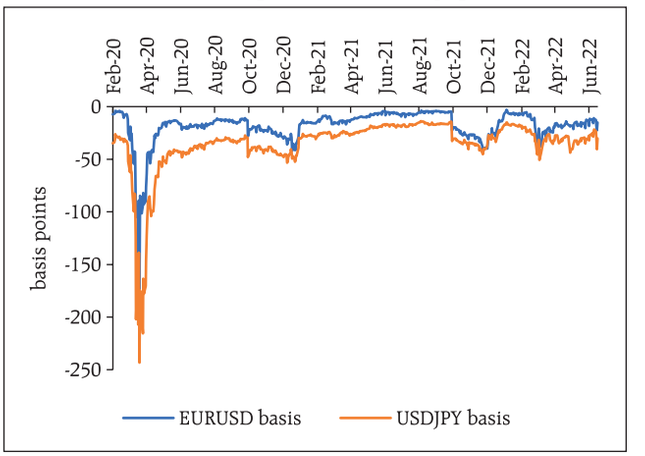
Source: Bloomberg.

1.14 Another key barometer of funding strains in markets, *viz.*, cross-currency swaps, has also tightened in the wake of the war (Chart 1.9), although the repeat of the "dash-for-cash" witnessed in March 2020 is not evident so far.

1.15 Reflecting the increase in risk aversion and impact of monetary policy tightening, corporate bond spreads in the US and in EMEs have widened despite some moderation in June 2022, as valuations increasingly reflect a weak economic outlook (Chart 1.10).

1.16 In sum, synchronised monetary tightening amidst heightened geopolitical tensions poses several financial stability risks: sell-offs of financial assets and market dislocations, especially since central banks may be constrained in their use of tools to address market dysfunction; rise in interest rates and increase in debt servicing costs with debt levels at record highs; and, higher borrowing costs for governments, wider deficits and rollover risks.

Chart 1.9: FX-implied Dollar Funding Spreads



Note: EURUSD and USDJPY 3m OIS cross currency basis (more negative = more expensive USD funding)
Source: Bloomberg

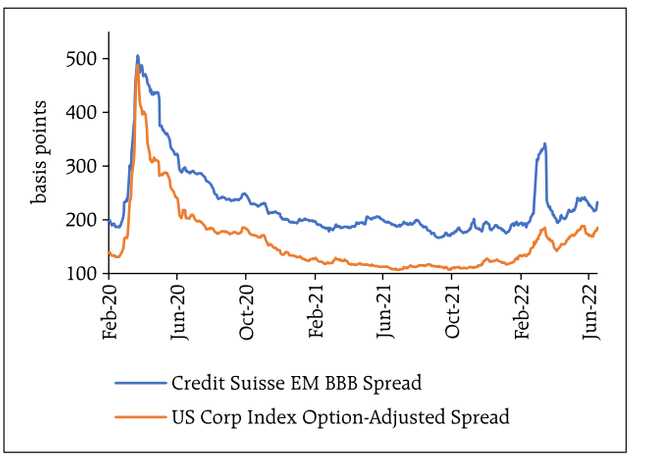
I.1.2 Other Global Macrofinancial Risks

1.17 New stresses have exposed vulnerabilities in hitherto unknown corners of the financial system. Global macrofinancial conditions pose heightened challenges for policy authorities in both AEs and EMEs and threaten to disrupt financial stability.

A. Debt Distress in EMEs

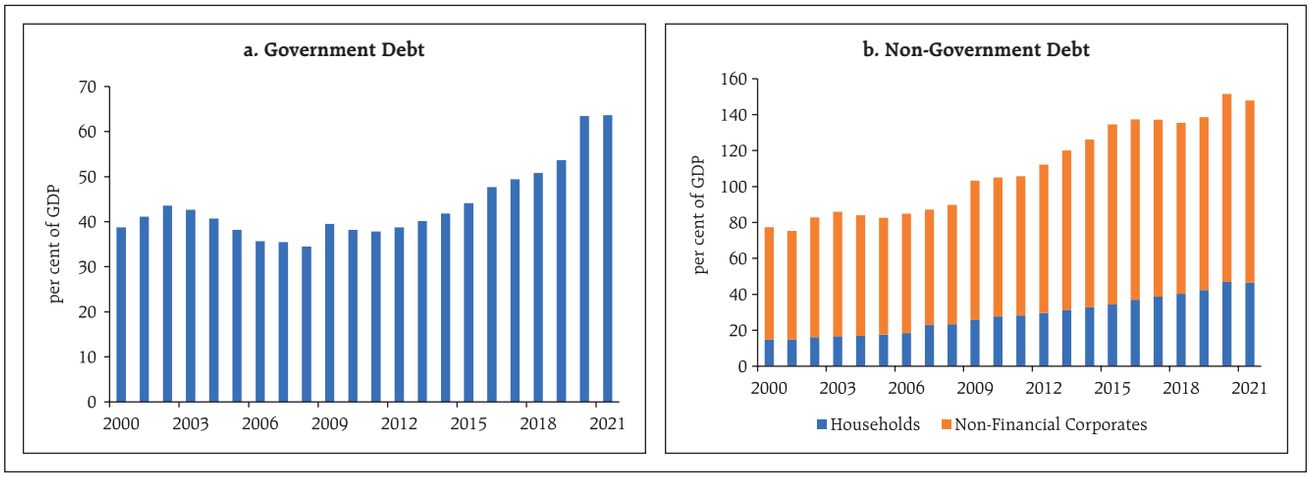
1.18 The economic and financial fallout of the pandemic required active and large fiscal support, which pushed up sovereign debt levels of EMEs

Chart 1.10: Credit Spreads



Sources: Federal Reserve, Bloomberg

Chart 1.11: Emerging Markets Debt



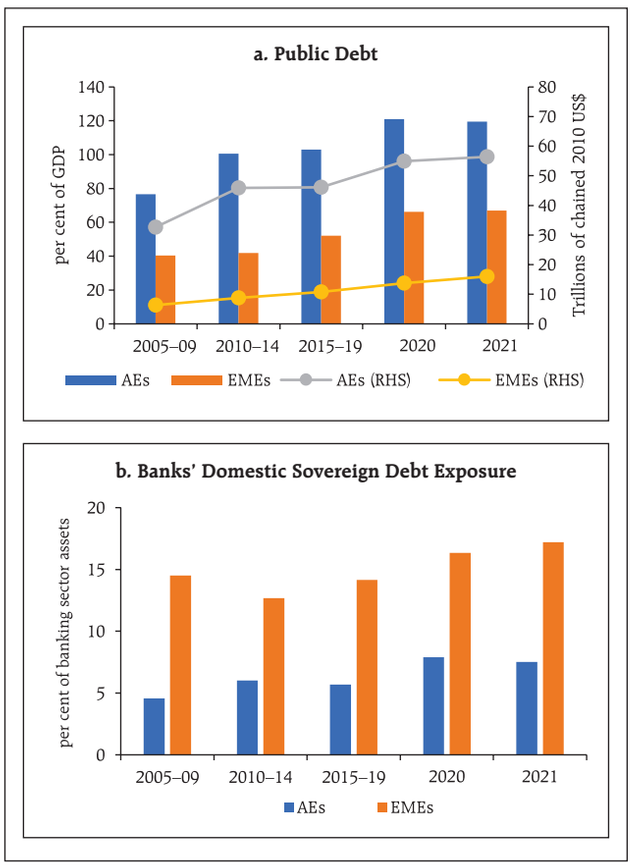
Source: IIF.

significantly (Chart 1.11 a and b). While easy financial conditions and the recovery from the pandemic had helped these countries to sustain such high debt levels up to early 2022, the risk of a debt crisis has risen substantially in recent times, driven by the deteriorating external environment for low-income developing economies and economies that have a high share of dollar-denominated debt. The likely erosion of risk appetite and tighter financial conditions could increase debt-servicing costs at a time when their ability to generate foreign exchange to service debt appear to be more constrained. From a financial stability perspective, higher debt levels in the face of macroeconomic shocks can increase the probability of default. Deleveraging could lead to reduction in aggregate demand, amplifying shocks to the financial system into a systemic shock.

B. Sovereign Debt Holdings and Bank Balance-sheet Nexus

1.19 As banks' holdings of sovereign debt increased in EMEs (Chart 1.12), it has deepened the so-called sovereign-bank nexus[3] as governments depend on banks for financing of sovereign bonds and banks

Chart 1.12: Public Debt and Banks' Exposure



Source: IMF.

[3] International Monetary Fund (2022), "Global Financial Stability Report—Shockwaves from the War in Ukraine Test the Financial System's Resilience", Washington, DC, April.

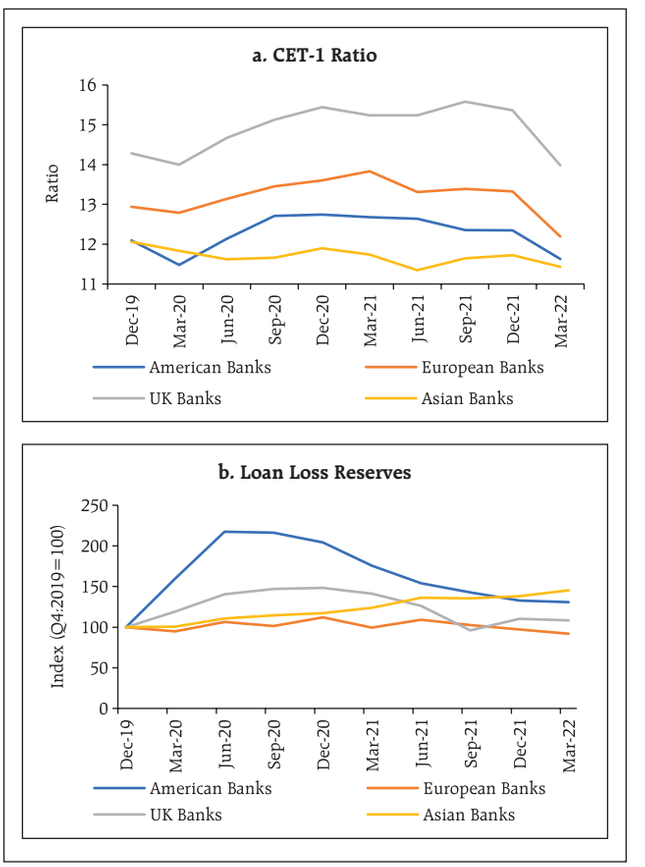
rely on government securities for investment, for meeting regulatory requirements, and as collateral to obtain funding from central bank and others.

1.20 With the sovereign credit outlook deteriorating in several emerging markets, the nexus between sovereign debt holdings and bank balance sheets poses risks to macro-financial stability. Hardening of government bond yields in the face of additional borrowing could result in mark-to-market losses for banks. This could potentially reduce their lending and adversely affect overall economic activity, especially in countries with high fiscal vulnerability and less capitalised banking systems. If banks' appetite to hold sovereign debt diminishes in such a scenario, it could trigger negative feedback loops through multiple channels. Other potential channels of risk highlighted by the IMF[4] include: (i) reduction in bank soundness and potential for lending to the economy; (ii) diminished ability of governments to support banks in times of stress due to deteriorating government finances; and (iii) headwinds to economic recovery as monetary tightening adversely impacts corporate profitability and increases credit risk for banks.

1.21 The IMF's recommended policy response to mitigate risks include: (i) fiscal discipline and strengthening of medium-term fiscal frameworks to build resilience; (ii) preserving bank capital resources to absorb losses; (iii) conducting bank stress tests by taking into account the multiple channels of the nexus; (iv) examining options to weaken the nexus once the post-pandemic economic recovery takes hold; and (v) fostering a deep and diversified investor base to strengthen market resilience in countries with underdeveloped local currency bond markets. It also favours a more risk-sensitive regulatory and supervisory treatment with appropriate disclosures on all material sovereign exposures.

1.22 Notwithstanding these multiple challenges, banks exhibit resilience as they entered the pandemic with relatively strong balance sheets, supported by better quality capital and higher liquidity buffers. Losses have been modest and, unlike in the global financial crisis (GFC) when banks deleveraged and cut back on lending, global bank lending remains strong, and the underlying robustness of their solvency and liquidity positions is comforting (Chart 1.13). Market valuations also reflect prices recovering

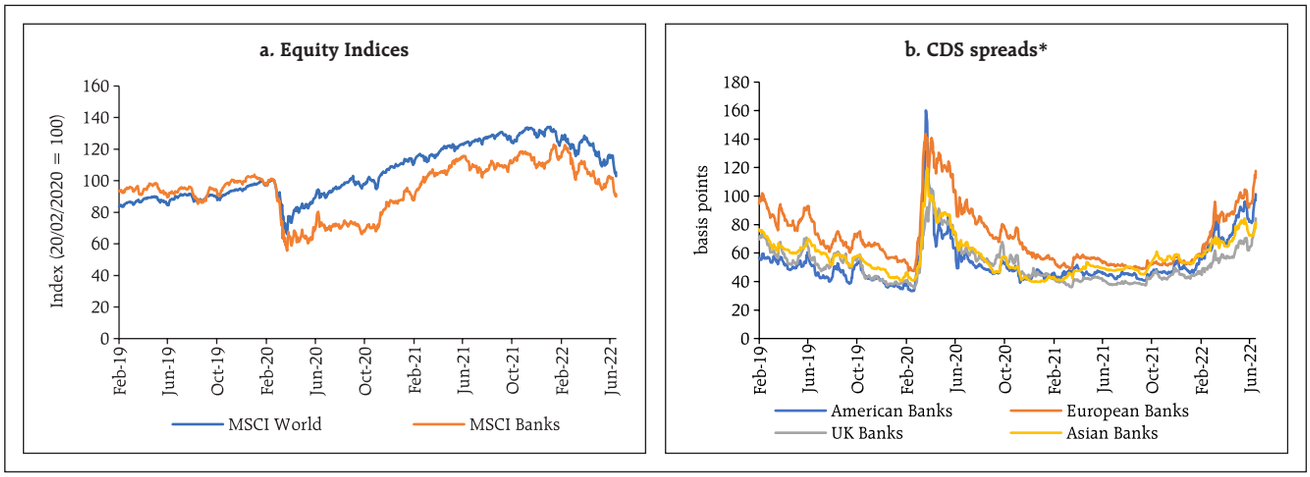
Chart 1.13: Banks' Capital and Provisions*



Note *: Sample of select major banks - American (6), European (9), UK (4) and Asian (7).
Source: Bloomberg.

[4] Ibid.

Chart 1.14: Equity Prices and Credit Default Swap (CDS) Spreads



Note *: Sample of select major banks - American (8), European (7), UK (4) and Asian (5).
Source: Bloomberg and Refinitiv.

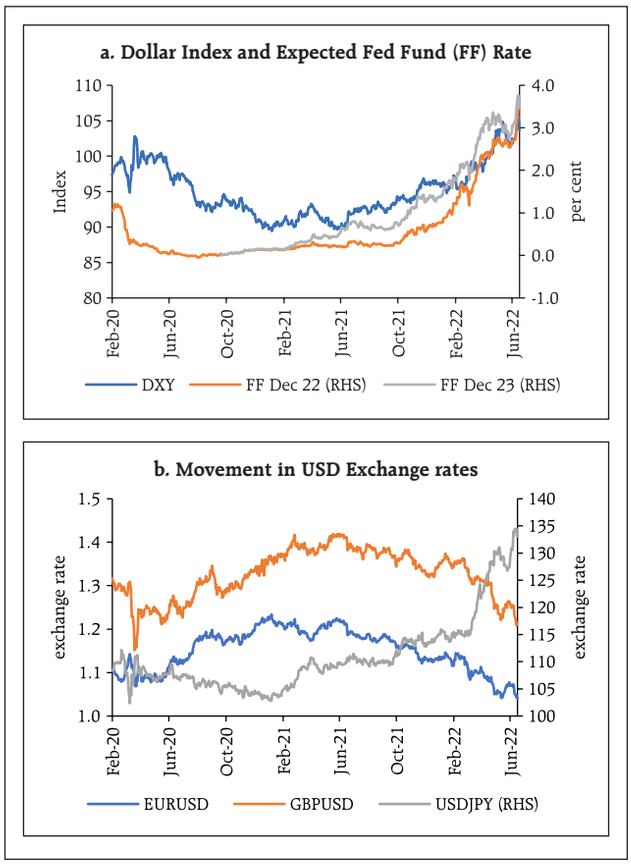
to pre-pandemic levels, even though there has been some moderation in recent period (Chart 1.14).

C. Capital Flows and Exchange Rate Volatility

1.23 The unrelenting ascent of the USD against its AE peers has also contributed to the tightening of financial conditions by triggering a 'flight-to-home' bias, especially among passive investors tracking indices (Chart 1.15 a). The USD has now surged to its strongest level in two decades. Even the Japanese Yen (JPY) – usually a safe-haven currency – fell precipitously against the USD as the Bank of Japan reiterated its decision to continue with accommodative monetary policy (Chart 1.15 b).

1.24 Spillovers to EMEs are asymmetric and, in some cases, disruptive, triggering capital outflows

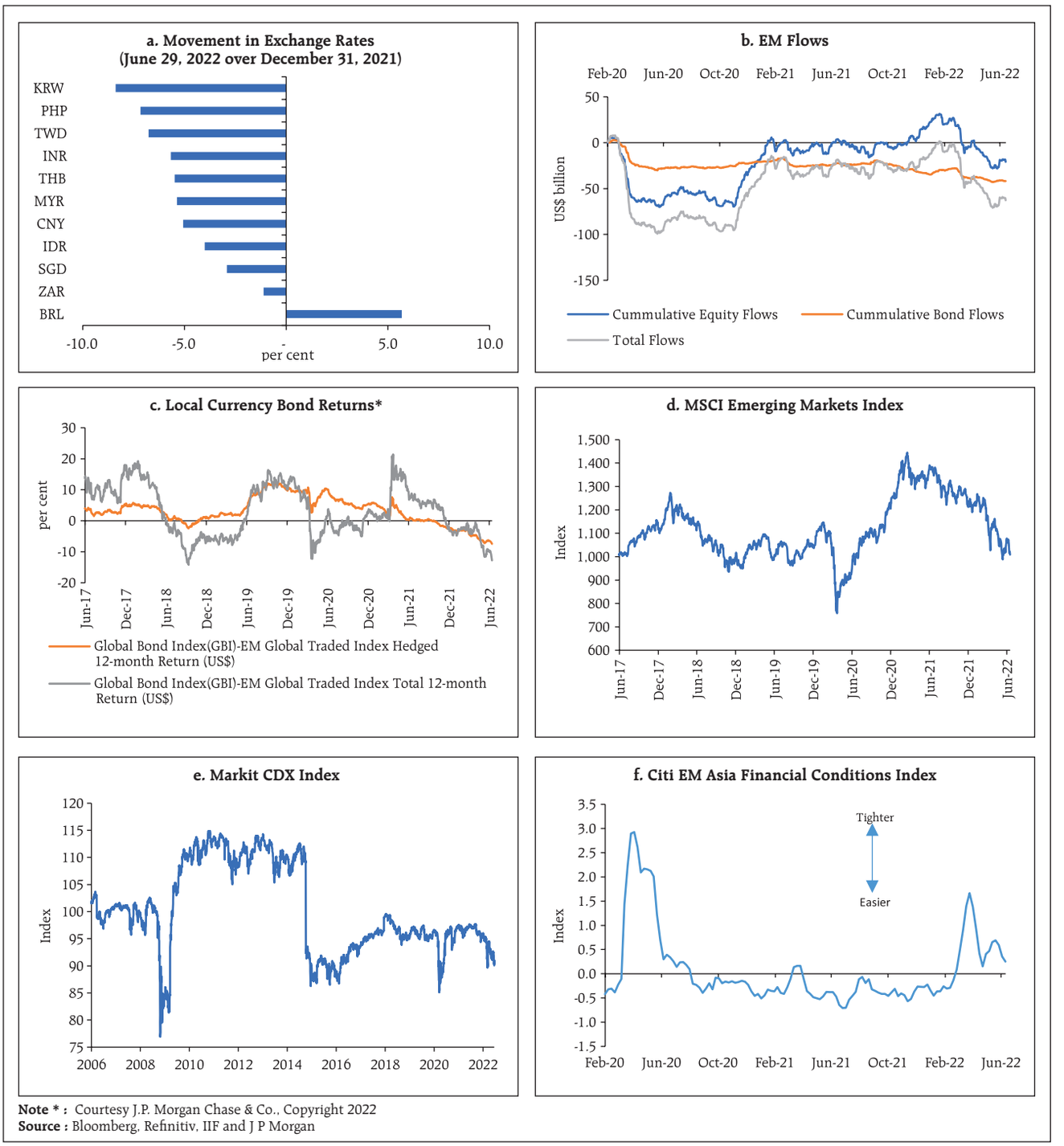
Chart 1.15: Movement in US Dollar



Note: DXY – US Dollar Index, FF – Expected Federal Funds Rate based on Futures in Dec' 22 and 23
Source: Bloomberg

(Charts 1.16 a and b). In some EMEs, local currency bond returns turned negative (Chart 1.16 c), equity prices fell (Chart 1.16 d), and CDS spreads widened (Chart 1.16 e), tightening financial conditions (Chart 1.16 f).

Chart 1.16: Spillovers to Emerging Markets

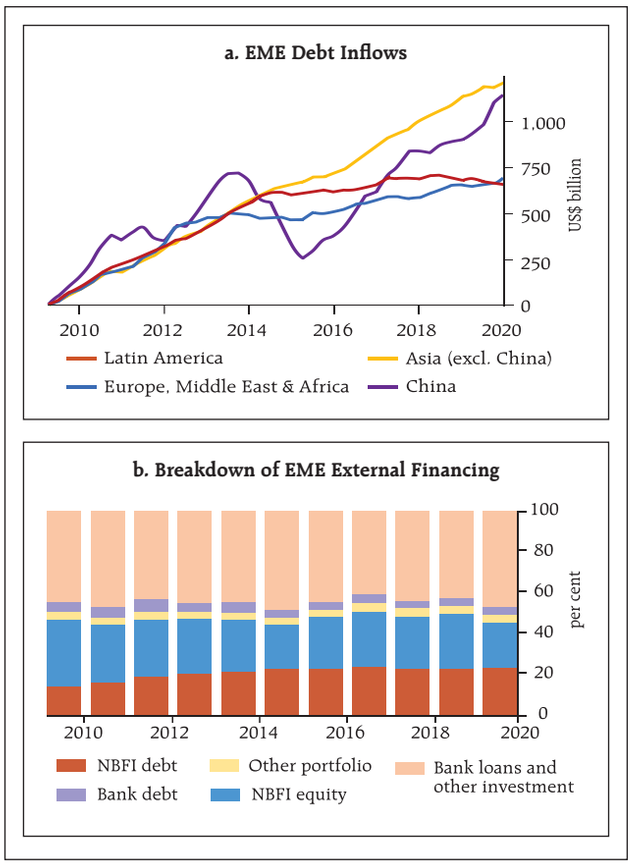


Note * : Courtesy J.P. Morgan Chase & Co., Copyright 2022
Source : Bloomberg, Refinitiv, IIF and J P Morgan

1.25 External debt of EMEs witnessed sharp growth in the post-GFC era (Chart 1.17 a). A study of its financing pattern reveals that non-bank financial institutions (NBFIs) are playing an increasing role in their funding (Chart 1.17 b).

1.26 The Financial Stability Board (FSB)[5] has examined the prominent role of NBFIs in funding EME external debt. Declines in EME asset prices around the COVID-19 outbreak resulted in sales by foreign investors, large-scale capital outflows and currency depreciation in some jurisdictions. Sizable capital outflows were recorded in circuits which relied more on passive bond funds, while sovereign rating downgrades added to corporate borrowing costs. While EME authorities deployed both standard crisis management tools and new measures, such as large-scale asset purchases, to mitigate pressures in local currency bond markets, these actions did not directly address the underlying vulnerabilities in EMEs. The FSB proposes the following broad policy measures: (i) limit the build-up of non-financial corporate foreign currency mismatches; (ii) further develop foreign currency hedging markets at the domestic and regional levels to manage currency risks; (iii) deepen local currency debt markets and foster a broader domestic investor base; (iv) tackle NBFIs' vulnerabilities, including those relating to liquidity mismatches in open-ended funds; and (v) facilitate risk monitoring by closing data gaps and enabling timely adoption of policies to mitigate vulnerabilities.

Chart 1.17: EMEs External Debt



Source: FSB.

D. Risks in NBFIs[6]

1.27 NBFIs potentially reduce cost of borrowing, diversify investor base and enable risk sharing, but they also pose significant challenges as their financing is generally procyclical, fuelling cross-border spillovers. In recent episodes, the flows through NBFIs unwound rapidly during times of stress, engendering quicker transmission of liquidity shocks across countries. This experience brings to the fore the underlying disquiet in the current

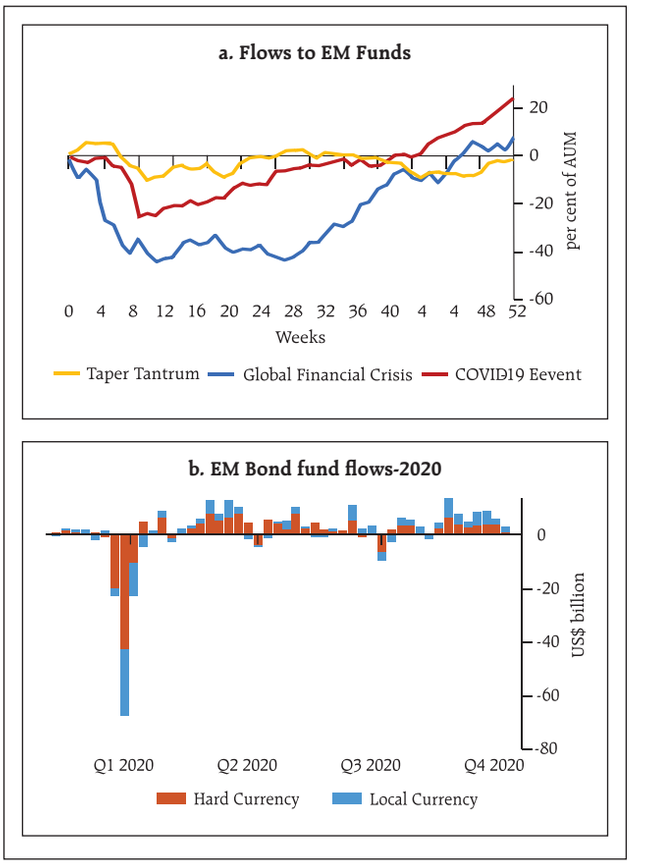
[5] Financial Stability Board (2022), US Dollar Funding and Emerging Market Economy Vulnerabilities, April.

[6] NBFIs are non-bank financial entities as defined by FSB and comprise of all financial institutions that are not central banks, banks or public financial institutions.

phase of tightening of global liquidity conditions (Chart 1.18). Since many of the vulnerabilities in the NBFI sector that emerged during the GFC have also been observed during the pandemic, the increasing role of NBFIs in EME external debt financing requires close monitoring.

1.28 NBFIs account for nearly half of the total global assets of all financial institutions and their interconnectedness in cross-border business is also rising. The complexity of the network of NBFIs and banks in dollar funding chains with multiple layers of intermediation has the potential to amplify contagion. As NBFIs maintain exposure to debt denominated in both foreign and domestic currencies, they often have unhedged exposure/short-term hedges and significant currency mismatches, unlike banks that refrain from maintaining large open currency positions. NBFI exposures can be upsetting in an event of sharp movements in exchange rates. In addition, unlike banks, they do not have strong regulatory prescriptions for liquidity buffers nor do they have access to central bank liquidity. Any liquidity mismatches, therefore, exposes NBFIs to redemption risks and sudden portfolio reallocations, including reduction in funding from banks. In many cases, NBFIs supersede their own risk assessment with algorithm-driven tracking of indices and credit ratings, which leads to herd behaviour and has the potential to intensify cross-border spillovers.

Chart 1.18: Portfolio Outflows



Source: FSB.

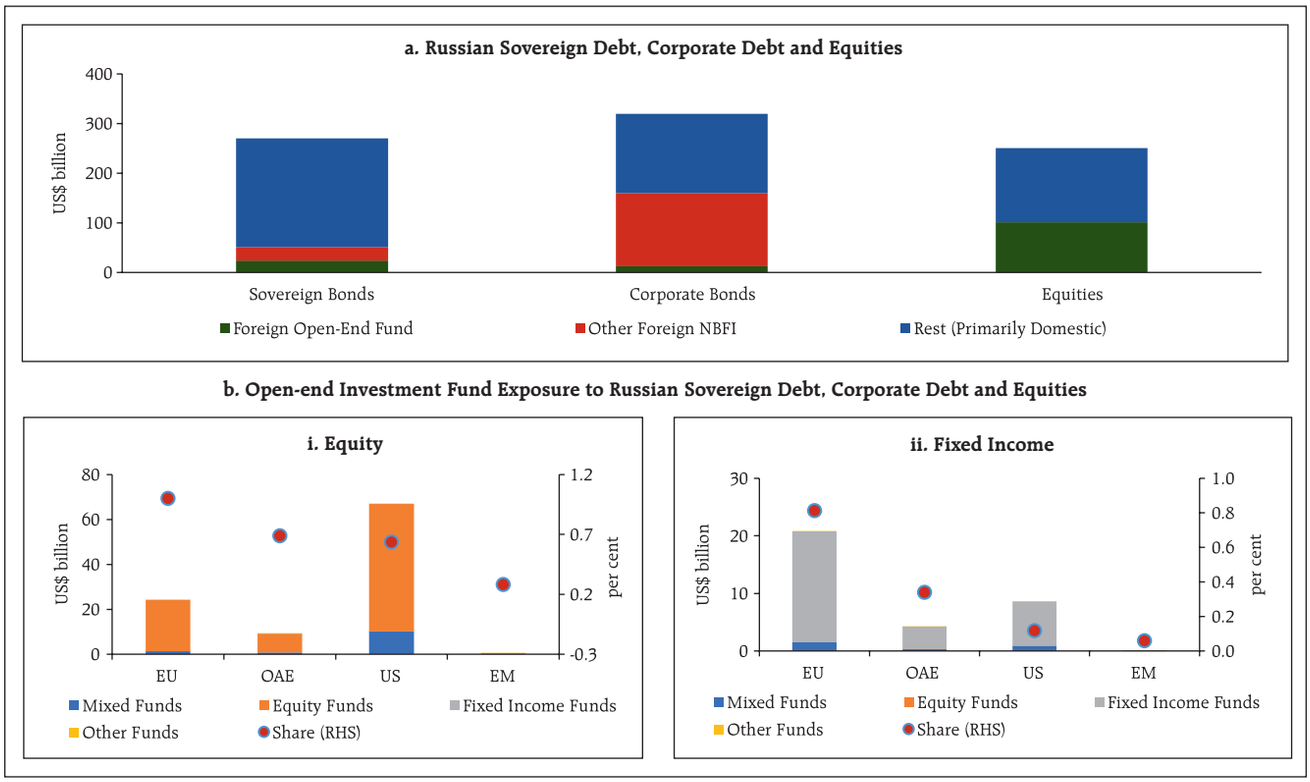
E. Geopolitical Risks

1.29 The war in Ukraine and ensuing sanctions have raised concerns about exposures of banks and non-banks to geopolitical risks. Banks' direct claims on Russia have been on a decline since 2014 and form only 0.3 per cent of total exposures of European Union banks, which have a dominant share worldwide[7]. An area of concern is the extent of indirect exposures resulting from derivative transactions and other off-balance sheet exposures, which are difficult to quantify but could be sizeable. Foreign NBFIs had substantial investment in the Russian sovereign and corporate debts and equities in Q4:2021[8], where high redemption frequency open-ended funds (OEFs) had sizable investments in equities and fixed-income assets, which were predominantly held by US and

[7] European Insurance and Occupational Pensions Authority (2022), Joint Committee Report on Risks and Vulnerabilities in The EU Financial System, March

[8] IMF (2022). Global Financial Stability Report, April

Chart 1.19: Russian Equity and Debt



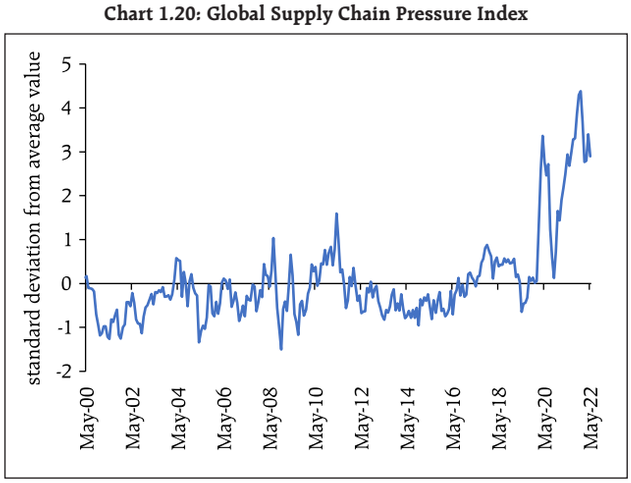
Source: IMF.

European funds (Chart 1.19 a and b). Though these exposures have a relatively low share in their total assets, credit and liquidity risks along with difficulty in valuing investments could materialise, depending on the duration of the war.

F. Commodity Markets

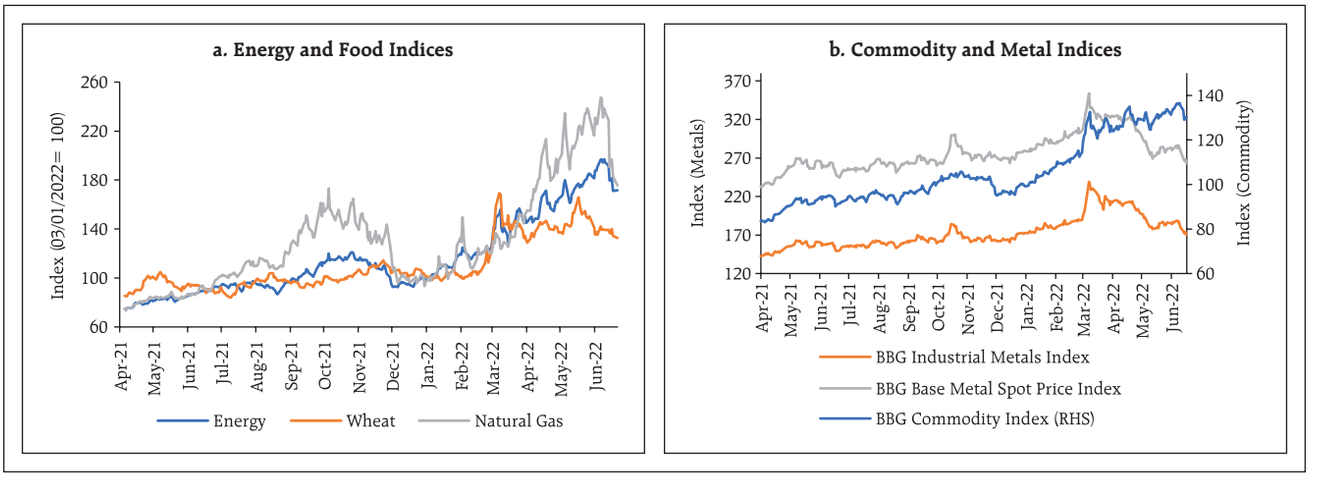
1.30 The war has exacerbated supply chain disruptions and forced a sharp rise in commodity prices with heightened volatility (Chart 1.20,

Chart 1.20: Global Supply Chain Pressure Index



Source: Federal Reserve Bank of New York.

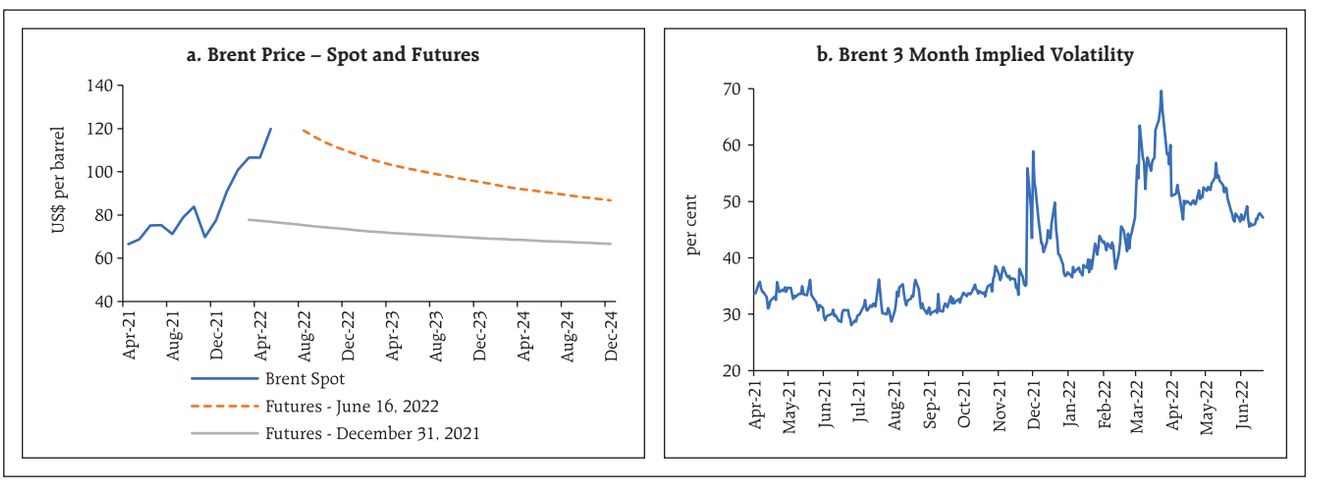
Chart 1.21: Commodity Prices



Source: Bloomberg.

1.21 and 1.22). The food price index of the Food and Agricultural Organisation (FAO) reached its peak in March 2022: though it has moderated marginally during April and May 2022, it remained 29.2 per cent higher on an y-o-y basis. Both energy and non-energy prices have surged, and supply is especially affected for essential commodities such as crude oil, natural gas, key metals, edible oils and wheat. Notwithstanding some recent moderation, prices of many commodities, which reached historical peaks, are expected to remain at elevated levels in the medium term, given the uncertainties around the duration of the war. Second round effects are emanating from rise in prices of substitute commodities, increase in input costs, production shortages and transportation and storage costs as well as the cost of finance.

Chart 1.22: Crude Oil – Prices and Volatility



Source: Bloomberg.

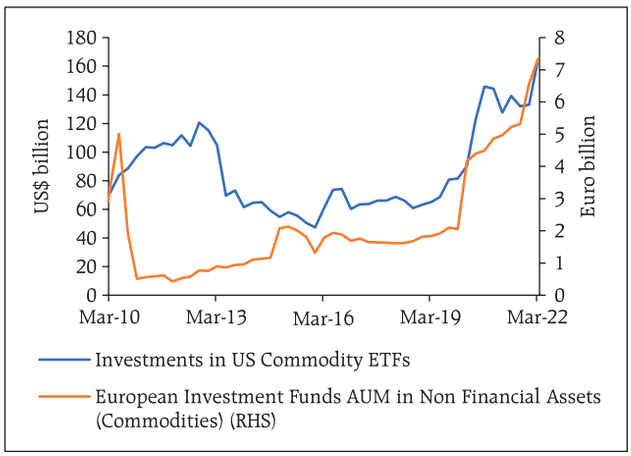
1.31 Supply issues in the energy sector have become more persistent as investment in the oil sector has moderated in the wake of low prices in past years and the move towards renewable energy.

1.32 As per the World Bank[9], energy and non-energy prices are forecast to rise by 50 and 20 per cent in 2022, respectively. Any further outbreak of COVID-19, possibility of moderation in global growth and high uncertainty about future energy demand are considered downside risks for commodity prices.

1.33 Given the high financialisation of commodity markets, investment funds have become core drivers of commodity prices, especially in a period of declining returns on other investments. The assets under such funds have nearly doubled over the last two years to a new high (Chart 1.23).

1.34 In addition to their implications for inflation, high commodity prices pose several risks in terms of the challenges for monetary policy, the health of financial institutions and the integrity and stability of financial markets. Interconnected commodity markets with close linkages between cash and derivatives compel producers, traders and consumers to lock in prices and hedge risks, making the impact of price rises on financial institutions and markets particularly severe. Combined with the broad-based commodity price surge and high shipping costs, some segments of commodity markets are experiencing financing difficulties, with participants exposed to commodity derivative trades facing large margin requirements and liquidity shortages. Since banks provide funding to commodity traders and act as intermediaries in derivative markets, they face higher credit risk as well as increase in hedging costs, which can become a propagation channel for spillovers. While this has prompted market participants in some jurisdictions to seek support from central banks, there is the issue of moral hazard, as provision of central bank liquidity can incentivise commodity traders in taking on excessive risks. Furthermore, the opacity of commodity markets and presence of largely unregulated entities warrant sufficiently higher disclosure standards as threshold for central bank intervention.

Chart 1.23: Investment in Commodity Linked Investment Funds



Source: FRED, Federal Reserve Bank of St. Louis & ECB.

[9] World Bank (2022), Commodity Markets Outlook, April.

1.35 The swiftness of moves to safe assets and surge in initial margin requirements in anticipation of further deterioration in underlying conditions reflects the suddenness and destabilising nature of funding pressures for trading firms. There are also heightened concerns about the impact on financial stability from recent developments in the commodity market. EMEs, in particular, face additional pressures in view of large share of commodities in consumption baskets.

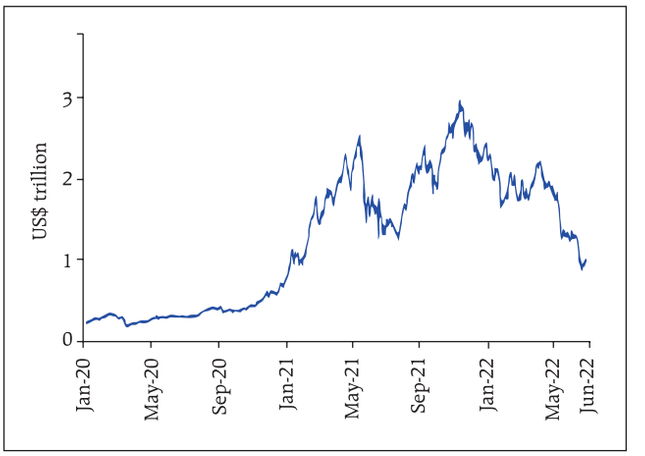
G. Cryptoisation and Central Bank Digital Currencies (CBDCs) in EMEs

1.36 Technological advances powered by cryptography and distributed ledger technology (DLT) have led to the rise of new digital assets such as cryptoassets and stablecoins, which generally have no underlying assets and are primarily used for speculative investments. The market value for cryptoassets grew tenfold from early 2020 to late 2021 when it peaked at almost USD 3.0 trillion before recording a sharp decline below US $ 1 trillion in June 2022 (Chart 1.24).

1.37 The risks from cryptoassets to financial stability appear to be currently limited as the overall size is small (0.4 per cent of global financial assets) and their interconnectedness with the traditional financial system is restricted. The associated risks are, however, likely to grow as these assets and the ecosystem supporting their growth are evolving. The risks from stablecoins that claim to maintain a stable value against existing fiat currencies require close monitoring, in particular - they are akin to money market funds and face similar redemption risks and investor runs because they are backed by assets that can lose value or become illiquid in times of market stress.

1.38 Cryptocurrencies, typically created on decentralised systems, are designed to bypass the financial system and all its controls, including Anti-Money Laundering (AML)/Combatting the Financial Terrorism (CFT) and Know Your Customer (KYC) regulations. They are characterised by highly volatile prices. As a sub-class of cryptocurrencies, *viz.*, stablecoins are supposedly less volatile as they are linked to a currency (or similar assets). Currently, the market capitalisation of a total of 19,920 cryptocurrencies trading on 528 exchanges stands at $908.7 billion[10], with Bitcoin accounting for 44 per cent of this market capitalisation. The top two cryptocurrencies account for 59 per cent while the top five account for more than three fourths.

Chart 1.24: Crypto Market Capitalisation



Source: Coinmarketcap.

1.39 Cryptocurrencies are not currencies as they do not have an issuer, they are not an instrument of debt or a financial asset and they do not have any intrinsic value. At the same time, cryptocurrencies pose risks. Historically, private currencies have resulted in instability over time and in the current context, result in 'dollarisation', as they create parallel currency system(s), which can undermine sovereign control over money supply, interest rates and macroeconomic stability. For developing economies, cryptocurrencies can erode capital account regulation, which can weaken exchange rate management. Furthermore, cryptocurrencies can

[10] Coinmarketcap.com, accessed on June 17, 2022 (17:00 HRS IST)

lead to disintermediation from the formal financial system, impairing financial stability.

1.40 Cryptoassets have gained in popularity in EMEs in recent years, especially in countries with volatile exchange rates. For residents in these countries, cryptoassets pegged to reserve currencies such as USD-linked stablecoins are a convenient tool to avoid capital controls and KYC/AML requirements. While trading of USD-linked stablecoins *vis-à-vis* some EME currencies has soared since 2020, some EME currencies are also gaining shares in stablecoin trading relative to conventional FX trading. In the extreme case of sharp declines in the purchasing power of local fiat currencies and stringent capital controls, some seek refuge in highly risky cryptoassets such as Bitcoin, which are not pegged to any reserve currency. Although the degree of cryptoisation thus far appears limited, its growth circumvents restrictions on exchange rates and capital controls and limits the effectiveness of domestic monetary policy transmission, posing a threat to monetary sovereignty. Problems with these assets such as price crashes. could spill over to payment systems and adversely affect real economic activity.

1.41 It is in this context that central banks in both AEs and EMEs have become increasingly engaged in projects related to CBDCs – digital money that is denominated in the national unit of account and is a liability of the central bank. In a survey[11] conducted by the BIS across EME central banks and published in April 2022, the top motivations for CBDC issuance varied: providing a cash-like digital means of payment in light of reduced cash usage; an increase in private digital payment services; boosting financial inclusion[12]; strengthening competition among payments service providers (PSPs); increasing efficiency and reducing the costs of financial services[13]. A majority of central banks considered many of these motivations as jointly important and are developing CBDCs or running concrete experiments.

1.42 Central banks surveyed generally do not foresee offering interest on CBDCs. The view was that a non-interest bearing CBDC is consistent with the objectives of providing a cash-like digital means of payment. At the same time, it can help keep credit disintermediation and the impact on monetary policy in check depending on the design of CBDC. As noted by the US Federal Reserve[14], however, CBDC could serve as a close substitute for commercial bank deposits, and potentially disintermediate banks and exacerbate runs on them as holders can convert deposits into CBDCs. Shift away from deposits to CBDCs could potentially decrease credit availability or increase credit costs. A majority of central banks in the BIS survey are uncertain about imposing limits on CBDC transactions or balances to counter disintermediation risk. Therefore, it is imperative for every country to work out their own risk mitigation measures while designing a CBDC.

I.2 Domestic Macrofinancial Risks

1.43 Since the release of the December 2021 FSR, the recovery in domestic economic activity, which had lost some momentum with the onset of the Omicron-driven third wave of the pandemic, has been gaining traction in spite of the globally overwhelming geopolitical shock of the war in Ukraine. While there has been a rise in COVID-19 infections in some parts of the country since the second fortnight of April, close to 90 per cent of the adult population is fully vaccinated with total vaccination doses having crossed 196 crore by June 21, 2022. The pace of vaccination of children below 18 years is rising

[11] Chen, Sally, Goel, Tirupam, Qiu, Han and Shim, Ilhyock (2022), "CBDCs in emerging market economies", Bank for International Settlements, BIS Papers No 23, April

[12] Promoting financial inclusion is a top consideration for Peru, Mexico and South Africa and one of the main considerations for more than half of all central banks participating in the BIS survey.

[13] The Central Bank of Brazil, for example, noted its focus on technology to foster innovation and enhance financial markets efficiency

[14] Board of Governors of the Federal Reserve System (2022), Financial Stability Report, May

and precautionary doses of COVID-19 vaccines are being made available to all those who are eligible. With mobility rising beyond pre-pandemic levels in terms of people, goods and services, India is learning to cope with COVID-19. Turning to the impact of the war, the immediate consequence has been a surge in domestic inflation with spillovers to financial markets. The Indian economy has, however, remained resilient so far on the strength of its own macro-fundamentals. Although real GDP growth slowed from 5.4 per cent in October-December 2021 to 4.1 per cent in January-March 2022 - taking the annual growth in 2021-22 to 8.7 per cent from 8.9 per cent in the NSO's second advance estimates - more recent high-frequency indicators of economic activity suggest that momentum has picked up in the first quarter of 2022-23 in a broad-based manner. Barring the uncertainty surrounding the future path of the pandemic and the war, incoming data have brightened the outlook.

1.44 Turning to an assessment of risks from financial developments since the December 2021 FSR, financial markets in India experienced bouts of volatility in 2022, so far. Initially, they were fuelled by global spillovers through the expectations channel about the likely pace and magnitude of monetary policy normalisation by systemically important central banks. As the quarter progressed, they were amplified by country-specific factors such as the third wave of Omicron infections, inflation concerns and elevated crude prices. The strengthening of the USD and net foreign portfolio investment (FPI) outflows were other factors that had large country-specific effects. By the close of February 2022, the war took over, producing sudden and large adjustments in risk assessment across the world, surges of volatility, elevated levels of crude and other commodity prices - which reached levels not seen in 15 years.

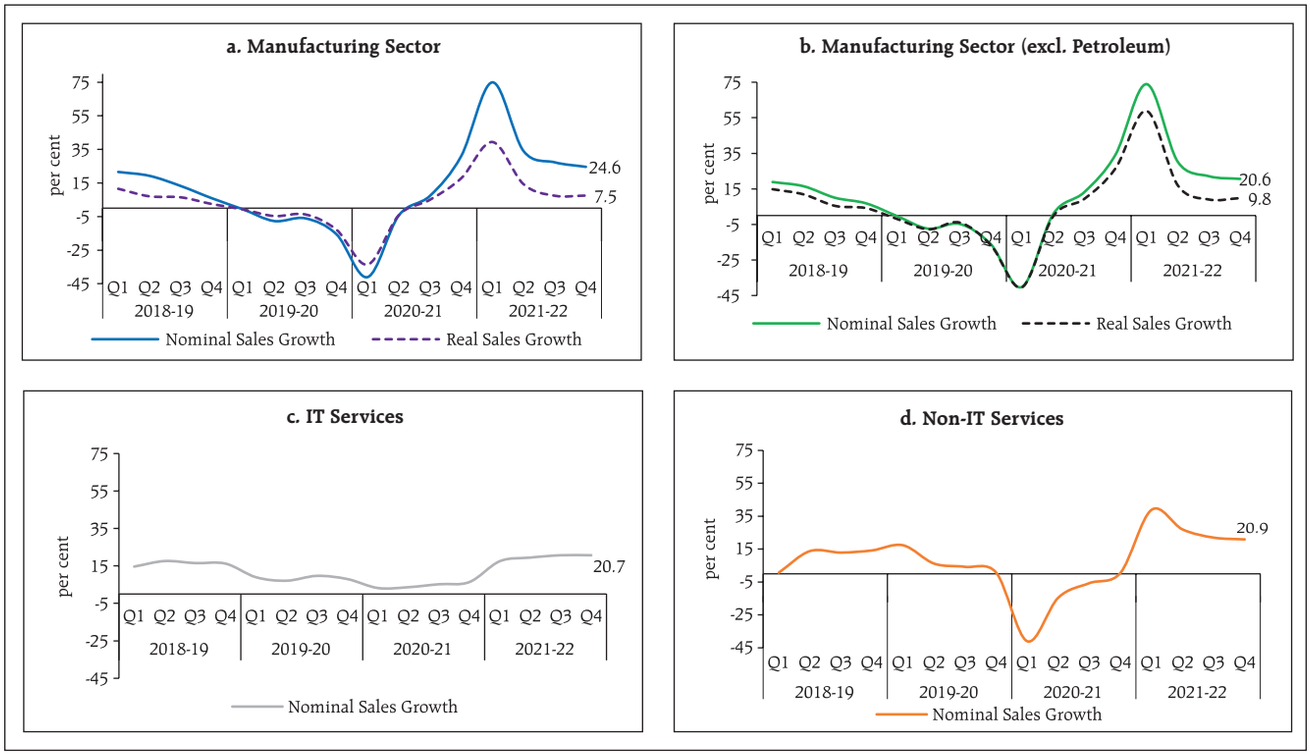
1.45 The sharp rise in crude oil prices has adversely impacted domestic inflation and the rise in prices of petroleum products will have second round effects on prices of various goods and services. The Reserve Bank's estimates show that a 10 per cent rise in crude oil price above USD 100 per barrel could increase domestic inflation by 30 bps and reduce GDP growth by 20 bps respectively[15]. Since February 2022 policy, the Reserve Bank had revised GDP growth downward by 60 bps and inflation upward by 220 bps primarily because of the rise in Indian basket of crude oil price – as on June 16, 2022, it rose to USD 117.2 per barrel from USD 73.3 per barrel in December 2021.

1.46 Amongst financial intermediaries, the banking sector, buffered by regulatory dispensations provided by the Reserve Bank during the pandemic, built up risk absorbing capacity through capital raising, including, from the market and profit retention. With gross non-performing assets (GNPA) ratios down to their lowest levels in six years and a modest return to profitability, bank credit growth is in double digits after a long hiatus. NBFCs have mobilised to fill the space opened up by risk aversion among banks through the greater part of 2021-22. In the microfinance sector, customer protection and harmonising regulations with other financial intermediaries has assumed priority from a financial stability perspective. Another set of macro financial risks in the financial stability monitor is in the leveraging of technology to facilitate digital penetration and consumer orientation towards a "less cash" society - credit, settlement and cyber risks as well as those associated with innovations. In the payments space, enhancing awareness about digital payments and extending the outreach of payment systems across India and beyond will warrant targeted literacy programmes and intervention strategies. Going forward, the introduction of a CBDC in India in conformity with the stated objectives of monetary policy, financial stability and efficient operations of currency and payment systems will engage attention.

[15] Reserve Bank of India (2022), Monetary Policy Report, April

Chart 1.25: Nominal and Real Sales Growth of Listed Non-Financial Private Companies

(y-o-y, per cent)



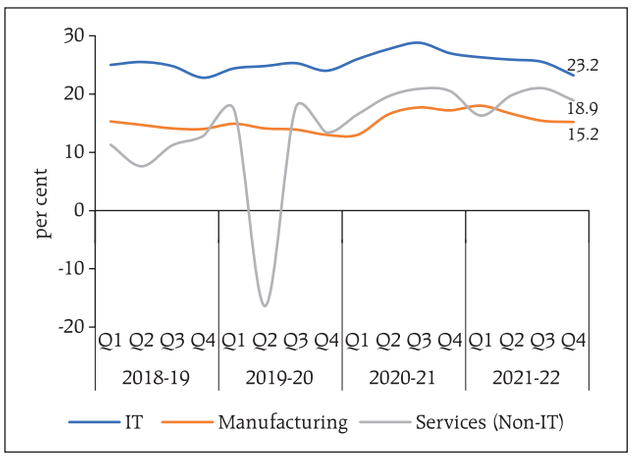
Note: Sample of 2,758 listed private nonfinancial companies used for Q4:2021-22.
Source: Capitaline and RBI staff calculations.

I.2.1 Corporate Sector

1.47 In H2:2021-22, the Indian corporate sector witnessed healthy sales growth reflecting sustained recovery in demand condition of manufacturing sector. The rise in sales of manufacturing companies was partly aided by price increase, but real sales also recorded robust year-on-year and sequential increase. (Chart 1.25 a and b). Information technology (IT) companies exhibited pandemic proofing and maintained strong growth while non-IT services companies are on a recovery (Chart 1.25 c and d).

1.48 Rising input costs fueled a 35 per cent increase in raw material expenses of manufacturing companies. Accordingly, they exercised pricing power and passed these costs through to selling prices, as reflected in healthy operating profit margins. IT and non-IT service sector companies were able to maintain their operating profit margins despite staff costs rising by 23 per cent and 16 per cent, respectively (Chart 1.26).

Chart 1.26: Operating Profit Margin - Listed Non-Financial Private Companies

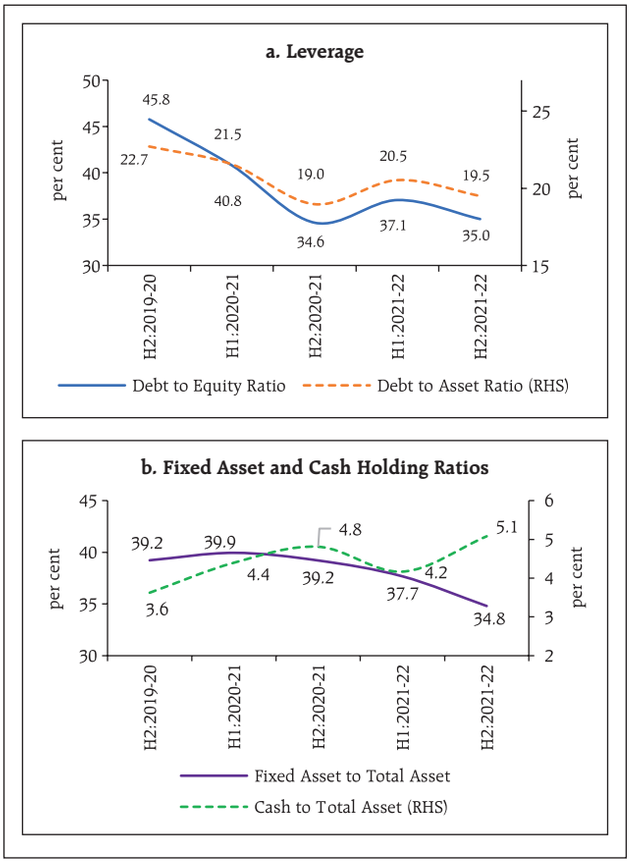


Note: Sample of 2,758 listed private nonfinancial companies used for Q4:2021-22.
Source: Capitaline and RBI staff calculations

1.49 In H2:2021-22, leverage of listed private manufacturing companies as reflected in debt-to-equity and debt-to-asset ratios eased further from the peak in H2:2019-20 and from the uptick in H1:2021-22 (Chart 1.27 a). The declining share of fixed assets in total assets pointed to the capex cycle remaining subdued. On the other hand, the share of cash holdings (including balances with banks and highly liquid investments) in total assets increased, indicating corporate preference towards cash buffers rather than investing in capacity expansion or new projects (Chart 1.27 b).

1.50 Retained earnings, reduction in fixed assets and trade payables were the major sources of funds, which were deployed for buildup of inventories, trade receivables, financial investments as well as cash holdings. Also, as activities have picked up, corporates are borrowing more long term and their reliance on short term borrowings have come down.

Chart 1.27: Leverage, Fixed Assets and Cash Holdings of Listed Private Manufacturing Companies



Note: Data is based on 1569 common listed private manufacturing companies.
Source: Capitaline and RBI staff calculations.

I.2.2 Government Securities and Corporate Bond Markets

1.51 Overall, the benchmark 10-year G-sec yield hardened by 116 basis points (bps), between end-December 2021 and June 16, 2022, to 7.62 per cent, mainly reflecting global developments interspersed with domestic factors (Chart 1.28). Concomitant with the rise in yields, the weighted average cost of government borrowing rose by 72 bps to 6.96 per cent during January-May 2022 compared to April-December 2021, while the weighted average maturity declined to 16.31 years from 16.91 years during the same period.

1.52 Global spillovers from elevated crude prices, hawkish signals from systemically important central banks and a rise in US treasury yields has imparted a tightening bias to G-sec yields in India from September 2021. By the end of December 2021, the benchmark 10-year yield had risen almost

Chart 1.28: Government Securities Yield

Source: Refinitiv

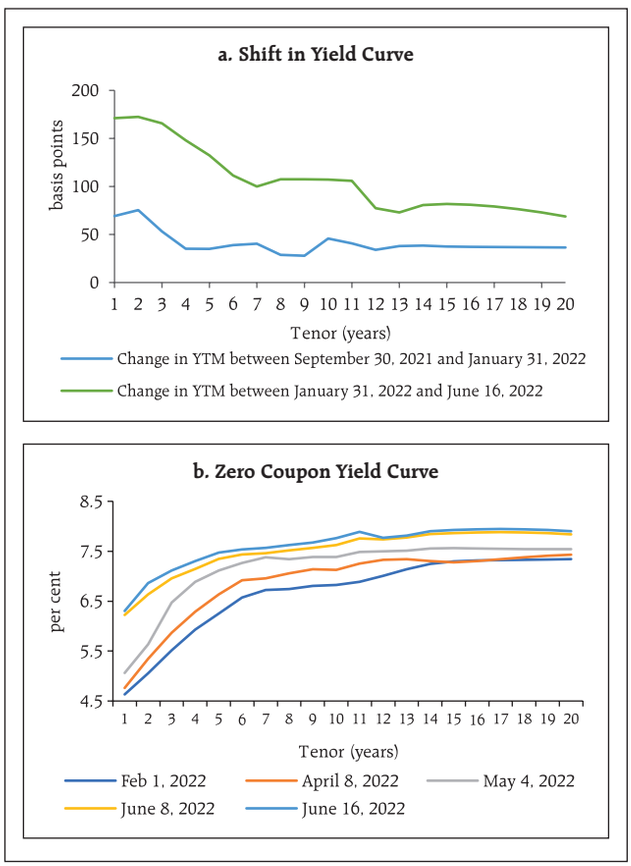
monotonically through Q3:2021-22 to close at 6.45 per cent, up by 23 bps from end-September 2021 levels.

1.53 Global cues continue to impart bearish sentiments and by mid-January 2022 the benchmark yield was at a two-year high. Domestic developments also provided upside to yield movements. Rising cut-offs and devolvements on primary dealers (PDs) also contributed to a hardening bias in yields. G-sec yields continued to move upwards through February 2022 in spite of the issue of a new 10-year benchmark (6.54 GS 2032). The yield curve steepened in the 8-10 years maturity segment. While switch operations of ₹1.2 lakh crore had provided a temporary respite, the announcement in the Union Budget 2022-23 of a borrowing programme of ₹14.95 lakh crore impacted sentiment and the ensuing sell-off pushed the 10-year benchmark on the Budget day to 6.83 per cent. The status quo monetary policy announcement of February 10 and cancellations of primary auctions followed by rejections of bids on specific securities did assuage market nervousness. Thereafter, the shock of the war in Ukraine took over and dispelled the calm. A tightening tendency set in alongside the surge in international crude and commodity prices. Nevertheless, the borrowing programme of the Union Government for 2021-22 was completed in the weekly auction in the primary segment on February 25, 2022.

1.54 Although the benchmark yields softened in the second half of March with the easing of crude prices, it surged with the release of the Union Government's borrowing programme on April 4, especially in response to frontloading for the first half of the year. To help banks manage their investment portfolios, the limit under the held-to-maturity (HTM) category was expanded on April 8, but this did not contain the rise in yields over the rest of the month. On May 4, 2022, the benchmark yield hardened to an intra-day high of 7.42 per cent, with the policy rate hike bringing about an upward shift in the yield curve, especially at the short end in response to the repricing of shorter-term securities with the introduction of the standing deposit facility (SDF) by the Reserve Bank. The G-sec yields hardened further in response to the 50 bps increase in policy rate in India and aggressive policy response of major central banks to persistence of high inflation (Chart 1.29 a and b).

1.55 Besides the projected borrowing requirement indicated in the Union Budget 2022-23, larger repayment obligations of ₹3.08 lakh crore during 2022-23 as compared to ₹2.86 lakh crore in the

Chart 1.29: Yield Curve Movement

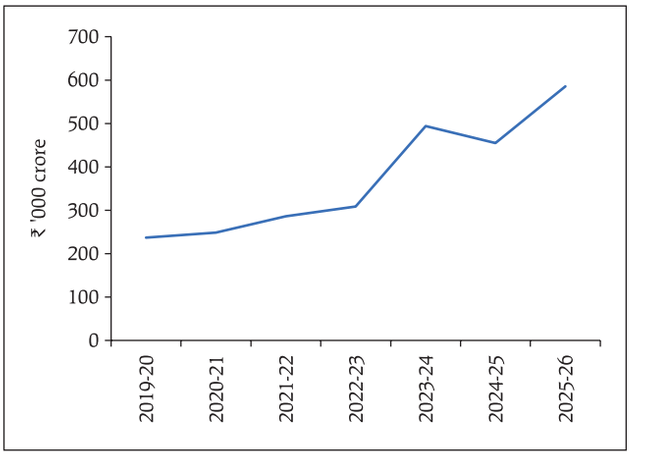


Source: Bloomberg

previous year continue to weigh on the evolution of yields (Chart 1.30). At the short end, more frequent rollover of treasury bills, the stock of which has increased to ₹9.99 lakh crore as on June 10, 2022 from ₹4.24 lakh crore in March 2020, may tighten market conditions going forward. Portfolio rebalancing in respect of EME exposure of foreign investors remains a contingent risk to market conditions (Chart 1.31).

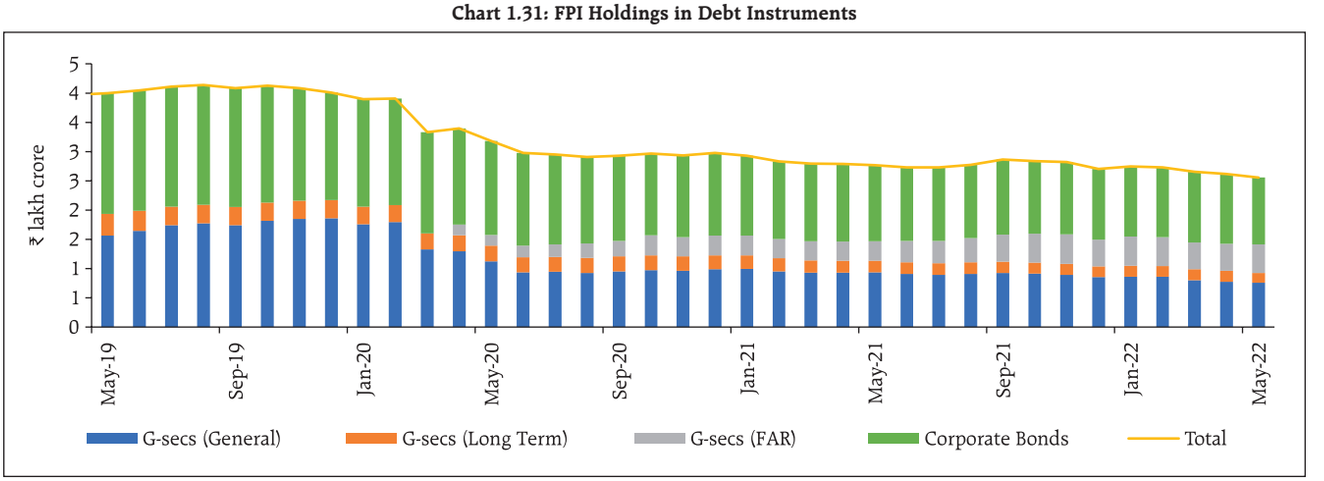
1.56 In 2022-23 and over the medium term, financial risks associated with the profile and underlying dynamics of public debt would impinge on the functioning of debt and fixed income markets. At the end of March 2021, the outstanding debt of general government (Centre and States) peaked at 89.4 per cent of GDP and is expected to remain at elevated levels until 2025-26. This will likely sustain a rising supply of issuances to the market, imparting pressure on yields and consequent crowding out of the private sector from the financial resources envelope. In 2021-22, the weighted average yield of G-Sec issuances increased by 49 basis points over the previous year. Going forward, yields may continue to reflect risk premia, with spillovers on to the private sector through higher financing costs. While the interest rate and growth rate differential (r-g) has generally remained favourable during the last three decades (excluding the COVID-19 period), the normalisation of monetary policy operations worldwide may limit this advantage. A credible debt management strategy would, therefore, involve a reduction of primary deficits or generation of modest surpluses to ensure debt sustainability.

Chart 1.30: Repayment Obligations of Central Government Dated Securities



Source: RBI (Repayment obligation for central government for FY 2022-23 as on May 12, 2022).

Chart 1.31: FPI Holdings in Debt Instruments



Source: CCIL

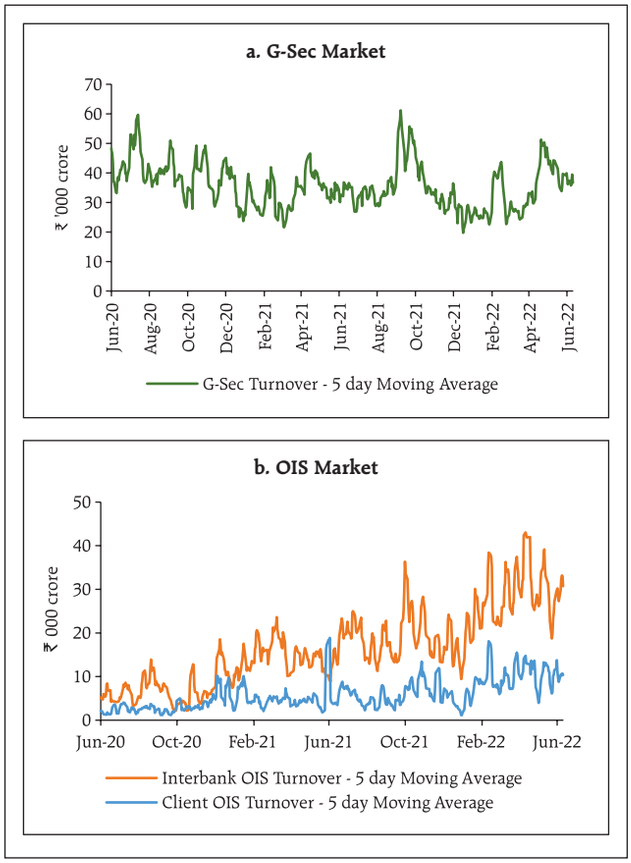
1.57 Trading activity in the government securities market, which has been picking up since mid-March 2022, moderated in May-June 2022, alongside interbank and client turnover in overnight indexed swap (OIS) market (Chart 1.32 a and b).

1.58 In the corporate bond market, financial conditions remained easy, with spreads narrowing through 2021-22 in response to the Reserve Bank's monetary and liquidity operations. The compression in spreads occurred across rating segments. AAA-rated corporate bonds were priced at the same level as risk-free government securities, with spreads turning negative on occasions (Chart 1.33). There was a decline in turnover, however, as primary issues decreased with private placements being overwhelmingly preferred alongside a reduction in investments by foreign portfolio investors. Since January 2022 corporate bond yields have hardened, tracking movements in G-sec yields, though lower issuances have capped upward pressures. In the aftermath of the war, the bearish sentiment in the G-sec market is being reflected in the corporate bond market across maturities and ratings. As on June 16, 2022, the yield on 3-year AAA-rated corporate bonds was 7.40 per cent, 141 bps up from end-March 2022.

I.2.3 External Sector Developments and Foreign Exchange Markets

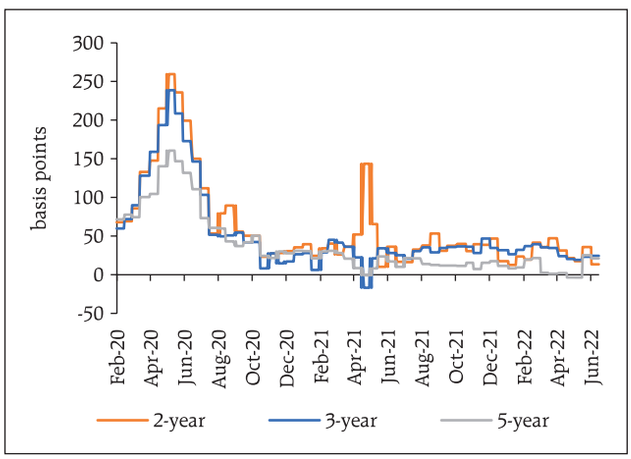
1.59 India's external sector has remained resilient during the pandemic. As the recovery in domestic economic activity gathered pace and strength and found expression in rising import demand, the current account balance moved from a surplus of 0.9 per cent of GDP in 2020-21 to a deficit of (-)1.2 per cent in 2021-22, as the trade deficit widened. While export performance was robust, surging prices of commodities, especially crude oil, delivered a terms-of-trade shock to the trade deficit in addition to the

Chart 1.32: Activity in Government Securities and Overnight-Indexed Swap Market



Source: CCIL and RBI Staff calculations

Chart 1.33: AAA Corporate Bond Spreads (*vis-à-vis* Government Securities)

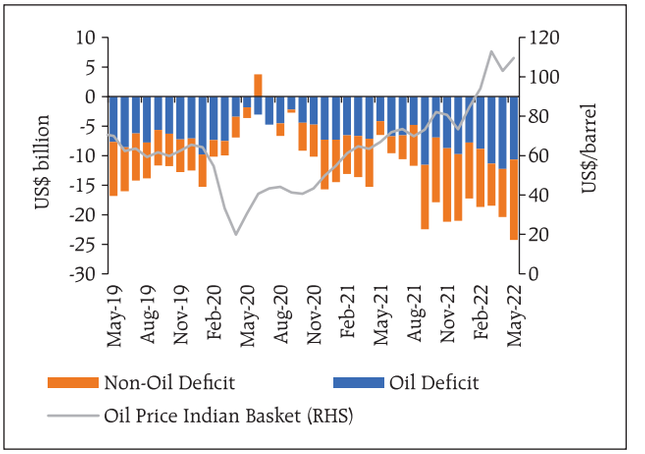


Source: Bloomberg

pressure from domestic demand; both oil and non-oil trade accounts recorded higher deficit (Chart 1.34 and 1.35).

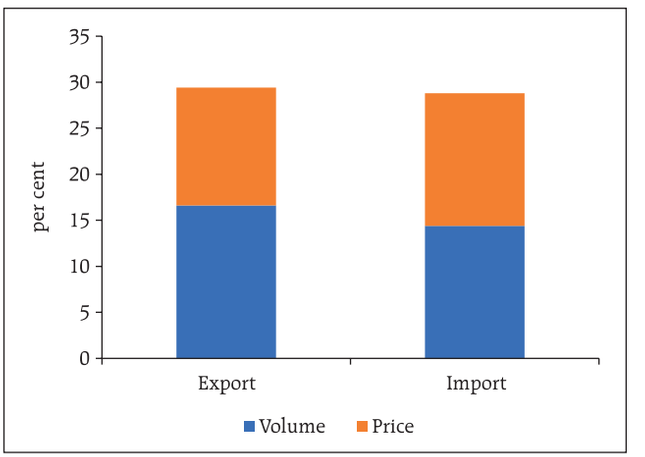
1.60 Impediments to supply chains, availability of key raw materials and intermediates and logistics disruptions notwithstanding, India's exports of merchandise and services performed robustly, providing an offset to widening trade deficit and an increase in net investment income payments (Chart 1.36). A renewed pick-up in remittances, after a pandemic imposed hiatus also tempered the widening of current account deficit in the financial account. Foreign direct investment (FDI) remained a stable source of external funding, with rising outward FDI turning out to be a noteworthy feature of balance of payments developments in 2021-22. FDI amounted to USD 38.6 billion in 2021-22, marginally lower than the record level of USD 44.0 billion in 2020-21.

Chart 1.34: Drivers of Trade Deficit



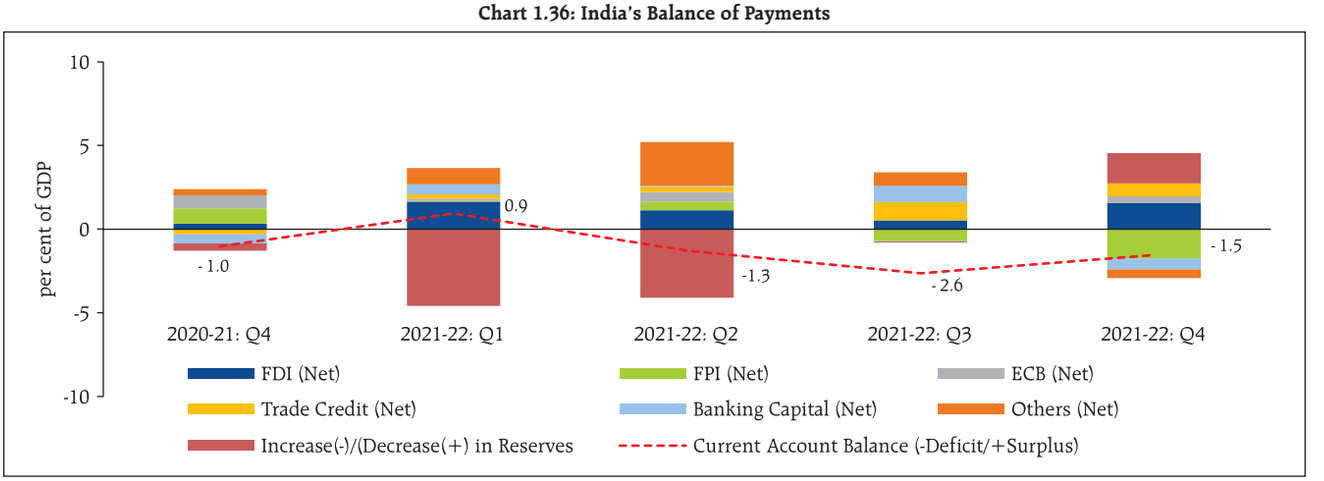
Source: DGCI&S

Chart 1.35: Decomposition of India's Trade Growth (2021-22) over Pre-Covid (2019-20)



Source: RBI staff calculations

Chart 1.36: India's Balance of Payments

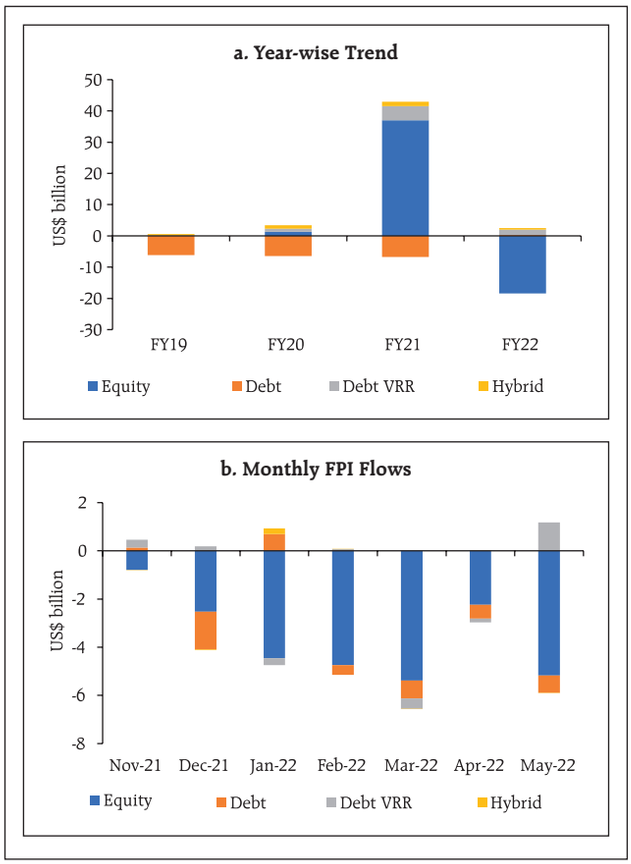


Source: RBI

1.61 At the same time, portfolio flows have become increasingly risk averse with flights to safety impacting EMEs as an asset class (Chart 1.37). While short-term trade credits surged in line with imports, net inflows under external commercial borrowings (ECB) amounted to USD 12.8 billion in 2021-22 as against net outflow of USD 4.0 billion in the previous year.

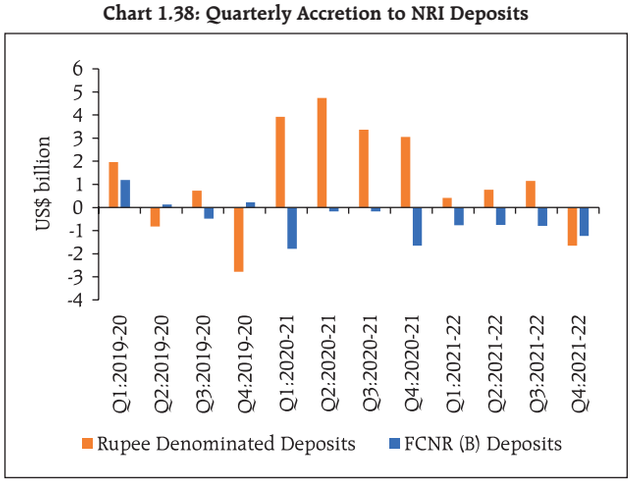
1.62 Non-resident deposits ebbed in response to tightening external financial conditions and the depreciation of the INR. Foreign currency non-resident (banks) {FCNR(B)} deposits have generally recorded outflows in every quarter since early 2020 (Chart 1.38). As a result, the share of foreign currency denominated NRI deposits in Q4:2021-22 has declined to 12.2 per cent from 18.6 per cent during the last two years and they are denominated in USD (74 per cent), followed by Pound sterling (11 per cent) and Japanese Yen (10 per cent).

Chart 1.37: Trends in FPI net Investments



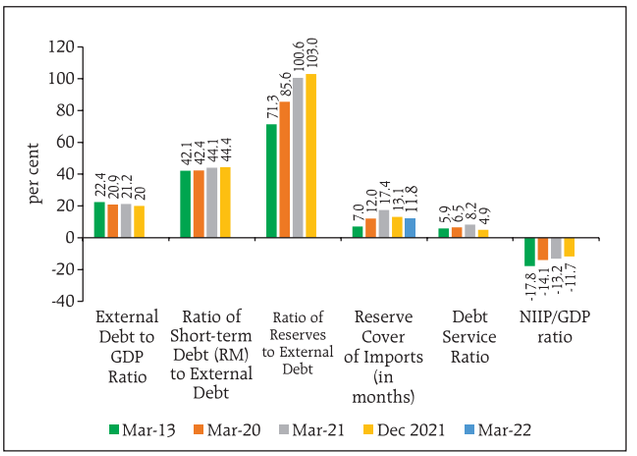
Source: NSDL/CDSL, SEBI

Chart 1.38: Quarterly Accretion to NRI Deposits



Source: RBI

Chart 1.39: External Sector Vulnerability Indicators



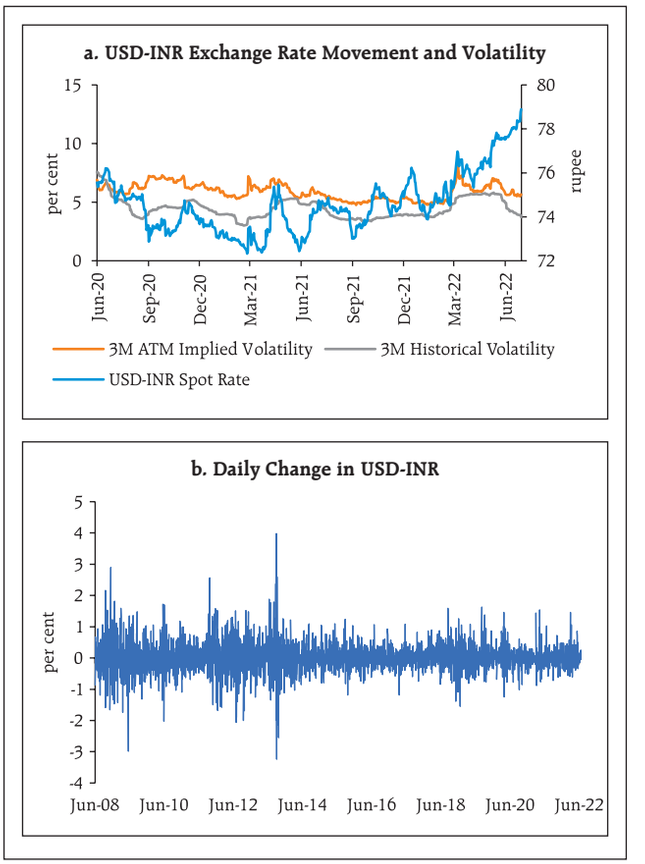
Source: RBI and Government of India

1.63 During 2021-22, foreign exchange reserves increased by USD 30.3 billion on account of net inflows of ECB and improved banking capital, and sizable net FDI. As on June 17, 2022, foreign exchange reserves declined to USD 590.6 billion from a peak of USD 642.5 billion on September 3, 2021, which is equivalent to nearly 10 months of imports projected for the current financial year, thereby providing sufficient buffer against external shocks. As a result of the accumulation of large foreign exchange reserves in recent years, various external vulnerability indicators show marked improvement *vis-à-vis* the taper tantrum period. This augurs well for mitigating external risks and global spillovers (Chart 1.39).

1.64 The INR, which was trading range bound before the knock-on effects from global geopolitical spillovers, experienced some volatility and depreciated by 5.7 per cent against the USD during the calendar year 2022 so far (up to June 29) (Chart 1.40). On a financial year basis, the depreciation of the INR was lower at 3.9 per cent. The INR has, however, turned out to be one among the stable currencies relative to peers in the period since the war (Chart 1.41).

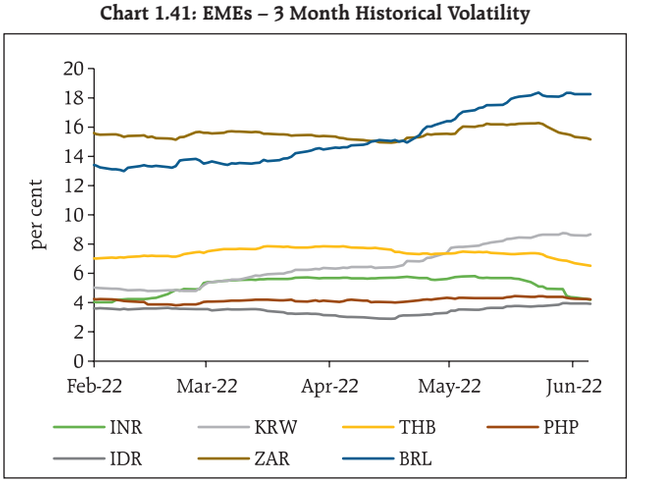
1.65 Heighted global uncertainty from the geopolitical conflict, surge in crude oil prices

Chart 1.40: USD-INR Exchange Rate Movement



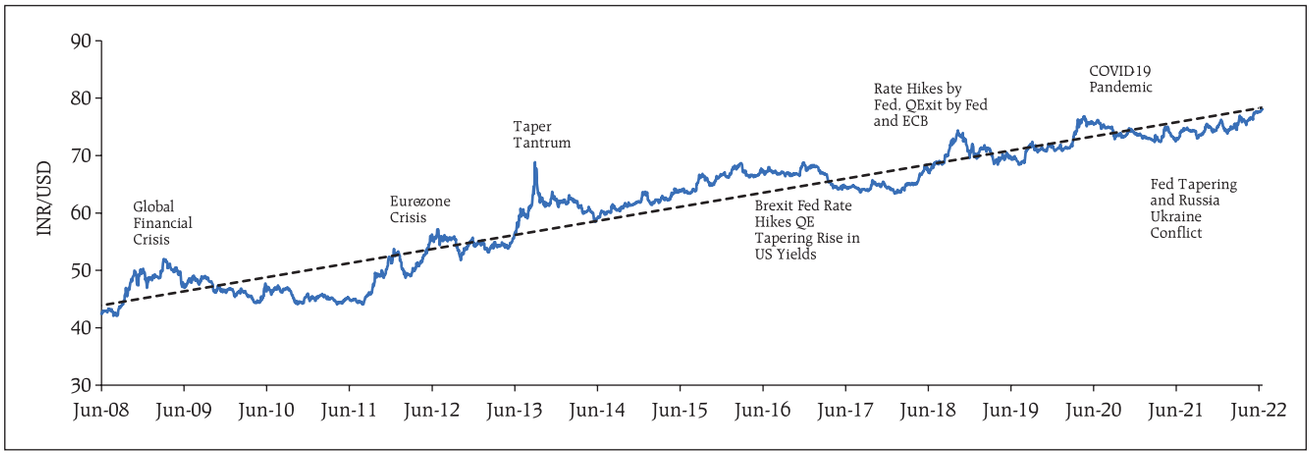
Source: Bloomberg

Chart 1.41: EMEs – 3 Month Historical Volatility



Source: Bloomberg

Chart 1.42: USD-INR Long Term Trend



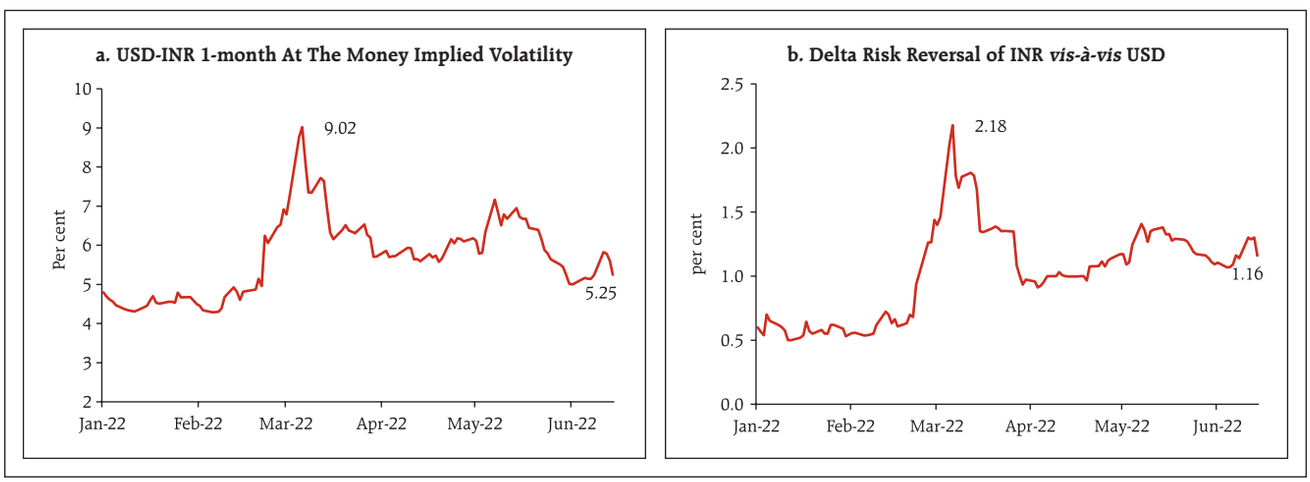
Note: Dotted line indicates long-term trend of the USD-INR exchange rate
Source: Bloomberg

and monetary policy tightening by systemically important central banks have weighed heavily on the INR in 2022 relative to the preceding year. The USD-INR exchange rate touched an all-time low of 78.98 on June 29, 2022, as recession fears and risk-off sentiment spread worldwide. The INR has, however, shown resilience relative to previous episodes of volatility, trading close to its long-term trend (Chart 1.42).

1.66 The 1-month implied volatility of the USD-INR started increasing by end-February 2022 (Chart 1.43 a). Risk reversal (RR[16]) also increased during the same period. The RR came down subsequently from a high of 2.18 in March 2022 to 1.16 on June 16, 2022 (Chart 1.43 b).

1.67 Along with the spot market, volatility was also observed in the forward market, with a general

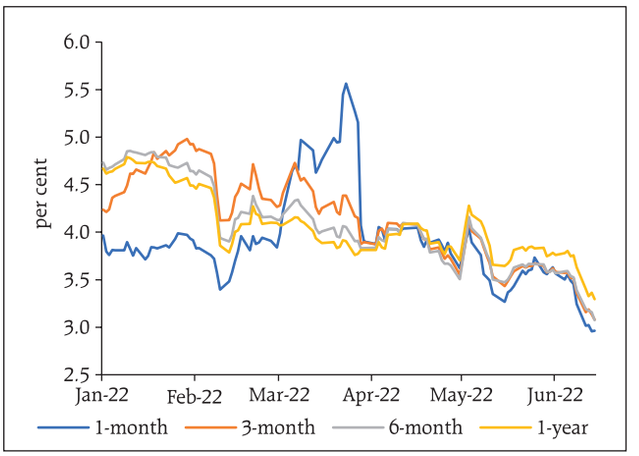
Chart 1.43: USD-INR Implied Volatility



Source: Bloomberg.

[16] Risk Reversal is a measure of the difference between the implied volatilities of out-of-the money call and put options. A positive risk reversal indicates that the volatility of calls is greater than the volatility of similar puts, implying that more market participants are expecting a rise in the USD-INR exchange rate.

Chart 1.44: Forward Premia Curve



Source: Bloomberg

Table 1.1: Outstanding External Debt

	Dec-20 (USD billion)	Per cent of Total External Debt	Dec-21 (USD billion)	Per cent of Total External Debt
Multilateral	68.1	12.0	71.5	11.6
Bilateral	30.5	5.4	30.7	5.0
IMF	5.7	1.0	23.2	3.8
Export Credit	6.5	1.1	5.6	0.9
Commercial Borrowing	212.5	37.4	226.4	36.8
NRI Deposits	140.5	24.7	141.9	23.1
Rupee Debt	1	0.2	1	0.2
Short-Term Debt	103.5	18.2	114.6	18.6
Of which, Short-Term Trade Credit	99.6	17.5	110.5	18.0
Total External Debt	**568.3**	**100.0**	**614.9**	**100.0**

Source: Department of Economic Affairs, Ministry of Finance, GoI

softening in the forward premia across tenors along with sharp spikes in near-month tenors. The hedging cost for firms as reflected by one-year forward premium declined from 4.6 per cent at end-December 2021 to 3.3 per cent on June 16, 2022 (Chart 1.44).

1.68 Among the components of India's external debt liabilities, commercial borrowings and deposits of non-resident Indians (NRIs) together constituted nearly 60 per cent of India's external debt followed by short-term trade credits account (18 per cent) (Table 1.1). Net ECB[17] amounted to USD 12.8 billion during 2021-22. Nearly 80 per cent of the ECB are denominated in US dollars and 5 per cent each are denominated in Euro and Japanese yen. A predominant component (56 per cent) of ECB loans are hedged (Table 1.2). Private sector borrowers have a larger share of hedged loans. Also, certain

Table 1.2: Hedging of ECB* loans

(As on March 31, 2022)

Description	Amount (USD million)
A. ECB - Total outstanding	179,994
B. ECB - INR denominated	16,721
C. ECB – FDI Companies' borrowings from foreign parent	27,879
D. ECB – Non-Rupee and non-FDI [= A-B-C]	135,394
of which:	
(a) Public sector companies	56,614
(b) Private companies and others	78,780
E. Hedging details of non-Rupee non-FDI ECB (*i.e.*, D above)	
(i) Hedging declared on registration during April 2019-March 2022	40,641
of which:	
(a) Public sector companies	7,669
(b) Private companies and others	32,972
(ii) Other past loans reported hedged by borrowers	15,628
of which:	
(c) Public sector companies	8,975
(d) Private companies and others	6,653
F. ECB – Unhedged {D-(E1+E2)}	79,125
G. Percentage share of unhedged ECB {(F)/(A)*100}	44.0

* includes Foreign currency convertible bonds (FCCBs) and Rupee denominated bonds (RDBs)
Source: RBI

[17] ECB account for the largest share in total debt service payments (Ref: Government of India (2021). 'India's External Debt - A Status Report 2020-21', September

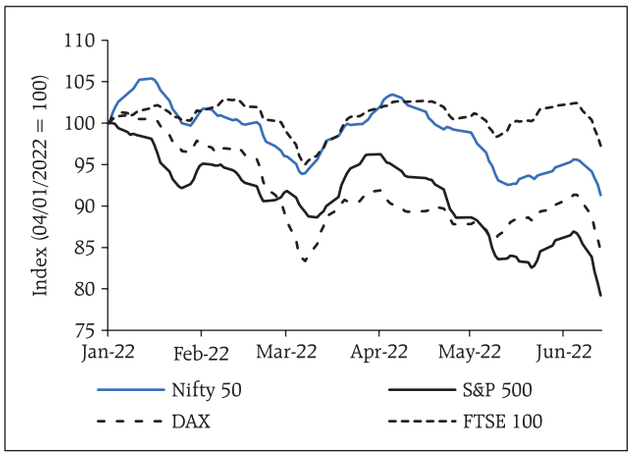
unhedged loans, where borrower's earning is in foreign currency (*e.g.*, shipping companies), retain natural hedge.

I.2.4 Domestic Equity Market

1.69 Domestic equity indices had made significant gains during 2020 and 2021, outperforming peers on the back of better growth prospects. Developments in 2022 have, however, unsettled market sentiments and increased risk aversion, with the war triggering a broad-based sell-off. In line with corrections underway in stock markets in major economies, sentiments in Indian equity markets have turned bearish and have registered negative returns, with the BSE Sensex decreasing by 11.6 per cent and Nifty 50 declining by 11.5 per cent between end-December and June 16, 2022. (Chart 1.45).

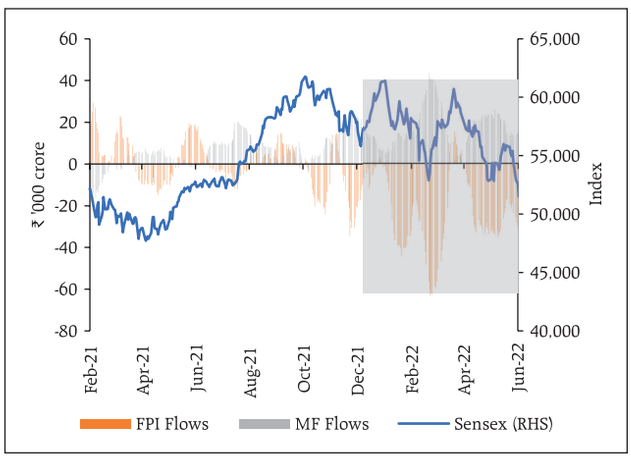
1.70 Spillovers from the global risk-off sentiment have triggered FPI outflows from EMEs, including India. After record inflows of ₹2.76 lakh crore in 2020-21, Indian equities witnessed selling pressures from foreign institutional investors (FIIs) for the eighth consecutive month up to May 2022 with the total net outflow of ₹1.3 lakh crore in 2021-22 and cumulative net outflow of ₹66,809 crore in April and May 2022. Sustained buying interests from domestic institutional investors (DIIs), however, supported the market, capping losses (Chart 1.46 and 1.47).

Chart 1.45: Movements in Nifty 50 and Global Stock Market Indices



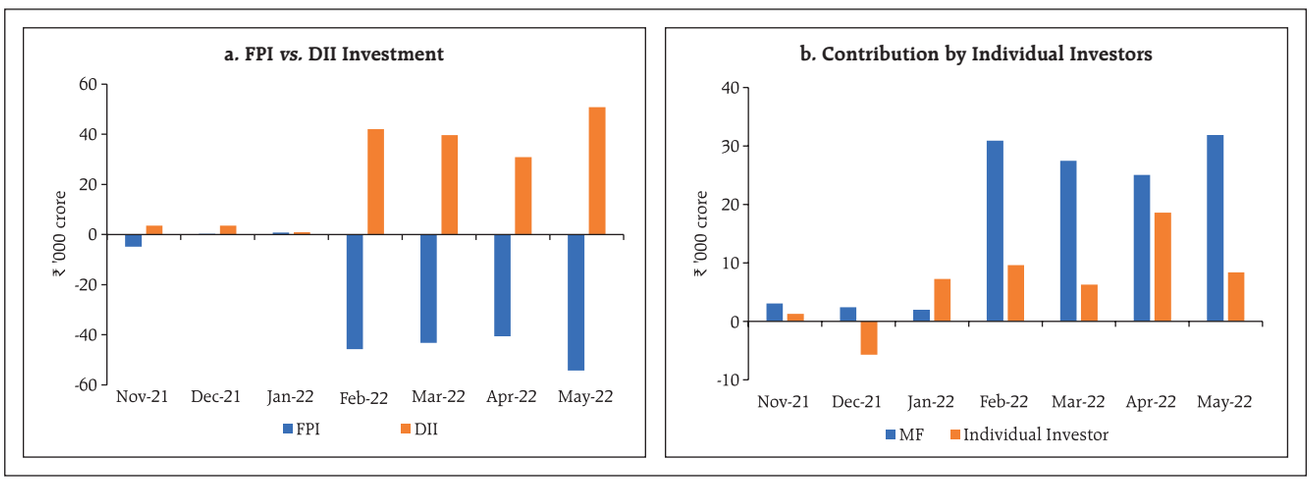
Source: Bloomberg

Chart 1.46: BSE Sensex and Foreign Institutional Flows



Note: FPI flows, and MF flows are represented on 15 days rolling sum basis
Sources: Bloomberg, NSDL, SEBI

Chart 1.47: Trends in Foreign and Domestic Investments in Cash Segment



Sources: NSE, BSE

1.71 Until the recent correction, equity market valuations remained rich, with the 12-month trailing price-to-earnings (PE) of the BSE Sensex well above its 10-year average of 22.4, before falling to 20.8 by mid-June 2022. The 12-month forward PE multiple, however, is still above emerging and developed market peers (Chart 1.48 a and c). Market capitalisation was 1.12 times GDP, above its 10-year average of 0.79 (Chart 1.48 b). Moreover, bond-equity-earnings-yield ratio (BEER) - a measure of relative attractiveness of equities *vis-à-vis* bonds - dipped below its long-term average of 1.61 (Chart 1.48 d).

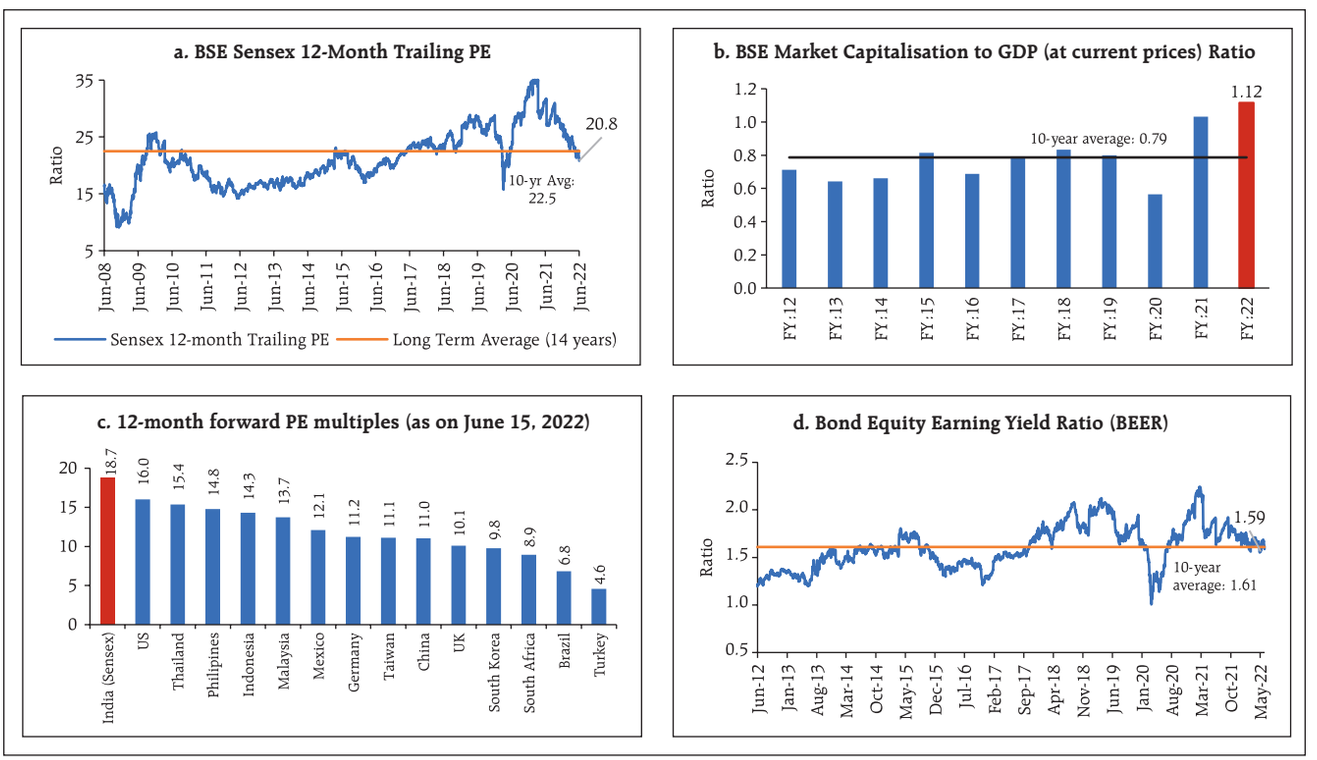
1.72 The easing of pandemic related restrictions and brightened prospects of economic recovery led to a slew of Initial Public Offerings (IPOs) in 2021-22. Corporates raised the highest ever funds through IPOs in 2021-22, amounting to ₹1.11 lakh crore, with many new age tech companies/start-ups getting listed.. During November 2021 to May 2022, seven start-up IPOs were listed, raising ₹38,170 crore, with an average oversubscription rate of 40 times and 4 of them registered gains on the day of listing (Table 1.3). Their post-listing performance has, however, moderated significantly. Also, at end-May 2022, six of the eight start-ups listed during 2021-22 were trading at a loss as compared to their listing prices.

Table 1.3: Fund Raising through IPOs

Particulars/IPO Types	Main Board IPOs excluding start-up IPOs	Start-up IPOs in 2021-22	Start-up IPOs during Nov-21 to May-22
Number	43	8	7
Total Capital Raised (₹crore)	66,300	45,309	38,170
Average No. of times oversubscribed	55.73	41.91	39.49
Average of same day listing gains	34.84	19.9	15.9

Source: SEBI

Chart 1.48: Equity Market Valuation Indicators



Note: GDP for 2021-22 is based on 2nd advance estimates.
Sources: Bloomberg, MOSPI, RBI Staff Calculations

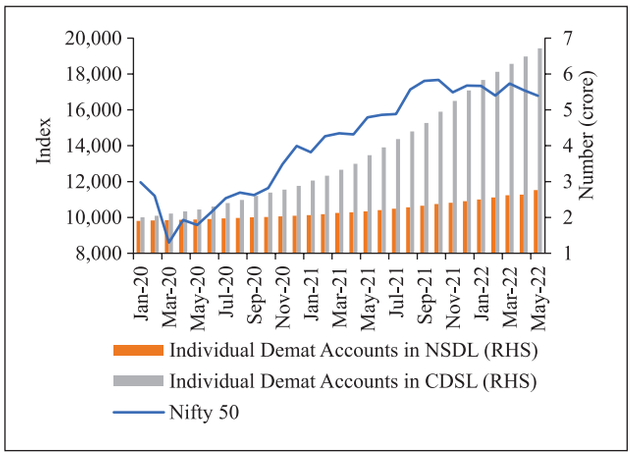
1.73 Individual investors' participation in stock exchanges has increased significantly since the onset of the COVID-19 pandemic and registration of new investors on exchanges is reaching beyond metropolitan centres and big cities. During January 2020 to May 2022, the number of demat accounts of individuals has increased by 3.4 times in the Central Depository Services Limited (CDSL) and by 1.5 times in the National Securities Depository Limited (NSDL) (Chart 1.49).

1.74 The decline in real returns on fixed income investments, simplification of know your customer (KYC) registration processes, effective use of digital technology and opening of online accounts, enhanced availability of investment information on digital modes and growing public awareness has promoted a widening of the investor base, including first-time investors. The number of retail investors who are actively trading in the stock market is also on the rise (Chart 1.50).

I.2.5 Commodity Derivatives

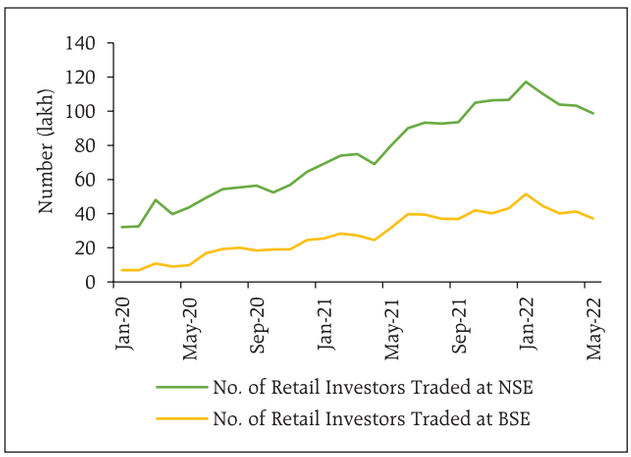
1.75 During November 2021-May 2022, the benchmark domestic commodity derivative indices, *viz.*, MCX iCOMDEX composite increased 19.6 per cent, whereas Nkrishi Index (which was discontinued w.e.f. April 01, 2022) increased by 18.7 per cent. The S&P GSCI and Refinitiv/Core Commodity CRB Total Return Index increased by 33.7 per cent and 33.5 per cent, respectively, during November 2021 – May 2022 (Chart 1.51).

Chart 1.49: Demat Accounts with Depositories



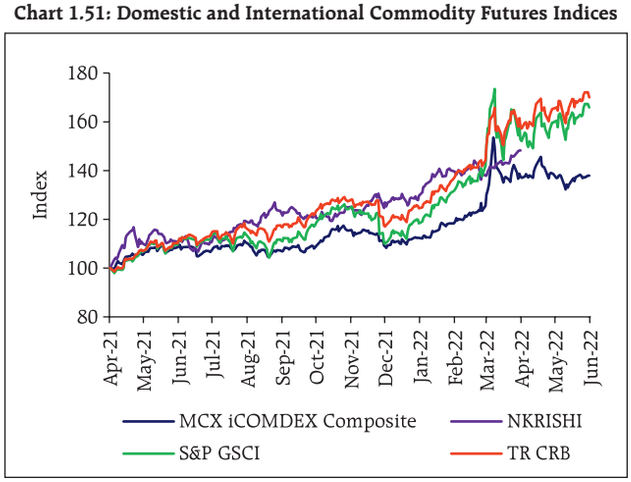
Sources: SEBI and Bloomberg

Chart 1.50: Trend of Number of Retail Investors Trading in the Exchanges



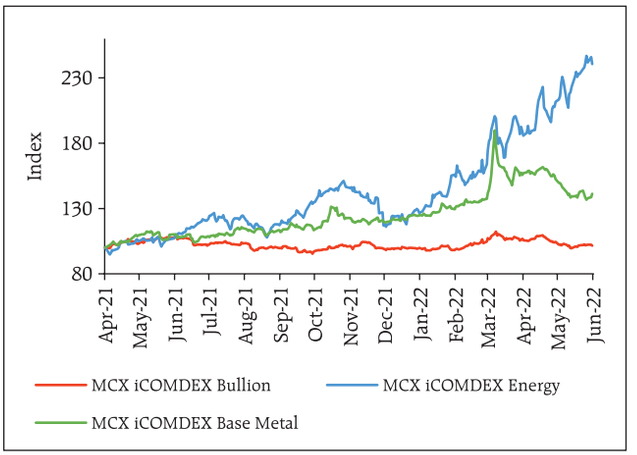
Note: The number of retail investors denote the number of unique PANs of individuals traded in the month.
Source: BSE and NSE

Chart 1.51: Domestic and International Commodity Futures Indices



Note: The value for April 2021 has been considered as 100 for all Indices. Nkrishi index was discontinued *w.e.f.* April 01, 2022.
Source: Multi-Commodity Exchange of India Ltd. (MCX), National Commodity and Derivatives Exchange Limited (NCDEX), S&P Global and Refinitiv.

Chart 1.52: Movement in select Sectoral Indices in Commodity Derivatives



Note: The index value for April 2021 has been considered as 100.
Source: MCX

1.76 The iCOMDEX Energy Index increased by 64.4 per cent, reflecting the surge in crude oil and natural gas prices during November 2021 - May 2022 (Chart 1.52).

1.77 The aggregate turnover in commodity derivatives (across all exchanges) increased by 13.1 per cent during November 2021 – May 2022 over the corresponding period of the previous year, with energy derivatives being the driving factor (Table 1.4).

I.2.6 Mutual Funds

1.78 Assets under management (AUM) of open-ended mutual funds, both debt and equity, have grown by 65 per cent since the onset of the pandemic and stood at ₹26.5 lakh crore in May 2022 (Chart 1.53).

1.79 Investors' preference for safe assets in recent times is reflected in the rising share of liquid assets in aggregate holdings of debt mutual funds Chart 1.54).

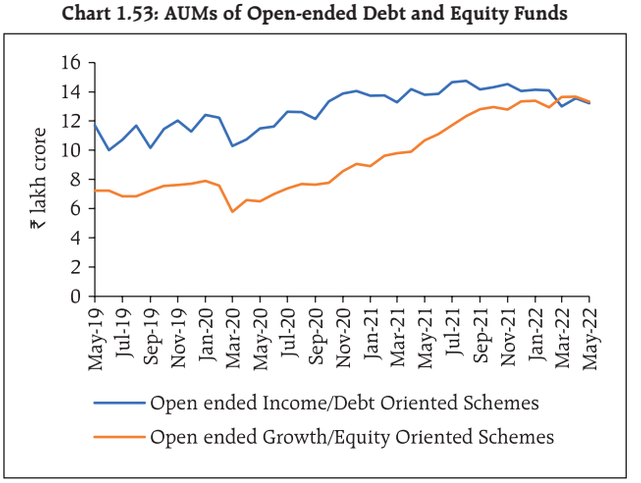
Table 1.4: Segment-wise Aggregate Turnover (Futures + Options)

(₹ crore)

FY Period/ Turnover	Agri.	Bullion	Energy	Metals	Total Turnover
2020-21 (Nov-May)	3,61,452	28,52,001	12,84,388	10,32,174	55,30,015
2021-22 (Nov-May)	2,30,137	19,14,647	34,09,005	6,98,747	62,52,536
Change (per cent)	-36.3	-32.9	165.4	-32.3	13.1

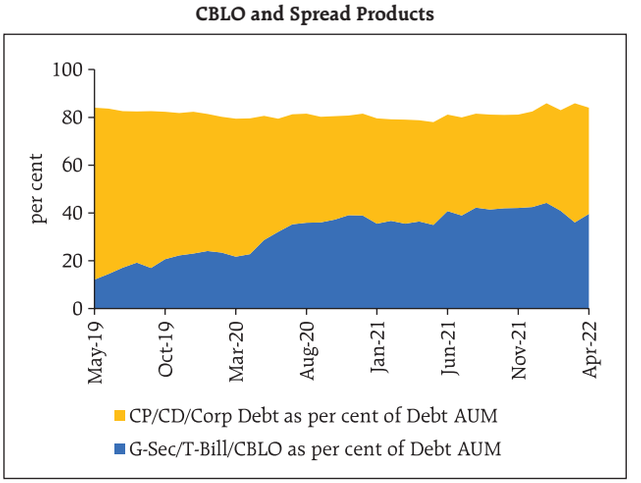
Note: Turnover includes Futures + Option turnover wherein Option Turnover is based on Notional value.
Turnover of Index Futures at MCX and NCDEX added in the respective sector.
No trading activity was observed in gems and stones segment in all exchanges during the period.
Source: MCX, NCDEX, BSE, National Stock Exchange (NSE), Indian Commodity Exchange Ltd. (ICEX)

Chart 1.53: AUMs of Open-ended Debt and Equity Funds



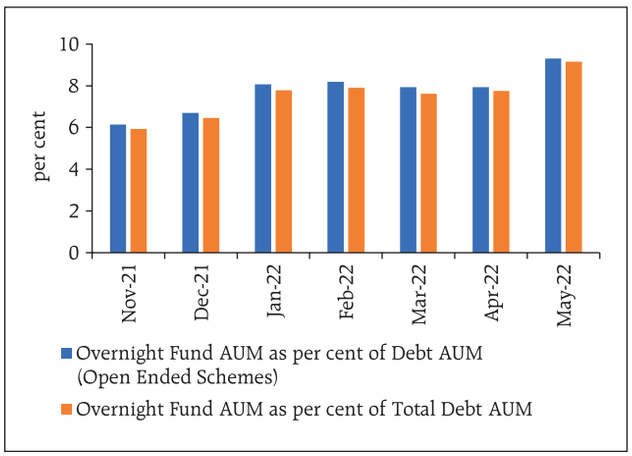
Source: AMFI

Chart 1.54: MFs' Investment in G-Sec/T-Bills/ CBLO and Spread Products



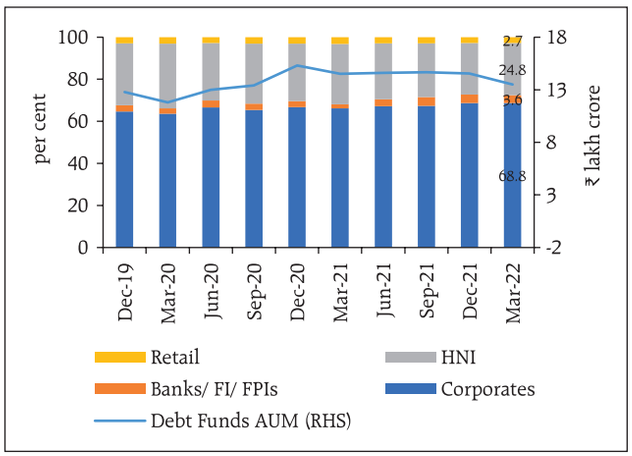
Source: SEBI

Chart 1.55: Trends in Overnight Funds



Source: SEBI

Chart 1.56: Investor Profile of Debt Schemes



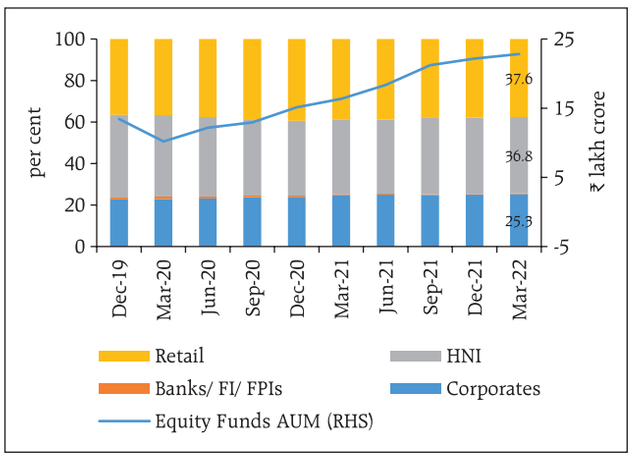
Source: AMFI

1.80 The share of overnight mutual funds in the total debt AUM of open-ended schemes have risen from 6.1 per cent in November 2021 to 9.3 per cent in May 2022 (Chart 1.55).

1.81 Incorporated entities and high net worth individuals (HNIs) continue to dominate the investor profile of open-ended debt funds, accounting for more than 90 per cent of their total AUM and over 60 per cent share in equity funds (Chart 1.56 and 1.57).

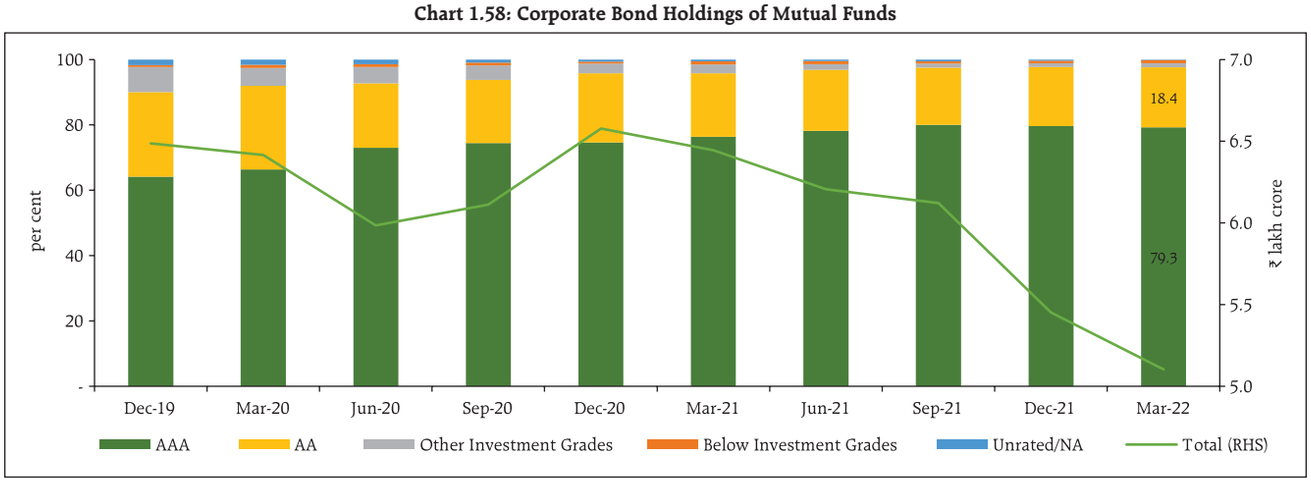
1.82 Lower-rated corporate bond holdings of mutual funds have been moderating since early 2021 and the decline has been particularly sharp during H2:2021-22 (Chart 1.58).

Chart 1.57: Investor Profile of Equity Schemes



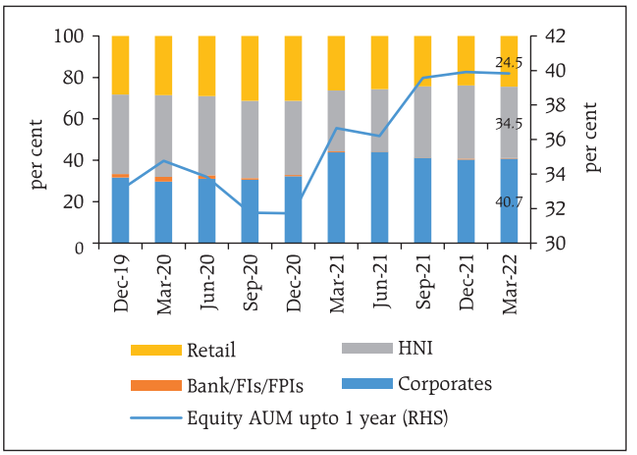
Source: AMFI

Chart 1.58: Corporate Bond Holdings of Mutual Funds



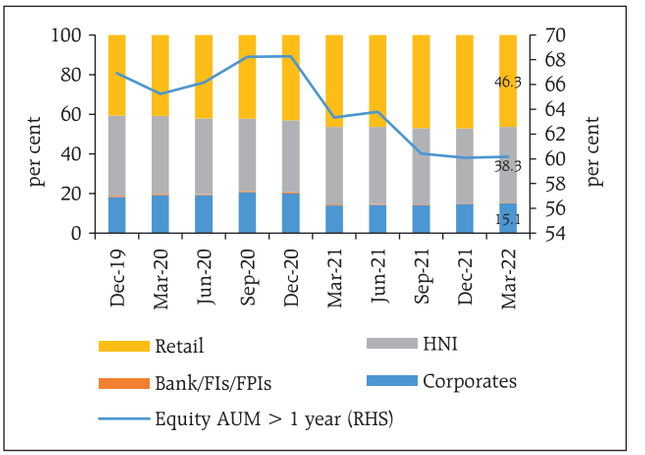
Source: Prime Database

Chart 1.59: Investor Profile of Equity Schemes up to one year



Source: AMFI and RBI staff calculations

Chart 1.60: Investor Profile of Equity Schemes above one year



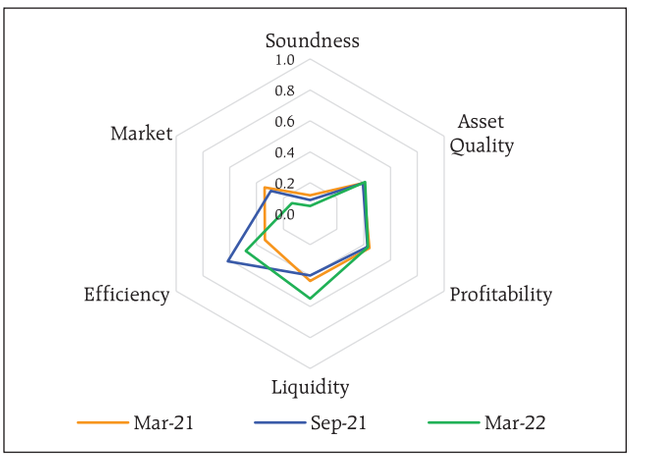
Source: AMFI and RBI staff calculations

1.83 The share of equity funds held for longer duration (beyond one year) has gradually declined in favour of holdings up to one year (Chart 1.59 and 1.60).

I.2.7 Banking Stability Indicator[18]

1.84 The banking stability indicator, which presents an overall assessment of changes in underlying conditions and risk factors that have a bearing on the stability of the banking sector, showed improvement in soundness, efficiency and market risk dimensions in H2:2021-22 (Chart 1.61). The improvement in the soundness indicator reflects enhanced capital buffers as CRAR rose by 18 bps to 16.7 per cent. Although the liquidity risk indicator deteriorated marginally during H2:2021-22 due to decline in the liquidity-coverage ratio (LCR) from 160.9 per cent to 147.3 per cent in March 2022, the latter remains well above the regulatory requirement of 100 per cent. Asset quality and profitability indicators remained broadly unchanged during 2021-22.

Chart 1.61: Banking Stability Map



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

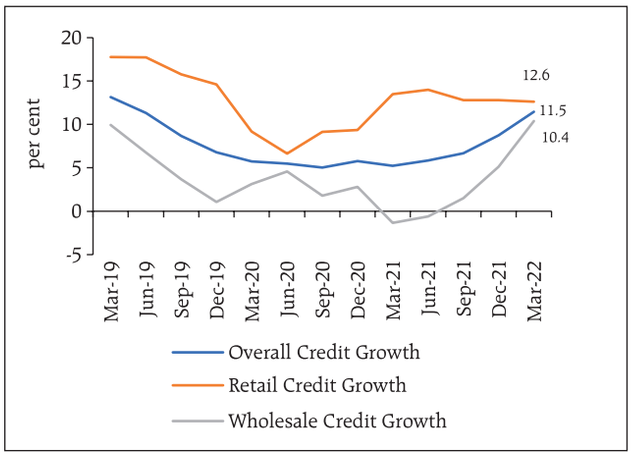
I.2.8 Banking Credit

1.85 As the Indian economy made its way through waves of the pandemic, annual growth in bank credit by scheduled commercial banks (SCBs) reached 13.1 per cent in early June 2022, a rate last recorded in March 2019. The impetus has stemmed from wholesale credit[19], which moved to double-digit growth trajectory from a declining profile a year ago. At the same time, retail credit growth remained

[18] The methodology for compilation of Banking Stability Indicator has been refined from this issue of the FSR, where a few variables of the existing dimensions have been replaced, an additional dimension (market risk) has been incorporated and weighting pattern has been revised (see Annex 2 for detailed methodology and the variables used under different BSI dimensions).

[19] Wholesale loans comprise gross loans and advances of the banking sector wherein aggregate funded exposure of the obligor is ₹5 crore or more and Retail loans comprise gross loans and advances of the banking sector wherein aggregate exposure of the obligor is less than ₹5 crore.

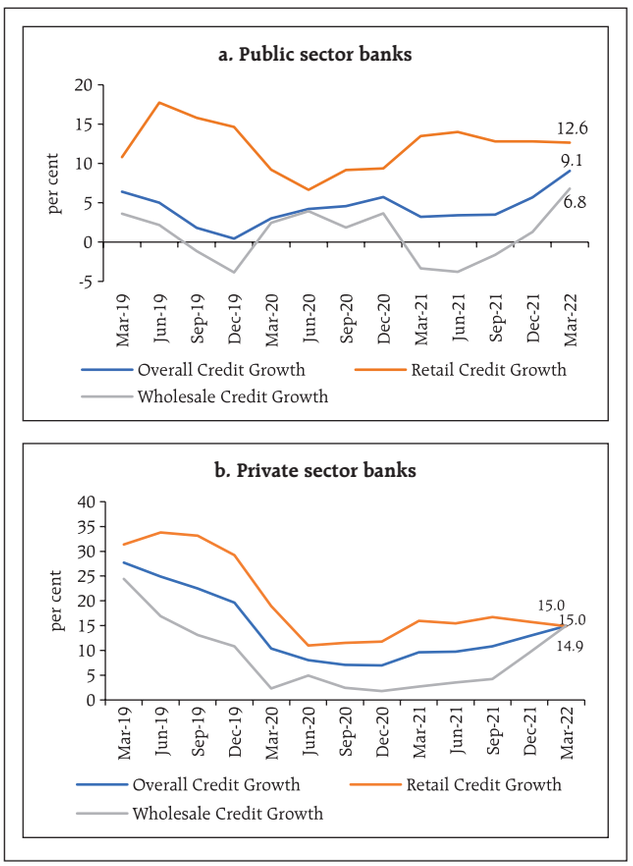
Chart 1.62: Credit Growth - SCBs



Note: SCBs here include PSBs, PVBs and FBs
Source: RBI supervisory returns, CRILC and staff calculations

robust (Chart 1.62). Within the banking sector, private sector banks (PVBs) continue to outpace their counterparts in the public sector in credit growth, both wholesale and retail (Chart 1.63 a and b).

Chart 1.63: Credit Growth



Source: RBI supervisory returns and staff calculations

1.86 A deeper profiling of bank credit indicates that most of the revival was in the second half of 2021-22, and it has continued during the current financial year so far (Table 1.5). While personal loans remained a dominant component, credit demand from the industrial sector revived after collapsing in 2020-21 as well as in the first half of 2021-22. A significant portion of new industrial loans was extended as working capital loans. Loan growth to private corporate sector turned positive after two successive years of decline and deleveraging.

Table 1.5: Incremental Growth in Credit by SCBs (excl. RRBs)

(Amount in ₹ '000 crore)

	2019-20	2020-21	2021-22*	
	Full year	Full year	Full year	Second half
A. Economic Sector				
i) Agriculture	11	113	166	114
ii) Industry	28	-115	149	234
iii) Transport operators	-3	5	-2	0
iv) Professional and other services	53	-10	51	85
v) Personal Loans	388	335	466	338
of which, Housing Loan	182	162	201	145
vi) Trade	108	113	51	90
vii) Finance	79	50	191	190
viii)Others	-60	29	75	66
B. Organisational Sector				
i) Public Sector	137	58	228	244
ii) Private Corporate Sector	-71	-95	170	288
iii) Households Sector – Individuals	511	433	655	470
iv) Household Sector – Others **	6	122	73	92
v) Others (MFIs, NPISHs, NRIs and cooperatives)	21	3	22	23
C. Type of Loan Account Wise				
i) Working capital loans	32	-88	222	278
ii) Term loans	569	588	823	751
iii) Cards	43	15	41	33
iv) KCC	0	20	9	9
v) Export credit	-19	6	22	23
vi) Import credit	0	-1	0	0
vii) Other miscellaneous	-19	-20	31	22
Total credit	**605**	**521**	**1,148**	**1,116**

** Data pertaining to March-2022 are provisional.*
** 'Others' within household sector include proprietary concerns, partnership firms, Hindu undivided families.
Source: Basic Statistical Returns, RBI

1.87 Importantly, banks' balance sheets remain robust, with non-performing assets (NPAs) on a decline for both wholesale and retail loans, and capital buffers remain adequate (Chart 1.64 a). The decline in risk-weighted assets continues, indicating that banks are still careful about the risk profile of borrowers in a dynamic environment characterised by considerable uncertainty (Chart 1.64 b).

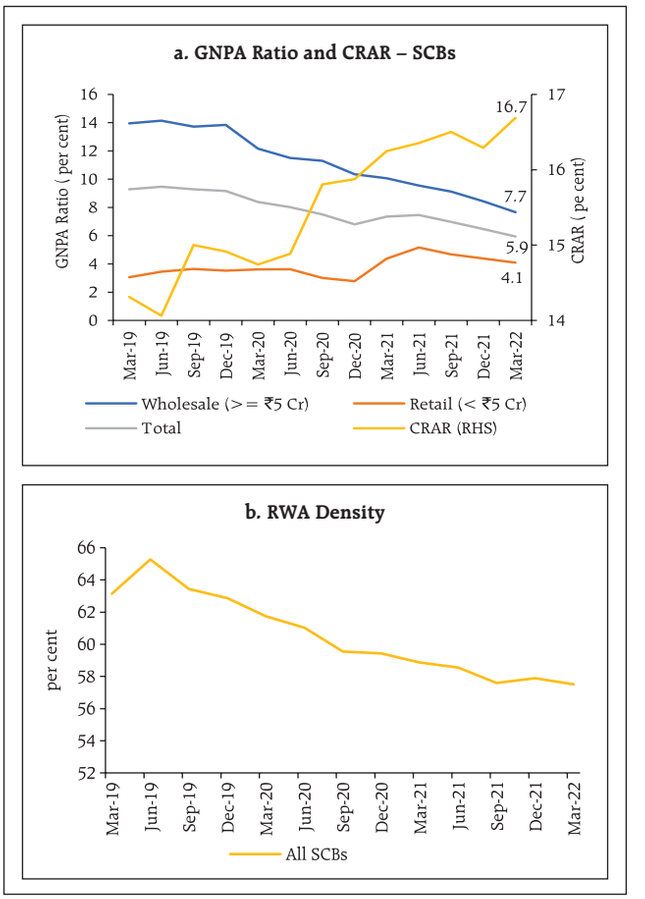
I.2.9 Interest Rate Risk in Banking Book

1.88 The shift of banking sector towards the external benchmark linked lending rate (EBLR) based pricing of loans has improved the pace and extent of monetary policy transmission[20] (Table 1.6).

1.89 Most banks have chosen the Reserve Bank's repo rate as their external benchmarks. Under the EBLR regime, the shift in interest rate cycle will have a quicker impact on both deposit and lending rates of banks; their investment portfolios would also undergo revaluation.

1.90 A survey of select banks (five PSBs and five PVBs) showed that 20 per cent of the loan book linked to EBLR has reset frequency less than the

Chart 1.64: Asset Quality, Capital Adequacy and Risk Weights



Source: RBI supervisory returns and staff calculations

Table 1.6: Share of Floating Rate Linked Outstanding Rupee Loans of SCBs: Interest Rate Benchmarks

(per cent to Total)

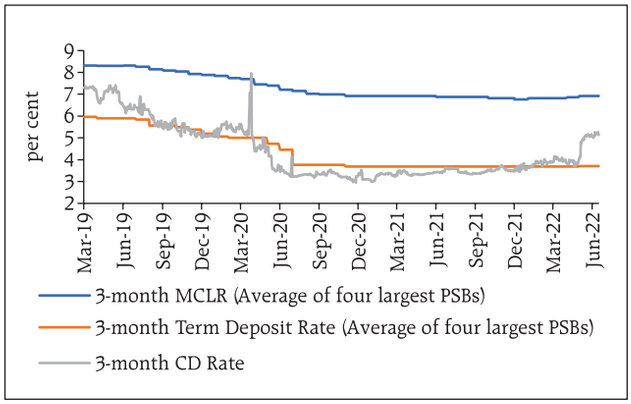
Bank Group	Base Rate					MCLR					External Benchmark				
	Sep-19	Mar-20	Mar-21	Dec-21	Mar-22	Sep-19	Mar-20	Mar-21	Dec-21	Mar-22	Sep-19	Mar-20	Mar-21	Dec-21	Mar-22
Public sector banks (11)	14.6	11.9	7.8	6.6	6.0	83.1	79.5	68.7	61.4	57.7	0.4	4.8	20.3	28.3	32.7
Private sector banks (21)	8.3	6.8	3.9	3.0	2.7	86.7	75.5	53.0	39.9	35.9	4.6	17.5	43	57	60.8
Foreign banks (42)	6.8	5.2	2.7	1.7	1.3	67.3	56.7	30.7	24.8	23.5	25.7	37.9	66.6	73.3	73.9
SCBs (74)	12.5	10.2	6.4	5.3	4.7	83.8	77.7	62.8	53.1	49.2	2.4	9.3	28.6	39.2	43.6

Note: Figures in parentheses refer to the number of banks. Data are provisional and subject to change. Figures in the table do not add upto hundred because residual loans are linked to BPLR.
Source: Individual bank submissions and staff calculations

[20] RBI Bulletin (2022), Monetary Transmission to Banks' Interest Rates: Implications of External Benchmark Regime, April

underlying benchmark (Table 1.7). This may expose banks to basis risk. Moreover, over a third of the advances are at fixed rates in the case of PVBs, which may experience unrealised losses through reduction in the NPV of future cash flows in a rising interest rate cycle and reduce their economic value of equity (EVE). PSBs, which have larger share of MCLR-linked loans may also be exposed to erosion in EVE as their deposit and lending rates are sticky and change less frequently than market interest rates (Chart 1.65)

Chart 1.65: Movement in Interest Rates



Source: Bloomberg and Centre for Monitoring Indian Economy (CMIE).

I.2.10 Wholesale Bank Credit

1.91 An analysis of the funded amount of obligors in the "companies" category, which accounts for 85.5 per cent of the total funded amount to wholesale obligors, shows that credit absorption by public sector undertakings (PSUs) remains robust. The decline in credit to non-PSU cohorts during 2019-20 and 2020-21 has reversed, largely driven by PVBs' lending (Table 1.8).

1.92 SCBs exposures to the private non-financial corporate sector grew, with higher rated companies recording 10.13 per cent loan growth during 2021-22 (Table 1.9).

Table 1.7: Share of Gross Advances Linked to Tenure of Interest Benchmark

(per cent)

Aggregate Loan amount (as a per cent of Advances)	MCLR		External Term Benchmark(s)		Other Benchmark(s)		Fixed Rate
	≤ Interest Benchmark tenor	> Interest Benchmark tenor	≤ Interest Benchmark tenor	> Interest Benchmark tenor	≤ Interest Benchmark tenor	> Interest Benchmark tenor	
PSBs	43.8	0.2	19.0	16.5	6.2	0.0	14.3
PVBs	11.4	5.3	16.7	25.3	0.5	4.2	36.5
SCBs	30.8	2.3	18.1	20.0	3.9	1.7	23.2

Note: Sample of ten banks (five PSBs and five PVBs)
Source: Individual bank submissions and staff calculations

Table 1.8: Growth in Wholesale Credit

(y-o-y, per cent)

	PSU			Non-PSU		
	Mar-20	Mar-21	Mar-22	Mar-20	Mar-21	Mar-22
PSB	19.50	5.39	15.09	-4.10	-8.97	0.01
PVB	45.06	60.02	8.99	-0.78	-6.13	13.49
PSB+PVB	21.96	11.65	14.09	-2.84	-7.86	5.35

Source: CRILC and RBI staff calculations

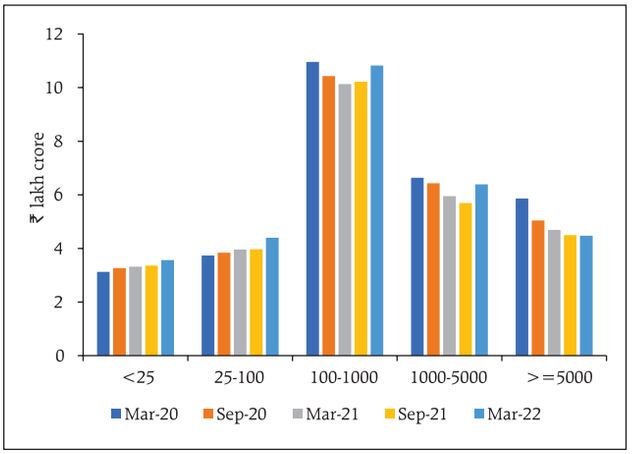
Table 1.9: Growth in Wholesale Credit to Non-PSU Non-Financial Companies

(y-o-y, per cent)

	Mar-20	Mar-21	Mar-22
AA and above	15.83	-15.03	10.13
Other Investment Grade	-5.06	-6.17	-0.17
Below Investment Grade	-15.75	3.96	0.50
Unrated/NA	-5.85	-9.88	12.63
Total	-3.83	-7.36	5.89

Source: Prime Database, CRILC and RBI staff calculations

Chart 1.66: Exposure Distribution of Non-PSU Non-Financial Obligors



Source: CRILC and RBI staff calculations

1.93 A size-wise disaggregation of wholesale credit also points to increase in banks' exposure in all categories in Q4:2021-22, except for the category of loans above ₹5,000 crore, which has remained flat (Chart 1.66).

1.94 Mirroring wholesale credit movements, banking sector exposure to private NBFCs/housing finance companies (HFCs) also increased in H2:2021-22. Most of the incremental credit was to top rated entities (Chart 1.67).

1.95 The general pickup in financing requirements in the real sector was facilitated by improvement in long term ratings upgradation, which is also evident from aggregate mobilisation of funds through market instruments (Chart 1.68 and Table 1.10).

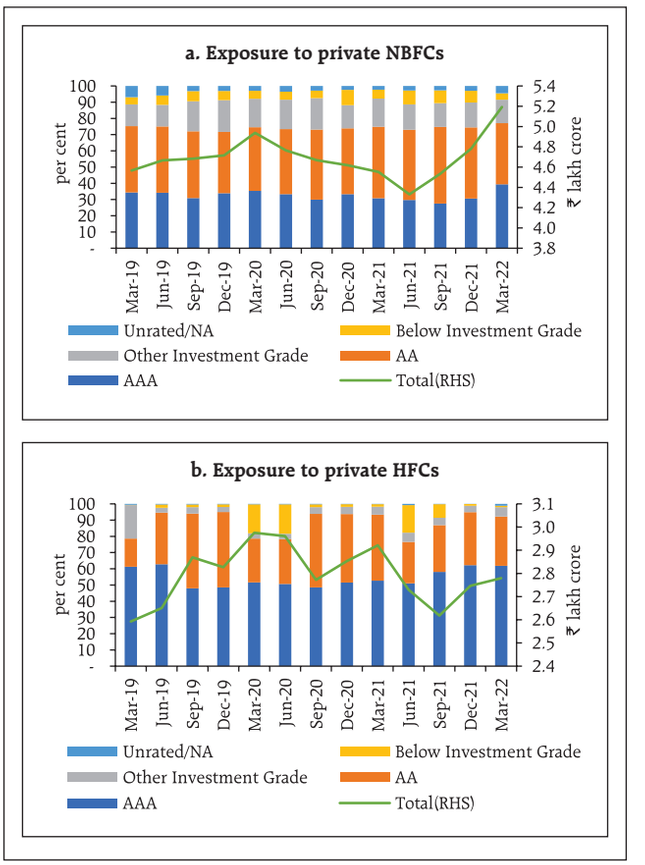
Table 1.10: Aggregate Mobilisation of Funds

(₹ '000 crore)

Quarter-end Outstanding Amount under	Mar-20	Sep-20	Mar-21	Sep-21	Mar-22
Commercial Paper (CP)	345	362	364	371	352
Corporate Bonds	3,254	3,406	3,613	3,701	4,017
ECB	1,242	1,211	1,241	1,291	1,358
Wholesale Credit	5,582	5,410	5,507	5,492	6,079
Total	**10,423**	**10,389**	**10,725**	**10,855**	**11,806**

Note: Wholesale credit numbers are for PSBs, PVBs and FBs combined based on CRILC
Sources: RBI, SEBI and NSDL

Chart 1.67: Bank Credit to NBFCs/HFCs

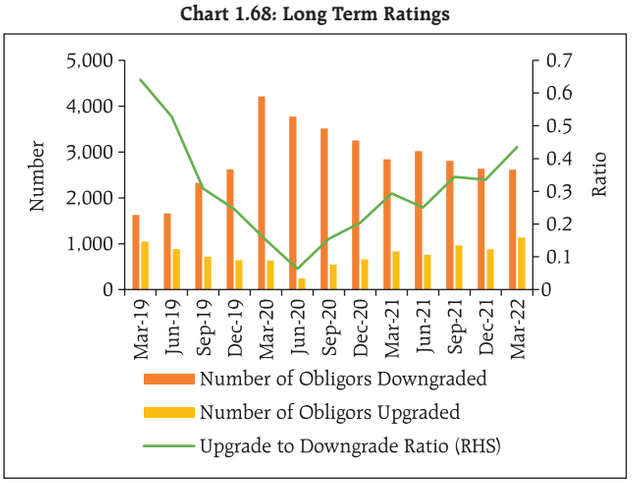


Source: Prime Database, CRILC and RBI staff calculations

I.2.11 Non-Banking Financial Companies (NBFCs)

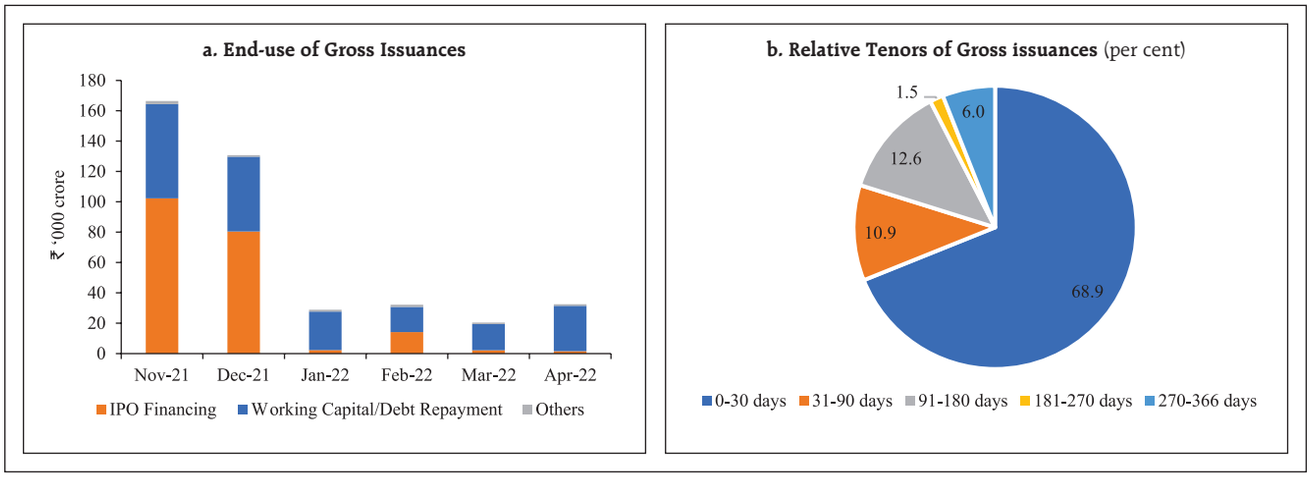
1.96 The NBFC sector has a satisfactory capital position and asset quality at the aggregate level. An analysis of commercial paper (CPs) issued by a sample of ten large NBFCs, which accounted for 70

Chart 1.68: Long Term Ratings



Source: NSDL, CRILC, Prime Database and RBI staff calculations

Chart 1.69: NBFC CP Issuances



Source: RBI

per cent of gross issuances during November 2021 to April 2022, revealed that 69 per cent of issuances were in the 0-30 days tenor. Moreover, 49 per cent of the funds raised were used for IPO financing (Chart 1.69). In the revised regulatory framework for NBFCs issued in October 2021, the Reserve Bank has placed a ceiling of ₹1 crore per borrower for financing subscription to IPOs, with effect from April 1, 2022. Consequently, since December 2021, there has been a sharp decline in IPO funding by NBFCs. The majority of the funds raised through CPs are for working capital or debt repayment.

1.97 The GNPA ratio of the sector (excluding core investment companies) has improved from 6.1 per cent in March 2021 to 5.8 per cent in March 2022. Moreover, Special Mention Accounts (SMAs)[21] decreased from 13.3 per cent of total advances in September 2021 to 9.2 per cent in March 2022. Pockets of stress are, however, observed in select NBFC cohorts, *viz.*, NBFC-Factor (21.8 per cent) and NBFC- Investment and Credit Companies (7.9 per cent) (Table 1.11).

Table 1.11: Asset Quality Ratios across NBFC Categories

(per cent)

		GNPA	SMA-0	SMA-1	SMA-2
NBFC - MFI (2.9 %)	**Mar-21**	5.4	2.3	1.7	1.0
	Jun-21	6.1	8.8	4.4	2.4
	Sep-21	5.9	4.4	2.2	1.4
	Dec-21	5.7	2.4	2.1	1.4
	Mar-22	4.7	2.1	1.5	1.3
NBFC - Factor (0.1%)	**Mar-21**	25.0	13.7	1.7	1.7
	Jun-21	29.2	14.2	2.2	2.7
	Sep-21	26.0	13.8	1.5	1.1
	Dec-21	27.1	13.6	2.3	0.0
	Mar-22	21.8	11.7	1.3	0.0
NBFC - ICC (51.6 %)	**Mar-21**	8.0	7.5	3.2	3.1
	Jun-21	9.6	8.2	4.5	3.9
	Sep-21	9.0	7.2	3.9	3.3
	Dec-21	9.0	6.6	3.6	2.9
	Mar-22	7.9	6.1	3.3	2.3
NBFC - IFC (44.2 %)	**Mar-21**	3.9	5.2	1.9	2.4
	Jun-21	3.8	3.0	0.1	6.9
	Sep-21	3.8	1.9	0.0	10.9
	Dec-21	4.0	0.2	0.0	3.3
	Mar-22	3.6	2.5	2.2	2.1
NBFC-IDF (1.2 %)	**Mar-21**	0.4	0.0	0.1	1.7
	Jun-21	0.4	0.0	0.0	0.6
	Sep-21	0.4	0.0	0.0	0.6
	Dec-21	0.8	0.6	0.1	0.0
	Mar-22	0.3	0.0	0.1	0.4
Total	**Mar-21**	6.1	6.3	2.6	2.7
	Jun-21	6.9	5.8	2.5	5.1
	Sep-21	6.5	4.7	2.1	6.5
	Dec-21	6.6	3.6	1.9	3.0
	Mar-22	5.8	4.3	2.7	2.2

Note: Number in parenthesis indicates percentage share of each category of NBFC to total advances of NBFCs.
Source: RBI Supervisory Returns

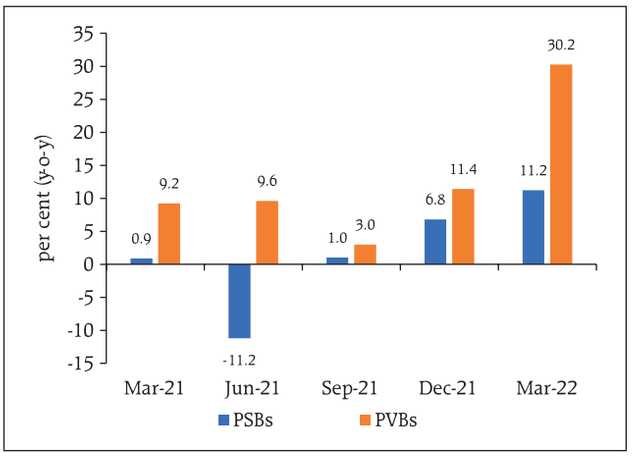
[21] Special Mention Account (SMA): - a) Loans in the nature of revolving facilities like cash credit/overdraft: if outstanding balance remains continuously in excess of the sanctioned limit or drawing power, whichever is lower, for a period of 31-60 days - SMA-1; 61-90 days - SMA-2. b) Loans other than 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.

I.2.12 Credit flows to the MSME Sector

1.98 The micro, small and medium enterprise (MSME) sector, which was hit hard by the pandemic, is showing signs of revival: aggregate credit to the sector witnessed a strong revival during Q4:2021-22, supported by significant growth in lending by PVBs (Chart 1.70). The upsurge of domestic demand and pick up in ancillary industries and service units has increased funding requirement of this sector, which provides employment to a large section of the population.

1.99 The Emergency Credit Line Guarantee Scheme (ECLGS[22]) has played a key role in reviving the MSME sector. Loans amounting to ₹3.32 lakh crore were sanctioned under the ECLGS, till April 30, 2022, of which an amount of ₹2.54 lakh crore was disbursed (₹2.36 lakh crore by SCBs). The drawdown under ECLGS 1.0, 2.0 and its extension comprised over 97 per cent of the total guarantees issued (Chart 1.71).

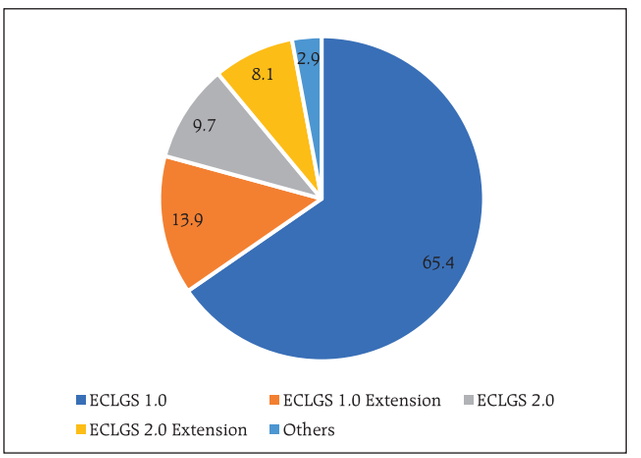
Chart 1.70: Credit to MSME Sector



Source: RBI supervisory returns and staff calculations

Chart 1.71: ECLGS Guarantee Disbursed

(per cent share)

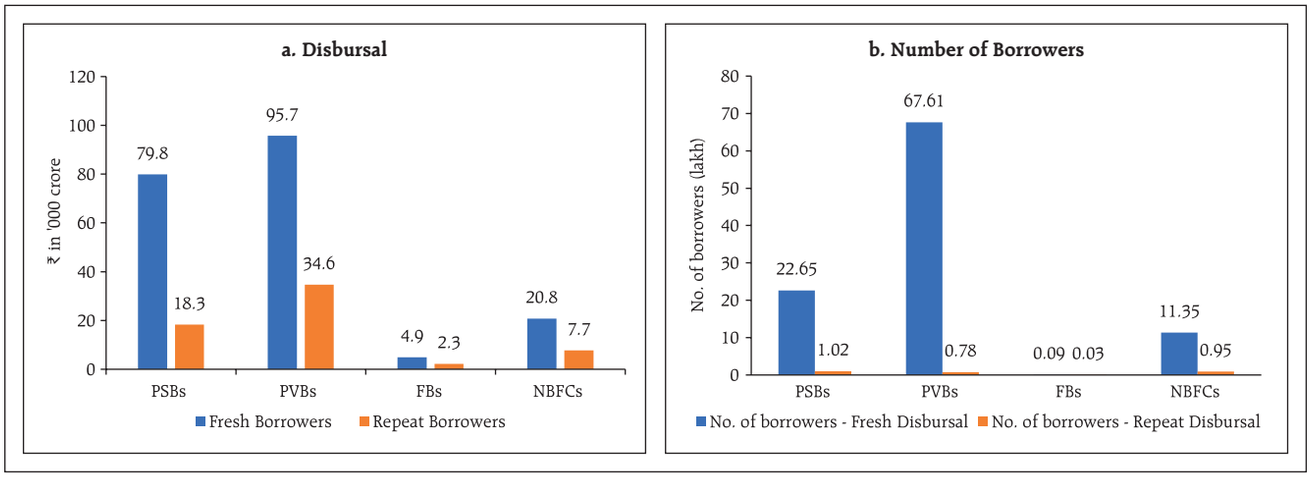


Note: Others include ECLGS 1.0 Extension, ECLGS 2.0 Extension, ECLGS 3.0 Extension and ECLGS 4.0

Source: National Credit Guarantee Trustee Company Limited (NCGTC)

[22] Emergency Credit Line Guarantee Scheme (ECLGS), a Government initiative launched on May 20,2020 provides 100 per cent guarantee coverage from NCGTC to select borrowers. It was originally devised for MSMEs/business enterprises whose total fund-based credit outstanding across all lending institutions was up to ₹25 crore. The Scheme has undergone different iterations through the following components: ECLGS 1.0, ECLGS 1.0 (Extension), ECLGS 2.0, ECLGS 2.0 (Extension), ECLGS 3.0, ECLGS 3.0 (Extension) and ECLGS 4.0 since its launch. The validity of ECLGS stands extended to March 31, 2023 or till guarantees for an amount of ₹5 lakh crore are issued.

Chart 1.72: Bank Group-wise ECLGS Guarantee



Source: National Credit Guarantee Trustee Company Limited (NCGTC)

1.100 PVBs showed greater appetite than PSBs in utilising different ECLGSs, though the number of repeat borrowers remained similar for PSBs and PVBs (Chart 1.72 a and b).

1.101 The aggregate GNPA Ratio (PSBs and PVBs) in the MSME sector has moderated from 11.3 per cent in September 2021 to 9.3 per cent in March 2022. They, however, remain relatively high. Moreover, restructuring of portfolios to the tune of ₹46,186 crore constituting 2.5 per cent of total advances under the May 2021 scheme[23] has the potential to create stress in the sector (Tables 1.12 and 1.13).

Table 1.12: MSME Restructuring

Restructuring Scheme	Aggregate portfolio restructured (₹ crore)	
	PSBs	PVBs
Restructuring- January 2019 scheme	26,190	2,174
Restructuring- February 2020 scheme	5,860	1,364
Restructuring- August 2020 scheme	18,232	11,027
Restructuring- May 2021 scheme	30,285	15,901

Source: RBI supervisory returns and staff calculations.

Table 1.13: MSME Asset Quality Profile

(per cent)

	PSBs + PVBs				
	0 days past due	SMA-0	SMA-1	SMA-2	GNPA
Mar-21	74.0	7.3	5.7	2.2	10.8
Jun-21	72.4	8.6	3.8	3.4	11.9
Sep-21	76.3	6.6	2.6	3.1	11.3
Dec-21	75.4	8.8	3.1	2.3	10.4
Mar-22	79.7	6.4	3.5	1.1	9.3

Source: RBI supervisory returns and staff calculations.

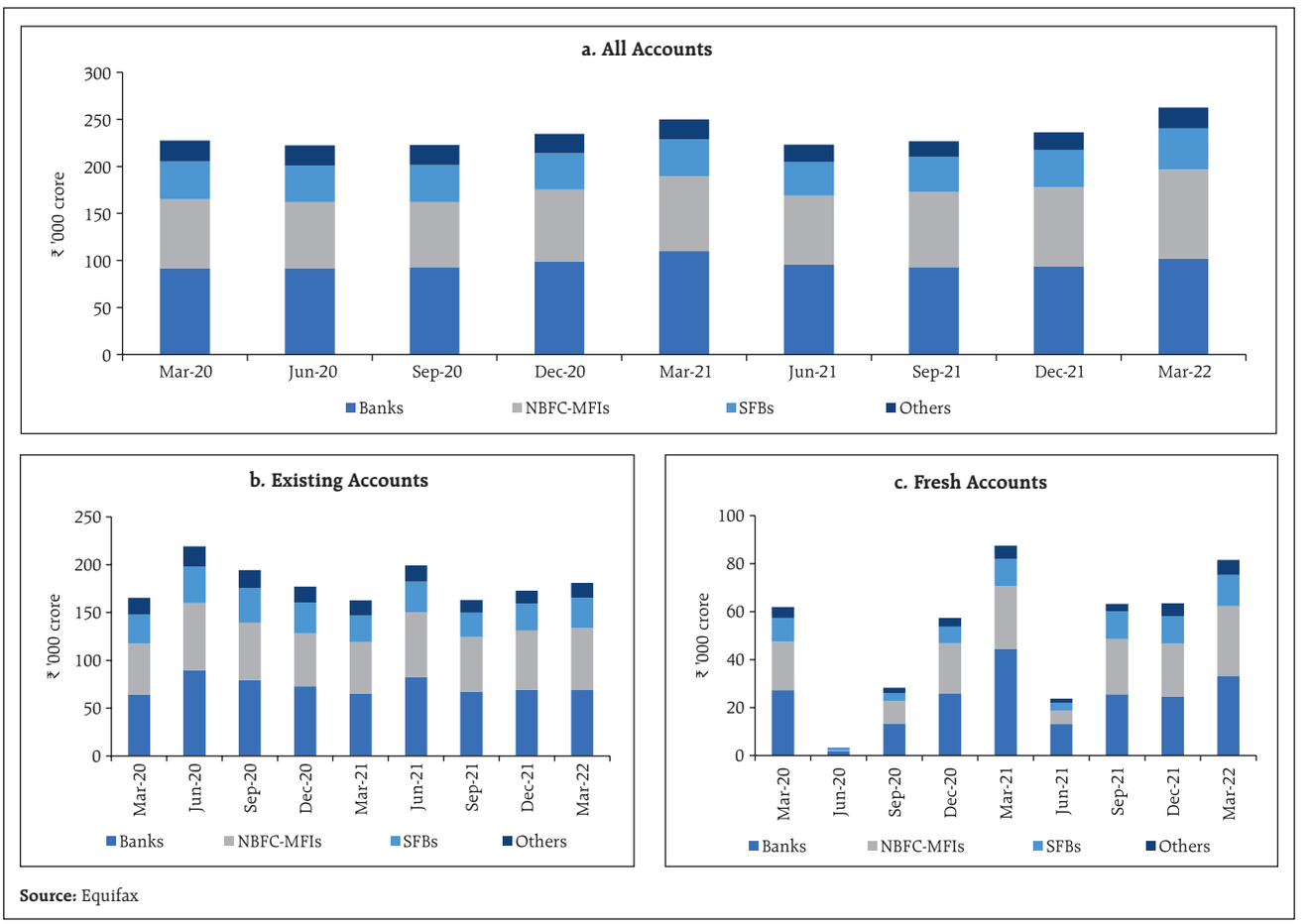
[23] Resolution Framework 2.0 – Resolution of Covid-19 related stress of Micro, Small and Medium Enterprises (MSMEs) with details provided in circular DOR.STR.REC.12/21.04.048/2021-22 dated May 5, 2021

1.102 Borrowers who availed ECLGS 1.0 and 2.0 continue to avail extension facilities. Coupled with the higher avail rate (*i.e.*, proportion of MSME borrowers availing ECLGS loans to the total eligible base) among low-rated borrowers and those that had a higher need for credit even before the pandemic, this portends potential stress in banks' MSME portfolios.

1.2.13 Microfinance Segment

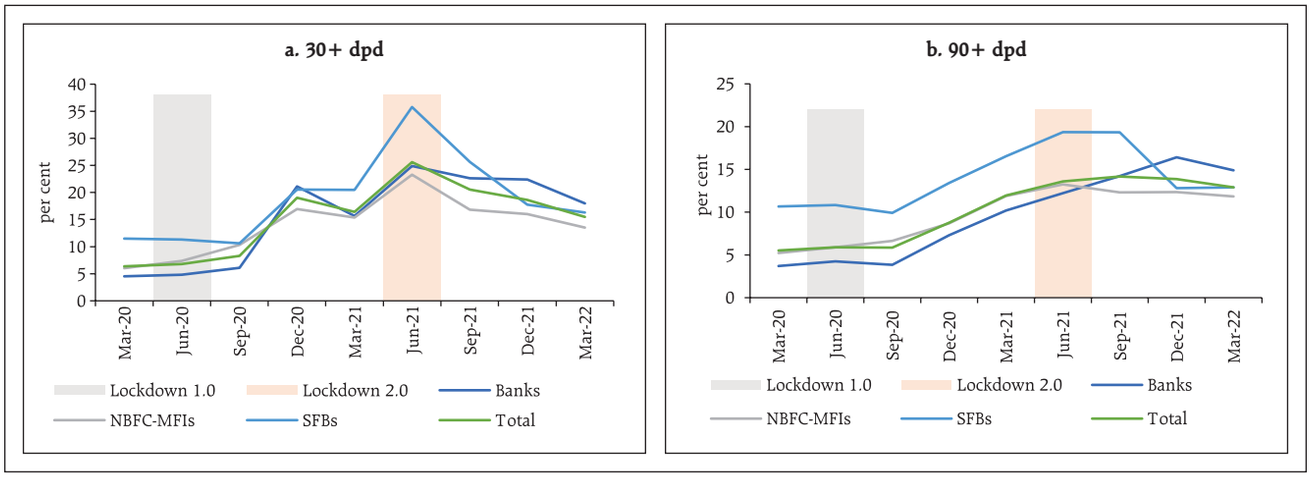
1.103 Aggregate credit to the microfinance sector is expanding steadily and has now exceeded its pre-pandemic levels. Credit provided by all types of lenders are showing signs of stabilisation (Chart 1.73 a, b and c). Importantly, the growth in credit appears to be broad-based as lending to both existing and fresh borrowers is growing.

Chart 1.73: Lending to the Microfinance Segment



Source: Equifax

Chart 1.74: Stress in the Microfinance Segment



Source: Equifax

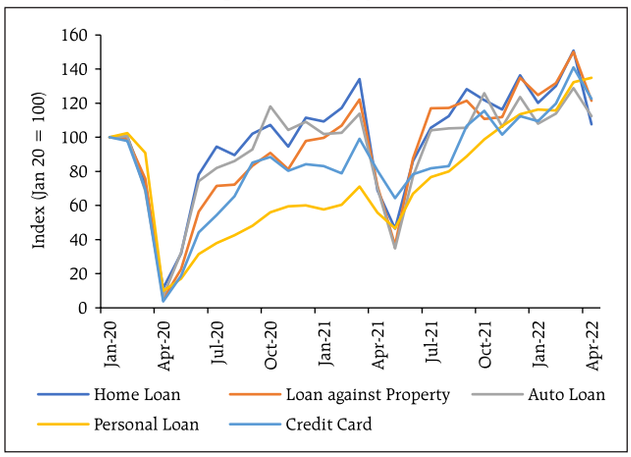
1.104 The microfinance segment, which witnessed reduction in credit and increase in impairments during the pandemic, is showing signs of revival. Stress in this segment is diminishing, with delinquency levels measured in terms of 30+ dpd (days past due) declining and 90+ dpd remaining steady across lenders in H2:2021-22 (Chart 1.74).

I.2.14 Consumer Credit

1.105 Based on inquiry volumes[24], the demand for consumer credit, which was consistently trending upwards after the second wave of the pandemic, has moderated in Q1:2022-23 (Chart 1.75).

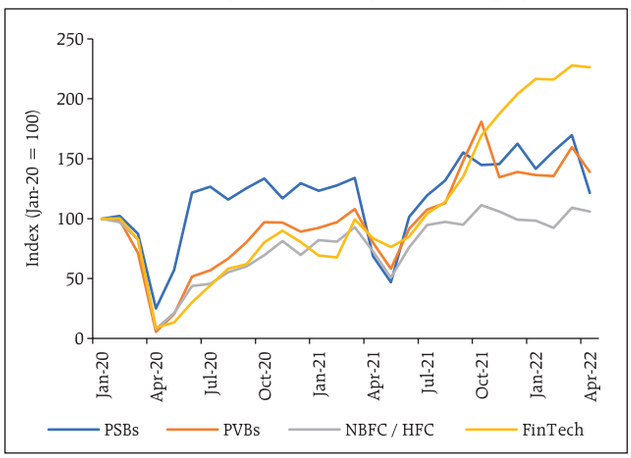
1.106 The volume of enquiries indicates that loan demand has increased substantially after the second wave of the pandemic across all borrower categories, with home loans and loans against property recording the maximum growth. The moderation in enquiries with banks, NBFCs and HFCs, which began after December 2021 due to the emergence of Omicron continues, but there has been a significant rise in the case of FinTech[25] platforms (Chart 1.76).

Chart 1.75: Inquiry Volumes by Product Category



Source: TransUnion CIBIL

Chart 1.76: Inquiry Volumes by Lender Category

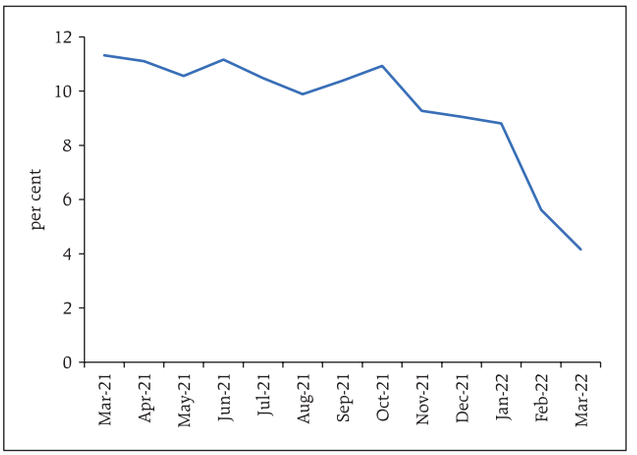


Source: TransUnion CIBIL

[24] A credit inquiry is created when any borrower applies for a loan and permits the lender to pull their credit record. Inquiries are among the first credit market measures to change in credit record data in response to changes in economic activity.

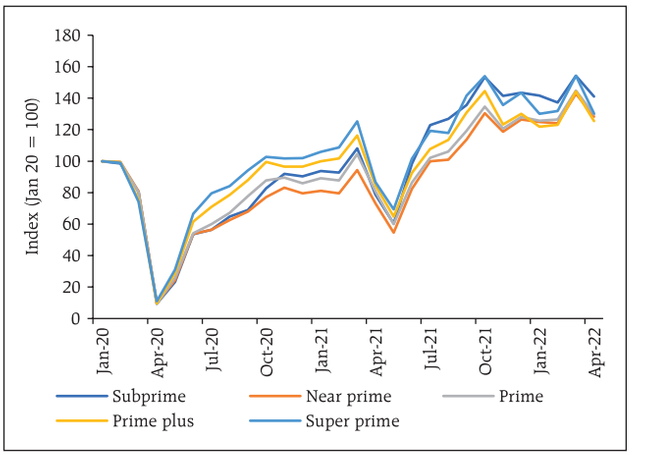
[25] TransUnion CIBIL's FinTech category comprises of NBFCs registered with RBI and active in digital lending category as also peer to peer lending platforms.

Chart 1.77: Growth in Credit Active Consumers (y-o-y)



Source: TransUnion CIBIL

Chart 1.78: Inquiry Volumes by Risk Tier



Source: TransUnion CIBIL

1.107 The declining trend in the growth in credit for active consumers[26] is persisting. (Chart 1.77).

1.108 Inquiry volumes by risk tier shows that loan demand from all categories of borrowers is stabilising (Chart 1.78). The distribution by risk tier[27] shows improvement in the customer mix across all category of lenders, except PSBs whose exposure to below-prime borrowers rose marginally (Table 1.14).

1.109 The proportion of portfolios at 90 dpd or beyond, a measurement of impairment in consumer

Table 1.14: Consumer Distribution by Risk Tier and Lender Category

(as a per cent of credit active consumers)

Score Band	Select NBFCs[28] (24)		All NBFCs		All PSBs		All PVT Banks		Industry	
	Mar-21	Mar-22	Mar-21	Mar-22	Mar-21	Mar-22	Mar-21	Mar-22	Mar-21	Mar-22
Subprime	29.6	25.2	33.5	28.9	29.2	30.5	18.2	16.1	28.3	27.1
Near prime	24.5	23.6	25.1	23.6	26.0	25.7	17.4	16.8	23.3	22.2
Prime	29.6	35.6	28.5	34.4	28.7	27.6	33.0	35.5	29.1	30.7
Prime plus	14.6	14.1	11.6	11.8	11.8	11.9	21.5	21.2	14.1	14.4
Super prime	1.6	1.5	1.2	1.3	4.4	4.3	9.8	10.3	5.2	5.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Below Prime	54.1	48.8	58.6	52.5	55.2	56.2	35.6	32.9	51.6	49.3

Source: TransUnion CIBIL

[26] Consumers withatleast one outstanding credit account.

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

[28] A select list of NBFCs particularly active in the consumer segment was segregated so as to examine issues of possible concentration of risk.

credit, has stabilised across lender categories (Table 1.15). The improvement in credit standards is also reflected in moderation in approval rates (Chart 1.79).

I.2.15 Housing Market

1.110 The housing market in India is becoming organised and is getting increasingly financed by banks for both home buyers as well as builders. During the current phase of the economic recovery, the housing market has also regained momentum driven by a combination of easy financial conditions and supportive policy environment. As a result, housing sales have increased, and new launches have expanded, though there was some hiatus around the emergence of Omicron in Q4:2021-22 (Chart 1.80). Overall, the decline in unsold inventory has helped

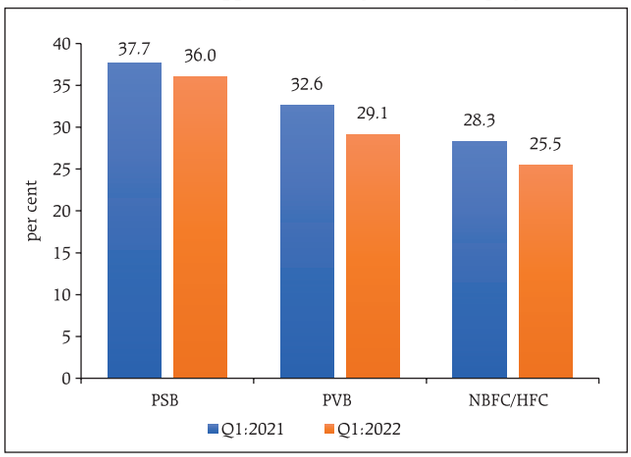
Table 1.15: Delinquency Levels in Aggregate Consumer Credit across all Product Categories

(per cent)

	PSB	PVB	NBFC/HFC	FinTech
Mar-21	4.90	2.01	3.05	3.13
Apr-21	4.94	2.04	3.96	3.57
May-21	5.71	2.48	5.08	4.69
Jun-21	5.52	2.63	4.57	3.69
Jul-21	5.29	2.76	4.59	4.71
Aug-21	5.35	2.63	4.20	4.68
Sep-21	4.87	2.22	3.64	4.83
Oct-21	5.12	1.89	3.96	4.61
Nov-21	5.07	1.78	3.47	4.53
Dec-21	4.85	1.97	3.23	3.58
Jan-22	4.97	2.07	2.97	3.29
Feb-22	4.78	1.85	3.00	2.81
Mar-22	4.45	1.40	2.34	2.26

Note: based on 90 days past due balances
Source: TransUnion CIBIL

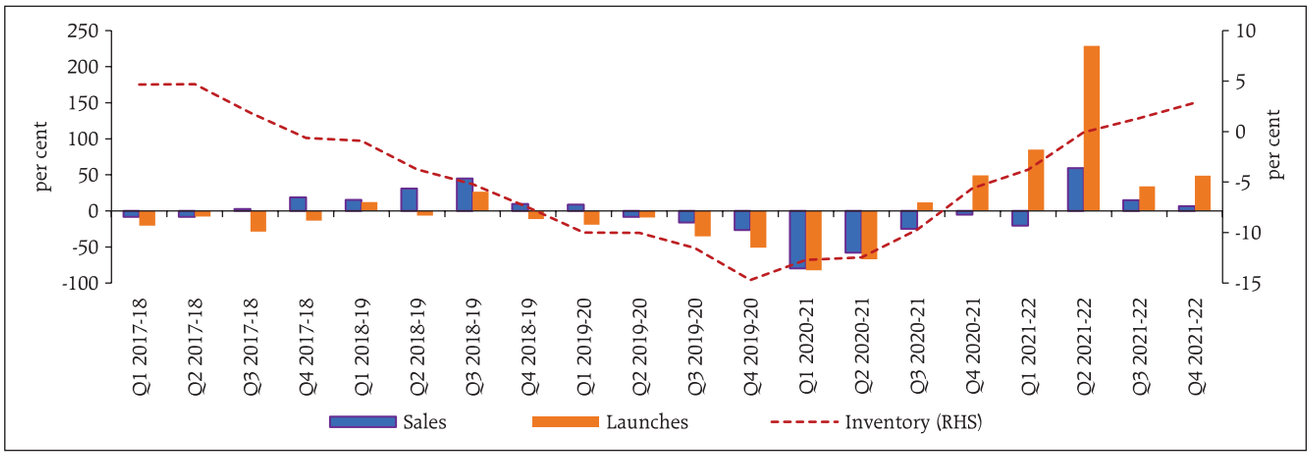
Chart 1.79: Approval Rates by Lender Category



Source: TransUnion CIBIL

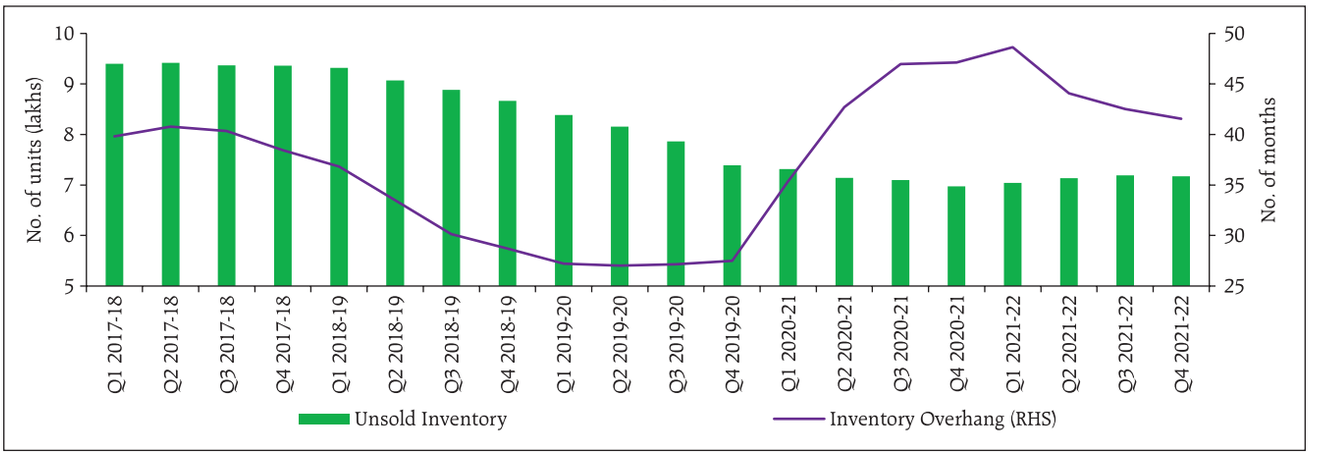
Chart 1.80: House Sales, Launches and Unsold Inventory

(y-o-y growth, per cent)



Source: PropTiger Datalabs

Chart 1.81: Unsold Inventory and Inventory Overhang



Source: PropTiger Datalabs

bring down the inventory overhang[29] during the last three quarters of 2021-22 (Chart 1.81).

I.2.16 Systemic Risk Survey[30]

1.111 In the May 2022 round of Systemic Risk Survey, global spillovers and financial market volatility moved to the 'high' risk category. Global growth uncertainty, commodity price movements, geopolitical conditions and monetary tightening in AEs were perceived to be the major drivers of escalation in global risks. The rise in financial market risk was assessed to be emanating from tightening of financial conditions: foreign exchange pressure; interest rate and liquidity tightening; and elevated equity price volatility. The survey respondents assessed that macroeconomic uncertainty, though rising, remained a 'medium' risk. Three-fourths of the respondents perceived the war in Ukraine to have a medium impact on the Indian economy as a whole.

1.112 Nearly 44 per cent of the panellists judged that the prospects of the Indian banking sector over a one-year horizon have improved and another 35 per cent expected the same to remain unchanged. Around 38 per cent of the respondents expected marginal deterioration in asset quality of the banking sector over the next three months attributable to factors such as COVID-19 induced regulatory forbearance, improved asset quality recognition, higher input costs, supply chain bottlenecks impacting profit margins of firms and tightening of monetary and liquidity conditions. Most of the panellists expected marginal to considerable improvement in credit demand over the next three months on the back of recovery in GDP growth, higher consumer spending, pick up in manufacturing sector activity, public investment in infrastructure and higher demand for working capital.

Summary and Outlook

1.113 The global economy faces downside risks to growth prospects even as inflationary pressures persist. Central banks the world over face the challenges of managing soft landings while maintaining macroeconomic and financial stability.

[29] Inventory overhang indicates the number of months it will take for the current unsold inventory to get cleared in the current market scenario.

[30] Details are given in Annex 1

1.114 Despite bouts of volatility, the global financial system has maintained overall stability. Financial conditions have, however, tightened markedly over the past few months, driven by a combination of increasing risk aversion among market participants in the face of downside risks to the outlook and front-loaded monetary policy normalisation to manage inflation and inflationary expectations.

1.115 The economic cost of the war and sanctions are interacting with monetary tightening, financial market volatility, the pandemic and vaccine access. For EMEs, rising interest rates will tighten external financing conditions and leave them vulnerable to a generalised flight to safety. Those with large debt overhangs will face pressure on budgets and debt servicing. The risks to long term growth prospects remain large and to the downside.

1.116 The Indian economy and the domestic financial system remain strong and resilient in a hostile international environment, supported by robust domestic macroeconomic fundamentals. On the back of adequate capital buffers and improving asset quality levels, the Indian banking system is well positioned to support economic growth, with bank credit growing in double digits after a long hiatus. The non-banking system remains well capitalised. Financial markets, however, are witnessing heightened volatility because of global spillovers. Going forward, preserving macroeconomic and financial stability on a durable basis holds the key to reviving India's tryst with its longer term growth prospects and developmental aspirations, including its emerging role in the global economy.

Chapter II

Financial Institutions: Soundness and Resilience

The Indian banking sector embarked upon a phase of consolidation during H2:2021-22. Banks bolstered risk absorbing capacity as gross non-performing assets declined to their lowest level in six years. Macro stress tests reveal that all banks would be able to comply with minimum capital adequacy norms even in a severe stress scenario, although some segments as well as non-banking financial companies may be vulnerable to liquidity shocks. Contagion risks increased in March 2022 vis-à-vis September 2021 on account of deepening inter-bank market linkages.

Introduction

2.1 Policy support, including regulatory dispensations, helped the Indian banking sector navigate waves of the pandemic and strengthen their risk absorption capacity. With the progressive normalisation of economic activity, banks were able to kick start a fresh lending cycle while simultaneously improving profitability. There are, however, early signs of stress in certain sectors, calling for caution and monitoring on an ongoing basis.

2.2 This chapter presents an evaluation of the soundness and resilience of financial intermediaries in India by analysing their recent performance on key parameters, as reflected in their offsite reporting to the Reserve Bank. Section II.1 presents an assessment of business mix, asset quality, capital adequacy, earnings and profitability of scheduled commercial banks (SCBs) and evaluates their resilience against macroeconomic shocks through stress tests and sensitivity analysis. Section II.2 provides a snapshot of the performance of small finance banks (SFBs). Sections II.3 and II.4 examine the recent financial performance of urban cooperative banks (UCBs) and non-banking financial companies (NBFCs) and stress tests their resilience. The concluding Section II.5 provides a detailed analysis of the network structure and connectivity of the Indian financial system and presents the results of contagion analysis under adverse scenarios.

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

2.3 After reaching a high of 11.9 per cent in March 2021, aggregate deposit growth (y-o-y) moderated gradually through 2021-22 reaching 9.9 per cent in March 2022 and further to 9.1 per cent by June 3, 2022 (Chart 2.1 a). Growth in current and savings account (CASA) deposits also moderated during this period, primarily on account of public sector banks (PSBs). Nevertheless, CASA deposit growth has exceeded the growth of term deposits for all categories of banks during the COVID-19 pandemic, which partly reflects households' preference for liquidity in the face of higher uncertainty (Chart 2.1 b).

2.4 As the recovery gained traction, bank credit picked up during H2:2021-22 and reached 11.5 per cent in March 2022, rising further to 12.9 per cent as on June 3, 2022. Lending by both PSBs and private sector banks (PVBs) increased (Chart 2.1 c). While credit growth in the agriculture sector

[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. SCBs include public sector banks, private sector banks and foreign banks. For CRAR projections, a sample of 46 SCBs accounting for around 98 per cent of the assets of the total banking sector (non-RRB) have been considered.

[2] The analyses done in the chapter are based on the data available as of June 13, 2022 which are provisional, unless stated otherwise.

Chart 2.1: Deposit and Credit Profile of SCBs

Source: RBI supervisory returns and staff calculations.

Table 2.1: Increase in New Loans by SCBs: Economic Sectors and Organisations*

Sector	Q4:2020-21	Q1:2021-22	Q2:2021-22	Q3:2021-22	Q4:2021-22
	Increase during the quarter (₹ '000 crore)				
Economic Sector wise					
Agriculture	13	-50	72	3	24
Industry	57	-134	63	110	36
Services	121	-226	116	100	116
Personal Loans	31	-135	114	41	55
Organisation wise					
Public Sector	64	-133	49	101	57
Private Corporate Sector	99	-146	73	74	97
Household Sector	64	-285	268	76	85
of which: Individuals	*47*	*-235*	*227*	*58*	*66*
Others	-3	2	3	10	1
Total	**223**	**-562**	**393**	**261**	**239**
Share of new loans in total loans (per cent)	**16.7**	**11.6**	**15.1**	**16.8**	**17.9**

Note: *excluding Regional Rural Banks (RRBs).
Source: Basic Statistical Returns - 1, RBI.

declined marginally despite a step-up in lending by PVBs, industrial credit continued to strengthen, driven by robust lending by PVBs and Foreign Banks (FBs). PSBs too recorded growth in industrial credit after almost three years of contraction (Chart 2.1 e). Lending to the services sector accounted for 41.8 per cent of credit extended by FBs (Chart 2.1 d). Growth in personal loans[3] remained steady during 2021-22 and accounted for over 30 per cent of incremental lending by PSBs and PVBs. In personal loan sector, housing loans, credit card receivables and vehicle/ auto loans recorded double digit growth (Chart 2.1 f).

2.5 Rapid credit expansion during the second half of 2021-22 was aided by new loan accounts in the industrial and services sector (Table 2.1), with the share of new loans in total loans increasing in successive quarters of the year.

II.1.1 Asset Quality

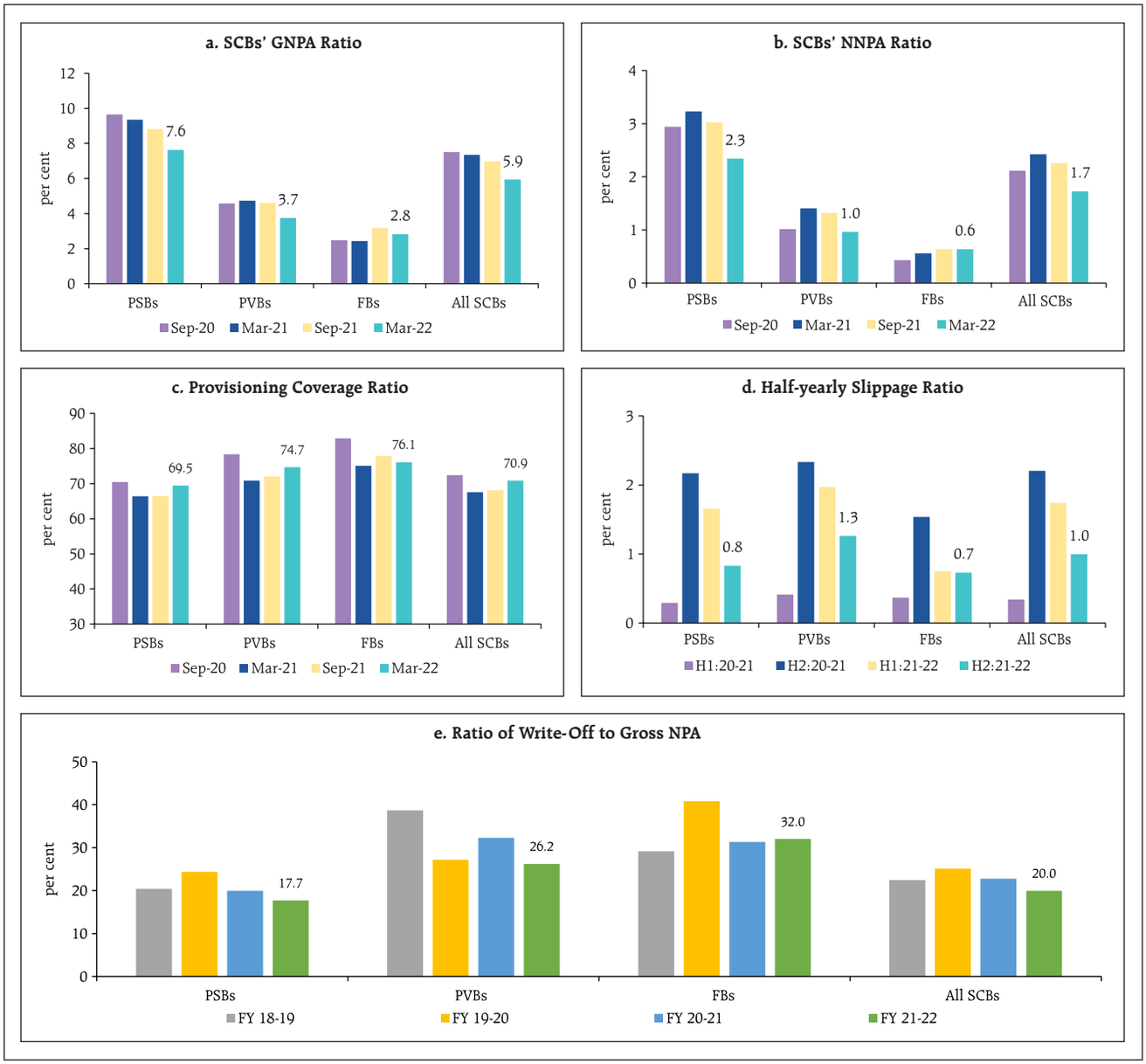
2.6 Asset Quality of SCBs continued to improve steadily through the year, with gross non-performing assets (GNPA) ratio declining from 7.4 per cent in March 2021 to a six-year low of 5.9 per cent in March 2022 (Chart 2.2 a). Net non-performing assets (NNPA) ratio also fell by 70 bps during 2021-22 and stood at 1.7 per cent at the year-end (Chart 2.2 b). The provisioning coverage ratio (PCR[4]) improved to 70.9 per cent in March 2022 from 67.6 per cent a year ago (Chart 2.2 c). The slippage ratio, measuring new accretions to NPAs as a share of standard advances at the beginning of the period, declined across bank groups during 2021-22 (Chart 2.2 d). Write-off ratio[5] declined for the second successive year to 20.0 per cent in 2021-22 (Chart 2.2 e).

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

[4] PCR is the ratio of provisions (without write-offs) held for GNPA to GNPA.

[5] Write-off ratio is the ratio of write-off during the year to GNPA at the beginning of the year.

Chart 2.2: Select Asset Quality Indicators



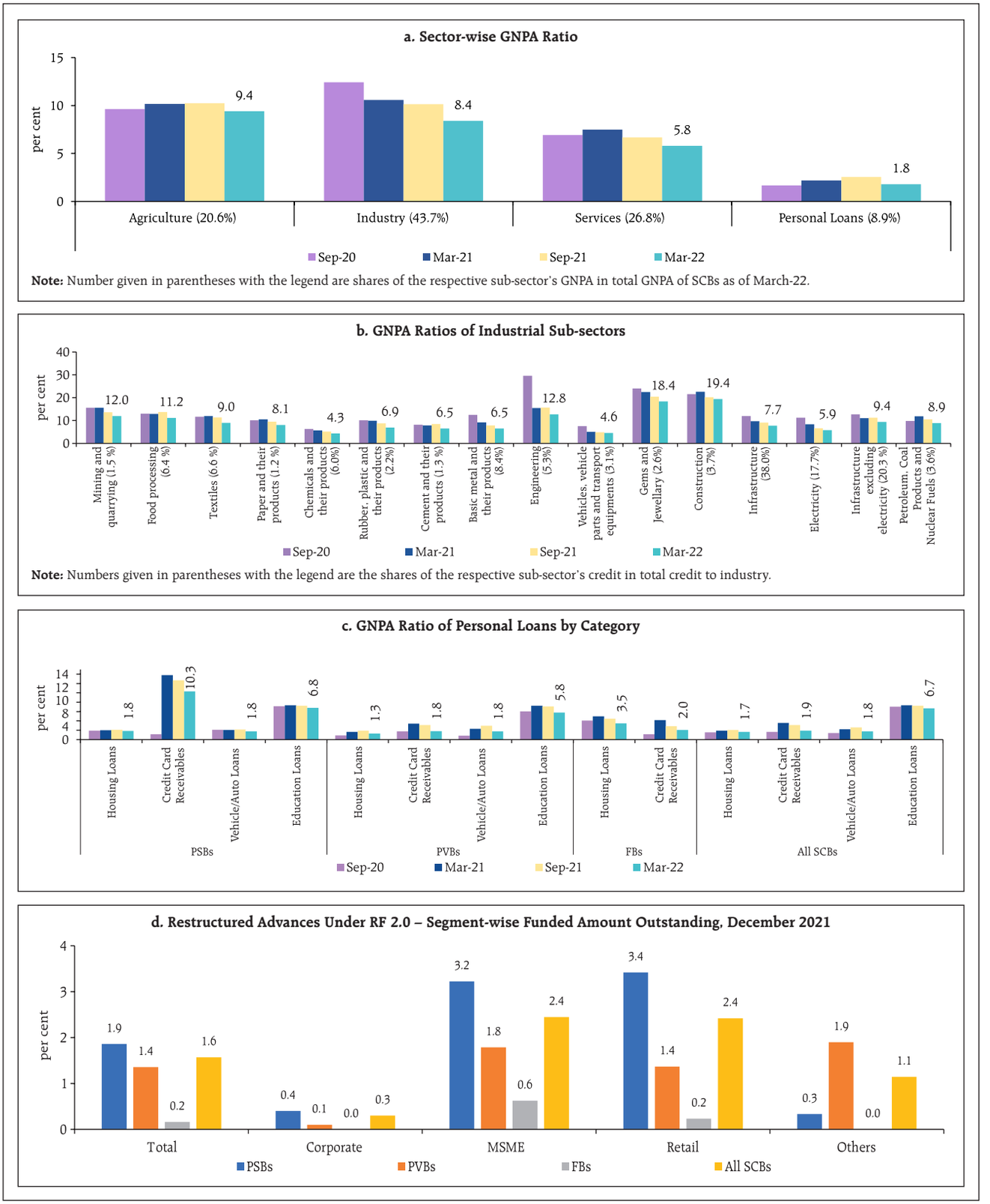
Source: RBI supervisory returns and staff calculations.

II.1.2 Sectoral Asset Quality

2.7 SCBs' asset quality improved across all major sectors (Chart 2.3 a). There was a broad-based improvement in the GNPA ratio in respect of the industrial sector, though it remained elevated for gems and jewellery and construction sub-sectors (Chart 2.3 b). The asset quality of the personal loans segment improved, especially for credit card receivables and education loans (Chart 2.3 c).

2.8 Restructuring of loans by entities impacted by the second wave of COVID-19 under the Resolution Framework (RF) 2.0 was 1.6 per cent of total advances in December 2021. Restructured assets constituted 2.4 per cent each of the advances under MSME and retail sectors. PSBs had a relatively larger share of restructured loan assets in their books (Chart 2.3 d). Earlier, restructuring under RF 1.0 was limited to 1.0 per cent of total advances.

Chart 2.3: Sectoral Asset Quality Indicators



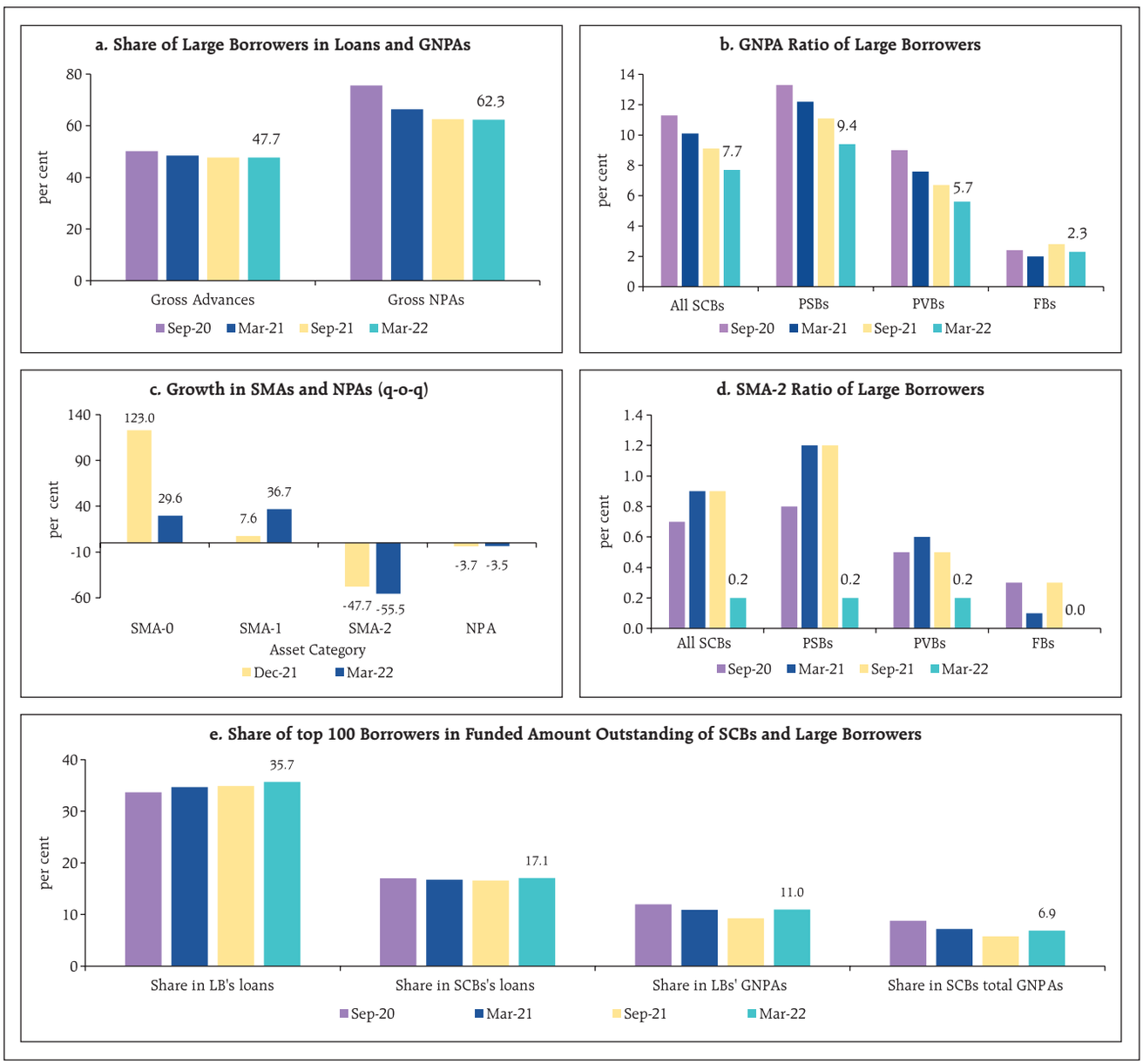
Source: RBI supervisory returns and staff calculations.

II.1.3 Credit Quality of Large Borrowers[6]

2.9 The share of large borrowers in SCBs' loans has been declining in recent years, indicating reduction in credit concentration and diversification of borrowers. Their share in total GNPA of SCBs moderated marginally to 62.3 per cent during H2:2021-22 and remained well below its level in September 2020 (75.6 per cent) (Chart 2.4 a).

2.10 The GNPA ratio of large borrowers has been declining over the last two years to reach 7.7 per cent in March 2022 (Chart 2.4 b). Their special mention account (SMA)-2 loans and NPAs also declined during

Chart 2.4: Select Asset Quality Indicators of Large Borrowers



Source: RBI supervisory returns and staff calculations.

[6] 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.

Q3 and Q4 of 2021-22, though the persistent rise in their SMA-0 and SMA-1 loans carries the potential to cause stress going forward (Chart 2.4 c and d).

2.11 As industrial activity revived during the second half of the year, the share of top 100 large borrowers in SCBs' total loan books as well as in SCBs' GNPA increased. These borrowers accounted for 17.1 per cent of SCBs' total credit and 6.9 per cent of their GNPA (Chart 2.4 e).

II.1.4 Capital Adequacy

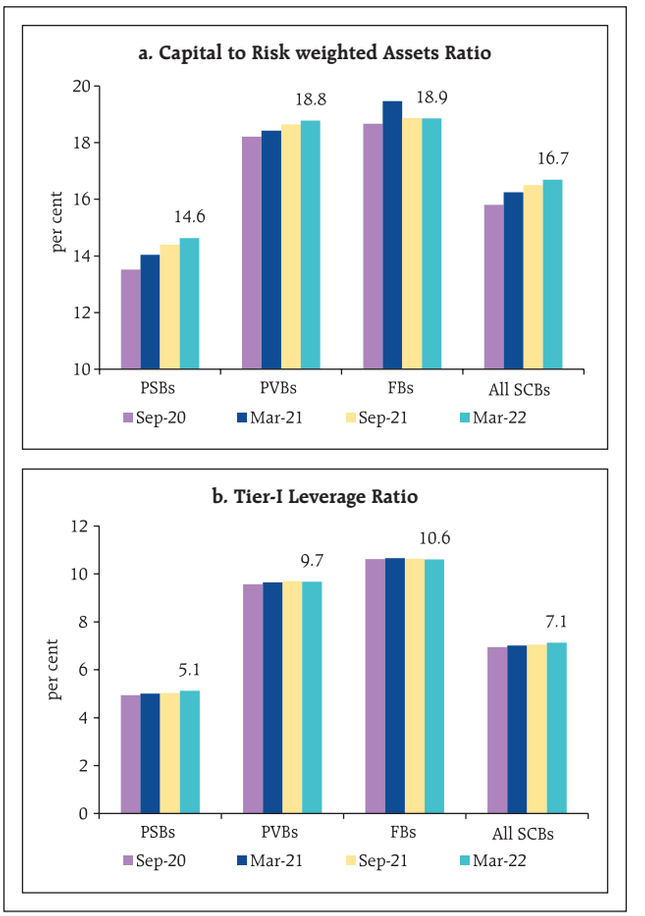
2.12 Capital raising and earnings retention by banks supported capital augmentation. The CRAR has been on the rise since March 2020, improving further to 16.7 per cent in March 2022. The CRAR of PVBs and FBs remained above 18 per cent (Chart 2.5 a). The system level Tier-I[7] leverage ratio has also been rising after March 2020 and stood at 7.1 per cent in March 2022 (Chart 2.5 b).

II.1.5 Earnings and Profitability

2.13 Net interest margin (NIM) of SCBs increased marginally during 2021-22 and stood at 3.4 per cent (Chart 2.6 a). While NIMs of all bank groups increased during H2:2021-22, they remained lower for PSBs than PVBs. PSBs recorded high growth in profit after tax (PAT) (Chart 2.6 b).

2.14 The return on assets (RoA) and return on equity (RoE) ratios improved during H2:2021-22. PVBs, which have been maintaining higher profitability than PSBs, improved their profile from the moderation recorded in the first half of the year (Chart 2.6 c and d).

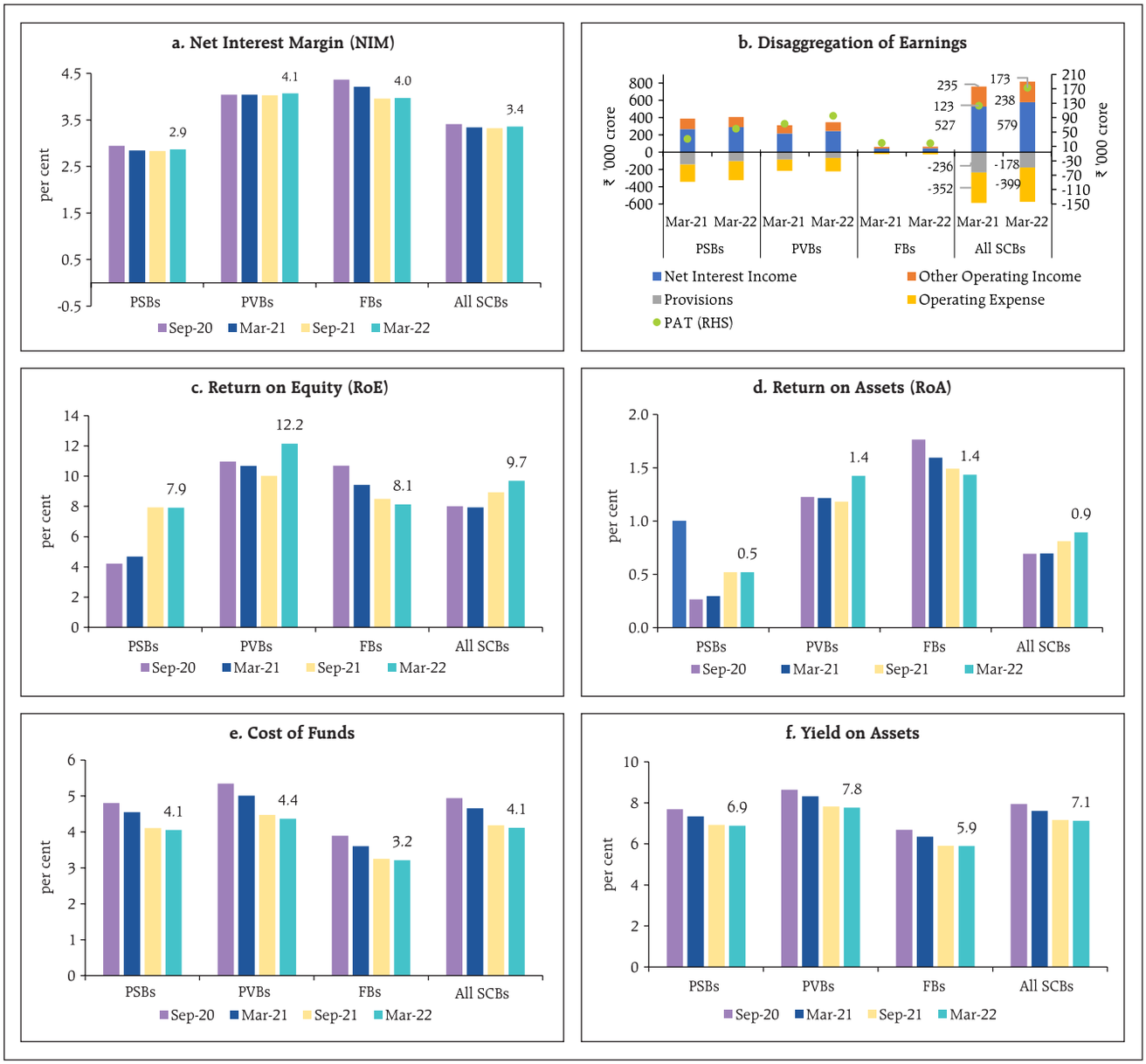
Chart 2.5: Capital Adequacy



Source: RBI supervisory returns and staff calculations.

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

Chart 2.6: Select Performance Indicators of SCBs (Annualised)



Source: RBI supervisory returns and staff calculations.

2.15 After declining continuously for the last two years in tune with easy monetary and liquidity conditions, the cost of funds and yield on assets for SCBs settled at 4.1 per cent and 7.1 per cent, respectively, which were 10 bps lower than their levels in the previous half-year (Chart 2.6 e and f).

II.1.6 Resilience – Macro Stress Tests

2.16 Macro-stress tests[8] were 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

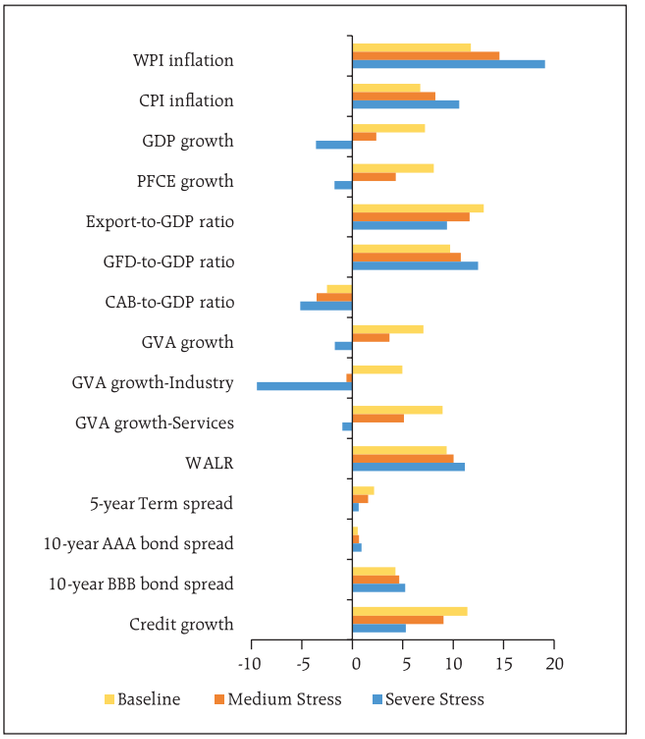
[8] From this edition of FSR, the macro-stress testing framework has been modified, predominantly by integrating a wider set of macroeconomic and macro-financial indicators in the models (See Annex 2 for detailed methodology).

two adverse[9] (medium and severe) scenarios. The baseline scenario is derived from the forecasted values of macro 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).

2.17 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 16.5 per cent in March 2022 to 15.0 per cent by March 2023. It may go down to 14.2 per cent in the medium stress scenario and to 13.3 per cent under the severe stress scenario by March 2023 (Chart 2.8 a). None of the 46 SCBs would breach the minimum capital requirement of 9 per cent in the next one year, even in a severely stressed situation (Chart 2.8 b).

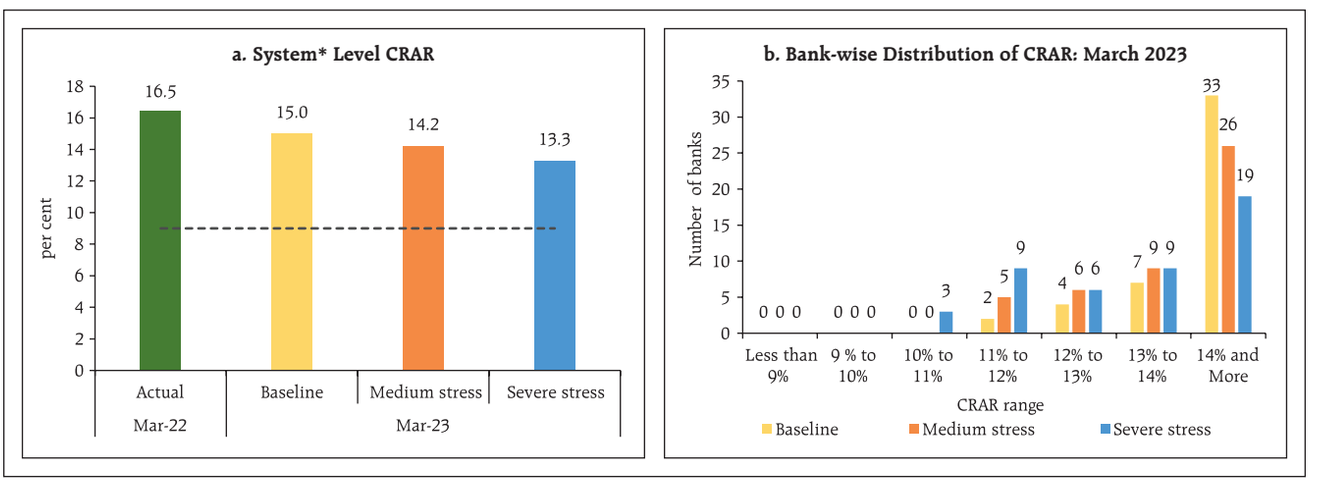
Chart 2.7: Macro Scenario Assumptions for 2022-23
(average of four quarters)

(per cent)



Source: RBI staff calculations.

Chart 2.8: CRAR Projections



* For a system of 46 select banks.
Note: The capital projection is made under a conservative assumption of minimum profit transfer to capital reserves at 25 per cent for profit making SCBs. It does not take into account any capital infusion by stakeholders.
Source: RBI supervisory returns and staff calculations.

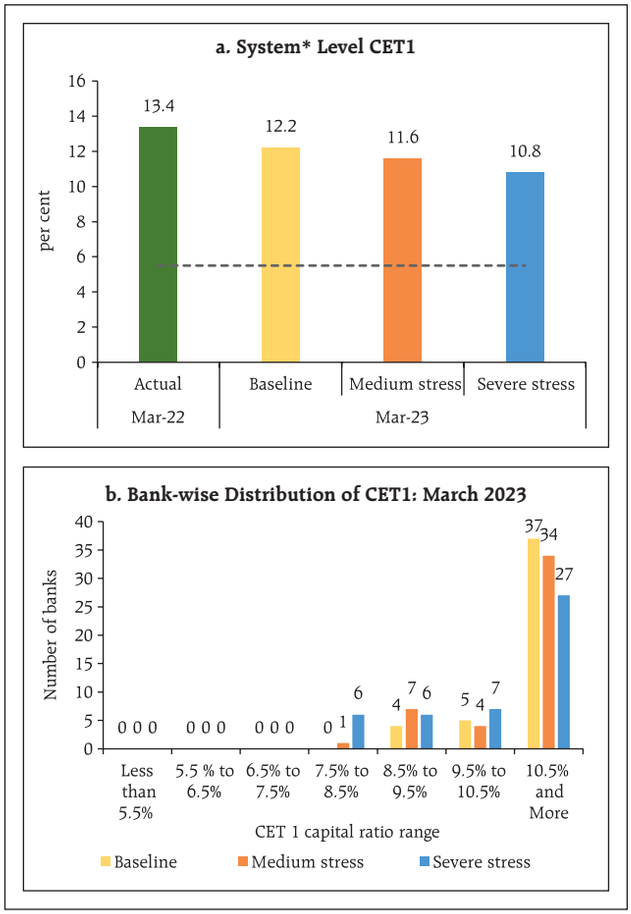
[9] **The adverse scenarios are stringent conservative assessments under hypothetical adverse economic conditions and model outcomes should not be interpreted as forecasts. They are indicative of the possible economic impairment latent in banks' portfolios, with implications for capital planning.**

2.18 The common equity Tier I (CET 1) capital ratio of the select 46 SCBs may decline from 13.4 per cent in March 2022 to 12.2 per cent by March 2023 under the baseline scenario (Chart 2.9 a). Even in a severely stressed macroeconomic environment, the aggregate CET1 capital ratio would deplete only by 260 basis points, which would not breach the minimum regulatory norms. Furthermore, all these banks would be able to meet the minimum regulatory CET1 ratio of 5.5 per cent over the next one year under all the three scenarios (Chart 2.9 b).

2.19 Support measures provided by the regulator during the COVID-19 pandemic aided in arresting GNPA ratios of SCBs even with the winding down of regulatory reliefs. Under the assumption of no further regulatory reliefs as well as without taking the potential impact of stressed asset purchases by National Assets Reconstruction Company Limited (NARCL) into account, stress tests indicate that GNPA ratio of all SCBs may improve from 5.9 per cent in March 2022 to 5.3 per cent by March 2023 under the baseline scenario driven by higher expected bank credit growth and declining trend in the stock of GNPAs, among other factors (Chart 2.10). If the macroeconomic environment worsens to a medium or severe stress scenario, the GNPA ratio may rise to 6.2 per cent and 8.3 per cent, respectively. At the bank group level too, the GNPA ratios may shrink by March 2023 in the baseline scenario. In the severe stress scenario, however, the GNPA ratios of PSBs may increase from 7.6 per cent in March 2022 to 10.5 per cent a year later whereas it would go up from 3.7 per cent to 5.7 per cent for PVBs and 2.8 per cent to 4.0 per cent for FBs over the same period.

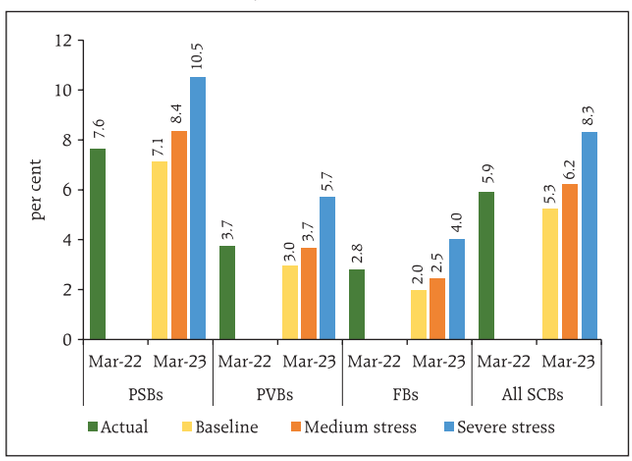
2.20 Under housing loans, the financed property is generally the underlying collateral and hence, any fall in prices may have implications for lending banks. Accordingly, in the Indian case, house prices were subjected to shocks and it was found that even after a substantial price fall, the system level CRAR would

Chart 2.9: Projection of CET 1 Capital Ratio



* For a system of 46 select banks.
Note: The capital projection is made under a conservative assumption of minimum profit transfer to capital reserves at 25 per cent for profit making SCBs. It does not take into account any capital infusion by stakeholders.
Source: RBI supervisory returns and staff calculations.

Chart 2.10: Projection of SCBs' GNPA Ratios



Source: RBI supervisory returns and staff calculations.

remain well above the regulatory requirement of 9 per cent. At individual bank level, however, shocks of 55 per cent, 60 per cent and 80 per cent fall in the collateral value can result in the capital of one, two and three banks, respectively, to decline below the regulatory limit (Box 2.1).

Box 2.1: Housing Price and Financial Stability – Sensitivity Analysis

The global financial crisis (GFC) of 2008 underscored the role of a steep drop in housing prices in exacerbating stress in the financial system. The resilience of top Indian scheduled commercial banks (SCBs) to prolonged drops in house prices is tested, using account level data unlike the macro stress test presented earlier. The housing sector is looked at in isolation and only property prices are subjected to shocks but in a conservative stance.

With sales growth in the housing market turning positive in Q2:2021-22, housing loan numbers have maintained double-digit growth (Chart 1 a). On the other hand, the growth in housing prices, as measured by the all-India house price index (HPI) of the Reserve Bank, remains below 5 per cent and presently sits at 1.8 per cent (Chart 1 b).

With waivers being discontinued and with interest rates rising, the growth in house sales has lost momentum and inventory overhang is still well over 36 months.

A sensitivity analysis of the impact of the fall in housing prices on the capital of banks with outstanding mortgages is conducted in line with the methodology of Banco Central do Brasil and Bank Negara Malaysia. The analysis is based on loan-level data till March 2022 obtained from the Residential Asset Price Monitoring Survey (RAPMS). The house property (for which the loan has been availed) is taken as the collateral.

The present value of the collateral is estimated by using the change in HPI since the time of origination of the loan. The rate of interest of each housing loan is arrived at by using its sanctioned amount, tenor and equated monthly instalment (EMI). It is then used to arrive at the outstanding amount under the assumption that all EMIs until date have been paid in full. The estimated collateral value is then subjected to price shocks, simulating a sequence of decreases in steps of five percentage points each. Loans for which the shocked collateral value becomes lower than the amount outstanding are considered delinquent. Although collateral falling below the amount outstanding may not result in loans becoming NPAs, a sustained house price fall is considered to factor in capital losses by making allowance for provisions and income loss equivalent to a sub-standard loan. For non-delinquent loans there would be an increase in risk due to increase in the loan-to-value (LTV) ratio. Hence risk-weighted assets (RWA) for them are adjusted upwards using the internal rating based (IRB) formula (Annex 2).

Simulations of reductions in residential property prices show a very small possibility of non-compliance to regulatory capital. Even in the event of substantial drop in the collateral value, system level capital to risk-weighted assets ratio (CRAR) will remain well above the regulatory requirement of 9 per cent. Taken individually,

Chart 1a. Housing Loan - Growth

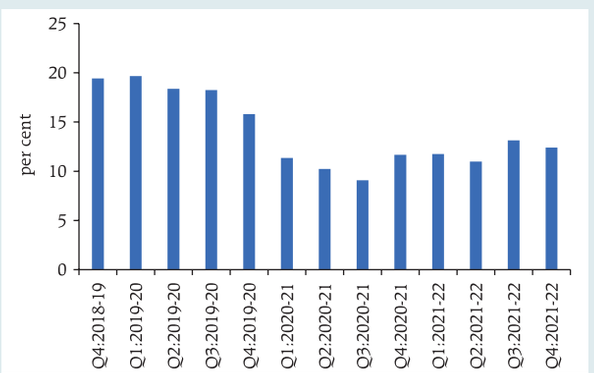
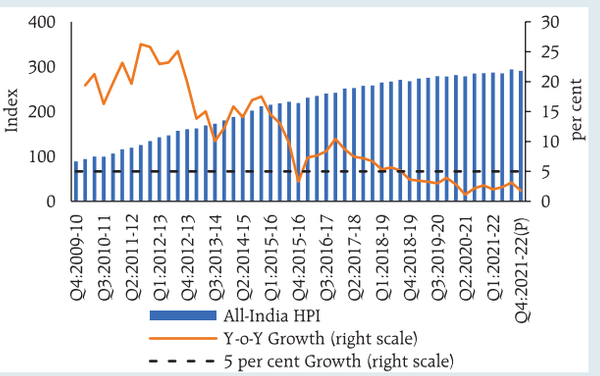
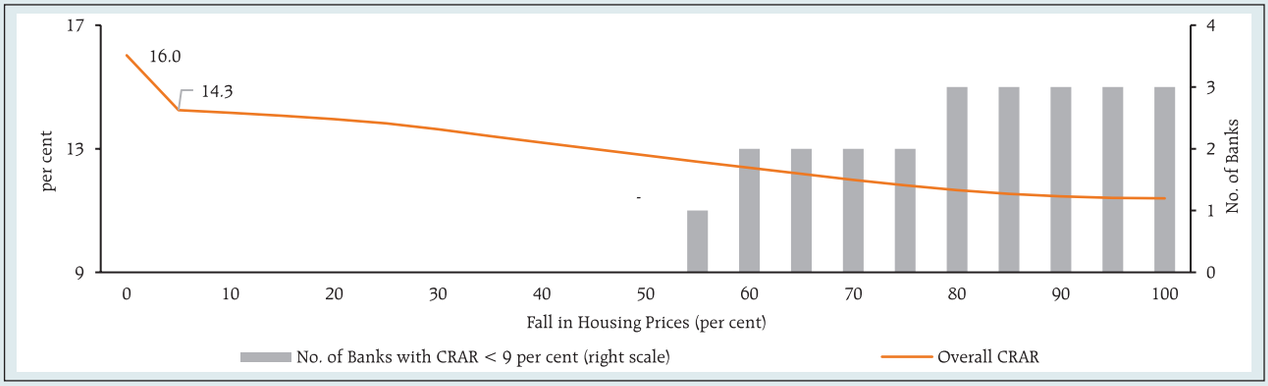


Chart 1b: Movement of House Price Index



Source: RBI

Chart 2: Sensitivity Analysis - House Price Risk



Source: RBI returns and staff calculations.

all 20 banks under study are able to maintain CRARs above 9 per cent in response to a shock, up to the extent of 55 per cent on collateral value. Thereafter, a maximum of three banks with large housing loan portfolios face a decline of CRAR below the prescribed minimum under different price shock scenarios (Chart 2).

The analysis reveals that the impact of house price shock on banks' CRAR may not be significant to cause financial instability even when a sustained fall in prices is considered. Strong capital position of the banks and the fact that housing loan portfolio constitutes only around 15 per cent of SCBs loan portfolio are the key mitigants.

References:

1. *Banco Central do Brasil (2021). Financial Stability Report, October*
2. *Bank Negara Malaysia (2019). Financial Stability Review, Second Half 2019.*
3. *Reserve Bank of India (2019): Residential Asset Price Monitoring Survey (July* 11)

II.1.7 Sensitivity Analysis[10]

2.21 Top-down[11] sensitivity analysis involving several single-factor shocks to simulate credit, interest rate, equity price and liquidity risks have been carried out under various stress scenarios[12] to assess the vulnerabilities of SCBs, based on their operations up to March 2022.

a. Credit Risk

2.22 Credit risk sensitivity has been analysed under two scenarios, in which the system-level GNPA ratio is assumed to rise by (i) one SD[13] and (ii) two SD from its prevailing level in a quarter. Under a severe shock of two SD, the GNPA ratio of 46 select SCBs moves up from 6.0 per cent to 11.5 per cent, the system-level CRAR declines from 16.5 per cent to 12.6 per cent

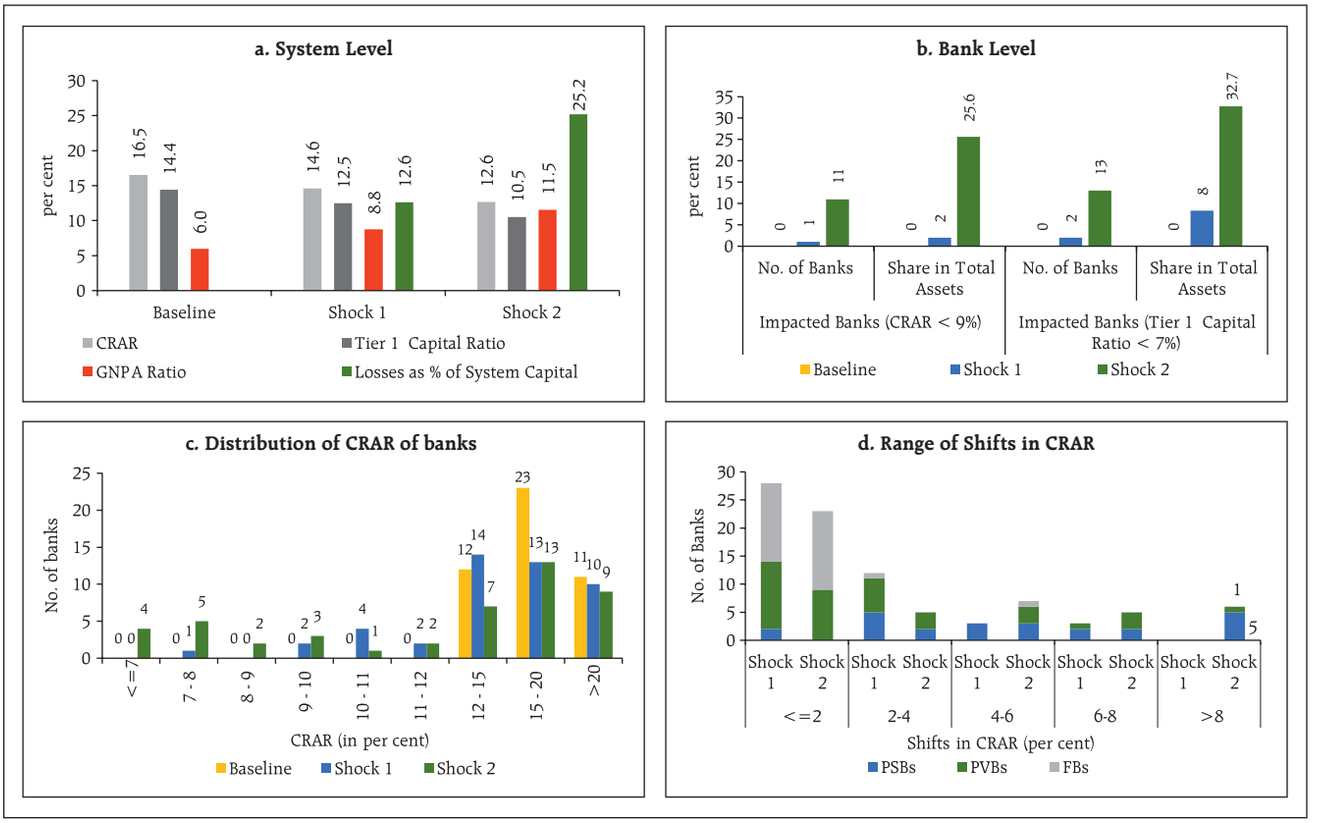
[10] Under macro stress tests, the shocks are in terms of adverse macroeconomic conditions, while in sensitivity analyses, shocks are applied to single factors like GNPA, interest rate, equity prices, deposits, and the like, one at a time. Also, macro stress tests for GNPA ratios are applied at the system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

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

[12] Single factor sensitivity analysis stress tests 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.

[13] The SD of the GNPA ratio is estimated by using quarterly data since March 2011. One SD shock approximates a 47 per cent increase in the level of GNPA.

Chart 2.11: Credit Risk - Shocks and Outcomes



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

and the Tier-1 capital ratio falls from 14.4 per cent to 10.5 per cent. The system-level capital impairment could be 25.2 per cent under the severe shock (Chart 2.11 a). A reverse stress test shows that it requires a shock of 4.7 SD to bring down the system-level CRAR to the regulatory minimum of 9 per cent.

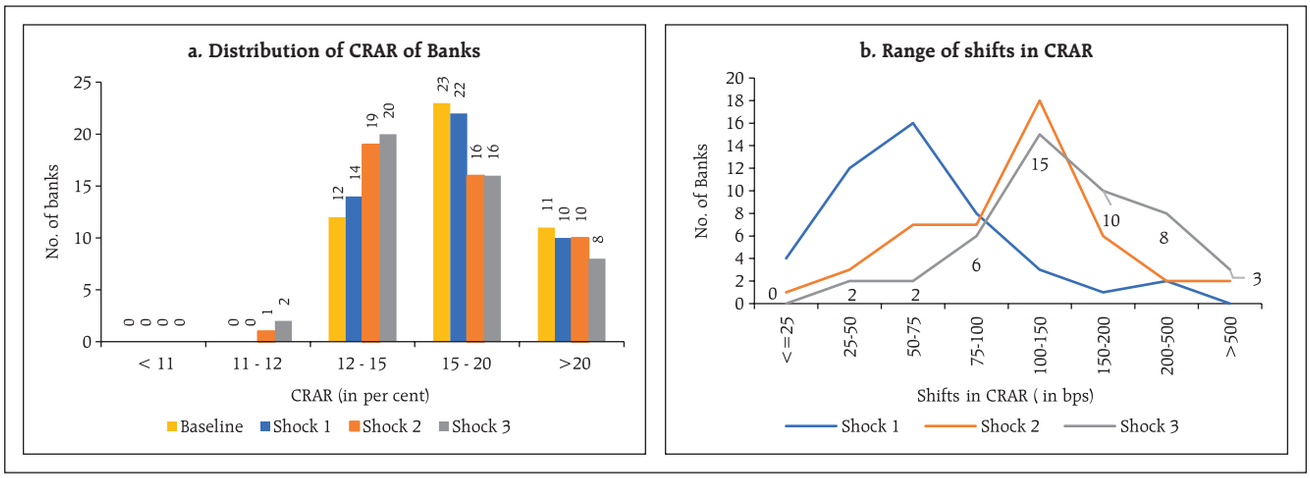
2.23 Bank-level stress test results show that under the severe (two SD shock) scenario, 11 banks with a share of 25.6 per cent in SCBs' total assets, fail to maintain the regulatory minimum level of CRAR (Chart 2.11 b). In such a scenario, the CRAR falls below 7 per cent in case of four banks (Chart 2.11 c) and six banks record a decline of over eight percentage points in their CRARs. In general, PVBs and FBs face lower CRAR erosion than PSBs under both scenarios (Chart 2.11 d).

b. Credit Concentration Risk

2.24 Stress tests on banks' credit concentration - considering top individual borrowers according to their standard exposures – show that in the extreme scenario of the top three individual borrowers of respective banks failing to repay[14], no bank would face a situation of the CRAR falling below the regulatory minimum, although three banks

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

Chart 2.12: Credit Concentration Risk: Individual Borrowers – Exposure

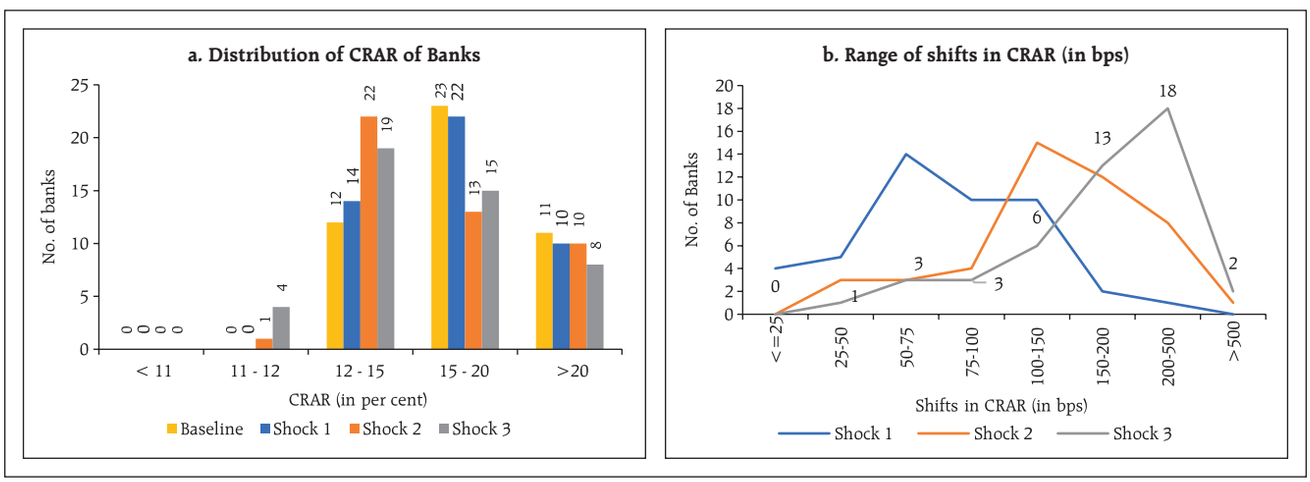


Note: For a system of select 46 SCBs
Shock 1: Topmost individual borrower fails to meet payment commitments
Shock 2: Top 2 individual borrowers fail to meet their payment commitments
Shock 3: Top 3 individual borrowers fail to meet their payment commitments
Source: RBI supervisory returns and staff calculations.

experience a decline of more than five percentage points in their CRARs (Chart 2.12 a and b).

2.25 Under the extreme scenario of the top three group borrowers in the standard category failing to repay[15], the CRARs for all banks remain above 11 per cent, though two banks experience more than five percentage points decline in the CRAR (Chart 2.13 a and b).

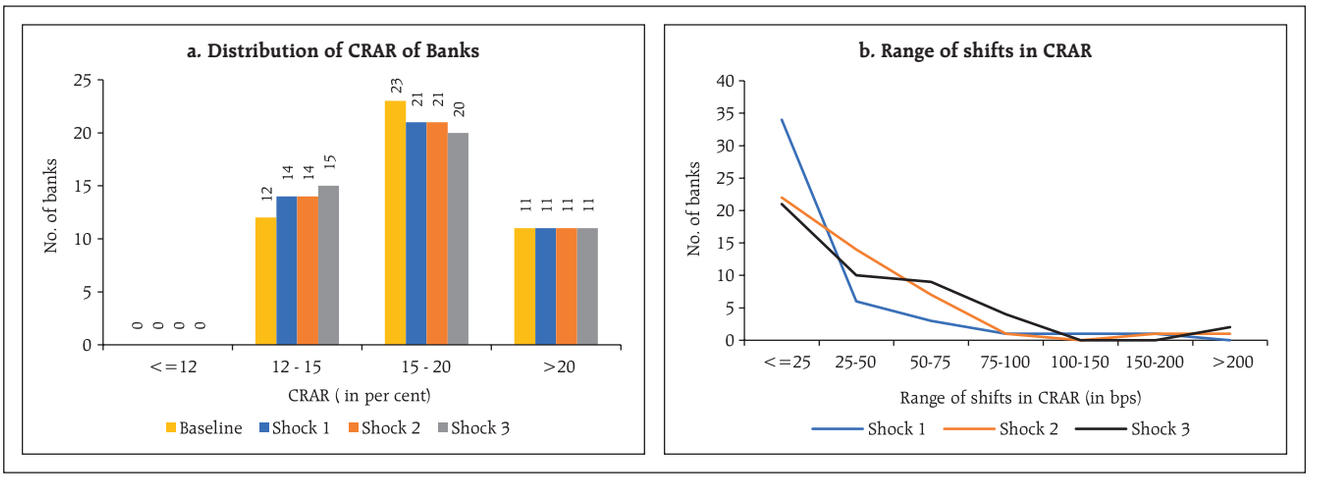
Chart 2.13: Credit Concentration Risk: Group Borrowers – Exposure



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

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

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



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

2.26 In the extreme scenario of the top three individual stressed borrowers of respective banks failing to repay[16], a majority of the banks experience a reduction of 25 bps or less in their CRAR (Chart 2.14).

c. Sectoral Credit Risk

2.27 Shocks applied on the basis of volatility of industry sub-sector wise GNPA ratio indicate varying magnitudes of increases in banks' GNPAs in different sub-sectors. A two SD shock to the energy and metals segments reduces the system-level CRAR by 16 bps and 13 bps, respectively (Table 2.2).

d. Interest Rate Risk

2.28 The market value of investments subject to fair value for the sample of SCBs under review

Table 2.2: Decline in System Level CRAR
(basis points, in descending order for top 10 most sensitive sectors)

	1 SD	2 SD
Infrastructure - Energy (112%)	8	16
Basic Metal and Metal Products (205%)	8	13
Infrastructure - Transport (42%)	3	6
Construction (53%)	2	4
Food Processing (46%)	2	4
Infrastructure - Communication (29%)	1	3
Gems and Jewellery (29%)	1	3
Cement and Cement Products (153%)	1	2
Petroleum (non-infra), Coal Products (non-mining) and Nuclear Fuels (78%)	1	2
Mining and Quarrying (164%)	1	2

Note: For a system of select 46 banks.
Numbers in parentheses 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.

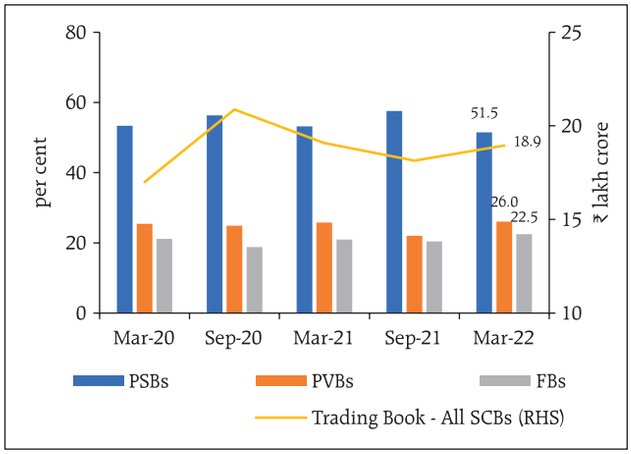
[16] In case of failure, the borrower in sub-standard or restructured category is considered to move to the loss category.

stood at ₹18.9 lakh crore in March 2022 (Chart 2.15). 94.8 per cent of these investments were classified as 'available for sale (AFS)' and the remaining were under the 'held for trading (HFT)' category. PSBs hold more than half of the total trading book portfolio of SCBs, though their share has come down in the recent period.

2.29 The sensitivity (PV01[17]) of the AFS portfolio increased minimally across bank groups *vis-à-vis* the December 2021 position, reflecting higher reliance on active interest rate risk management by banks. In terms of PV01 curve positioning, the tenor-wise distribution of PSBs' portfolio indicated marginally higher allocation in the 5-10 year, paring the allocation to the 'less than 1-year' bucket. PVBs have built up investments/allocation in the 'less than 1-year' bucket and 'more than 10-year' bucket. FBs have continued to prefer the 'more than 10-year' bucket, while increasing their positioning marginally in the '5-10 year' bucket. 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 held as cover for hedging derivatives (Table 2.3).

2.30 As on June 8, 2022, yields have moved up across the curve relative to December 2021, with the upward shift being more pronounced at the shorter end. This can be attributed to sustained building up of inflation pressures, prevailing geopolitical turmoil and accelerated monetary policy normalisation. As compared to December 2021, the yield curve was flatter by March 2022, the upward shift being more prominent up to 12 years as well as at the longer end of the curve. The spike in the short end of the curve may be ascribed to the increased usage of variable rate reverse repo (VRRR) (Chart 2.16).

Chart 2.15: Trading Book Portfolio: Bank-group wise



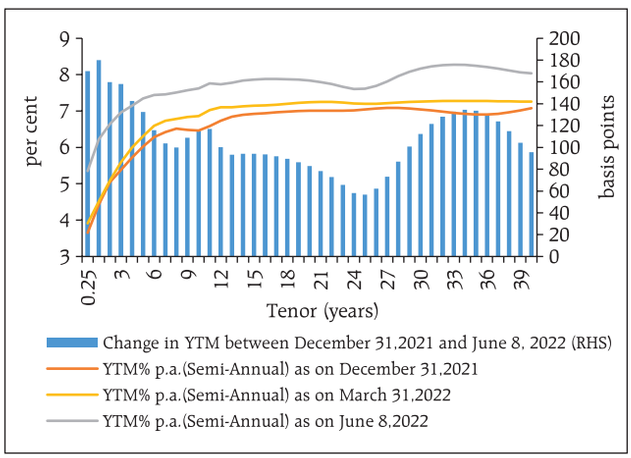
Source: Individual bank submissions and staff calculations.

Table 2.3: Tenor-wise PV01 Distribution of AFS Portfolio

	Total (in ₹ crore)	Share (in per cent)			
		<1 year	1-5 year	5-10 year	>10 years
PSBs	215.3 (211.8)	7.0 (8.7)	39.5 (39.3)	43.7 (42.2)	9.8 (9.8)
PVBs	61.3 (58.6)	23.7 (16.3)	50.0 (55.3)	12.2 (14.5)	14.1 (13.8)
FBs	137.7 (135.1)	2.8 (4.1)	22.5 (22.2)	16.7 (15.7)	58.0 (58.0)

Note: Values in the parentheses indicate December 2021 figures
Source: Individual bank submissions and staff calculations

Chart 2.16: Yield Curves and Shift in Yields across Tenors since December 2021 (updated till June 8, 2022)



Source: Bloomberg

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

2.31 Trading profit of banks has recorded a marked reduction after Q1:2021-22. During Q4:2021:22, it fell by 17 per cent on a q-o-q basis for PSBs, while it increased for PVBs. FBs continued to report trading losses for the fifth consecutive quarter, with trading losses increasing in Q4:2021-22. The share of trading profits in net operating income declined to low single digits for both PSBs and PVBs (Table 2.4). There was also a rebound in other operating income (OOI) beyond pre-pandemic levels.

2.32 The interest rate exposure of PVBs and FBs in their HFT portfolios remained higher than that of PSBs, with PSBs having an overall short position in their HFT books, where short positions were built up in 'less than 1-year' and 'more than 10-year' buckets. Banks diverged in their trading strategies and interest rate outlook: PSBs had pronounced short positions in the more than 10-year bucket, while PVBs were long in all buckets and FBs were marginally short in the less than 1-year bucket (Table 2.5).

2.33 Any hardening of interest rates would depress investment income under the AFS and HFT categories (direct impact). It is assessed that a parallel upward shift of 250 bps in the yield curve would reduce the system level CRAR by 80 bps to 15.70 per cent. Analogously, the system level CET I capital would decline by 83 bps to 12.57 per cent (Table 2.6).

2.34 During 2021-22, PSBs preferred to augment their allocation in SDLs and wind down their other holdings in the HTM category (Chart 2.17). Under the then prevailing low interest rate conditions, banks sold a large portion of their HTM portfolio and booked profits, The outstanding HTM portfolio as on March 31, 2022, has relatively the same proportion of unrealised gains from SDLs and unrealised losses

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

(in ₹ crore)

	Q4: 2020-21	Q1: 2021-22	Q2: 2021-22	Q3: 2021-22	Q4: 2021-22
PSBs	5104 (9.1)	9024 (17.7)	5765 (13.9)	3023 (6.4)	2507(4.7)
PVBs	2499 (5.4)	3669 (7.7)	1996 (4.4)	573 (1.2)	1155 (2.3)
FBs	-223 (-1.9)	-417 (-4.3)	-204 (-2.6)	-874 (-11.2)	-2183 (-20.3)

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

Table 2.5: Tenor-wise PV01 Distribution of HFT portfolio

	Total (in ₹ crore)	Share (in per cent)			
		<1 year	1-5 year	5-10 year	>10 years
PSBs	-0.04 (1.5)	-12.7 (0.7)	180.0 (13.6)	161.1 (27.6)	-228.4 (58.2)
PVBs	14.4 (8.0)	1.8 (2.4)	5.7 (16.1)	92.0 (14.1)	0.4 (68.1)
FBs	7.5 (9.4)	-9.2 (-5.0)	14.4 (23.2)	74.3 (29.4)	20.5 (52.4)

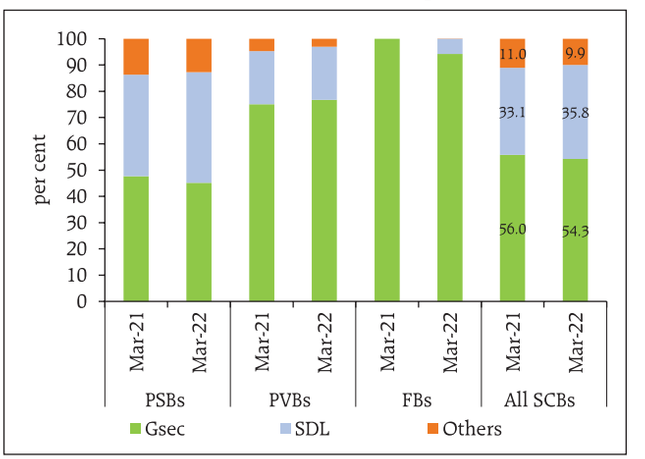
Note: Values in the brackets indicate December 2021 figures.
Source: Individual bank submissions and staff calculations.

Table 2.6: 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	2.2	-1.3	1.3	4.1	3.8	1.2	2.3	2.2
Reduction in CRAR (bps)	77		35		301		80	
Reduction in CET-I Capital (bps)	81		36		308		83	

Source: Individual bank submissions and staff calculations.

Chart 2.17: HTM Portfolio – Composition

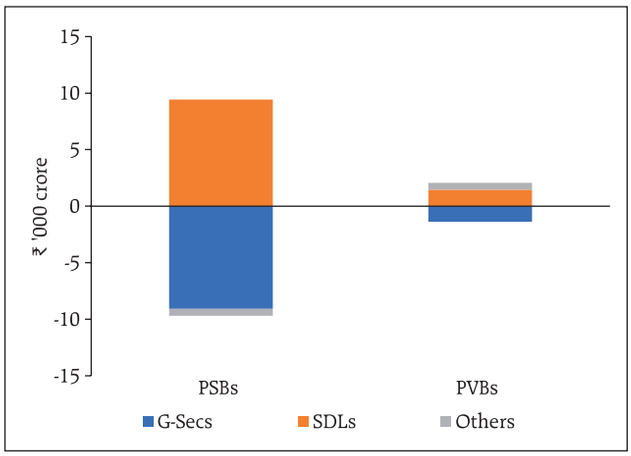


Note: Increase in share of SDL in FBs' HTM portfolio is consequent to amalgamation of Lakshmi Vilas Bank Ltd. with DBS Bank India Ltd.
Source: Individual bank submissions and staff calculations.

from G-Secs (Chart 2.18). Since G-Secs form the largest share of the HTM portfolio, the presence of substantial unrealised losses, especially in respect of PSBs, at the beginning of the interest rate tightening cycle, portends risk to their financial health going forward.

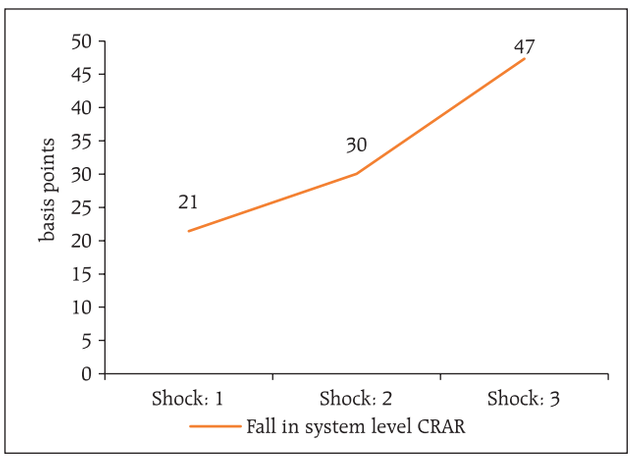
2.35 In March 2022, holding of SLR securities by PSBs and PVBs in the HTM category amounted to 21.0 per cent and 18.2 per cent of their NDTL, respectively, while it stood at 1.1 per cent for FBs. Taking advantage of the special dispensation permitting banks to classify SLR securities acquired between September 2020 and March 2022, under the HTM category, banks increased their HTM portfolio by 9 per cent during 2021-22. With PSBs' HTM holdings approaching their regulatory threshold, the enhancement in HTM limit to 23 per cent of NDTL for securities acquired between April 1, 2022 and March 31, 2023 would enable banks to better manage their investment portfolio.

Chart 2.18: HTM Portfolio – Unrealised Gain/Loss as on March 31, 2022



Source: Individual bank submissions and staff calculations.

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.

e. Equity Price Risk

2.36 An analysis of the possible impact of a significant fall in equity prices on banks' CRAR indicates that equity price risk is limited for the overall system as banks have low proportion of capital market exposures due to regulatory limits. Under the scenarios of 25 per cent, 35 per cent and 55 per cent drops in equity prices, the system level CRAR would decline by 21 bps, 30 bps and 47 bps, respectively (Chart 2.19).

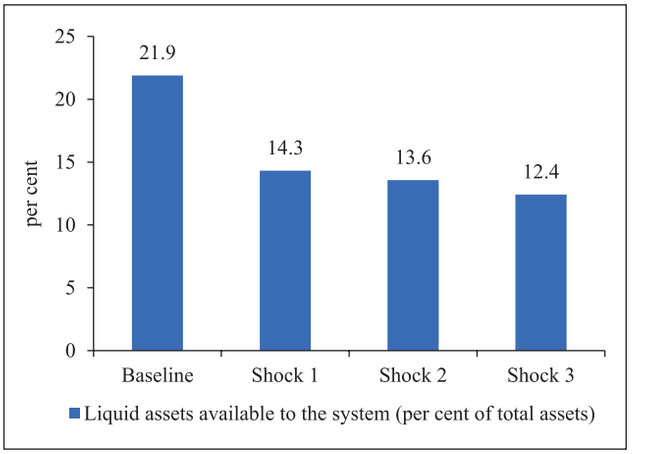
f. Liquidity Risk

2.37 Liquidity risk analysis aims to capture the impact of a possible run on un-insured deposits[18] and potential increase in demand for unutilised portions of sanctioned/committed/guaranteed credit lines.

[18] Un-insured deposits are estimated to be about 49 per cent of total deposits, based on ₹5 lakh deposit insurance limit (Source: DICGC Annual Report, 2020-21).

2.38 In a 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[19] at the system level as a percentage of total assets will decrease to 12.4 per cent from 21.9 per cent (Chart 2.20).

Chart 2.20: Liquidity Risk – Shocks and Outcomes



Note: Liquidity shocks consisted 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 also a withdrawal of a portion of un-insured deposits as given below:

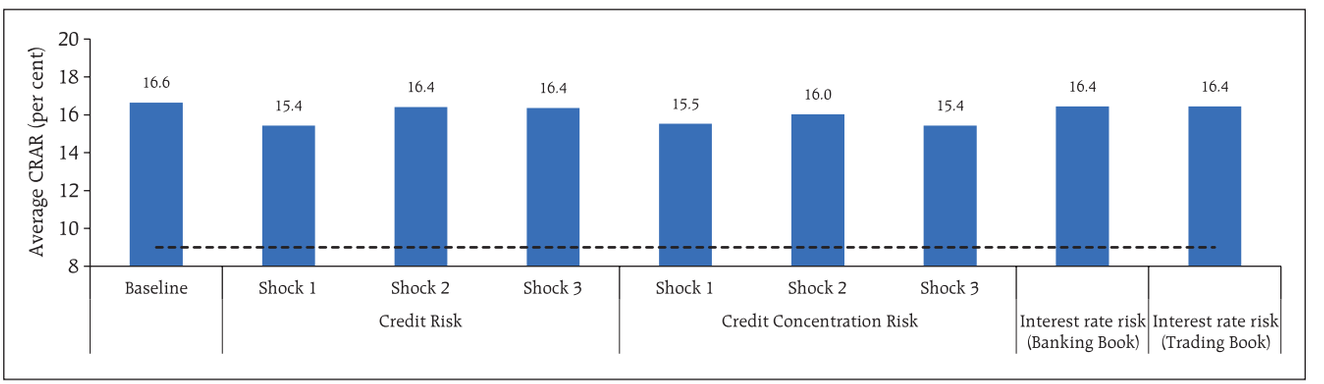
Shock	Shock 1	Shock 2	Shock 3
Per cent withdrawal of un-insured deposits	10	12	15

Source: RBI supervisory returns and staff calculations.

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

2.39 A series of bottom-up stress tests (sensitivity analyses) has been conducted for select banks[20] with the reference date of March 31, 2022. The results testify to banks' general resilience to different kinds of shocks and are generally in line with the findings from the top-down stress tests. Under different stress scenarios, the CRAR of all banks would remain above the regulatory minimum of 9 per cent. Average CRAR of banks is found to be higher than under a similar stress test exercise conducted a year ago with March 31, 2021 as the reference date (Chart 2.21).

Chart 2.21: Bottom-up Stress Tests –Credit and market risks – Impact on CRAR



Credit Risk: Gross Credit	Shock1	NPAs increase by 50 per cent
	Shock2	30 per cent of restructured assets become NPAs
	Shock3	5 percentage points increase in NPAs in each top 5 sector/industry
Credit Risk: Concentration	Shock1	The top three individual borrowers default into sub-standard category
	Shock2	The largest group borrower defaults into sub-standard category
	Shock3	The largest borrower of each of top five industries/sectors defaults into sub-standard category
Interest Rate Risk – Banking Book	Shock	Parallel upward shift in INR yield curve by 2.5 percentage points
Interest Rate Risk – Trading Book	Shock	Parallel upward shift in INR yield curve by 2.5 percentage points

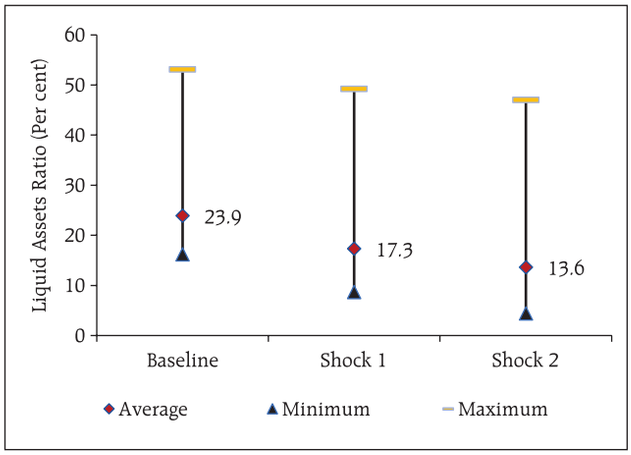
Source: Select banks (Bottom-up stress tests).

[19] 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 15 per cent of NDTL (following the Circular DOR.BP.BC.No.65/21.04.098/2019-20 dated April 17, 2020).

[20] Stress tests on various shocks were conducted on a sample of 27 select banks (ten PSBs, thirteen PVBs and four FBs). Details of these are given in Annex 2.

2.40 The bottom-up stress tests for liquidity risk performed on select banks indicate that they would have positive liquid assets ratios[21] under various alternative scenarios. HQLAs would enable banks in the sample to withstand liquidity pressures from sudden and unexpected withdrawal of deposits in each scenario. Under both scenarios, average liquid assets ratios of the select banks are found to be lower than those obtained under a similar exercise a year ago (Chart 2.22).

Chart 2.22: Bottom-up Stress Tests – Liquidity risk



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

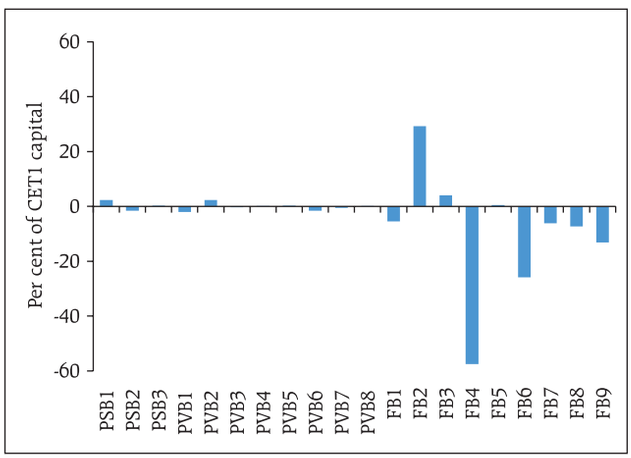
Source: Select banks (Bottom-up stress tests).

II.1.9 Bottom-up Stress Tests: Derivatives Portfolio

2.41 A series of bottom-up stress tests (sensitivity analyses) on derivative portfolios have been conducted for select banks[22] with the reference date as March 31, 2022. 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 ranged from 100 to 250 basis points, a 20 per cent appreciation/depreciation shocks of foreign exchange rates is assumed. The stress tests are carried out for individual shocks on a stand-alone basis.

2.42 Most of the FBs maintain significantly negative net mark-to-market (MTM) positions as a proportion of CET-1 capital in March 2022. The MTM impact is by and large, muted for PSBs and PVBs (Chart 2.23).

Chart 2.23: MTM of Total Derivatives Portfolio, Select Banks – March 2022



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

2.43 The derivative portfolios of the sample banks are positioned to gain from an interest rate rise and *vice versa*. Potential MTM gains from a rise in interest rates has amplified in March 2022 as compared with the September 2021 position. Going forward, MTM gains for derivatives portfolio are expected to rise further against the backdrop of a rising interest rate regime. Contrary to interest rate shocks, the net impact of both the foreign exchange rate

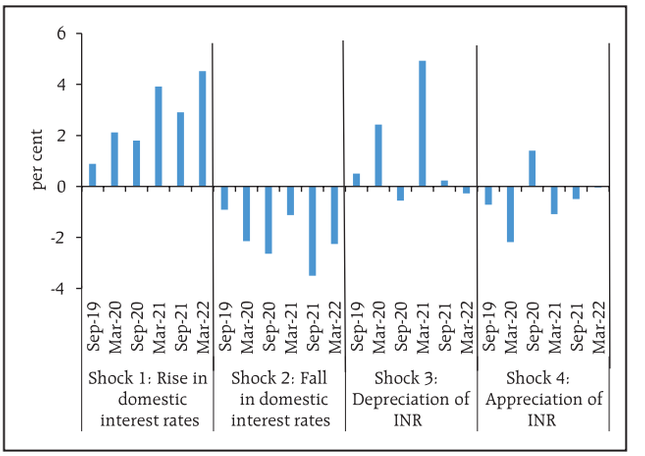
[21] Liquid Assets Ratio = $\frac{\text{Liquid Assets}}{\text{Total Assets}}$ x 100. Under shock scenarios, a negative liquid assets ratio reflects the percentage deficit in meeting the required deposit withdrawal.

[22] Stress tests on derivatives portfolios were conducted for a sample of 20 banks (three PSBs, eight PVBs and nine FBs), constituting the major active authorised dealers and interest rate swap counterparties. Details of test scenarios are given in Annex 2.

shocks remained subdued in the last two quarters (Chart 2.24).

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

(per cent to capital funds)



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

II.2 Small Finance Banks

2.44 The universe of small finance banks (SFBs) form 1.0 per cent of total assets of the SCBs. Aggregate deposits and credit of SFBs increased by 32.7 per cent and 23.1 per cent, respectively, during the four quarters of 2021-22 (quarterly average y-o-y growth). SFBs have been aggressively increasing their CASA deposits, with their share in total deposits increasing from 18.4 per cent in March 2019 to 33.9 per cent in March 2022 even as term deposits recorded a growth of 15.7 per cent (y-o-y) in March 2022 (Chart 2.25 a).

2.45 The high balance sheet growth of SFBs from a low base has raised some concerns on asset quality: their restructured standard advances portfolio remains higher than pre-pandemic levels, though below the peak of September 2021 (Chart 2.25 b).

Chart 2.25: Select Performance Indicators of Scheduled SFBs

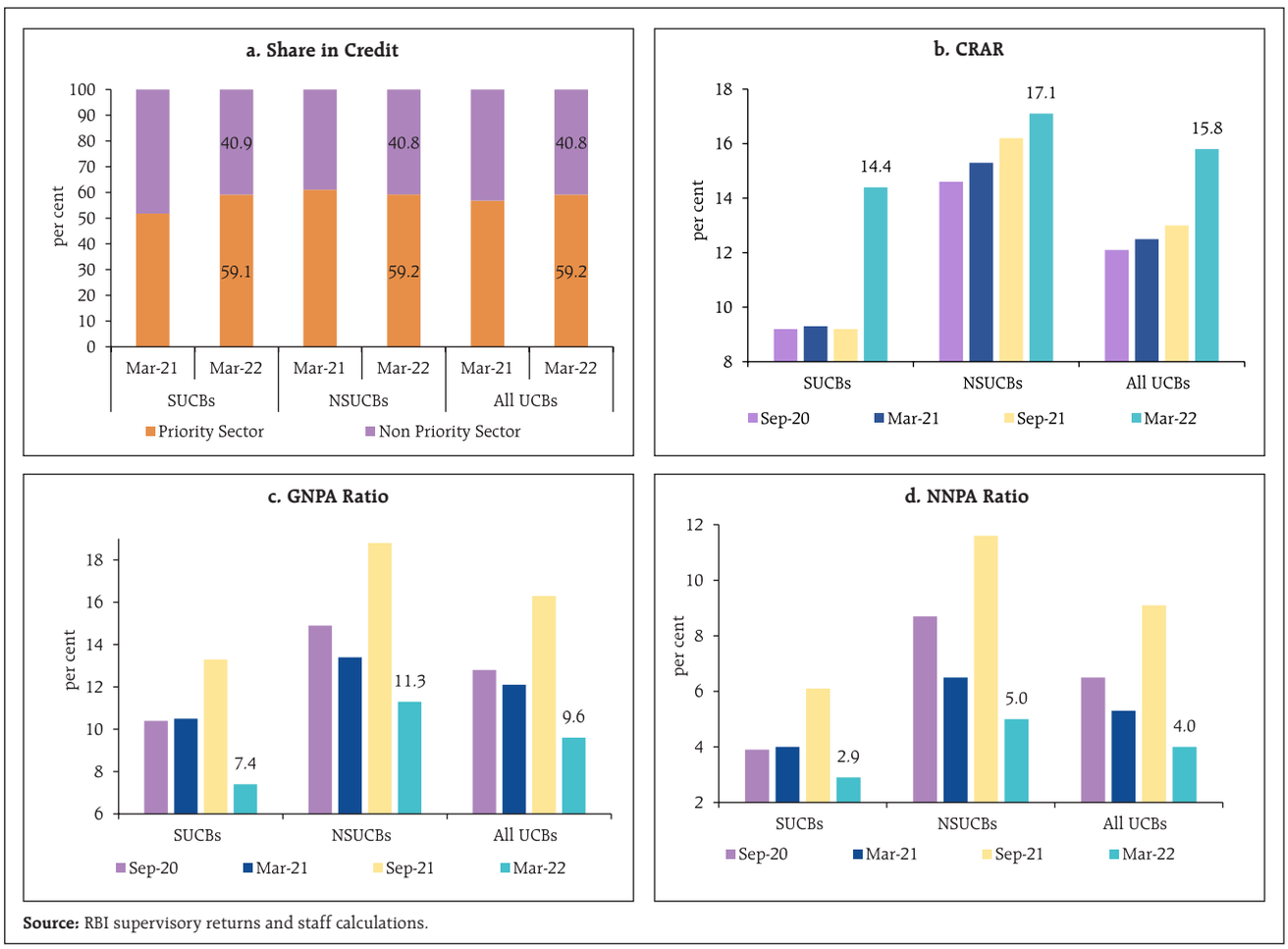
Source: RBI supervisory returns and staff calculations.

The concentration of SFBs to limited geographies and customer profiles are factors influencing these developments. Their CRAR, however, remains comfortable at 19.3 per cent in March 2022, which is higher than the larger group of SCBs, though their PCR at 53.9 per cent stood significantly lesser than other banking groups in the SCB cohort (Chart 2.25 c). The RoE and RoA numbers had slipped into negative zone in September 2021. These ratios have, however, recorded a turnaround in H2:2021-22 but remain lower than historical trends (Chart 2.25 d).

II.3 Primary (Urban) Cooperative Banks

2.46 Priority sector lending[23] of primary (urban) cooperative banks (UCBs)[24] crossed the March 31, 2022 target of 50 per cent and is nearing the March 31, 2023 target of 60 per cent (Chart 2.26 a). The CRAR of UCBs improved during H2:2021-22 to reach 15.8 per cent in March 2022. The CRAR of scheduled UCBs (SUCBs) improved to 14.4 per cent primarily because of the amalgamation of one UCB with an SFB (Chart 2.26 b).

Chart 2.26: Select Performance Indicators of UCBs *(Contd.)*



Source: RBI supervisory returns and staff calculations.

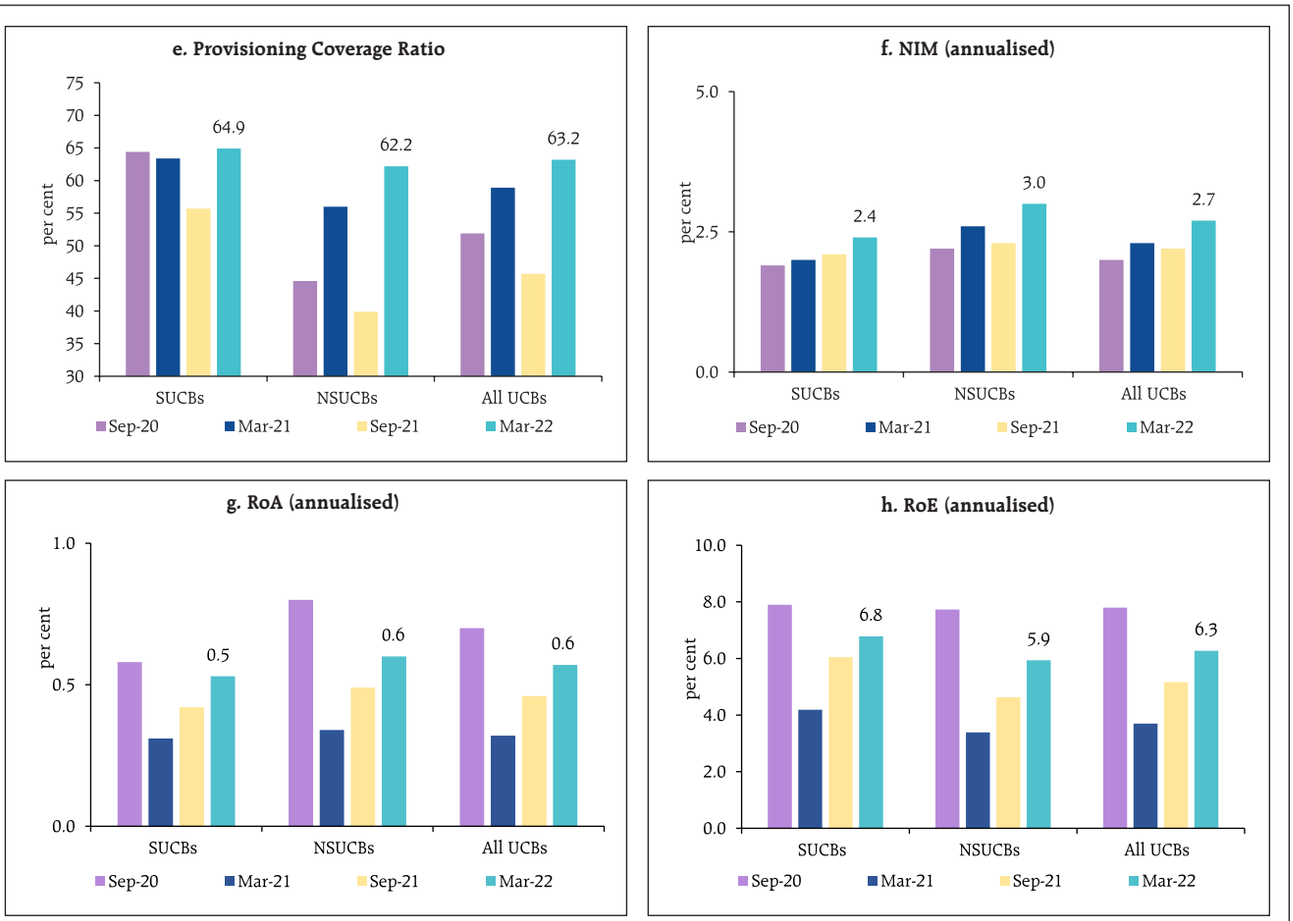
[23] Master Directions – Priority Sector Lending (PSL) – Targets and Classification (Master Directions FIDD.CO.Plan.BC.5/04.09.01/2020-21)

[24] Data are provisional and based on off-site surveillance (OSS) returns. The figures for March 2022 may be read with reference to the following explanations:

(a) The March 2022 data excludes data for one UCB which was amalgamated with an SFB.

(b) The data for March 2022 for some UCBs is yet to be received and may undergo change depending on receipt of additional/audited data.

Chart 2.26: Select Performance Indicators of UCBs *(Concld.)*



Source: RBI supervisory returns and staff calculations.

2.47 After a sudden spike in September 2021 caused by the second wave of COVID-19, GNPA ratios of both SUCBs and NSUCBs improved significantly to 7.4 per cent and 11.3 per cent, respectively, by March 2022 (Chart 2.26 c). Their NNPA ratios also moderated during the year (Chart 2.26 d). Though provisions declined, PCR of SUCBs and NSUCBs improved to 64.9 per cent and 62.2 per cent, respectively, due to large fall in their GNPAs (Chart 2.26 e). UCBs recorded improvement in profitability in terms of NIM, RoA and RoE ratios during 2021-22 (Chart 2.26 f, g and h).

II. 3.1 Stress Testing

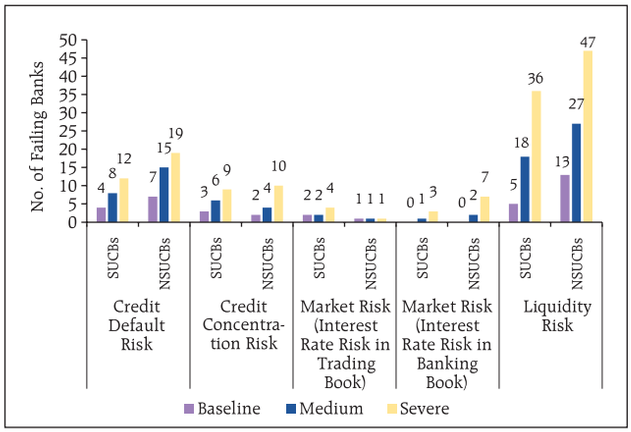
2.48 Stress tests have been conducted on a select set of UCBs[25] to assess credit risk (default risk and concentration risk), market risk (interest rate risk in trading book and banking book) and liquidity risk, based on their reported financial positions as of March 2022.

2.49 The results show that (a) a few UCBs fail on four of the five parameters even in the baseline scenario; (b) the impact of credit default risk is higher than credit concentration risk in all three scenarios; (c) the impact of shock to the trading book and the banking book is minimal; (d) liquidity shocks impact the largest number of UCBs (Chart 2.27).

II.4 Non-Banking Financial Companies[26] (NBFCs)

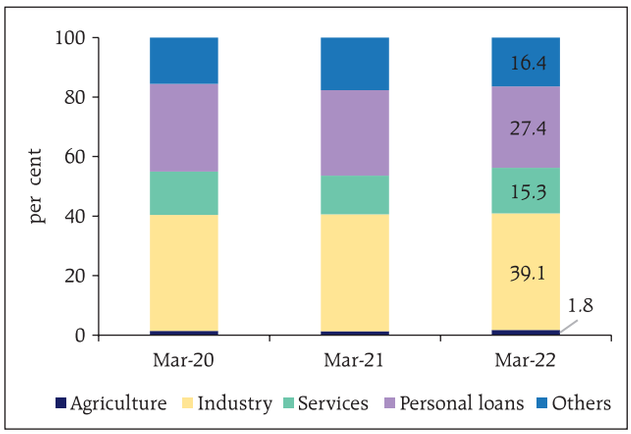
2.50 Aggregate credit extended by NBFCs stood at ₹28.5 lakh crores in March 2022. Loans to industry constituted the largest segment (39.1 per cent), followed by personal loans (27.4 per cent) and those to services (15.3 per cent). Credit to agriculture sector accounted for a miniscule share (1.8 per cent) (Chart 2.28). Government owned NBFCs accounted for 45.6 per cent of aggregate credit extended by all NBFCs (Chart 2.29). Their dominant share of over

Chart 2.27: Stress Test of UCBs



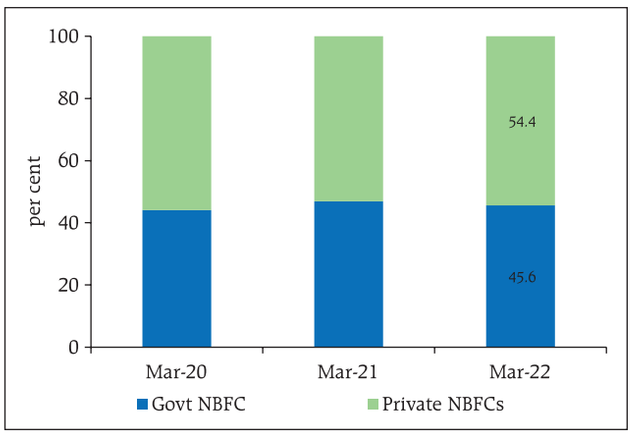
Source: RBI supervisory returns and staff calculations.

Chart 2.28: Sectoral Deployment of Credit by NBFCs



Source: RBI supervisory returns and staff calculations.

Chart 2.29: Total Credit by NBFCs - Ownership Pattern



Source: RBI supervisory returns and staff calculations.

[25] The stress test is conducted with reference to the financial position of March 2022 for select 115 UCBs (48 SUCBs, 67 NSUCBs) with asset size of more than ₹1,000 crore, excluding three banks under the Reserve Bank's All Inclusive Directions (AID). The detailed methodology used for stress test is given in Annex 2.

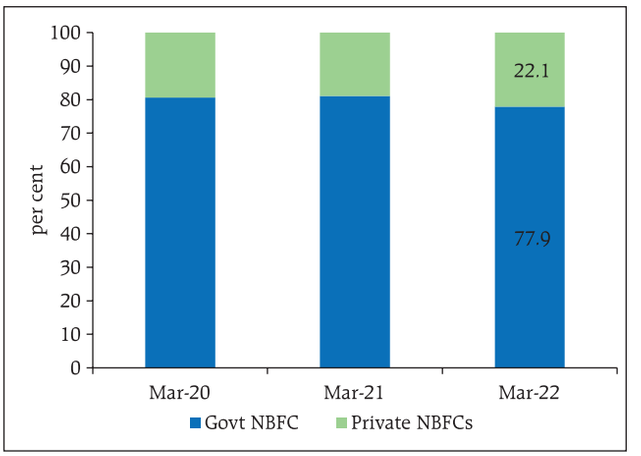
[26] The analyses done in this section are based on deposit taking and non-deposit taking systemically important NBFCs' (including CICs) data available as of June 13, 2022 which are provisional.

three fourths of the industrial loans has, however, been receding (Chart 2.30).

2.51 In terms of credit dispensation by category of NBFC, investment and credit companies (NBFC-ICC) and infrastructure finance companies (NBFC-IFC) predominated in gross loans and advances in March 2022 (Chart 2.31).

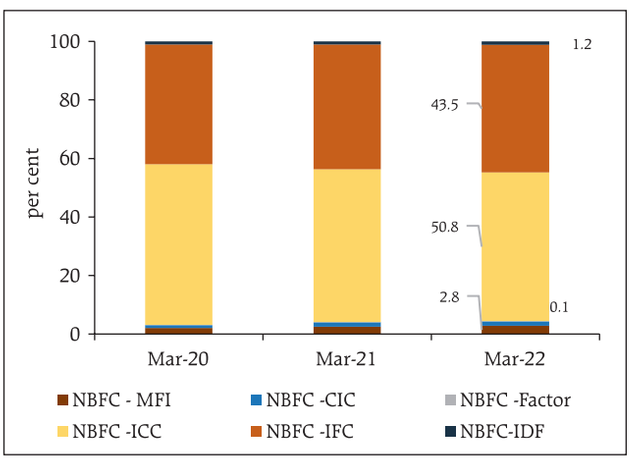
2.52 The GNPA ratio of NBFCs eased in March 2022 from 6.8 per cent in September 2021, the moderation witnessed across both public and private sector NBFCs. The improvement was primarily on account of 340 bps dip in the GNPA ratio of the services sector. Nevertheless, it remained higher than other sectors at 9.9 per cent. There was a larger concentration of NPAs in the industrial sector for which the loan book size far exceeds that of the services sector (Chart 2.32). The aggregate NNPA ratio of NBFCs also ebbed in March 2022, despite a 90 bps rise in the NNPA ratio for the industrial sector loans on account

Chart 2.30: Industrial Credit by NBFCs - Ownership Pattern



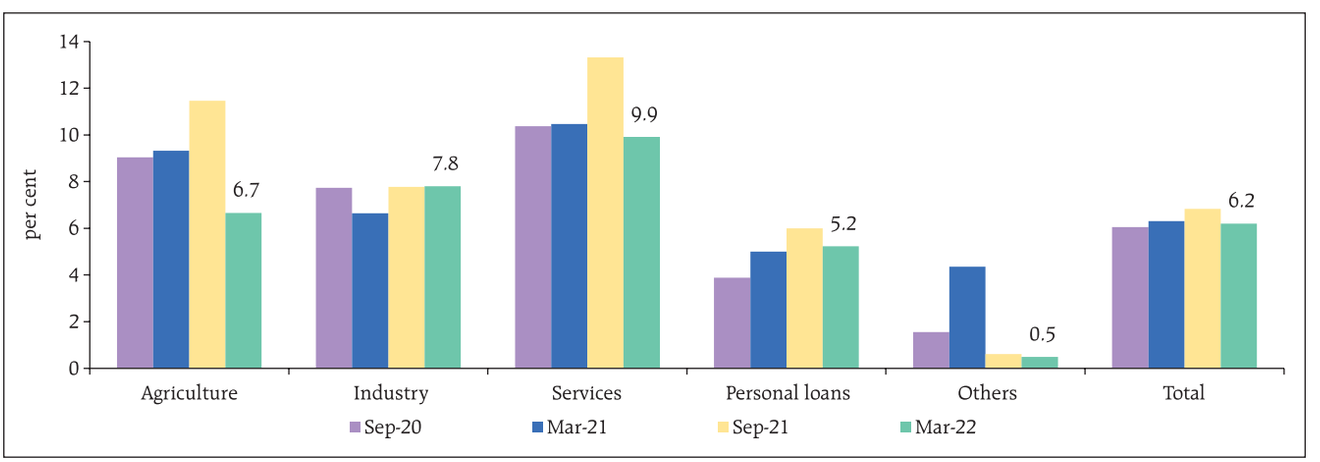
Source: RBI supervisory returns and staff calculations.

Chart 2.31: Share of Different NBFC Categories in Gross Advances



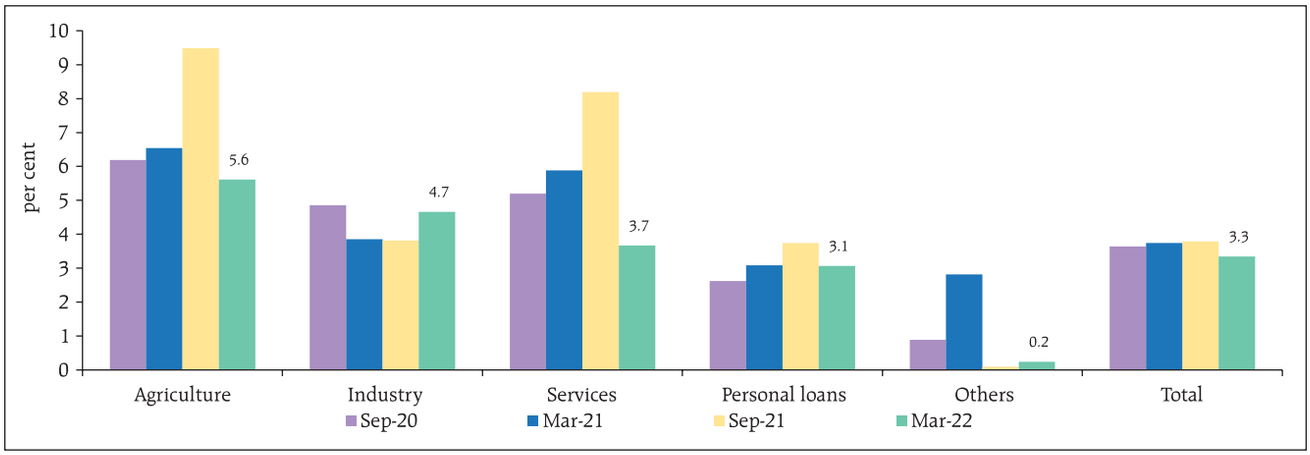
Source: RBI supervisory returns and staff calculations.

Chart 2.32: Sectoral GNPA ratio of NBFCs



Source: RBI supervisory returns and staff calculations.

Chart 2.33: Sectoral NNPA ratio of NBFCs

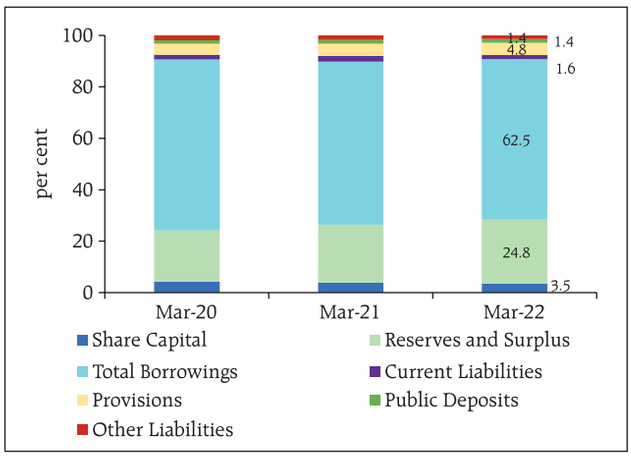


Source: RBI supervisory returns and staff calculations.

of curtailed provisioning (Chart 2.33). The capital position of NBFCs remained robust and their return on assets (RoA) recouped in March 2022 (Chart 2.34).

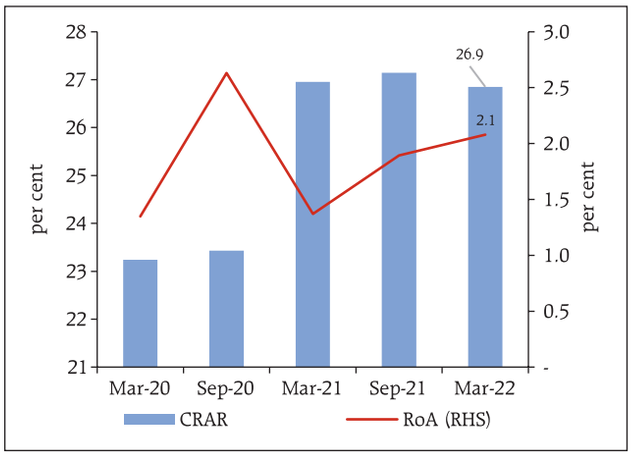
2.53 Borrowings remained the major source of funds for NBFCs (Chart 2.35), mainly in the form of debentures and bank borrowings (Chart 2.36).

Chart 2.35: NBFCs' Sources of Funds



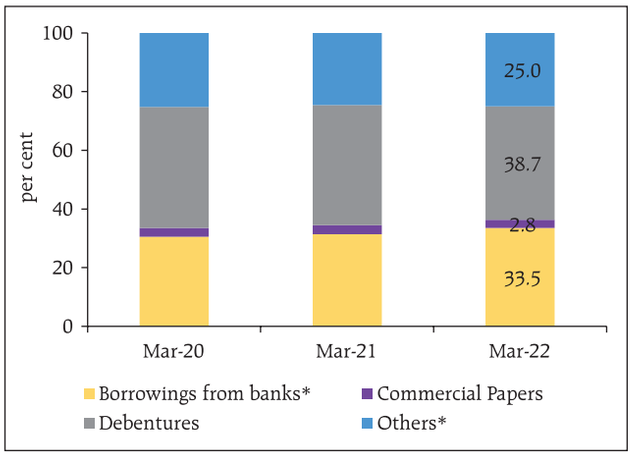
Source: RBI supervisory returns and staff calculations.

Chart 2.34: Capital Adequacy



Source: RBI supervisory returns and staff calculations.

Chart 2.36: Borrowings by NBFCs



Note *: Borrowings from banks comprises of both 1) Secured Borrowings and 2) Unsecured Borrowings
Others=Total Borrowings – (Borrowings by banks + Commercial papers + Debentures).
Source: RBI supervisory returns and staff calculation

II.4.1 Stress Test[27] - Credit Risk

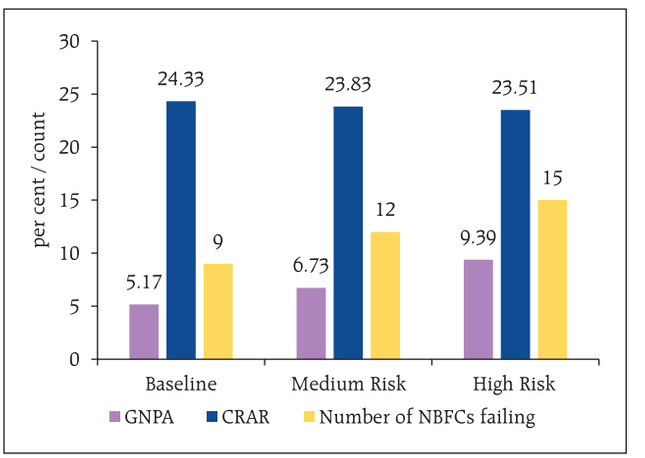
2.54 The resilience of NBFC sector to credit risk shocks has been assessed for a sample of 155 NBFCs[28] under a baseline and two stress scenarios – medium and high risk, with increase in the slippage ratio by 1 SD and 2 SD, respectively. The capital adequacy ratio of the sample NBFCs was at 26.7 per cent and GNPA ratio at 4.6 per cent in March 2022. The baseline scenario projected holds for one year ahead from this reference date, based on assumptions of business continuing under usual conditions.

2.55 Under the baseline scenario, the CRAR of nine NBFCs – comprising 1.72 per cent of total advances of the sample companies – is less than the minimum regulatory requirement of 15 per cent. Under a medium risk shock of a 1 SD increase in the slippage ratio, the GNPA ratio rises to 6.73 per cent and the resultant income loss and additional provisional requirements reduce the CRAR by 50 bps to 23.83 percent with CRARs of twelve NBFCs falling below 15 per cent. Under the high-risk shock of 2 SD increase in the slippage ratio, the GNPA ratio increases to 9.39 per cent, the capital adequacy ratio of the sector declines by 82 bps to 23.51 per cent and CRAR of fifteen NBFCs falls below minimum regulatory requirements (Chart 2.37).

II.4.2 Stress Test - Liquidity Risk

2.56 The resilience of the NBFC sector to liquidity shocks is assessed by capturing the impact of a combination of assumed increase in cash outflows and decrease in cash inflows[29]. The baseline scenario uses the projected outflows and inflows as of March 2022. One baseline and two stress scenarios are applied – a medium risk scenario involving a shock of 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 positions over the next one year in the baseline, medium and high-risk scenarios stood at 10 (representing 4.6 per cent of asset size of the sample), 23 (8.6 per cent) and 40 (21.5 per cent), respectively (Table 2.7).

Chart 2.37: Credit Risk in NBFCs - System Level



Source: RBI supervisory returns and staff calculation

Table 2.7: 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	3 (0.2)	4 (0.2)	4 (0.2)
Between 20 and 50 per cent	4 (1.0)	4 (2.8)	12 (5.7)
20 per cent and below	3 (3.4)	15 (5.6)	24 (15.6)

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

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

[28] The sample comprised 9 deposit taking NBFCs and 146 non-deposit taking systemically important (NDSI) NBFCs of total advances ₹14.75 lakh crore as of March 2022, which forms around 93 per cent of total advances of non-Government NBFCs in the sector. The sample for the stress test excludes government owned NBFCs, companies presently under resolution and investment focused companies.

[29] Stress testing based on liquidity risk was performed on a sample of 212 NBFCs – which includes 9 deposit taking NBFCs, 203 NDSI NBFCs. Total asset size of the sample as of March 2022 was ₹18.85 lakh crore, comprising 71.6 per cent of assets of the non-government NBFCs.

II.5 Interconnectedness

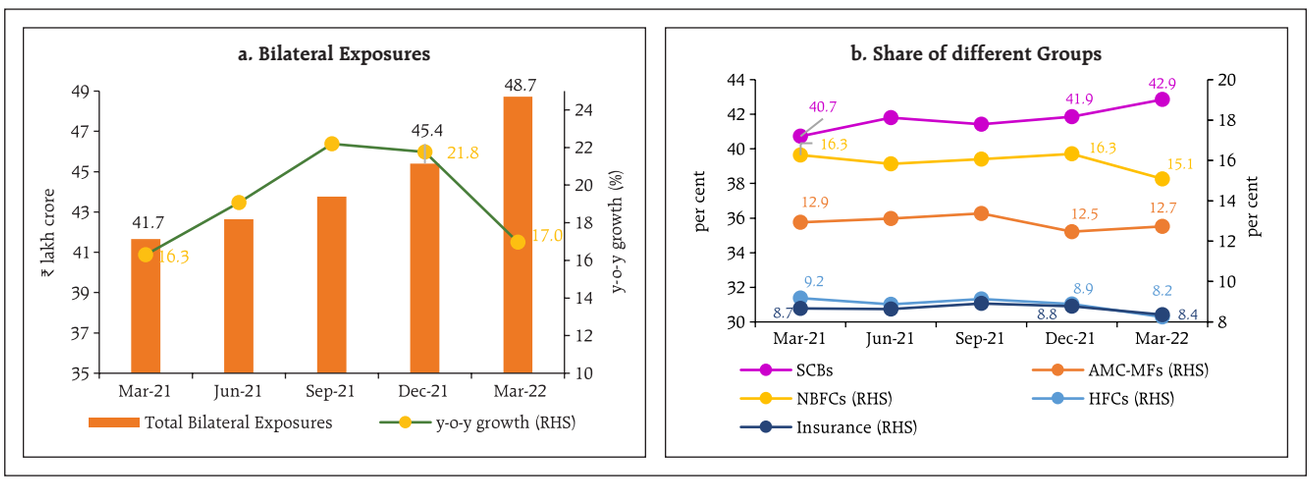
2.57 A financial system can be visualised as a network with financial institutions as nodes and bilateral exposures as links joining these nodes. These links which could be in the form of loans to, investments in, or deposits with each other act as a source of funding, liquidity, investment and risk diversification, but could also transform in adverse conditions into channels through which shocks can spread, leading to contagion and amplification of systemic shocks. Understanding the nuances of such networks becomes critical for safeguarding macroeconomic and financial stability.

II.5.1 Financial System Network[30] [31]

2.58 The total outstanding bilateral exposures[32] among the entities in the financial system maintained steady growth. A major part of the surge emanated from higher funding requirements of PVBs (Chart 2.38 a). The increase in the March 2022 quarter was primarily due to higher exposure of SCBs to the financial system and of All-India Financial Institutions (AIFIs) and asset management companies (mutual funds) (AMC-MFs) to SCBs (Chart 2.38 b).

2.59 SCBs had the largest share of bilateral exposures. The shares of NBFCs, HFCs and insurance companies declined on a sequential and on y-o-y basis. Owing to the correction in the equity markets, the share of AMC-MFs in bilateral exposures contracted sharply from 13.4 per cent in September 2021 to 12.5 per cent in December 2021 before rising marginally in Q4:2021-22 (Chart 2.38 b).

Chart 2.38: Bilateral Exposures between Entities in the Financial System



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

[30] 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 Unit, Reserve Bank of India.

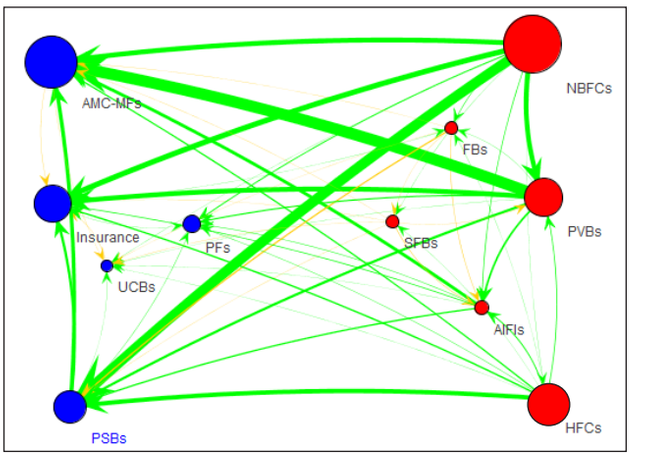
[31] Analysis presented here and in the subsequent part is based on data of 225 entities from the following *eight groups*: SCBs, scheduled UCBs (SUCBs), AMC-MFs, NBFCs, HFCs, insurance companies, pension funds and AIFIs. These 225 entities covered include 77 SCBs; 11 small finance banks (SFBs); 20 SUCBs; 25 AMC-MFs (which cover more than 98 per cent of the AUMs of the mutual fund sector); 40 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 90 per cent of assets of the sector); 18 HFCs (which represent more than 95 per cent of total HFC asset); 7 Pension Funds (PFs) and 5 AIFIs (NABARD, EXIM, NHB, SIDBI and NaBFID).

[32] Includes exposures between entities of the same group. Exposures are outstanding position as on March 31,2022 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 derivate instruments (excluding settlement guaranteed by CCIL).

2.60 In terms of inter-sectoral[33] exposures, AMC-MFs, followed by insurance companies, were the biggest fund providers in the system, whereas NBFCs and HFCs were the largest receivers of funds, followed by PVBs. Among the bank groups, PSBs and UCBs had net receivable positions *vis-à-vis* the entire financial sector whereas PVBs, SFBs and FBs had net payable positions (Chart 2.39).

2.61 Net receivables of AMC-MFs and PSBs from the financial system increased during 2021-22. Among recipients of funds from the financial system, PVBs recorded a large increase while payables of NBFCs and HFCs also increased during the period[34] (Chart 2.40).

Chart 2.39: Network Plot of the Financial System – March 2022

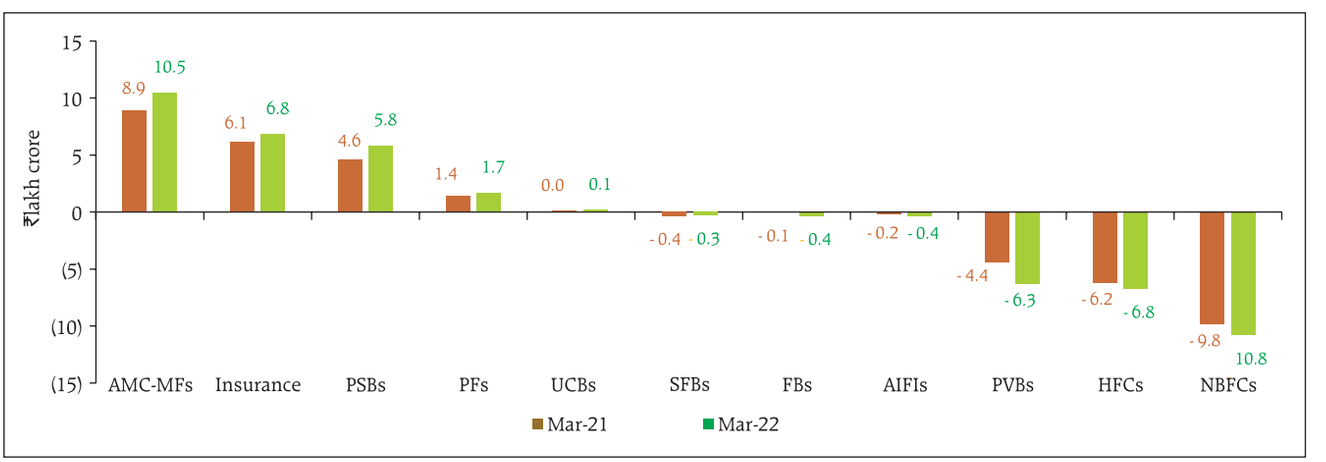


Note: Receivables and payable do not include transactions among entities of the same group. Red circles are net payable institutions and the blue ones are net receivable institutions.
Source: Supervisory returns of various regulators and RBI staff calculations

a. Inter-bank Market

2.62 Inter-bank exposures accounted for 3.1 per cent of the total assets of the banking system as of March 2022, with fund-based exposure constituting the major part (2.5 per cent). In absolute terms, both fund-based[35] and non-fund-based exposures (primarily letters of credit and bank guarantees)[36]

Chart 2.40: Net Receivables (+ve)/Payables (-ve) by Institutions



Note: Receivables and payables do not include transactions among entities of the same group.
Source: Supervisory returns of various regulators and RBI staff calculations.

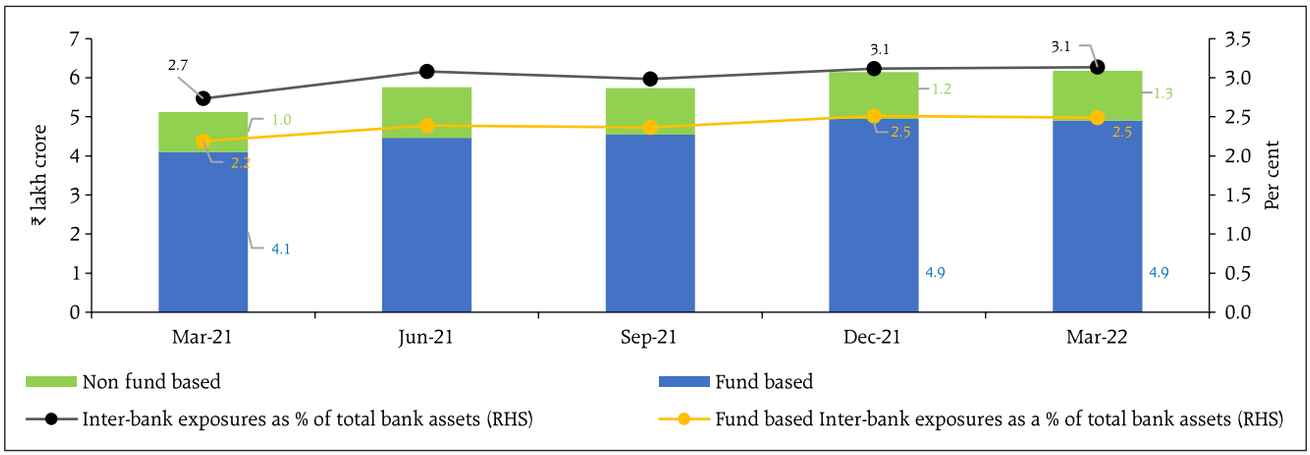
[33] Inter-sectoral exposures do not include transactions among entities of the same sector in the financial system.

[34] This is also due to inclusion of additional entities as compared to a year ago.

[35] 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.

[36] 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 2.41: Inter-bank Market



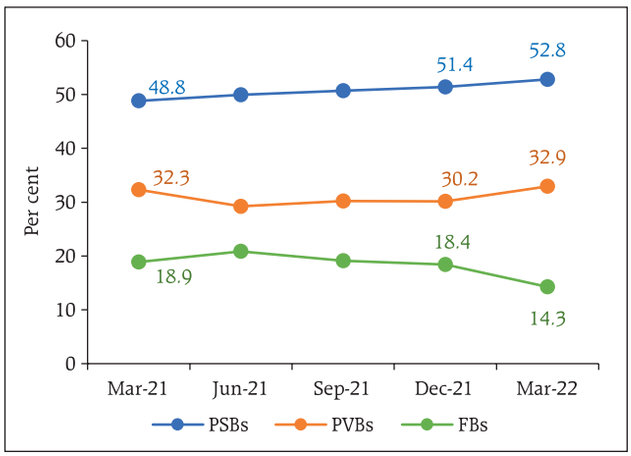
Source: RBI supervisory returns and staff calculations.

bounced back to reach their pre-pandemic levels (Chart 2.41).

2.63 PSBs continued to maintain a dominant position in the inter-bank market and their share increased both on sequential and annual bases. The share of PVBs increased on a sequential basis, whereas that of FBs fell during Q4:2021-22 (Chart 2.42).

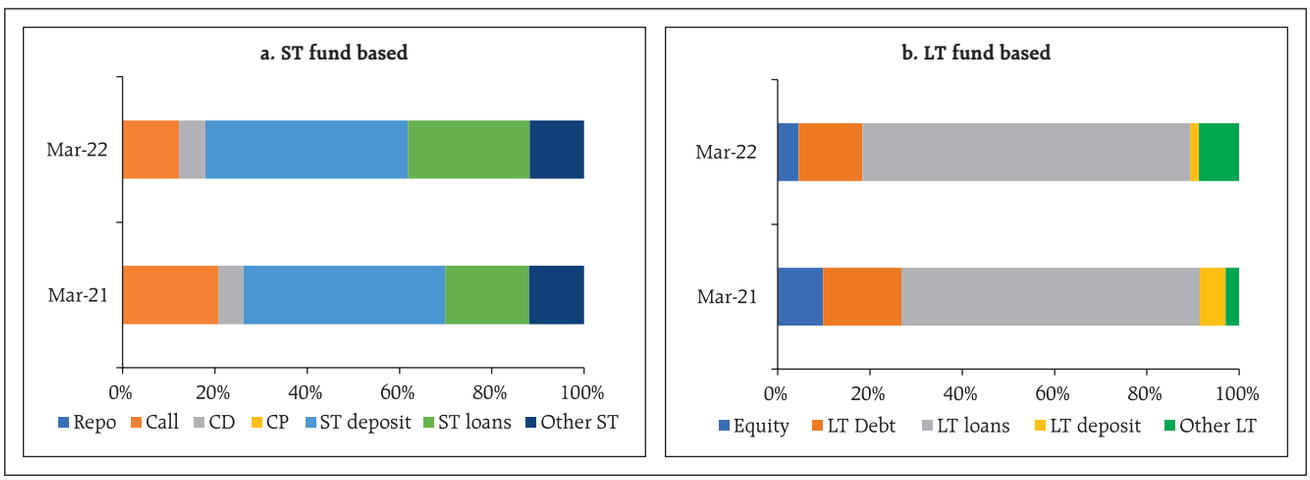
2.64 About 74 per cent of the fund-based inter-bank market was short-term (ST) in nature in which ST deposits had the highest share, followed by ST loans and call money market exposure. Long-term (LT) loans predominated in LT fund-based inter-bank exposures (Chart 2.43).

Chart 2.42: Different Bank Groups in the Inter-Bank Market – March 2022



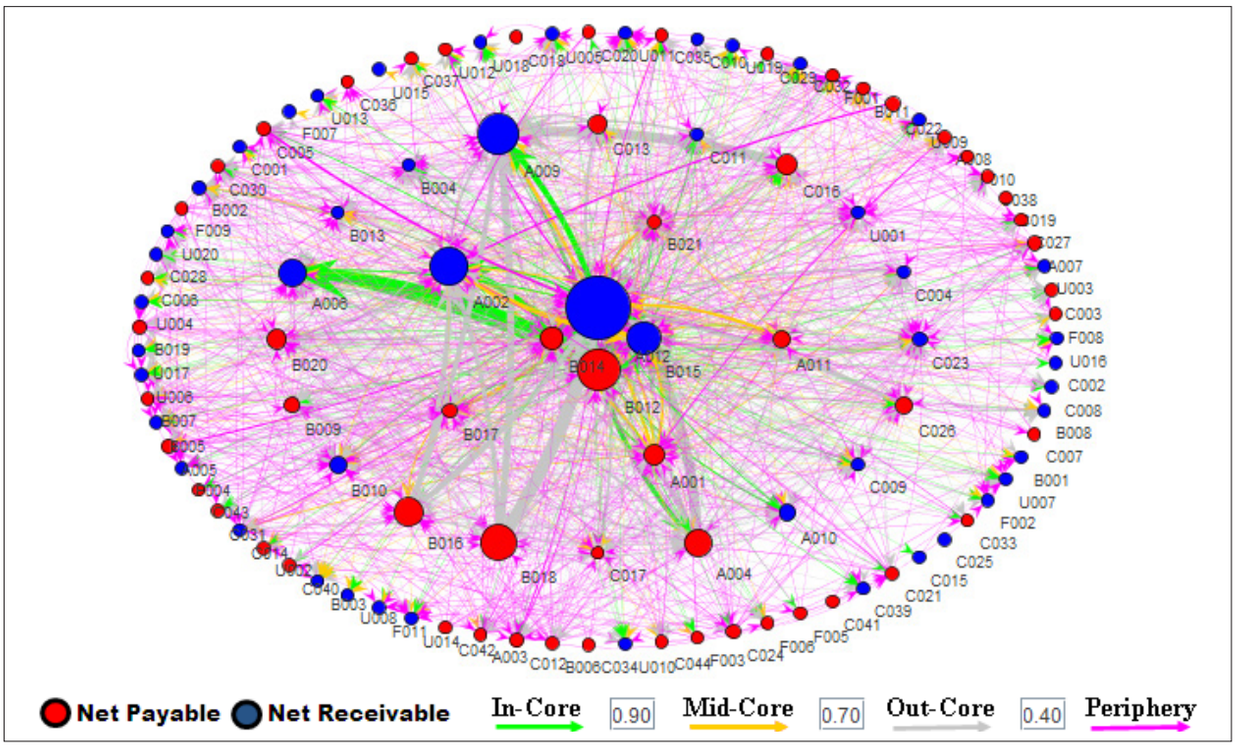
Source: RBI supervisory returns and staff calculations.

Chart 2.43: Composition of Fund based Inter-Bank Market



Source: RBI supervisory returns and staff calculations.

Chart 2.44: Network Structure of the Indian Banking System (SCBs + SFBs+ SUCBs) – March 2022



Source: RBI supervisory returns and staff calculations.

b. Inter-bank Market: Network Structure and Connectivity

2.65 The inter-bank market typically has a core-periphery network structure[37] [38]. As of end-March 2022, four banks were in the inner-most core and five banks in the mid-core circle. The four banks in the inner-most core included a large public and three private sector banks. 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 2.44).

2.66 The degree of interconnectedness in the banking system (SCBs), as measured by the connectivity ratio[39] continued to decline over the year. Smaller FBs do not actively participate in the inter-bank market. The rise in their local interconnectedness through tendency to cluster, however, intensified as reflected in the increase in

[37] 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.

[38] 77 SCBs,11 SFBs and 20 SUCBs were considered for this analysis.

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

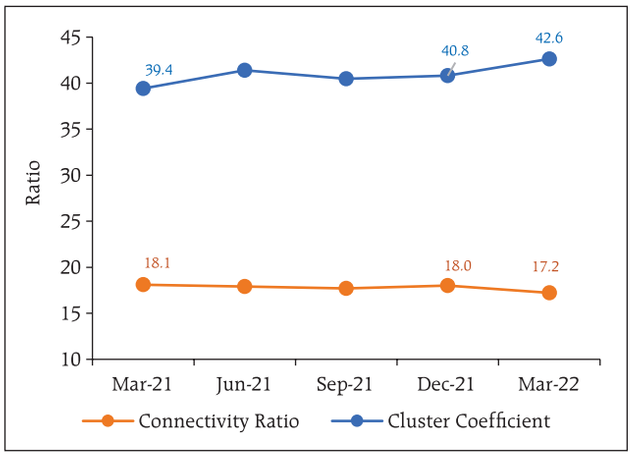
cluster coefficient to 42.6 per cent in March 2022 from 39.4 per cent a year ago (Chart 2.45).

c. Exposure of AMC-MFs

2.67 In terms of inter-sectoral exposures, AMC-MFs maintained their position as the largest net providers of funds to the financial system as of end 2021-22. Their gross receivables stood at ₹11.41 lakh crore (around 31 per cent of their average AUM) whereas their gross payables were ₹0.93 lakh crore as at end-March 2022. SCBs were the major recipients of their funding. The momentum of AMC-MF exposure to banking sector has been rising since June 2020, exceeding pre-pandemic levels by Q4:2021-22. Their receivables from AIFIs also increased (Chart 2.46 a).

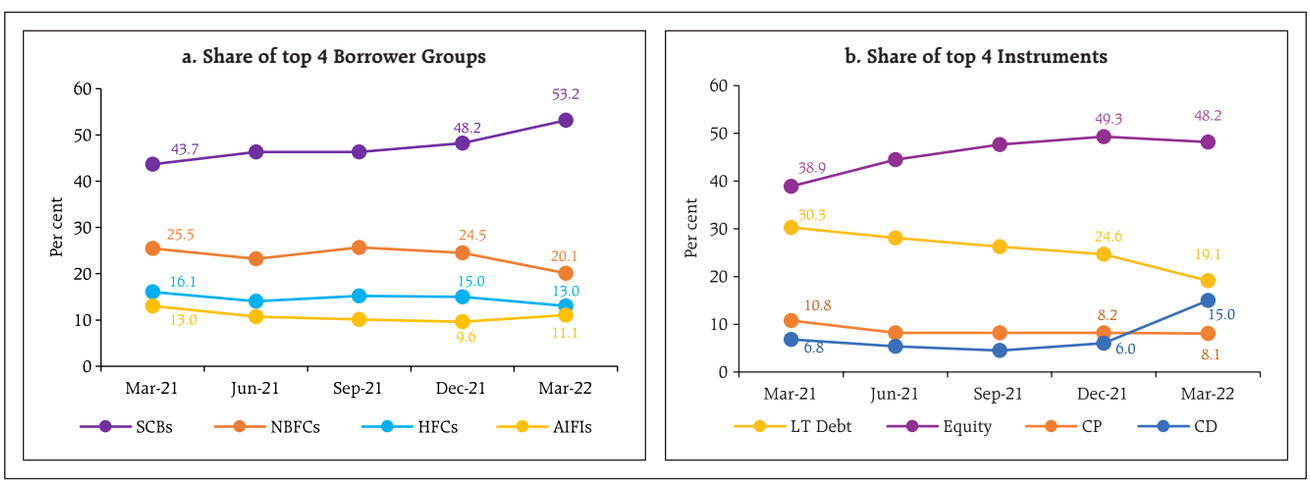
2.68 The asset composition of AMC-MFs witnessed a significant shift in Q4:2021-22. The share of equity holdings in AMC-MFs receivables declined in Q4:2021-22 with the meltdown in the equity market. Furthermore, the share of long-term (LT) debt underwent a sharp markdown sequentially. On the other hand, their exposure to CDs surged from 6 per cent to 15 per cent in Q4:2021-22 (Chart 2.46 b).

Chart 2.45: Connectivity Statistics of the Banking System (SCBs)



Source: RBI supervisory returns and staff calculations.

Chart 2.46: Gross Receivables of AMC-MFs from the Financial System



Source: Supervisory returns of various regulators and RBI staff calculations.

d. Exposure of Insurance Companies

2.69 Insurance companies were the second largest net providers of funds to the financial system, with gross receivables at ₹7.29 lakh crore and gross payables at ₹0.46 lakh crore in March 2022. SCBs were the largest recipients of their funds, followed by subscription to LT debt issued by NBFCs and HFCs, and equity (Chart 2.47 a and b).

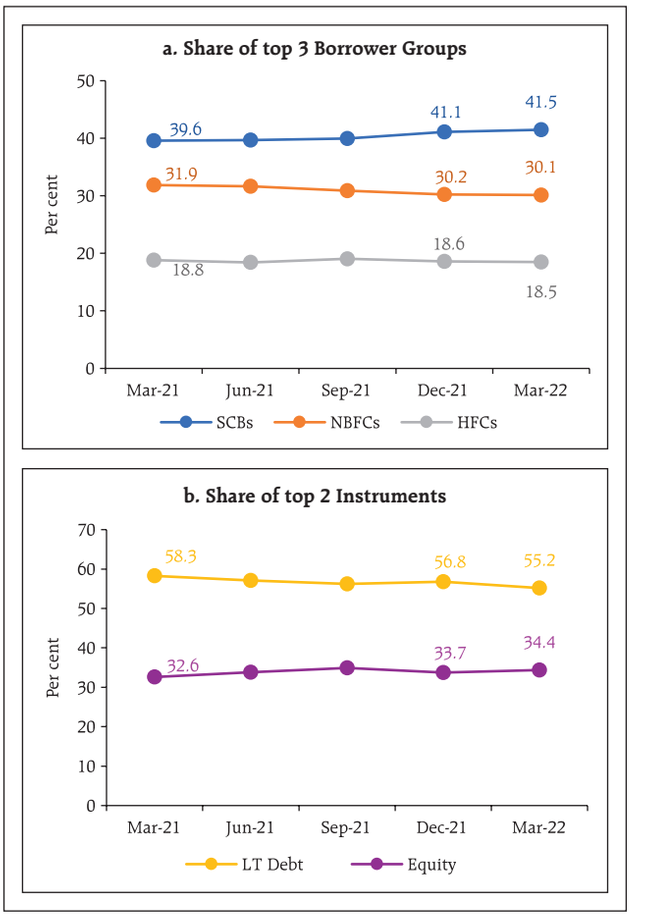
e. Exposure to AIFIs

2.70 AIFIs were net borrowers of funds from the financial system, their gross payables and gross receivables having increased to ₹5.19 lakh crore and ₹4.77 lakh crore, respectively, in March 2022. They raised funds mainly from SCBs (primarily PVBs), AMC-MFs and insurance companies (Chart 2.48 a). Given their nature of operations, LT debt and LT deposits remained their preferred instruments for raising funds but the combined share of these instruments has declined to 41.5 per cent from 52.7 per cent a year ago, and they mobilised funds through CPs and CDs in Q4:2021-22 (Chart 2.48 b).

f. Exposure to NBFCs

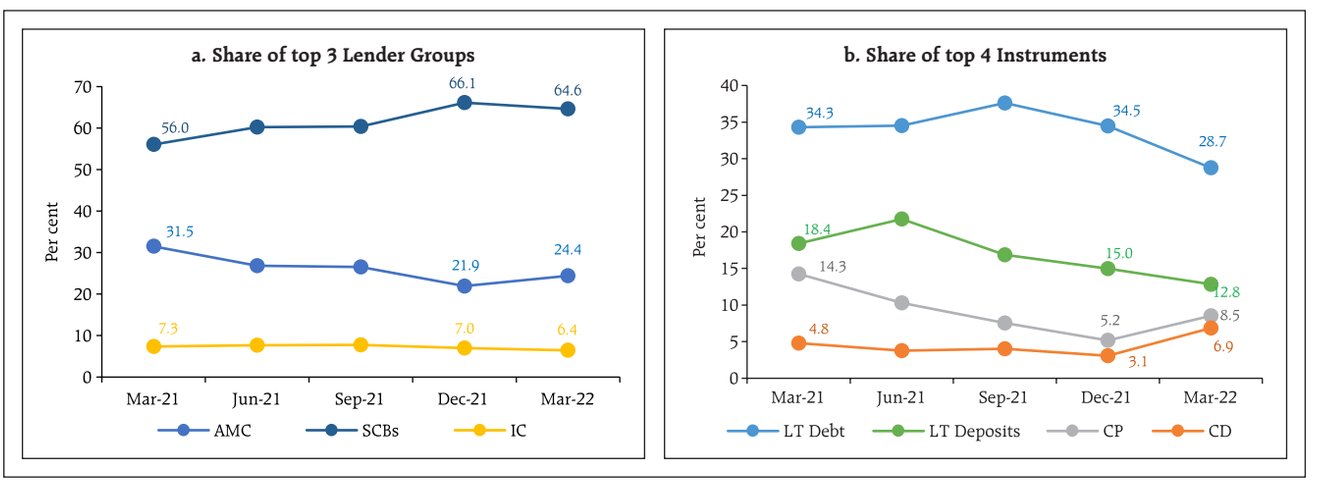
2.71 NBFCs were the largest net borrowers of funds from the financial system, with gross payables of ₹12.46 lakh crore and gross receivables of ₹1.62

Chart 2.47: Gross Receivables of Insurance Companies from the Financial System



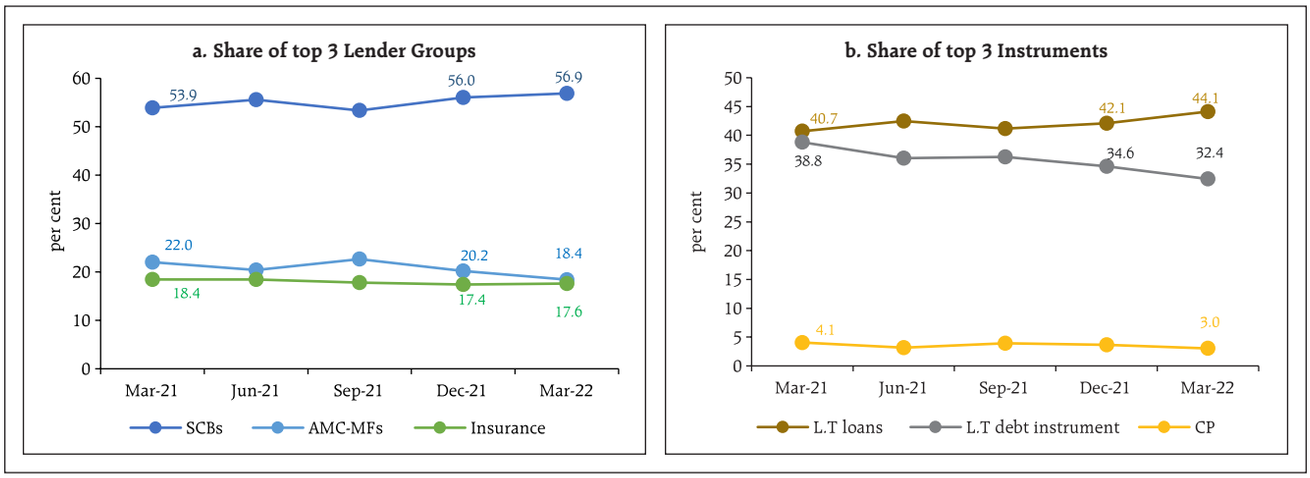
Source: Supervisory returns of various regulators and RBI staff calculations.

Chart 2.48: Gross Payables of AIFIs to the Financial System



Source: Supervisory returns of various regulators and RBI staff calculations.

Chart 2.49: Gross Payables of NBFCs to the Financial System



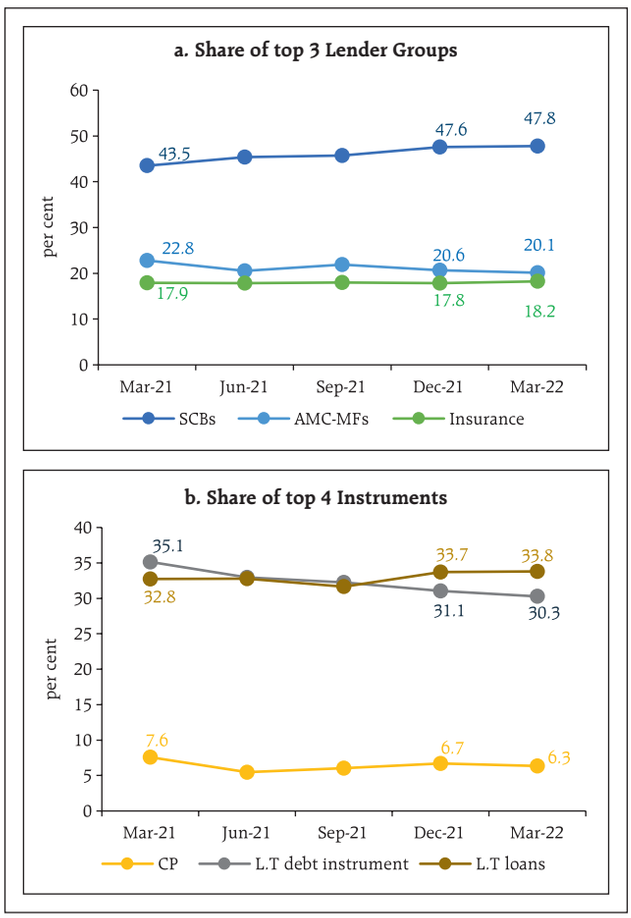
Source: Supervisory returns of various regulators and RBI staff calculations.

lakh crore as at end-March 2022. Over half of their borrowings were from SCBs and this share increased further during H2:2021-22 as their reliance on funding by AMC-MFs and insurance companies reduced. (Chart 2.49 a). Instrument wise, the NBFC funding mix saw a rise in LT loans whereas the share of LT debt instruments and CPs declined during 2021-22 (Chart 2.49 b).

g. Exposure to HFCs

2.72 HFCs were the second largest net borrowers of funds from the financial system, with gross payables of ₹7.40 lakh crore and gross receivables of ₹0.63 lakh crore as at end-March 2022. As in the case of NBFCs, the reliance of HFCs on funding from SCBs has been high and it rose further during the year. Their share of borrowings from AMC-MFs declined while the share of insurance companies has remained largely stable (Chart 2.50 a). The proportion of resource mobilisation through LT debt instruments has contracted since March 2021 while loans (both LT and ST) grew on an annual as well as sequential basis. The share of funds mobilised through CPs varied through the year (Chart 2.50 b).

Chart 2.50: Gross Payables of HFCs to the Financial System



Source: Supervisory returns of various regulators and RBI staff calculations.

III.5.2 Contagion Analysis

2.73 Contagion analysis uses network technology to estimate the systemic importance of individual banks. The failure of a systemically important bank leads to solvency and liquidity losses for the banking system, the scale of which depends on the capital and liquidity positions of banks as well as the extent and nature of exposure (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.

Table 2.8: Contagion Losses due to Bank Failure – March 2022

Trigger Code	% of Tier 1 capital of the Banking System	% of HQLA	Number of Bank defaulting due to solvency	Number of Bank defaulting due to liquidity
Bank 1	2.83	0.02	0	0
Bank 2	2.31	0.20	0	0
Bank 3	2.16	0.01	0	0
Bank 4	1.83	0.12	0	0
Bank 5	1.82	0.50	0	0

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

a. Joint Solvency[40]-Liquidity[41] Contagion Losses for SCBs due to Bank Failure

2.74 A contagion analysis of the banking network, based on the end-March 2022 position, indicates that the bank with the maximum capacity to cause contagion losses (Table 2.8) is positioned in the inner-most core of the core-periphery network structure (Chart 2.44) and its failure would lead to a solvency loss of 2.83 per cent of the total Tier 1 capital of SCBs and liquidity loss of 0.02 per cent of total HQLA of the banking system.

2.75 An analysis of the five banks with the maximum capacity to cause contagion losses shows that possible contagion losses due to their failure increased in March 2022 *vis-à-vis* September 2021, which may be attributed to the deepening of the inter-bank market during the interregnum.

2.76 The presence of banks with traditionally strong deposit franchise businesses in this cohort is indicative of rising credit growth and increased reliance on the inter-bank market. This, however, would not lead to the failure of any additional bank on solvency and liquidity criteria (Table 2.8 and Box 2.2).

Box 2.2: Determinants of solvency contagion loss due to bank failure

The international transmission of financial shocks post Global Financial Crisis has highlighted the importance of analysis of contagion channels. The extent of loss that could be triggered by a financial institution is also an indicator of its systemic importance. Global systemically important banks (G-SIBs) are also required to maintain additional capital buffers to reduce their probability of failure and its impact on the system (BCBS, 2018).

The FSR regularly makes assessments of contagion losses of the banking system due to failure of banks, NBFCs and HFCs and the results of hypothetical scenarios of failure of top five entities in each category having the maximum capacity to cause contagion losses are released on a half yearly basis.

In order to ascertain the factors influencing the extent of solvency contagion loss at a system level due to idiosyncratic failure of the top-most bank having the maximum capacity to cause such loss, two alternative autoregressive distributed lag (ARDL) models are

(Contd.)

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

[41] 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 failure of large net lender. Liquid assets are measured as: 17 per cent of NDTL + excess SLR + excess CRR.

Table 1: Estimated models

Variables	Model 1 ARDL(1,1,0)		Model 2 ARDL(1,0,0,1)	
	Coefficient	t-statistic	Coefficient	t-statistic
Dependent variable (-1)	-0.092	-0.779	-0.071	-0.555
Inter-bank exposure to total bank assets	3.573**	2.461	5.559***	3.305
Inter-bank exposure to total bank assets (-1)	-3.235	-1.597		
Tier 1 capital ratio	-2.587**	-2.268	-4.496**	-2.274
Connectivity ratio			0.185	0.337
Connectivity ratio (-1)			1.326*	1.770
Constant	38.460*	1.938	-30.535	-1.109
@Trend			1.564**	2.300
Regression Diagnostics:				
Adj. R-square	0.605		0.649	
Durbin-Watson statistic	2.496		2.093	
F-statistic	8.660***		7.155***	
Serial correlation LM test p-value	0.386		0.943	
BPG Heteroskedasticity test p-value	0.267		0.292	
Correlogram of residuals and squared residuals are insignificant for both the models.				
Bounds Test: F-statistic (Null: No levels relationship)	17.646***		16.862***	

Note *, ** and *** denote significance at 10%, 5% and 1% level, respectively.

estimated for the dependent variable (ratio of solvency contagion loss due to failure of the top-most bank to cause maximum loss to Tier 1 capital of the banking system) with the regressor variables being (i) ratio of inter-bank exposure to total bank assets; (ii) tier 1 capital ratio and (iii) connectivity ratio (which measures actual number of links relative to maximum possible number of links). Quarterly data from March 2017 to March 2022 are used for which stationarity and bounds test conditions were satisfied for applying the ARDL model (Pesaran, Shin and Smith, 2001).

The results suggest that solvency contagion loss is driven by inter-bank market size, banks' capital ratios and connectivity ratios – higher inter-bank exposure or interconnectedness leads to higher solvency contagion loss while better capital positions reduce the loss (Table 1). In the long run, only Tier-1 capital ratio is significant as per model 1, whereas both inter-bank exposure and Tier-1 capital ratios are significant as per model 2. One percentage point increase in the inter-bank exposure to total bank assets ratio contributes five percentage point rise in loss whereas, similar increase in Tier 1 capital ratio reduces loss by four percentage point as per model 2 (Table 2). It can thus, be concluded that in order to contain contagion loss, banks need to improve their capital position commensurate with the inter-bank market size and interconnectedness.

Table 2: Levels equation (long-run equation)

Variables	Model 1		Model 2	
	Coefficient	t-statistic	Coefficient	t-statistic
Inter-bank exposure to total bank assets	0.310	0.237	5.192***	3.313
Tier 1 capital ratio	-2.368**	-2.210	-4.199*	-2.108
Connectivity ratio			1.412	1.734
Constant	35.213*	1.873		
@Trend			1.460*	2.114

References:

1. BCBS, 2018. Global systemically important banks: revised assessment methodology and the higher loss absorbency requirement, July 2018.
2. Financial Stability Reports, various issues, Reserve Bank of India.
3. Pesaran, MH, Shin, Y., & Smith, R. (2001). Bound testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16(3), 289–326.

b. Solvency Contagion Losses for SCBs due to NBFC/HFC Failure

2.77 The failure of any NBFC or HFC would also act as a solvency shock to their lenders depending on the extent of exposure, and solvency losses can spread through contagion.

2.78 By end-March 2022, the idiosyncratic failure of an NBFC with the maximum capacity to cause solvency losses to the banking system would have impacted banks' total Tier-1 capital by 2.40 per cent (as compared with 2.28 per cent in September 2021). In a similar scenario in the HFCs' domain, the impact of total Tier-I capital would be 5.88 per cent (6.43 per cent in September 2021). In both cases, however, it would not lead to failure of any bank (Tables 2.9 and 2.10).

Table 2.9: Contagion Losses due to NBFC Failure – March 2022

Trigger Code	Solvency Losses as % of Tier -1 Capital of the Banking System	Number of Banks Defaulting due to solvency
NBFC 1	2.40	0
NBFC 2	1.85	0
NBFC 3	1.75	0
NBFC 4	1.42	0
NBFC 5	1.39	0

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

Table 2.10: Contagion Losses due to HFC Failure – March 2022

Trigger Code	Solvency Losses as % of Tier -1 Capital of the Banking System	Number of Banks Defaulting due to solvency
HFC 1	5.88	0
HFC 2	4.88	0
HFC 3	1.64	0
HFC 4	1.41	0
HFC 5	1.13	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

c. Solvency Contagion Impact[42] after Macroeconomic Shocks to SCBs

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

2.80 In the previous iteration, the shock was applied to the entity that could cause the maximum solvency contagion losses. In another iteration in which the initial impact of such a shock on an individual bank's capital is taken from the macro-stress tests[43],the initial capital loss due to macroeconomic shocks stood at 8.34 per cent, 12.88 per cent and 18.42 per cent of Tier-I capital for baseline, medium and severe stress scenarios, respectively. No bank fails

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

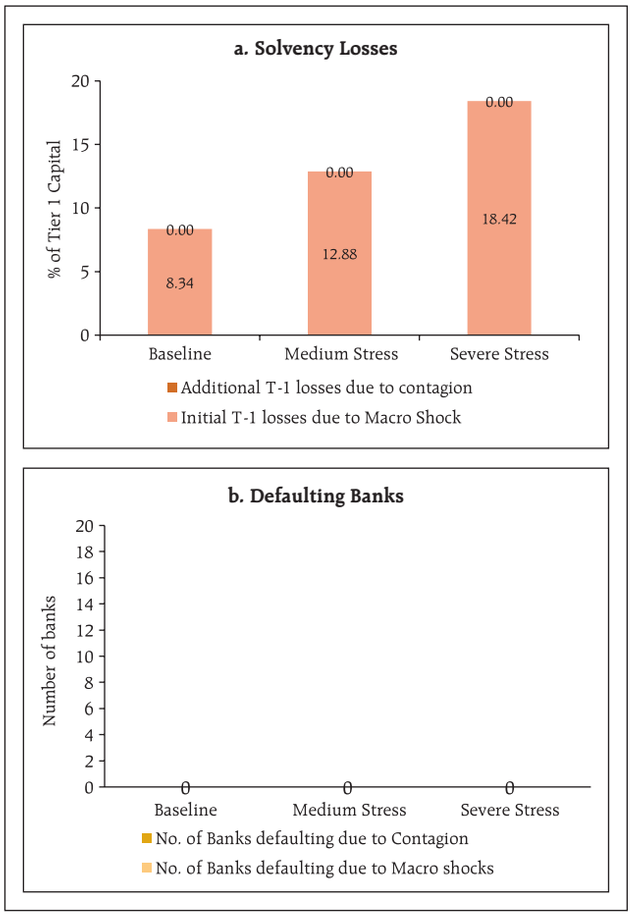
[43] The contagion analysis used the results of the macro-stress tests and made the following assumptions:

(a) The projected losses under a macro scenario (calculated as reduction in projected Tier 1 CRAR, in percentage terms, in March 2023 with respect to the actual value in March 2022) were applied to the March 2022 capital position assuming proportionally similar balance sheet structures for both March 2022 and March 2023

(b) Bilateral exposures between financial entities are assumed to be similar for March 2022 and March 2023.

to maintain Tier-I capital adequacy ratio of 7 per cent in any of the scenarios. As a result, there are no additional solvency losses to the banking system due to contagion (over and above the initial loss of capital due to the macro shocks) (Chart 2.51).

Chart 2.51: Contagion Impact of Macroeconomic Shocks (Solvency Contagion)



Note: The projected capital in March,2023 makes a conservative assumption of minimum profit transfer to capital reserves at 25 per cent and does not take into account any capital infusion by stakeholders.
Source: RBI supervisory returns and staff calculations.

Summary and Outlook

2.81 Financial entities have generally emerged resiliently from the pandemic and are expanding their business as the economic recovery takes hold. Their asset quality has improved and capital positions remained strong. Macro stress tests reveal that SCBs would be able to withstand adverse macroeconomic circumstances. Also, any negative shock to house prices is not likely to significantly impact banks' capital positions. Sensitivity analysis shows that credit concentration risk and equity price risk may not be substantial but banks, especially PSBs, having substantial unrealised losses in their books at the beginning of the interest rate tightening cycle, portends risks to their financial health going forward. Network analysis results suggest that contagion losses have increased during H2:2021-22.

Chapter III

Regulatory Initiatives in the Financial Sector

Global regulatory efforts continued to focus on risks associated with the crypto ecosystem and the threat of decentralisation. On the domestic front, regulatory attention was engaged in deepening digitalisation in payments and other financial services, improving risk management capabilities of financial entities, facilitating retail participation in financial markets, enhancing investor protection, strengthening the framework for public issue as well as cash and derivative segments in equity markets and supervision of systemically important insurers. The Financial Stability and Development Council (FSDC) and its Sub-Committee remained committed to preserving the stability of the Indian financial system and building its resilience.

Introduction

3.1 At the global level, pandemic-proofing measures to aid households, firms and financial institutions buffered financial systems and ensured their normal functioning (Box 3.1).

3.2 Recent regulatory measures have focussed on curtailing solvency risk of financial entities, promoting market-based financing and reducing moral hazard of unduly prolonged policy support. At the same time, high levels of global debt,

Box 3.1: Pandemic-proofing Financial Systems

A wide range of support measures were introduced to insulate the economy and the financial system from the repercussions of the COVID-19 pandemic. Loan guarantees, fiscal transfers and extraordinary lending operations featured among the most common regulatory measures. Financial sector regulators in AEs adopted measures targeted at increasing banks' balance sheet resilience, including relaxations in capital and liquidity requirements, and flexibility in the calculation of expected losses and classification of non-performing loans (NPLs). EMEs permitted moratoriums on loan payments, provided liquidity requirement reliefs and granted flexibility in loss recognition and treatment of NPLs.

In the Euro Area, the aggregate NPL ratio of banks fell to 2.1 per cent, its lowest level since 2008, driven by sales and securitisation of NPLs. Potential cliff effects associated with the phasing out of pandemic support to corporates have not materialised, despite the rollback of most moratorium schemes. CET-1 capital ratios for Euro Area systemically significant institutions rose by 50 bps in 2021 to 15.2 per cent, well above regulatory requirements.

In the United States, credit quality of loan portfolios continued to improve during the second half of 2021. Gross leverage of large businesses slipped below pre-pandemic levels in H2:2021. Mortgage forbearance programs aided significantly in reducing the effect of the pandemic on mortgage delinquencies to below pre-pandemic levels by December 2021. The CET-1 ratio of US banks remained at levels higher than pre-2008 norms.

In the UK, actions taken by the Bank of England, Prudential Regulation Authority (PRA) and public authorities in response to the pandemic during 2020 enabled capital position of major banks and building societies to improve in Q3:2021. The aggregate CET-1 capital ratio stood at 16.5 per cent, which was 170 bps higher than the level at the beginning of the pandemic. Indicators of the quality of banks' assets have remained broadly stable since the July 2021 FSR. Furthermore, banks have released some of the provisions made during the earlier phases of the pandemic. UK households' finances have remained resilient as COVID-related support measures such as the furlough scheme and the ability to take a payment deferral on mortgages and consumer credit ended.

In Malaysia, the ongoing repayment assistance measures for households and businesses affected by the

(Contd.)

pandemic provided support to banks' asset quality by averting a premature materialisation of defaults among distressed but viable borrowers. The regularisation of loan repayments by large businesses and individual borrowers, as well as write-offs by several banks during H2:2021 also contributed to a marginal improvement in the gross impaired loans ratio, which was contained at 2.4 per cent. The impairment ratio for the household sector remained stable at 1.0 per cent as at end-December 2021. Banks have been maintaining capital buffers beyond the regulatory minimum and pay higher dividends to shareholders on the back of improved profitability.

In New Zealand, the NPL ratio fell to 0.39 per cent in March 2022, below pre-COVID levels. Capital buffers of banks remained high and above minimum prudential requirements, while Tier 1 capital levels have increased over the past one year on the back of retained earnings. Banks have written back provisions made in the early stages of the pandemic, as credit losses have been lower than expected. Net interest margins have stabilised around their long-term levels, following declines in lending and funding rates over 2020. Government support schemes have been effective in limiting financial losses suffered by businesses. Business balance sheets remained robust and levels of credit stress are low even in sectors that have been adversely affected by lockdowns.

Household and business balance sheets in Australia have strengthened, with the share of NPLs in total loans declining to 0.9 per cent and 0.7 per cent, respectively, in December 2021, which was lower than the pre-pandemic position. Businesses built liquidity buffers; their total cash holdings in June 2021 were about 30 per cent more than the pre-pandemic level. Policy support and cash buffers built earlier in the pandemic have helped many struggling businesses. Insolvencies and other financial stress indicators remained low. Australian banks' strong capital positions enabled unwinding of around half of the provisions made at the start of the pandemic and the return of capital to shareholders. CET-1 capital ratios of four major banks remained one percentage point above pre-pandemic levels. Banks' holdings of high-quality liquid assets also remained at high levels, pushing up liquidity coverage ratios (LCRs) comfortably above regulatory requirements.

References:

1. Bank Negara Malaysia (2021), "Financial Stability Review- First Half 2021", September.
2. Bank of England (2021), "Financial Stability Report", December.
3. Bank of International Settlements (2021), "BIS Quarterly Review", (September 2021).
4. Board of Governors of the Federal Reserve System (2022), "Financial Stability Report", May.
5. European Central Bank (2022), "Financial Stability Review", May.
6. Reserve Bank of Australia (2022), "Financial Stability Review", April.
7. Reserve Bank of New Zealand (2022), "Financial Stability Report", May.

monetary policy tightening, risks associated with the cryptocurrency ecosystem and climate related risks and more recently, geopolitical conflict posed threats to global financial stability.

3.3 Against this background, this chapter reviews regulatory initiatives undertaken globally and in India to fortify the stability and functioning of the financial system.

III.1 Global Regulatory Developments and Assessments

3.4 The Financial Stability Board (FSB) laid out four key areas to promote global financial resilience in February 2022[1] : (a) supporting financial market adjustment to a post-COVID world; (b) reinforcing financial system resilience, especially in the non-bank financial intermediaries sector; (c) harnessing

[1] Financial Stability Board (2022), "FSB Chair's letter to G20 Finance Ministers and Central Bank Governors", February.

benefits of digitalisation while containing its risks; and (d) addressing financial risks from climate change. More recently, the focus has shifted from managing recovery in a post-pandemic world to dealing with the impact of the war. At the same time, aggressive tightening of monetary policy in response to the accentuating inflationary pressures presages a major shift in global liquidity conditions and repositioning has started affecting global financial flows. One of its early ramifications is reflected in the crypto ecosystem with one stablecoin losing almost all its value and another de-pegging from the US dollar, underscoring the need for regulatory guardrails to ensure financial stability and consumer and investor protection.

3.5 Another area of focus has been the build-up of debt among non-financial corporates, rising dollar-denominated debt in emerging market economies (EMEs) and the role of NBFIs. Vulnerability of the financial system to cyber risk also attracted attention of policy makers. Climate-related risks and regulatory and supervisory approaches to address them are gathering momentum.

III.1.1 Crypto Ecosystem and Financial Stability

3.6 The FSB[2] examined vulnerabilities associated with three closely interrelated segments, *viz.*, unbacked crypto assets (such as Bitcoin); stablecoins and decentralised finance (DeFi); and crypto asset trading platforms. Several vulnerabilities associated with crypto asset markets have been highlighted such as linkages between crypto asset markets and the regulated financial system; liquidity mismatch, credit and operational risks, with the potential spillover to short term funding markets; increased use of leverage in investment strategies; concentration risk of trading platforms; and opacity and lack of regulatory oversight of the sector. Identification and quantification of risks posed by crypto-assets face data gap challenges.

3.7 The IOSCO[3] has noted that DeFi[4] is a spectrum and not a 'binary outcome', and that some DeFi products and services may retain a level of centralisation through concentrated ownership of the 'governance tokens', or by restricting the governance decisions for users. The risks associated with DeFi include speculative trading, flash loans, cross-border lending and borrowing, front running, cybersecurity, asymmetry and fraud. It has stressed the need for continuous examination of this evolving landscape and its implications for traditional financial institutions.

III.1.2 Debt and Financial Stability

3.8 In its discussion paper on debt overhang issues of non-financial corporates[5], the FSB observed that the debt of non-financial corporates has increased to an unprecedented level, which could pose risks to financial stability through underinvestment by viable corporates, misallocation of resources, and lower productivity due to loss of entrepreneurial capacity. It has addressed debt overhang issues through three different angles: (i) viability assessment of companies in the context of the pandemic; (ii) facilitating and incentivising timely restructuring and refinancing; and (iii) dealing with debt restructuring needs of corporates, especially MSMEs. Attracting new long-term equity investments and complementing banks'

[2] Financial Stability Board (2022), "Assessment of Risks to Financial Stability from Crypto-assets", February.

[3] International Organisation of Securities Commissions (2022), "IOSCO Decentralized Finance Report", March.

[4] DeFi refers to the provision of financial products, services, arrangements and activities that use distributed ledger technology ("DLT") in an effort to disintermediate and decentralise legacy ecosystems by eliminating the need for some traditional financial intermediaries and centralised institutions (*ibid*).

[5] Financial Stability Board (2020), "Approaches to Debt Overhang Issues of Non-Financial Corporates", February.

financing through capital-market-based solutions have been suggested for restructuring of firms' balance sheets, whereas fiscal incentives may be needed in the case of smaller firms.

III.1.3 Markets and Financial Stability

3.9 The IOSCO[6] analysed the corporate bond market microstructure and observed that secondary corporate bond trading has remained dependent on a small network of Over the Counter (OTC) dealers. It has stressed further exploration in improving price transparency in corporate bond markets, reducing heterogeneity of bonds and increasing standardisation.

3.10 The European Securities and Market Authority (ESMA) has proposed reforms to the regulatory framework for European Union Money Market Funds (MMFs), addressing liquidity issues and threshold effects for constant net asset value (CNAV) MMFs. It[7] suggests mandatory availability of at least one liquidity management tool for all MMFs; amending daily liquid asset/weekly liquid asset ratios as well as the pool of eligible assets; and allowing temporary use of liquidity buffers in times of stress. The proposed reforms also include enhancements of reporting requirements and the stress testing framework as well as clarification of the requirements on external support and new disclosure requirements linked to the rating of MMFs.

III.1.4 Cyber Risk and Financial Stability

3.11 The European Systemic Risk Board (ESRB)[8] has identified the need for establishment of a systemic cyber incident coordination framework to mitigate the risk from coordination failure in the constantly evolving cyber risk landscape. It proposes a macroprudential strategy, including cyber resilience and systemic cyber resilience stress tests as a tool for testing how systemic institutions in the financial system would respond to and recover from a severe but plausible cyber incident scenario. Macroprudential authorities need to define an acceptable level of disruption to operational systems. It recommends identification of systemically important nodes at financial and operational levels through cyber mapping to increase the understanding of vulnerabilities and contagion channels in the financial system.

III.1.5 Climate-related Risks and Financial Stability

3.12 The FSB[9] has proposed a framework for developing approaches to monitor, manage and mitigate risks arising from climate change and to promote consistent approaches across sectors and jurisdictions. It notes that climate-related risks, including physical, transition and liability risks may get transmitted across the financial system and may be amplified by the financial system across borders and sectors. There could also be risk transfer from banks to insurers, insurers to reinsurers and reinsurers to governments. Climate-related risks may exhibit tipping points and non-linearities, which may amplify the feedback effects between the financial sector and the real economy.

III.2 Domestic Regulatory Developments

3.13 Since the publication of the December 2021 issue of the FSR, the Financial Stability and Development Council (FSDC) chaired by the Union Finance Minister met once on February 22, 2022. The Council deliberated on the various mandates

[6] IOSCO (2022), "Corporate Bond Markets – Drivers of Liquidity During COVID-19 Induced Market Stresses", April.

[7] ESMA (2022), "ESMA opinion on the review of the Money Market Fund Regulation", February.

[8] European Systemic Risk Board (2022)," Mitigating systemic cyber risk", January.

[9] Financial Stability Board (2022)," Supervisory and Regulatory Approaches to Climate-related Risks: Interim Report", April.

of the FSDC, *viz.*, financial stability; financial sector development; inter-regulatory coordination; financial literacy; financial inclusion; and macro prudential supervision of the economy, including the functioning of large financial conglomerates, as well as major macro-financial challenges arising in view of global and domestic developments. The Council noted that Government and all regulators need to maintain constant vigil on financial conditions and functioning of important financial institutions, especially exposure to financial vulnerabilities in the medium to long-term. The Council discussed measures required for further development of the financial sector and to achieve an inclusive economic growth with macroeconomic stability. The Council also took note of the activities undertaken by the FSDC Sub-Committee chaired by the Governor, Reserve Bank of India.

3.14 In its 28th meeting, the FSDC Sub-Committee reviewed the major developments in the global and domestic economy as well as in various segments of the financial system and discussed the assessments of members about the scenario emerging from the third wave of the COVID-19 pandemic. The deliberations covered various regulatory issues and the activities of the technical groups under the Sub-Committee. The Sub-Committee also discussed the use of Aadhaar based e-KYC (e-Know Your Customer) and Aadhar Enabled Payment System by regulated entities (REs).

III.3 Initiatives from Regulators/Authorities

3.15 Financial sector regulators launched several initiatives for the development of the financial system and enhancement of its robustness and resilience (Annex 3).

III.3.1 Regulatory Framework for Microfinance Loans

3.16 The Reserve Bank issued a comprehensive regulatory framework for microfinance loans effective April 1, 2022, which has been made applicable to all REs of the Reserve Bank. The framework includes, *inter alia*, a common definition of microfinance loan for all REs, cap on outflows on account of repayment obligations of a household as a percentage of household income, no pre-payment penalty on microfinance loans, no requirement of collateral for microfinance loans, introduction of a standardised simplified fact sheet on pricing of microfinance loans, and guidelines on conduct towards microfinance borrowers. The framework is intended to address the concerns of over-indebtedness of low-income households, enable competitive forces to bring down interest rates on microfinance loans, strengthen customer protection measures for microfinance borrowers, and introduce activity-based regulation in the microfinance sector. Further, in view of interconnectedness of Section 8 companies (registered under Companies Act, 2013) with other financial intermediaries and potential transmission of any risk arising out of their business to the financial sector, Section 8 companies providing microfinance loans and having asset size of ₹100 crore and above, have been brought under the regulatory ambit of the Reserve Bank.

III.3.2 Digital Banking Units (DBUs)[10]

3.17 Following the announcement made in the Union Budget 2022-23 to set up 75 DBUs in 75 districts to commemorate 75 years of independence (Azadi ka Amrit Mahotsav), the Reserve Bank issued guidelines on establishment of Digital Banking Units (DBUs) applicable to all Domestic SCBs {excluding

[10] A DBU is a specialised fixed point business unit/hub housing certain minimum digital infrastructure for delivering digital banking products and services as well as servicing existing financial products and services digitally, in both self-service and assisted mode, to enable customers to have cost effective/convenient access and enhanced digital experience to/of such products and services in an efficient, paperless, secured and connected environment with most services being available in self-service mode at any time, all year round.

RRBs, PBs and local area banks (LABs)} to widen the reach of digital banking services.

III.3.3 Framework for Facilitating Small Value Digital Payments in Offline Mode

3.18 In order to improve the adoption of digital payments, especially in remote areas, the Reserve Bank has been encouraging entities to develop offline payment solutions. A pilot scheme for small value offline payments was conducted to test innovative technologies that enable retail digital payments even in situations where internet connectivity is low/not available. Based on the results, the Reserve Bank has issued a framework to enable small value digital payments in offline mode. Offline payments shall be made in proximity (face to face) mode only, using any channel or instrument like cards, wallets and mobile devices. The payment transaction may be offered without Additional Factor of Authentication (AFA). The upper limit of an offline payment transaction has been kept at ₹200 and the total limit for offline transactions on a payment instrument has been kept at ₹2,000 at any point in time. Replenishment of used limits can be done only in online mode with AFA.

III.3.4 Master Direction – Reserve Bank of India (Credit Derivatives) Directions

3.19 The Reserve Bank issued Master Directions on Credit Derivatives to provide a fillip to the CDS market and to facilitate the development of a liquid market for corporate bonds, especially for bonds of lower-rated issuers. The directions shall apply to credit derivatives transactions undertaken in OTC markets and on recognised stock exchanges in India. Residents and non-residents, who are eligible to invest in corporate bonds and debentures under the Foreign Exchange Management (Debt Instruments) Regulations, 2019, can participate in the credit derivatives market. Eligible market-makers in credit derivatives consist of SCBs (except SFBs, PBs, LABs and RRBs), NBFCs including stand-alone Primary Dealers (SPDs), HFCs with minimum net owned funds (NOF) of ₹500 crore and above and subject to specific approval of the Department of Regulation, Reserve Bank, and AIFIs. Market-makers will classify users as retail or non-retail; retail users shall be allowed to buy protection only for hedging while non-retail users, *viz.*, regulated financial entities, FPIs, *etc.*, shall be allowed to sell protection and buy protection for hedging or otherwise. Market participants shall not enter into CDS transactions if the reference entity is a related party to either the protection buyer or the protection seller. Participants can exit their CDS contract by unwinding the contract with the original counterparty or assigning the contract to any other eligible market participant through novation.

III.3.5 Legal Entity Identifier for Borrowers

3.20 The Legal Entity Identifier (LEI) code, which has been conceived as a key measure to improve the quality of financial data systems for better risk management, is a 20- digit unique code to identify parties to financial transactions worldwide. The guidelines, which were initially mandated for large borrowers of SCBs, have now been extended to primary UCBs and NBFCs. As on June 16, 2022, M/s Legal Entity Identifier India Ltd. had registered 47,483 LEIs. Non-individual borrowers enjoying aggregate exposure of ₹5 crore and above from banks and financial institutions (FIs) are required to obtain LEI codes. Borrowers with total exposure above ₹25 crores are required to obtain LEI by April 30, 2023, failing which they will not be sanctioned any new exposure.

III.3.6 Retail Direct Scheme

3.21 The Reserve Bank launched the RBI Retail Direct Scheme on November 12, 2021 to provide one-stop access to facilitate investment in government securities by retail investors. Under the scheme,

retail individual investors can open a Retail Direct Gilt (RDG) account with the Reserve Bank, using an online portal. Subsequent to the launch of the scheme, a market making scheme for the PDs was announced. As per the scheme, the PDs shall be present on the Negotiated Dealing System – Order Matching (NDS-OM) platform {Odd-lot and Request for Quotes (RFQ) segments} throughout market hours and respond to buy/sell requests from Retail Direct Gilt Account Holders (RDGAHs).

III.3.7 Cyber-Security Risks

3.22 CSIRT-FIN (Computer Security Incident Response Team – Finance Sector), made operational under the umbrella of Indian Computer Emergency Response Team (CERT-In), has been handling security incidents related to vulnerable services, botnets, open services phishing, unauthorised access and other such cyber issues. Financial entities have been on-boarded to CERT-In's Cyber Swachhta Kendra (CSK) for providing automated feeds regarding malware infections, botnets and vulnerable services. CSIRT-FIN has been issuing vulnerability notes and tailored threat intelligence alerts to financial entities that have been on-boarded on CERT-In's threat intelligence platform.

III.3.8 FinTech Developments

3.23 The financial technology (FinTech) industry has undergone tremendous growth over the past few years. The global FinTech market size was valued at US$ 111 billion in 2020, and is projected to reach US$ 698 billion by 2030, growing at a CAGR of 20.3 per cent[11]. The Indian FinTech industry, which is amongst the fastest growing FinTech markets in the world, was valued at US$ 50-60 billion in 2020 and is projected to reach US$ 150 billion by 2025[12]. India has the highest FinTech adoption rate globally (87 per cent)[13], receiving funding of US$ 8.53 billion (in 278 deals) during 2021-22. FinTech innovations are ubiquitous, especially in retail and wholesale payments, financial market infrastructures, investment management, insurance, credit provision and equity capital raising and may lead to material changes in the financial landscape.

3.24 The adoption of FinTech can promote financial inclusion, broaden offering of financial products and services, increase efficiency for delivery of financial services, better accessibility, affordability and enhanced customer experience. It may also lead to efficiency gains in credit delivery processes, better targeted products, improved risk management including, better underwriting models, improved adoption of RegTech reducing compliance cost for regulated entities *etc.*

3.25 The advent of FinTech has exposed the banking system to new risks which extend beyond prudential issues and often intersect with other public policy objectives relating to safeguarding of data privacy, cyber security, consumer protection, competition and compliance with AML policies. BigTechs can scale up rapidly and pose risk to financial stability, which can arise from increased disintermediation of incumbent institutions. Moreover, complex intertwined operational linkages between BigTech firms and financial institutions could lead to concentration and contagion risks and issues relating to potential anti-competitive behaviour.

3.26 Regulators and supervisors face a challenging balancing act between innovation-friendliness and managing risks to financial stability, which requires more engagement of stakeholders such as regulators, the FinTech industry, and the academia to work

[11] Report by Allied Market Research, (September 2021) (weblink: https://www.alliedmarketresearch.com/fintech-technologies-market).

[12] Boston Consulting Group and FICCI (2021), "Indian Fintech, A USD 100 Billion Opportunity", March.

[13] A dashboard by Invest India on BFSI-Fintech and Financial Services available at https://www.investindia.gov.in/sector/bfsi-fintech-financial-services.

Box 3.2: 'BigTechs': A Survey of International Regulatory and Supervisory practices

The entry of BigTechs in finance with strong technology driven non-financial service offerings and network externalities has changed the financial landscape. Globally, regulators/supervisors highlight three major concerns in this context:

a) **Financial Stability:** BigTechs entered the financial domain mainly as payment service providers but are now offering a host of financial services including credit, asset management, insurance, crowd funding (Table 1). They increase financial stability risks a) by bundling several financial activities through their platforms; b) increasing operational interconnectedness with financial incumbents through provision of technological support via outsourcing partnerships; and c) greater financial interconnectedness with financial incumbents[14].

b) **Governance:** BigTechs have a complex governance structure typically spreading across jurisdictions, offering financial services through subsidiaries/

Table 1: Financial service offerings by BigTech companies

BigTech	License provider* (year of license)	Main Business	Banks	Credit	Payment	Crowd funding	Asset Mgmt.	Insurance
Google	No	Internet search/ advertising			Y			
Apple	No	Tech/producing hardware			Y			
Facebook	No	Social media/ advertising			Y			
Amazon	No	E-commerce/ online retail		Y	Y	Y		Y
Alibaba (Ant Group)	The China Banking Regulatory Commission (2014) and The Hong Kong Monetary Authority (2019)	E-commerce/ online retail	Y	Y	Y	Y	Y	Y
Baidu	China Banking and Insurance Regulatory Commission (CBIRC) (2019) received stake through equity investment in a consumer finance company.	Internet search/ advertising	Y	Y	Y	Y	Y	Y
JD.com	The Hong Kong Monetary Authority (2019)	E-commerce/ online retail	Y	Y	Y	Y	Y	Y
Tencent	The China Banking Regulatory Commission (2015) and The Hong Kong Monetary Authority (2019)	Tech/gaming and messaging	Y	Y	Y	Y	Y	Y
NTT Docomo	Acquired stake through strategic equity investment in private German bank Bankverein Werther (2011)	Mobile communications	Y	Y	Y	Y		
Rakuten	European Union (2016) and The Financial Supervisory Commission (2020)	E-commerce/ online retail	Y		Y		Y	Y
Mercado Libre	The Brazilian Central Bank (2021)	E-commerce/ online retail		Y	Y		Y	

Notes: 1. Banking licenses are generally for internet banking.
2. "**Y**" Provision of financial service through BigTech entity and/or in partnership with financial institutions outside BigTech group in at least one jurisdiction. *: Only banking licenses.

Source: BIS/news portals/company websites.

(Contd.)

[14] Bains, Parma, Sugimoto, Nobuyasu and Wilson, Christopher (2022), "BigTech in Financial Services: Regulatory Approaches and Architecture", Fin-Tech Note, International Monetary Fund, January.

holding companies. This makes the task of identifying and monitoring the risks they pose to the financial system challenging. Moreover, BigTechs are emerging as "too-critical to fail" institutions as they become major providers of outsourced services (*e.g.*, cloud services) to financial institutions. Governance concerns stem from ensuring 'supervisory' access to test the resilience of the critical services outsourced to BigTechs, especially relating to cross border service arrangements.

c) **Legislative:** BigTechs occupy a dominant position in non-financial domains, often raising anti-trust concerns. They also have the potential to impact competition and market contestability in the financial domain. The key competitive advantage of BigTechs is the large stock of user data that they generate from their non-financial platforms which often creates data privacy and anti-competition issues. Any re-bundling of financial services by BigTechs may effectively reduce the choices available to the consumers, which may especially challenge retail finance models of open banking regime. Their all-pervasive outreach over domains and geographies poses serious challenges for legislatures across the jurisdictions.

Globally, regulators/supervisors are aiming to strike a balance between risks and benefits from the entry of BigTechs in the financial domain. Regulators are adopting licensing/authorisation approach both at the entity and activity level, and the same is being guided by the principle of 'proportionality' and 'flexibility' depending on the complexity of services offered by the BigTechs (Table 1). Going forward, regulators need to be mindful of the new interlinkages that BigTechs might create with the existing financial institutions.

towards common principles for management of FinTech activities, including business and revenue models, governance, conduct, risk management, regulation aspects for promoting a sustainable ecosystem.

III.3.9 Customer Protection

3.27 As observed from the complaints received under the erstwhile Banking Ombudsman Scheme (BOS), 2006 and the Reserve Bank - Integrated Ombudsman Scheme (RB-IOS), 2021, launched on November 12, 2021, the share of complaints received under the category 'loans and advances' and 'credit cards' stood at 39.5 per cent of the total complaints received during November 12, 2021 to March 31, 2022 as compared to 29.2 per cent during April 01, 2021 to November 11, 2021 (Table 3.1).

Table-3.1: Category of complaints received under the RB-IOS, 2021 and the erstwhile BOS, 2006

Grounds of Complaint		BOS Complaints (April 1 to Nov 11, 2021)		RB-IOS Complaints (Nov 12, 2021 - March 31, 2022)	
		Number	Share (per cent)	Number	Share (per cent)
1	Loans and Advances & Non-observance of FPC	36,434	17.4	18,651	25.7
2	Mobile/Electronic Banking	28,533	13.6	12,180	16.8
3	Failure to meet commitments and BCSBI code	27,337	13.1	109	0.2
4	Levy of charges without prior notice	12,806	6.1	814[15]	1.1
5	ATM/CDM/Debit card	30,652	14.7	11,185	15.4
6	Opening/Operation of Deposit accounts	6,196	3.0	9,677	13.3
7	Credit Card	24,769	11.8	10,027	13.8
8	Pension related	4,321	2.1	1,885	2.6
9	Remittance and Collection of instruments	2,164	1.0	1,088	1.5
10	Para-Banking	778	0.4	830	1.1
11	Others	35,206	16.8	6,134	8.5
Total		**2,09,196**	**100.0**	**72,580**	**100.0**

Source: Reserve Bank of India.

[15] Includes complaints related to fees/charges related to deposit accounts.

III.3.10 Enforcement

3.28 During December 2021 - May 2022, the Reserve Bank undertook enforcement action against 74 regulated entities (three PSBs; three PVBs; sixty-four co-operative banks; two FBs; and two NBFCs) and imposed an aggregate penalty of ₹9.98 crore for non-compliance with/contravention of statutory provisions and/or directions issued by the Reserve Bank.

III.3.11 Variation Margin for Non-centrally Cleared OTC Derivatives[16]

3.29 The Reserve Bank issued Master Directions for variation margin, which will come into effect from December 01, 2022. These Directions apply to foreign exchange derivatives, interest rate derivatives and credit derivative contracts that are non-centrally cleared. They apply to domestic covered entities regulated by a financial sector regulator (including branches of foreign banks operating in India) and resident non-financial entities with an average aggregate notional amount (AANA) of outstanding non-centrally cleared derivatives (NCCDs) of ₹25,000 crores and above and ₹60,000 crores and above, respectively, on a consolidated group wide basis. They are also applicable to foreign covered entities, including non-resident financial firms and non-resident non-financial entities having an AANA of outstanding NCCDs of US$ 3 billion and above and US$ 8 billion and above, respectively, on a consolidated group wide basis.

III.3.12 Payments Infrastructure Development Fund Scheme

3.30 The Payments Infrastructure Development Fund (PIDF) Scheme was operationalised by the Reserve Bank in January 2021 to incentivise the deployment of payment acceptance infrastructure such as physical Point of Sale (PoS) terminals, mobile PoS (mPoS), Quick Response (QR) codes in Tier-3 to Tier-6 centres and north-eastern states and Union Territories (UTs) of Jammu and Kashmir (J&K) and Ladakh. Beneficiaries of the PM SVANidhi Scheme in Tier-1 and Tier-2 centres were included under the scheme in August 2021 (Table 3.2). PIDF envisages creating 30 lakh new touch points every year for digital payments.

Table-3.2: Distribution of targets across centres

(in per cent)

Distribution of Acceptance Devices	Share of Total
Tier-1 to Tier-4 centres	30
Tier-5 and Tier-6 centres	60
North Eastern States and UTs of J&K and Ladakh	10

Source: RBI

3.31 Under the scheme, a subsidy of 60 to 75 per cent of the cost of physical PoS and 75 to 90 per cent of the cost of a Digital PoS shall be offered. Initially, 75 per cent of the subsidy amount shall be released and the balance shall be released after ensuring that performance parameters are achieved.

III.3.13 Individual Housing loans – Cooperative Banks

3.32 Taking into account the increase in housing prices and customer needs, the Reserve Bank increased the limits on housing loan sanctioned by UCBs for individual borrowers. The limits for Tier-I and Tier-II UCBs are now placed at ₹60 lakh and ₹140 lakh, respectively, whereas for Rural Cooperative Banks (RCBs – State Cooperative Banks and District Central Cooperative Banks), the limits are increased to ₹50 lakh for RCBs with assessed net worth less than ₹100 crore and ₹ 75 lakh for other RCBs. It has been decided to allow RCBs to extend finance to 'Commercial Real Estate – Residential Housing (CRE-

[16] The Reserve bank has released draft Directions (Margining for Non-Centrally Cleared OTC Derivatives Directions, 2022) prescribing guidelines for exchange of initial margin for NCCDs on June 16, 2022. It has invited comments/feedback on the same from banks, market participants and other interested parties by July 29, 2022.

RH)' within the existing aggregate housing finance limit of 5 per cent of their total assets as per their Board-approved policy, with periodic performance monitoring.

III.3.14 Cross Margin in Commodity Index Futures

3.33 The Securities and Exchange Board of India (SEBI) introduced cross margin benefits between commodity index futures and futures of its underlying constituents or its variants in June 2021 to improve the efficiency of use of margin capital by market participants. By reducing the total margin payment required on their positions, there is a reduction in the cost of trading and improvement in liquidity in index futures and underlying constituent futures. It allows a cross margin benefit of 75 per cent on the initial margin if a client arbitrages or holds offsetting positions in index futures and futures of its underlying constituents or its variants. The levy of extreme-loss margin and mark-to-market margin continue.

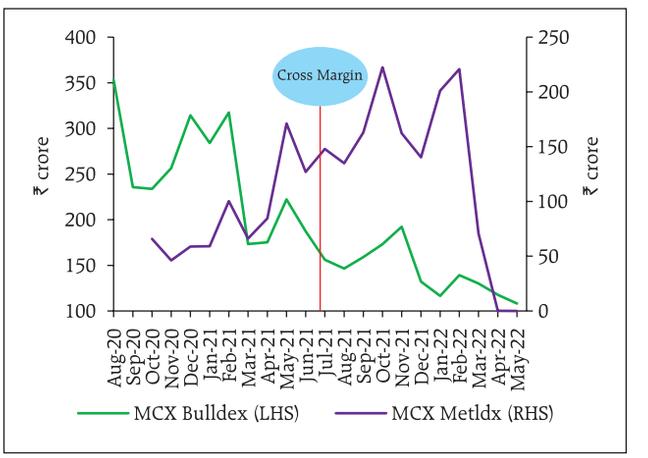
3.34 At the Multi-Commodity Exchange of India Limited (MCX), the cross-margin facility was introduced for futures in the MCX iCOMDEX Bullion Index (MCX BULLDEX) and the MCX iCOMDEX Base Metal Index (MCX METLDEX). The National Commodity and Derivatives Exchange Limited (NCDEX) has started providing cross margining benefit in initial margins between GUAREX[17] Index futures and its underlying constituent futures. There has been an overall decline in average trading volumes in two MCX indices, *viz.*, the MCX BULLDEX and the MCX METLDEX (Chart 3.1). This could be owing to heightened volatility in commodities since April 2021, which further intensified following the geopolitical developments since February 2022.

III.3.15 Tightening Framework for Public Issues

3.35 After reviewing various aspects of the public issue framework, including price bands, non-institutional investor (NII) allocation, objects of the issue and monitoring of issue proceeds, SEBI took steps to strengthen the process for public issues. For all book built public issues opening on or after January 14, 2022, a minimum difference of 5 per cent between the lower and upper price band shall be applicable. The changed framework also specifies that one third of the portion available to NIIs should be reserved for applicants with application size of more than rupees two lakh and up to rupees ten lakh, while two-third of the portion available to NIIs should be reserved for applicants with application size of more than rupees ten lakh.

3.36 For companies not meeting eligibility criteria, including those relating to net tangible assets, average operating profit and net worth, certain limits have been placed on offer for sale (OFS) to demonstrate a higher level of skin in the game by pre-issue substantial shareholders, including promoters. 50 per cent of the portion allocated to 'anchor investors' under a public issue shall be locked in for a period

Chart 3.1: Trends of Average Daily Traded Value (₹ crore)



[17] NCDEX GUAREX is a commodity futures price index on Guar Complex Commodities.

of 90 days, whereas the remaining portion would continue to remain locked in for a period of 30 days with effect from April 01, 2022. Several measures have been prescribed for enhancing the framework for monitoring of issue proceeds such as permission to credit rating agencies (CRAs) to act as monitoring agencies instead of SCBs and public FIs, bringing amounts raised for general corporate purpose under monitoring with enhanced disclosure norms.

III.3.16 Retail Investor Protection

3.37 Since the outbreak of pandemic, SEBI has taken several steps to protect the retail investors from misconducts by regulated entities. In July 2021, a framework was prescribed by SEBI for segregation and monitoring of collateral by brokers at client level with an objective to tighten the mechanism of protection of client collateral from misappropriation/ misuse by the broker and to ensure safeguard against default of broker and/or other clients, and the same has been implemented w.e.f. May 02, 2022. Earlier during September 2020, in order to curb the misuse of power of attorney (POA) given by the clients to the broker, it was prescribed that margin obligations to be given in the form of securities by client would be by way of pledge or re-pledge through the depository system. Now, to significantly mitigate the misuse of POA, a separate document called "Demat Debit and Pledge Instruction" (DDPI) was introduced in April 2022, under which the clients are required to explicitly agree to authorise the stock broker and/or to access their beneficial owner account for the limited purpose of meeting pay-in obligations for settlement of trades executed by them. These measures are quite significant in context of the unprecedented surge in investors in the last 2 years.

3.38 Besides these, SEBI as well as stock exchanges have recently taken several measures to ensure robust surveillance mechanism. Moreover, market surveillance and risk management is carried out online as well as up to the end-client level.

III.3.17 Capacity Building for Investors

3.39 Investor education and awareness has been a key strategy followed by the SEBI to enhance investor protection. During the pandemic, digital modes of conducting investor awareness activities were adopted. The SEBI has also introduced a programme called Securities Market Trainers (SMARTs) to conduct investor awareness programmes and media campaigns on cautioning investors against unsolicited investment tips. In these programmes, the SEBI provides free of charge centralised platforms for conduct of awareness webinars where digital educational contents is shared among the participants.

III.3.18 Framework for FinTech Entity in the International Financial Service Centre (IFSC)

3.40 The International Financial Services Centres Authority (IFSCA) proposes to cover (i) FinTech solutions resulting in new business models, applications, process or products in areas/activities linked to financial services regulated by the IFSCA; and (ii) advanced/innovative technological solutions which aid and assist activities in relation to financial products, financial services and financial institutions (TechFin). It aims at fostering innovation in financial services through a regulatory/innovation sandbox for FinTech activities and enabling pure play technology companies in providing allied activities/ services to banking and financial services. The framework empowers the IFSCA to grant 'Limited Use Authorisation' to eligible financial technology entities. This would enable them to apply and avail of grants under the IFSCA FinTech Incentive Scheme 2022, which aims at providing financial support to FinTechs at various stages of their lifecycle.

3.41 The framework also proposes to cover areas/ activities allied to financial products, financial services and financial institutions. Some class/ categories of technology companies can obtain

direct entry authorisation from the IFSCA without entering the regulatory sandbox, subject to certain conditions. The framework also includes an inter-operable regulatory sandbox (IORS) to facilitate testing of innovative hybrid financial products/ services falling within the regulatory ambit of more than one financial sector regulators in India. The IFSCA will facilitate Indian FinTech's access to foreign markets and entry of foreign FinTechs into India. Firms with innovative ideas or solutions across banking, capital or insurance sector can benefit from seamless interaction with a single/unified regulator in the IFSCA.

III.3.19 Fund Management Regulations at IFSCA

3.42 The IFSCA notified the Fund Management Regulations, 2022 under which eligibility and regulatory requirements for fund management entities (FMEs) managing retail schemes, non-retail schemes, venture capital schemes, portfolio management services and investment trusts have been prescribed. The regulations also carry requirements for exchange-traded funds (ETFs), portfolio management services (PMS), investment trusts (Real Estate Investment Trusts and Infrastructure Investment Trusts), in addition to environmental, social, and governance (ESG) related disclosures at entity level and scheme level. A FME intending to undertake a host of activities related to fund management can do so by seeking a single unified registration (Registered FME – Retail) from the IFSCA.

3.43 The regulations depending on the registration category require the FME to appoint key management personnel (KMPs) (Principal Officer; Fund Manager; Compliance and Risk Manager) and also various fiduciaries. The FME or its associate entities are required to make a skin in the game contribution to the schemes launched by them based on certain specified conditions. A detailed code of conduct has been prescribed for FME and their KMPs and fiduciaries. Requirements have also been prescribed for *inter alia* business continuity plans, cyber security and cyber resilience, risk management and change in control.

III.4 Other Developments

III.4.1 Deposit Insurance

3.44 The Deposit Insurance and Credit Guarantee Corporation (DICGC) has been extending insurance cover to depositors with the objective of maintaining the confidence of small depositors in the banking system of the country and promoting financial stability. Deposit insurance extended by the DICGC covers all commercial banks, including LABs and RRBs as well as co-operative banks in all the States and UTs.

3.45 The number of registered insured banks as on March 31, 2022 stood at 2,043, comprising 141 commercial banks (including 43 RRBs, two LABs, six payment banks and 12 small finance banks) and 1,902 co-operative banks (33 StCBs, 352 DCCBs and 1517 UCBs). As at end-March 2022, the limit of deposit insurance at ₹5 lakh fully protected 256.7 crore deposit accounts (97.9 per cent of total). In value terms, the insured deposits of ₹81 lakh crore formed 49.0 per cent of the total assessable deposits.

3.46 During the year 2021-22, deposit insurance premium of ₹19,491 crore was collected of which 93.6 per cent was contributed by commercial banks

Table-3.3. Deposit Insurance Premium

(in ₹ crore)

Period	Commercial Banks	Co-operative Banks
2021-22	18,247.7	1243.1

Source: Deposit Insurance and Credit Guarantee Corporation (DICGC).

Table-3.4: Deposit Insurance Fund (DIF)

(in ₹ crore)

As on	Deposit Insurance Fund	Reserve Ratio (per cent)
March 31, 2022	1,46,842	1.81
March 31, 2021	1,29,904	1.70

Source: Deposit Insurance and Credit Guarantee Corporation (DICGC)

and the rest by co-operative banks. The Deposit Insurance Fund (DIF) stood at ₹1.47 lakh crore, yielding a reserve ratio (ratio of DIF to insured deposits) of 1.81 per cent (Table 3.3 and 3.4).

3.47 During the period April 2021 to March 2022, the Corporation has settled claims of five liquidated banks for an amount aggregating to ₹1,124.1 crore and 12 supplementary claims of liquidated banks aggregating to ₹100.9 crore. The aggregate of main claims and supplementary claims in respect of 16 urban co-operative banks amounted to ₹1,225 crore under Section 17 (1) of the DICGC Act 1961. In addition to the claims settled as mentioned above, an amount of ₹3,791.6 crore was provided to Unity Small Finance Bank (USFB) for making payment to the depositors of the erstwhile Punjab and Maharashtra Co-operative Bank Ltd (PMCBL) pursuant to the merger of PMCBL with USFB with effect from January 25, 2022 under Section 16 (2) of the DICGC Act, 1961. Thus, the total claims settled amounted to ₹5,059.1 crore[18]. As per the amended Section 18 A of DICGC Act, the Corporation shall settle the claims within 90 days of imposition of such directions. The claims settled under this channel in the case of 22 urban co-operative banks under All Inclusive Direction (AID) amounted to ₹3,457.4 crore as on March 31, 2022. Overall, the Corporation has settled aggregate claims of ₹8,516.6 crore under different channels during 2021-22.

III.4.2 Corporate Insolvency Resolution Process (CIRP)

3.48 Since the inception of the Insolvency and Bankruptcy Code (IBC) in December 2016, 5,258 CIRPs have commenced by end-March 2022, of which 65 per cent have been closed. Of these, around 22

Table-3.5: Corporate Insolvency Resolution Process

Year/Quarter	CIRPs at the beginning of the Period	Admitted	Closure by				CIRPs at the end of the Period
			Appeal/ Review/Settled	Withdrawal under Section 12A	Approval of Resolution Plan	Commencement of Liquidation	
2016-17	0	37	1	0	0	0	36
2017-18	36	706	94	0	20	91	537
2018-19	537	1,157	154	97	78	306	1,059
2019-20	1,059	1,986	344	217	137	542	1,805
2020-21	1,805	538	86	160	120	351	1,626
Apr-Jun, 2021	1,626	141	11	34	33	75	1,614
Jul-Sep, 2021	1,614	190	21	37	17	68	1,661
Oct–Dec, 2021	1,661	255	9	32	46	106	1,723
Jan–Mar, 2022	1,723	248	11	9	29	70	1,852
Total	**NA**	**5,258**	**731**	**586**	**480**	**1609**	**1,852**

Note: 1. These CIRPs are in respect of 5119 CDs.
2. The data excludes 1 CD which moved directly from BIFR to resolution.
3. The data includes Dewan Housing Finance Corporation Limited data, Srei Equipment Finance Limited, Srei Infrastructure Finance Limited and Reliance Capital Ltd, wherein the application filed by the Reserve Bank was admitted under section 227 read with Financial Service Provider Rules of the Code.

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

[18] Inclusive of main claims settled under the expeditious claims settlement policy of the Corporation for an amount of ₹42.6 crore in case of three co-operative banks.

per cent were closed on appeal or review or settled, 17 per cent were withdrawn, 47 per cent ended in orders for liquidation and 14 per cent culminated in approval of resolution plans (Table 3.5).

3.49 Till March 31, 2022, 480 CIRPs have ended in resolution. Realisation by financial creditors (FCs) under resolution plans in comparison to liquidation value was 171 per cent while the realisation by them in comparison to their claims was 33 per cent. Forty seven per cent of the CIRPs, which were closed, yielded orders for liquidation, as compared with 14 per cent ending up with a resolution plan. The economic value in most of the corporate debtors (CDs) that ended in liquidation had almost completely eroded even before they were admitted into CIRP. These CDs had assets, on average, valued at less than 8 per cent of the outstanding debt amount (Table 3.6).

3.50 About 52 per cent of CIRPs initiated by operational creditors (OCs) were closed on appeal, review, or withdrawal. Such closures accounted for 71 per cent of all closures by appeal, review, or withdrawal (Table 3.7 and Table 3.8).

III.4.3 Mutual Funds

3.51 The asset base of the mutual funds (MFs) industry (excluding domestic fund-of-funds or FoF) at ₹37.2 lakh crore as on May 31, 2022, has nearly doubled in a span of five years (₹19.04 lakh crore on

Table-3.6: CIRPs Ending with Orders for Liquidation till March 31, 2022

State of Corporate Debtor at the Commencement of CIRP	No. of CIRPs initiated by			
	Financial Creditor	Operational Creditor	Corporate Debtor	Total
Either in BIFR or Non-functional or both	508	558	130	1196
Resolution Value > Liquidation Value	94	57	31	182
Resolution Value ≤ Liquidation Value*	608	652	140	1400

Note: 1. There were 88 CIRPs, where CDs were in BIFR or non-functional but had resolution value higher than liquidation value.
2. *Includes cases where no resolution plans were received and cases where liquidation value is zero or not estimated.
3. Data of 27 CIRPs is awaited.

Table-3.7: Outcome of CIRPs, Initiated Stakeholder-wise, as on March 31, 2022

Outcome	Description	CIRPs initiated by			
		Financial Creditor	Operational Creditor	Corporate Debtor	Total
Status of CIRPs	Closure by Appeal/Review/Settled	196	530	5	731
	Closure by Withdrawal u/s 12A	163	416	7	586
	Closure by Approval of Resolution Plan #	269	163	47	479
	Closure by Commencement of Liquidation	714	718	177	1609
	Ongoing	894	872	83	1849
	Total	**2,236**	**2,699**	**319**	**5,254**
CIRPs yielding Resolution Plans	Realisation by FCs as per cent of Liquidation Value	192.8	115.3	140.6	171.4
	Realisation by FCs as per cent of their Claims	42.7	16	25.5	32.9
	Average time taken for Closure of CIRP	531	528	516	528
CIRPs yielding Liquidations	Liquidation Value as per cent of Claims	6.3	8.9	9.7	7
	Average time taken for Closure of CIRP (days)	433	401	373	412

Note: # This data excludes data in respect of Financial Service Providers admitted under section 227 read with Financial Service Provider Rules of the Code.

Table-3.8: Sectoral Distribution of CIRPs as on March 31, 2022

Sector	No. of CIRPs						
	Admitted	Closed					Ongoing
		Appeal/ Review/ Settled	Withdrawal under Section 12 A	Approval of Resolution Plan	Commencement of Liquidation	Total	
Manufacturing	2103	257	236	244	698	1435	668
Food, Beverages & Tobacco Products	268	28	30	30	84	172	96
Chemicals & Chemical Products	217	29	31	29	65	154	63
Electrical Machinery & Apparatus	157	21	9	7	70	107	50
Fabricated Metal Products	113	14	17	11	42	84	29
Machinery & Equipment	240	38	34	20	71	163	77
Textiles, Leather & Apparel Products	360	43	39	30	139	251	109
Wood, Rubber, Plastic & Paper Products	242	28	30	30	72	160	82
Basic Metals	355	39	26	64	114	243	112
Others	151	17	20	23	41	101	50
Real Estate, Renting & Business Activities	1074	191	141	62	276	670	404
Real Estate Activities	263	53	23	12	32	120	143
Computer and related activities	153	22	23	5	53	103	50
Research and Development	6	2	1	1	0	4	2
Other Business Activities	652	114	94	44	191	443	209
Construction	578	104	68	49	111	332	246
Wholesale & Retail Trade	527	65	43	30	197	335	192
Hotels & Restaurants	112	21	16	14	29	80	32
Electricity & Others	156	16	7	26	50	99	57
Transport, Storage & Communications	150	18	14	11	58	101	49
Others	558	59	61	44	190	354	204
Total	**5258**	**731**	**586**	**480**	**1609**	**3406**	**1852**

Source: Insolvency and Bankruptcy Board of India (IBBI)

Table 3.9: Trends in Resource Mobilisation by Mutual Funds

(in ₹ Crores)

Months	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22
Mobilisation of Funds	8,03,250	9,14,933	7,88,172	7,65,767	9,84,059	8,17,044	8,41,776
Repurchase/Redemption	7,57,084	9,19,145	7,52,920	7,34,234	10,53,942	7,44,198	8,49,308
Net Inflow/Outflow of funds	46,165	-4,212	35,252	31,533	-69,883	72,847	-7,533
Assets under Management	37,33,702	37,72,696	38,01,210	37,56,296	37,56,683	38,03,683	37,22,010

Source: Securities and Exchange Board of India (SEBI)

May 31, 2017) (Table 3.9). The industry witnessed sustained inflows, despite volatile stock markets, especially since January 2022. The net inflows during November 2021 to May 2022 stood at ₹1.04 lakh crore.

3.52 Investments in MFs through systematic investment plans (SIPs) accounted for 15 per cent of the total assets under management (AUM) of the industry, as on May 31, 2022 (Table 3.10).

Table-3.10: Growth in SIPs (November 01, 2021 to May 31, 2022)

Particulars	Existing at the beginning of the period (Excluding STP)	Registered during the period	Matured during the period	Terminated prematurely during the period	Closing no. of SIPs at the end of April 30, 2022	AUM at the beginning of the period	AUM at the end of the period
	(in lakh)					(in ₹ crore)	
T-30 Cities	240.90	68.28	7.33	20.57	281.29	3,64,422.74	3,70,002.71
B-30 Cities	217.46	72.66	4.37	25.75	260.01	1,85,095.63	1,90,721.85
SIPs	**458.36**	**140.95**	**11.70**	**46.32**	**541.30**	**5,49,518.36**	**5,60,724.56**

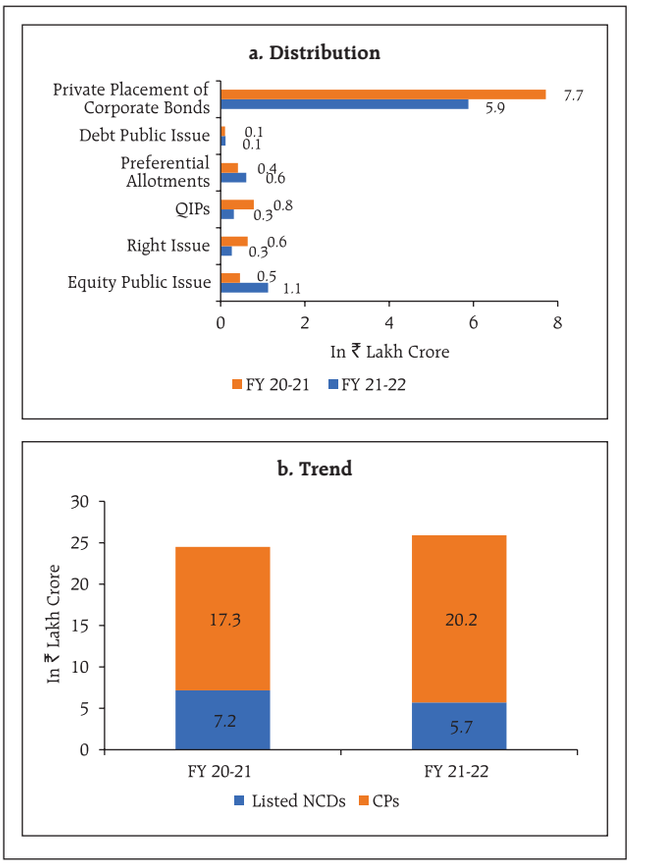
Note: T30 refers to the top 30 geographical locations in India by mutual funds' AUM and B30 refers to the locations beyond the top 30.
Source: Securities and Exchange Board of India (SEBI)

III.4.4 Capital Market

3.53 The total capital raised in primary markets during the period 2021-22 stood at ₹8.3 lakh crore, as compared with a mobilisation of ₹10.1 lakh crore during 2020-21. Funds raised through equity public issues went up 2.4 times, whereas the total funds raised through issuances of CPs and listed NCDs went up by 5.8 per cent to ₹25.9 lakh crore during 2021-22 (Chart 3.2 a and b).

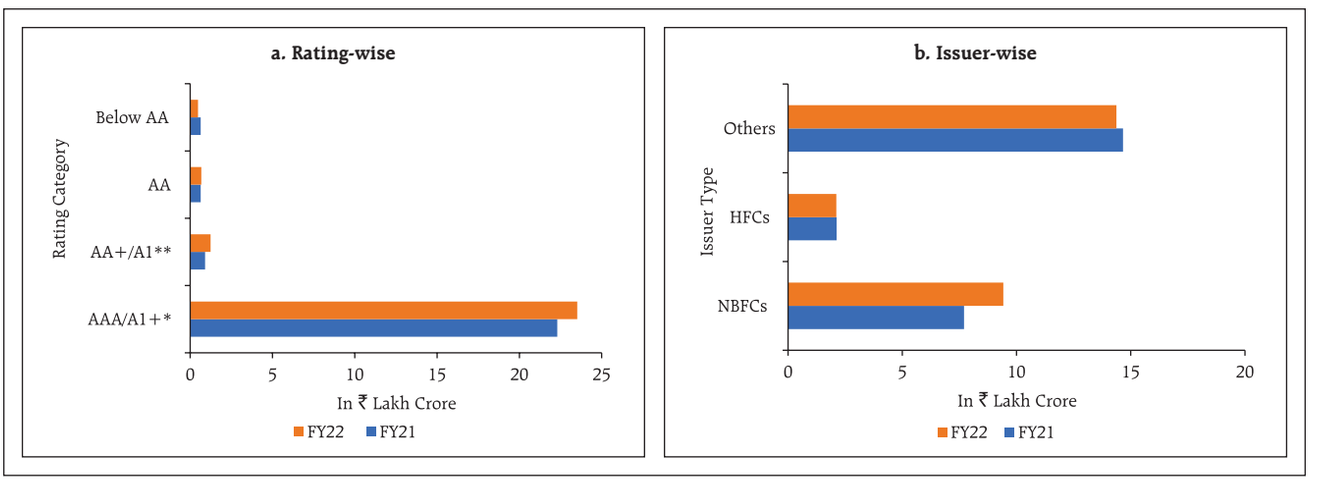
3.54 Issuances of bonds by NBFCs and HFCs were 17 per cent higher y-o-y during 2021-22. While issuances with AAA/A1+ rating dominated fund raising through corporate bonds, issuances with "AA and AA+/A1" rating categories also witnessed an increase of 24 per cent during the same period (Charts 3.3 a and b).

Chart 3.2: Funds Raised through Primary Market



Source: Securities and Exchange Board of India (SEBI).

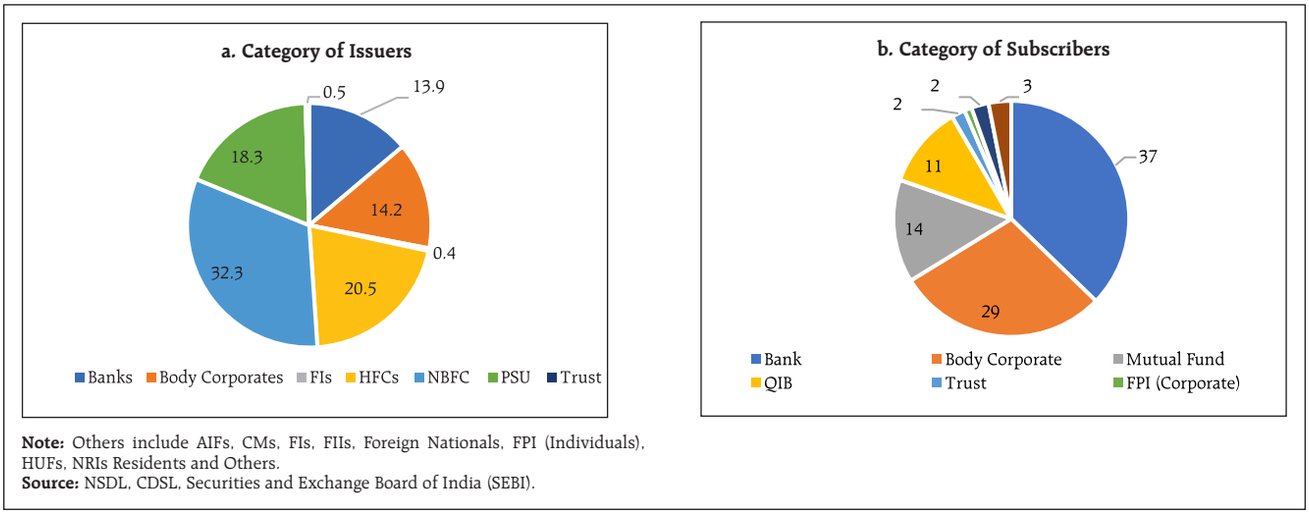
Chart 3.3: Issuances of CPs and Listed NCDs - Rating-wise and Issuer-wise



Note: ~97 per cent of the CP issuances are considered as A1+ rated.
Source: NSDL and CDSL

Chart 3.4: Category-wise Issuers and Subscribers of Corporate Bonds

(per cent share)



Note: Others include AIFs, CMs, FIs, FIIs, Foreign Nationals, FPI (Individuals), HUFs, NRIs Residents and Others.
Source: NSDL, CDSL, Securities and Exchange Board of India (SEBI).

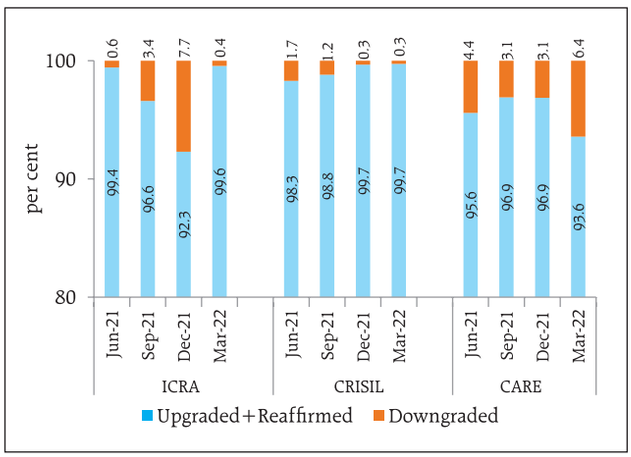
3.55 NBFCs and HFCs remained the major issuers, accounting for 53 per cent of total listed bonds during the year (Chart 3.4 a), whereas banks and body corporates were their major subscribers (Chart 3.4 b).

III.4.5 Credit Ratings

3.56 The high incidence of downgrades in ratings of listed issues was arrested as the pandemic's impact subsided. During Q4:2021-22, the share of downgraded listed issues by ICRA and CRISIL went down, whereas the same went up for CARE Ratings on a sequential basis (Chart 3.5).

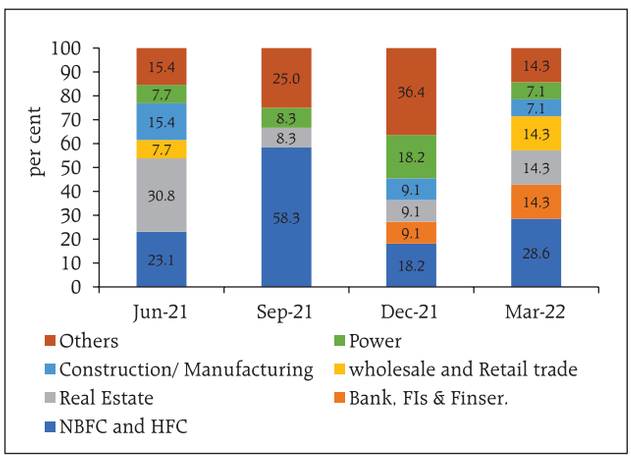
3.57 The rating downgrades are distributed across sectors. The combined share of NBFCs and HFCs went up from 18 per cent to 29 per cent during Q4:2021-22 (Chart 3.6).

Chart 3.5: Rating Actions across Credit Rating Agencies (CRAs)



Note: The data pertains to rating actions on debt issues of listed companies.
Source: Individual Credit Rating Agencies (CRAs) - CRISIL, ICRA and CARE.

Chart 3.6: Distribution of Rating Downgrades – Sector-wise



Source: Individual Credit Rating Agencies (CRAs) - CRISIL, ICRA and CARE

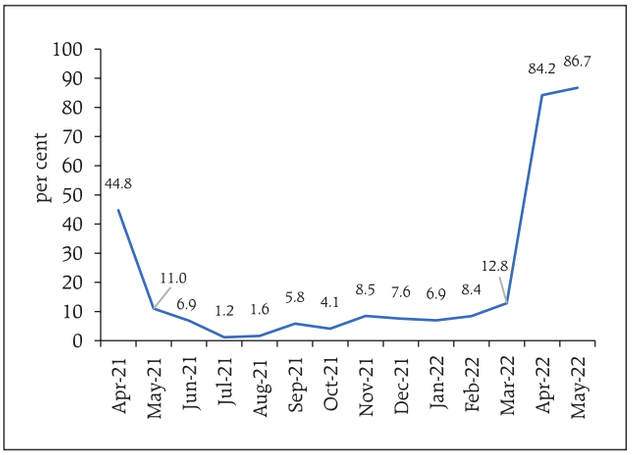
III.4.6 Insurance

3.58 During the first two months of current financial year (April-May 2022), the First Year Premium (FYP) of Life Insurance Business has gone up by 86.7 per cent when compared to the same period of last financial year say April-May 2021 (Chart 3.7). The spike in performance of Life Insurance premium during April-May 2022 *vis-à-vis* April-May 2021 is due to the base effect. The life insurance industry experienced low level of activities during the period April-May 2021 on account of second wave of the pandemic. However, the industry experienced normal level of activities during the period April-May 2022.

3.59 During the period April-May 2022, the Total Premium (First Year Premium + Renewal) experienced 39.1 percent growth when compared to the same period of last year say April-May 2021. (Chart 3.8).

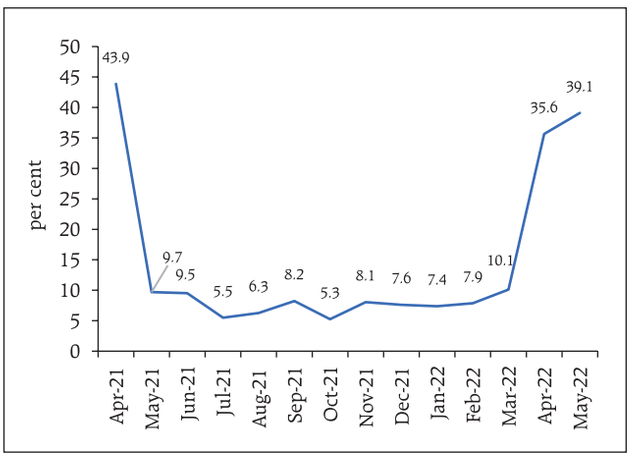
3.60 During the period April 2020-May 2022, the life insurance industry received 2.35 lakh claims aggregating to ₹18,135 crore for COVID related deaths. Of these, 2.34 lakh death claims amounting to ₹17,606 crore were settled. The claim paid ratio in the above cases stood at 99.18 per cent in number and 97.08 per cent in amount.

Chart 3.7: Growth in First Year Premium of Life Insurance Business – Life Insurance (data is cumulative for the financial year; per cent)



Source: Insurance Regulatory and Development Authority of India (IRDAI)

Chart 3.8: Growth in Total Premium (First Year + Renewal) of Life Insurance Business (data is cumulative for the financial year; per cent)



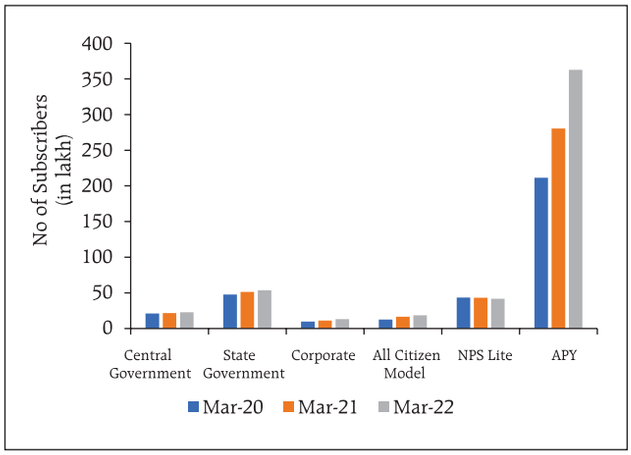
Source: Insurance Regulatory and Development Authority of India (IRDAI).

III.4.7 Pension Funds

3.61 The National Pension System (NPS) and the Atal Pension Yojana (APY) recorded a 22.6 per cent annual growth in number of subscribers and 27.3 per cent growth in the corpus during 2021-22 (Charts 3.9 and 3.10).

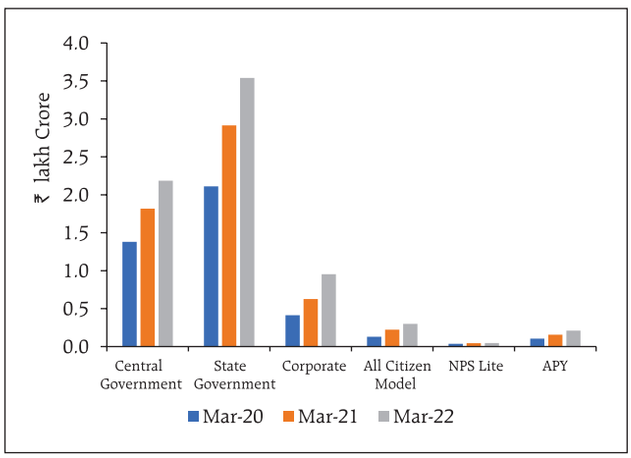
3.62 Both the NPS and the APY have progressed in terms of the total number of subscribers and AUM. Their combined subscriber base and AUM have reached 5.13 crores and ₹7,23,418 crores, respectively, of which APY has 3.62 crores of subscribers and AUM of ₹20,922 crores.

Chart 3.9: NPS and APY Subscribers – Sector-wise



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

Chart 3.10: NPS and APY AUM – Sector-wise



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

Summary and Outlook

3.63 Amidst the major challenges facing the global financial system emanating from the pandemic, geopolitical tensions and other shocks, technological innovations that have the potential to disrupt financial stability engaged the attention of regulators and other policymakers during 2021-22. The core of the financial system continues to exhibit resilience, a triumph for the post-GFC regulatory reforms that improved banking system resilience through higher capital buffers and improved liquidity standards. The NBFI sector, however, poses a hazard as the regulatory reform agenda is still unfinished. The growing threat of the crypto-assets ecosystem warrants drastic approaches by national authorities. Ongoing challenges relating to cyber risk and climate-related financial risks are the two other major focus areas for policy makers.

3.64 On the domestic front, efforts to improve financial system resilience continues. Regulators took several measures to strengthen financial intermediaries, accelerate digitalisation of the economy, develop market segments, improve access of retail investors and protect the interests of depositors/investors. The fast-changing financial landscape is keeping regulators on the vigil to not only safeguard the financial system from shocks, but also unlock its potential to drive economic growth.

Annexure 1

Systemic Risk Survey

In the 22nd round of Systemic Risk Survey, global spillovers and financial market volatility were assessed to have moved to the 'high' risk category. Macroeconomic uncertainty, though rising, remained a 'medium' risk. Going forward, respondents' perception of risks to financial stability included: (a) aggressive monetary policy tightening by advanced economies; (b) volatility in capital flows and exchange rates; (c) de-anchoring of inflation expectations; (d) faltering of economic recovery; (e) disruptions in global supply chains; (f) de-globalisation; and (g) climate change risk. A majority of the respondents judged that the prospects of the Indian banking sector over a one-year horizon have improved or remained unchanged.

The 22nd round of the Reserve Bank's systemic risk survey (SRS) was conducted in May 2022 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 new risks, which can potentially have a large impact on the Indian financial system, going forward; and (ii) likely impact of the ongoing war in Ukraine on the Indian economy.

The feedback from 48 respondents is encapsulated below.

- Global spillovers and financial market volatility moved to the 'high' risk category. They also assessed that macroeconomic uncertainty, though rising, remained a 'medium' risk. On the other hand, institutional risks and general risks are gauged to have moderated during the preceding six months though they stayed in the 'medium' risk category (Figure 1).
- Global growth uncertainty, commodity price movements, geopolitical conditions and monetary tightening in AEs were perceived to be the major drivers of escalation in global risks (Figure 2).
- The rise in financial market risk was assessed to be emanating from tightening of financial conditions: foreign exchange pressure; interest rate and liquidity tightening; and elevated equity price volatility (Figure 2).

Figure 1: Systemic Risk Survey: Major Risk Groups

Major Risk Groups	Nov-21	May-22	Change in Risk Perception[1]
A. Global Risks	5.7	6.8	Increase
B. Macroeconomic Risks	5.2	5.6	Increase
C. Financial Market Risks	5.8	6.3	Increase
D. Institutional Risks	5.6	5.3	Decline
E. General Risks	5.2	4.8	Decline

Source: Systemic Risk Survey (November 2021 and May 2022).

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	Nov-21	May-22	Change in Risk Perception
A. Global Risks	Global growth	5.6	7.0	Increase
	Sovereign risk/contagion	4.8	5.1	Increase
	Funding risk (External borrowings)	5.0	5.5	Increase
	Commodity price risk (including crude oil prices)	7.5	8.0	Increase
	Geopolitical risks#		7.4	
	Monetary tightening in advanced economies#		7.7	
B. Macro-economic Risks	Domestic growth	5.1	6.0	Increase
	Domestic inflation	6.6	7.7	Increase
	Current account deficit	5.1	6.6	Increase
	Capital inflows/outflows (Reversal of FIIs, Slowdown in FDI)	5.3	6.6	Increase
	Sovereign rating downgrade	4.3	4.4	
	Fiscal deficit	5.8	6.0	Increase
	Corporate sector risk	5.5	5.1	Decline
	Pace of infrastructure development	5.1	4.5	Decline
	Real estate prices	5.0	4.7	Decline
	Household savings	5.4	5.5	Increase
	Political uncertainty/governance/policy implementation	4.4	4.3	Decline
C. Financial Market Risks	Foreign exchange rate risk	5.5	6.3	Increase
	Equity price volatility	6.9	6.6	Decline
	Interest rate risk	5.9	6.7	Increase
	Liquidity risk	4.8	5.6	Increase
D. Institutional Risks	Regulatory risk	4.2	4.4	Increase
	Asset quality deterioration	6.1	5.5	Decline
	Additional capital requirements of banks	5.8	5.3	Decline
	Access to funding by banks	4.5	4.7	Increase
	Level of credit growth	6.2	5.4	Decline
	Cyber risk	6.6	6.0	Decline
	Operational risk	5.7	5.4	Decline
E. General Risks	Terrorism	4.5	3.9	Decline
	Climate related risks	5.6	5.7	Decline
	Social unrest (Increasing inequality)	5.5	5.2	Decline
	Cryptocurrency#		4.4	

Note:
Risk Category

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

#: New risk item introduced in 22nd round of RBI's Systemic Risk Survey conducted during May 2022.

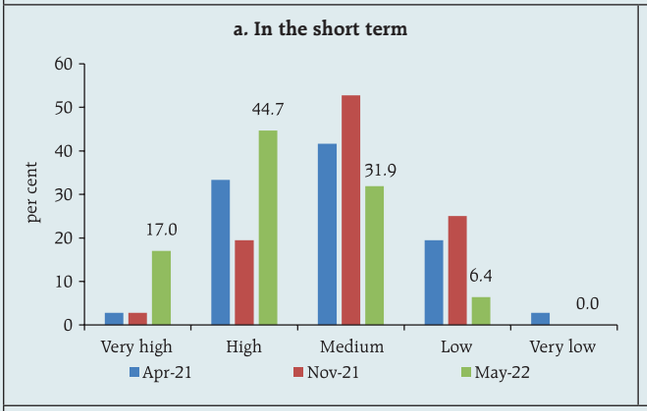
- A bearish outlook on domestic economic growth, inflation, current account balance, capital flows and fiscal deficit has led to intensification of overall macroeconomic risks (Figure 2).
- 'High' to 'very high' probability of occurrence of a high impact event in the global financial system in the short run (Chart 1a).
- A high impact event in the domestic financial system was rated as 'medium' to 'high' for the same time horizon (Chart 1c).

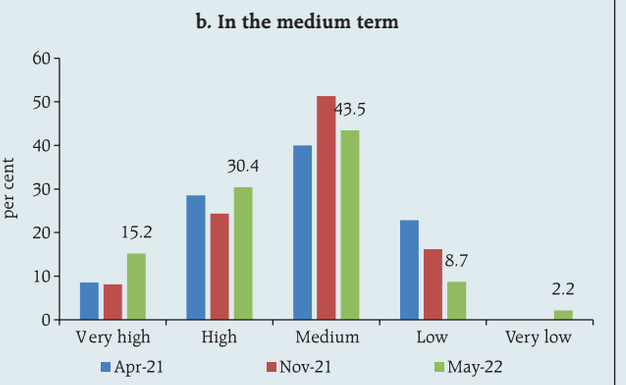
- In the medium term, chances of a high impact event in the global financial system *vis-a-vis* the domestic financial system was rated as high (Chart 1b and 1d).
- Confidence in the stability of the financial system, both global and domestic, has diminished during the last six months, though 60 per cent and 88 per cent of respondents remained fairly/highly confident of the stability of global and Indian financial systems, respectively (chart 1e and 1f).

Chart 1: Perception on Occurrence of High Impact Events in the Financial Systems

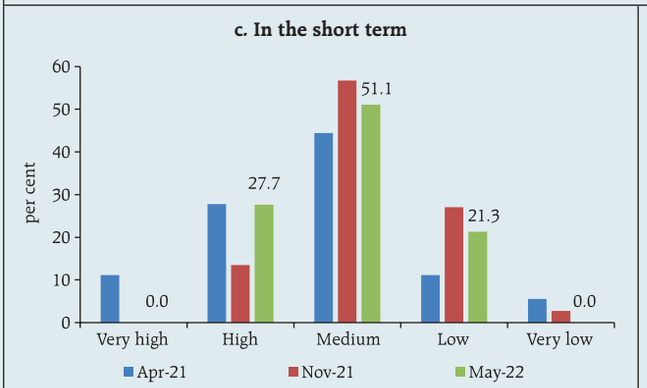
share of respondents (per cent)

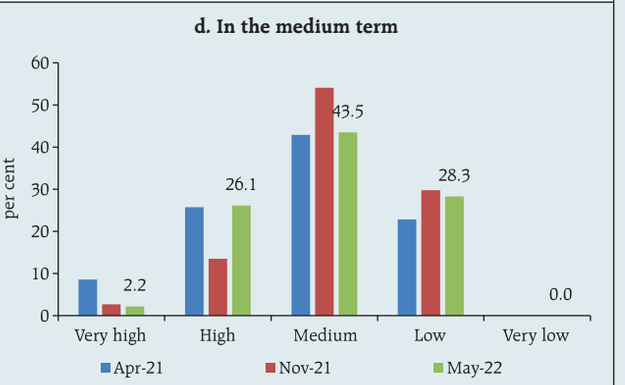
A. Probability of High Impact Event in the Global Financial System



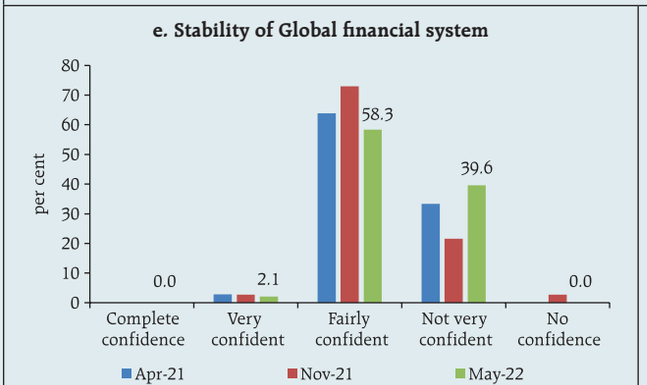


B. Probability of High Impact Event in the Domestic Financial System





C. Confidence in the Financial Systems



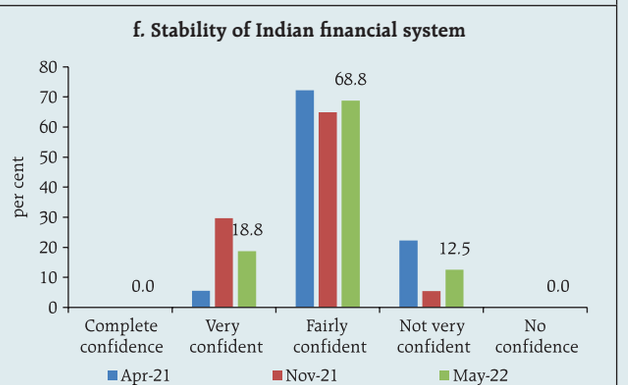
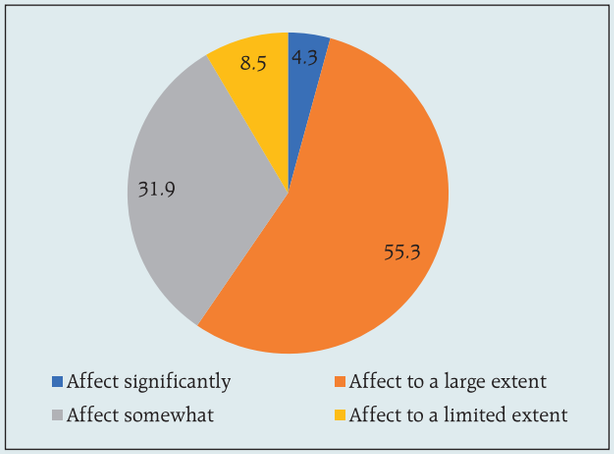


Chart 2: Expectation of Instability in Global Financial System affecting Indian Economy



- Spillovers from the global financial system to the Indian economy could be large though 40.4 per cent of respondents expected the impact to be relatively limited (Chart 2).

Three-fourths of the respondents perceived that the war in Ukraine to have a medium impact on the Indian economy as a whole (Charts 3a and 3b). The majority felt that the impact of the war is likely to be more on edible oils, crude oil and gas, automobile sector, base metals, agricultural commodities and fertilisers.

Nearly 44 per cent of the panellists judged that the prospects of the Indian banking sector over a one-year horizon have improved and another 35 per cent expected it to remain unchanged (Chart 4).

Most of the panellists expected marginal to considerable improvement in credit demand over the next three months on the back of recovery in GDP growth, higher consumer spending, pick up in manufacturing sector activity, public investment in infrastructure and higher demand for working capital (Chart 5a). Around 38 per cent of the respondents expected marginal deterioration in asset quality of the banking sector over the next three months, attributable to factors such as COVID-19 induced regulatory forbearance, improved asset quality recognition, higher input costs, supply chain bottlenecks impacting profit margins of firms and tightening of monetary and liquidity conditions (Chart 5b).

Chart 3: Impact of War in Ukraine

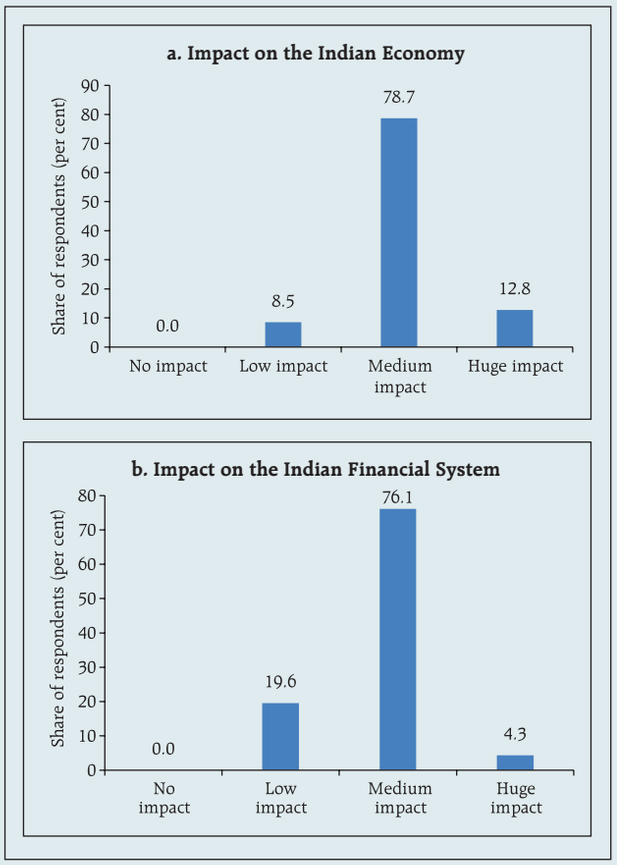


Chart 4: Prospects of Indian Banking Sector- Next One Year

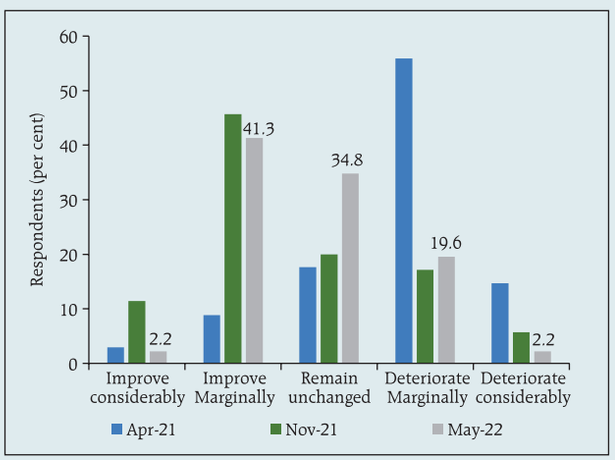
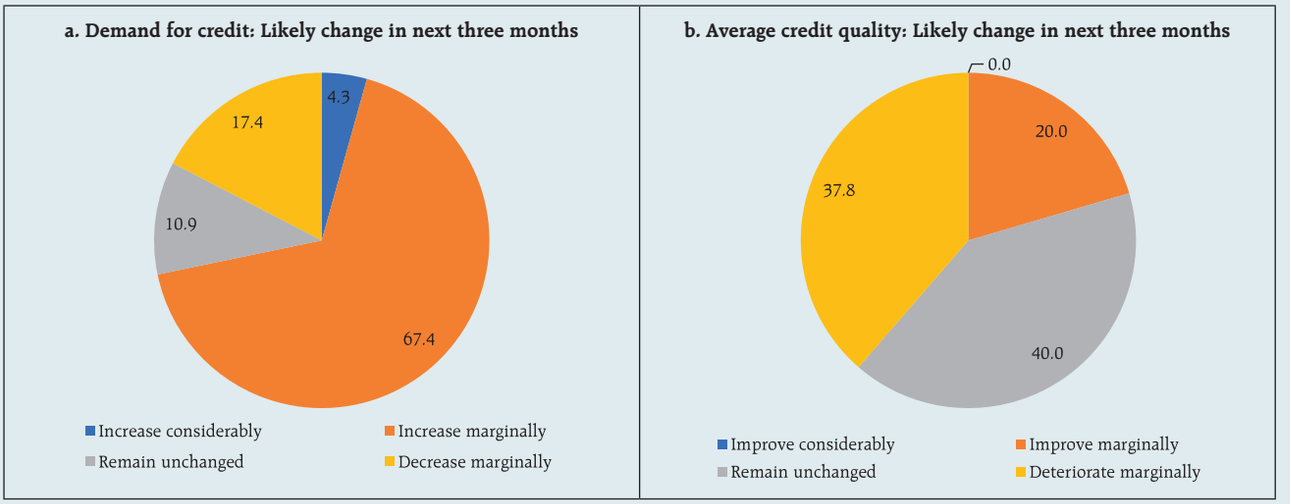


Chart 5: Indian Banking Sector – Outlook



Risks to Financial Stability

Going forward, respondents in the latest round of the SRS identified the following major risks to financial stability:

- Aggressive monetary policy tightening by AEs;
- Volatility in capital flows and exchange rates;
- De-anchoring of inflation expectations;
- Faltering of economic recovery;
- Disruptions in global supply chains;
- De-globalisation; and
- Climate change risk to the asset side exposure of financial sector.

Annex 2

Methodologies

2.1 Scheduled Commercial Banks

(a) Banking stability map and indicator

The banking stability map and indicator present 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. Existing methodology has been revised by replacing a few variables (financial ratios) of the existing dimensions, incorporating an additional dimension and changing to equal-weighting. The six composite indices would now 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 or the overall banking stability indicator takes values between zero and one.

Table 1: Ratios used for constructing the banking stability map and 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 $\left(\frac{CAB}{GDP}\right)$, Gross fiscal deficit-to-GDP ratio, Export-to-GDP ratio $\left(\frac{EXP}{GDP}\right)$, 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 forecasted 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 logs 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 logs of GNPA ratios of each bank group are modelled as follows:

II.1 Public Sector Banks

II.1a ADL Model

$$LGNPA_t = \alpha_1 + \beta_1 LGNPA_{t-1} - \beta_2 \Delta \text{NGDP}_{t-2} + \beta_3 RWALR\_PSB_{t-1} - \beta_4 \left(\frac{Exp}{GDP}\right)_{t-2} + \beta_5 \text{5y\_BBB\_Spread}_{t-1} - \beta_6 ICR_{t-4} + \beta_7 \text{Dummy}$$

where, $\alpha_1, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ and $\beta_7 > 0$

II.1b VAR Model

Log GNPA ratio of PSBs along with the macro variables *viz;* Nominal GDP growth and 5-year BBB bond spread are modelled using VAR model of order 1.

II.2 Private Sector Banks

II.2a ADL Model

$$LGNPA_t = \alpha_1 + \beta_1\, LGNPA_{t-1} - \beta_2\, \Delta GDP_{t-2} + \beta_3\, RWALR\_PVB_{t-1} - \beta_4 \left(\frac{Exp}{GDP}\right)_{t-3} + \beta_5\, 10y\_BBB\_Spread_{t-3} - \beta_6 \left(\frac{Net\ Profit}{Sales}\right)_{t-3} - \beta_7\, \Delta NIFTY_{t-3}$$

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

$$LGNPA_t = \alpha_1 + \beta_1\, LGNPA_{t-1} + \beta_2\, \Delta Oil_{t-1} + \beta_3\, WALR\_FB_{t-2} - \beta_4 \left(\frac{Exp}{GDP}\right)_{t-2} + \beta_5\, 10y\_BBB\_Spread_{t-2} - \beta_6 ICR_{t-3} + \beta_7 Dummy$$

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 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

$$NII_t = -\alpha_1 + \beta_1\, NII_{t-1} + \beta_2\, 5y\_TermSpread_{t-1} + \beta_3\, \Delta NGDP_{t-4} + \beta_4 \left(\frac{Exp}{GDP}\right)_{t-1} + \beta_5\, Spread\_PSB_t - \beta_6 GNPA\_PSB_{t-1}$$

$$\alpha_1, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5 \text{ and } \beta_6 > 0$$

Here, 5y_TermSpread is the difference between 5-year G-Sec yield and 3-month T-Bill rate. $Spread\_PSB_t$ is the difference between average interest rate earned by interest earning assets and average interest 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 of PSBs is modelled using the following ADL model:

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

III.1.3 Projection of Operating Expense (OE)

The y-o-y growth of OE is modelled using the following ADL model:

$$OE_t = \alpha_1 + \beta_1\, OE_{t-1} + \beta_2\, OE_{t-2} + \beta_3\, OE_{t-3} + \beta_4\, \Delta CPI_{t-1}$$

III.1.4 Projection of Provisions

The ratio of Provisions to gross loans and advances 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.1.4a ADL Model

$$Provisions_t = \beta_1\, Provisions_{t-1} + \beta_2\, GNPA\_PSB_{t-1} - \beta_3\, \Delta GDP_{t-2} + \beta_4 \left(\frac{GFD}{GDP}\right)_{t-3}$$

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 (NII)

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

$$NII_t = \alpha_1 + \beta_1\, NII_{t-1} + \beta_2\, 5y\_TermSpread_{t-1} + \beta_3 \left(\frac{Exp}{GDP}\right)_{t-1} + \beta_4\, Spread\_PVB_t - \beta_5 GNPA\_PVB_{t-1}$$

$$\alpha_1, \beta_1, \beta_2, \beta_3, \beta_4 \text{ and } \beta_5 > 0$$

$Spread\_PVB_t$ is the difference between average interest rate earned by interest earning assets and average interest 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 (OOI)

The ratio of OOI to total average assets of PVBs is modelled using the following ADL model:

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

III.2.3 Projection of Operating Expense (OE)

The y-o-y growth of OE is modelled using the following ADL model:

$$OE_t = \alpha_1 + \beta_1 OE_{t-1} + \beta_2 OE_{t-2} + \beta_3 OE_{t-3} + \beta_4 OE_{t-4} + \beta_5 \Delta WPI_{t-1}$$

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

$$Provisions_t = -\alpha_1 + \beta_1 Provisions_{t-1} + \beta_2 GNPA\_PVB_{t-1} - \beta_3 \Delta GDP_{t-2} - \beta_4 \left(\frac{Exp}{GDP}\right)_{t-1}$$

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 (NII)

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

$$NII_t = \alpha_1 + \beta_1 NII_{t-1} + \beta_2 \Delta NGDP_{t-2} - \beta_3 REER_{t-3} + \beta_4 Spread\_FB_t - \beta_5 GNPA\_FB_{t-1}$$

$$\alpha_1, \beta_1, \beta_2, \beta_3, \beta_4 \text{ and } \beta_5 > 0$$

Spread_FB is the difference between average interest rate earned by interest earning assets and average interest 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 (OOI)

The ratio of OOI to total average assets of FBs is modelled using the following ADL model:

$$OOI_t = \alpha_1 + \beta_1 OOI_{t-1} + \beta_2 \Delta GDP_{t-2} + \beta_3 \left(\frac{Exp}{GDP}\right)_{t-2}$$

III.3.3 Projection of Operating Expense (OE)

The y-o-y growth of OE is modelled using the following ADL model:

$$OE_t = \alpha_1 + \beta_1 OE_{t-1} + \beta_2 OE_{t-2} + \beta_3 \Delta WPI_{t-1}$$

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

$$Provisions_t = -\alpha_1 + \beta_1 Provisions_{t-1} + \beta_2 GNPA\_FB_{t-1} - \beta_3 \Delta GDP_{t-1} - \beta_4 \left(\frac{Exp}{GDP}\right)_{t-1}$$

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 are modelled using ADL models and are projected for four quarters ahead under assumed baseline as well as adverse scenarios. The 18 sectors are listed in Table 2.

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	Retail-Housing
7	Food Processing	16	Retail-Others
8	Gems and Jewellery	17	Services
9	Infrastructure	18	Others

The ADL models for sectoral PD projections are as follows:

1. *Engineering*

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

2. *Automobile*

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

3. *Cement*

$$PD_t = -\alpha + \beta_1 PD_{t-1} - \beta_2 \Delta Credit_{t-1} + \beta_3 WALR_{t-1} + \beta_4 Dummy_t$$

4. *Chemicals and Chemical Products*

$$PD_t = -\alpha + \beta_1 PD_{t-1} - \beta_2 PD_{t-2} - \beta_3 \Delta GVA(Industry)_{t-3} + \beta_4 WALR_{t-1} + \beta_5 REER_{t-2} + \beta_6 Dummy_t$$

5. *Construction*

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

6. *Textiles*

$$PD_t = -\alpha + \beta_1 PD_{t-1} - \beta_2 PD_{t-2} - \beta_3 \Delta GDP_{t-3} + \beta_4 \Delta REER_{t-2} - \beta_5 \Delta NIFTY50_{t-1} + \beta_6 Dummy_t$$

7. *Food Processing*

$$PD_t = \alpha + \beta_1 PD_{t-1} + \beta_2 \Delta REER_t - \beta_3 \left(\frac{Exp}{GDP}\right)_{t-3} - \beta_4 ICR_{t-1} + \beta_5 \Delta WPI_{t-1} + \beta_6 Dummy_t$$

8. *Gems and Jewellery*

$$PD_t = -\alpha + \beta_1 PD_{t-1} - \beta_2 PD_{t-4} - \beta_3 \Delta GDP_{t-1} + \beta_4 REER_{t-1} - \beta_5 \left(\frac{Exp}{GDP}\right)_{t-3} + \beta_6 RWALR_{t-2}$$

9. *Infrastructure*

$$PD_t = -\alpha + \beta_1 PD_{t-1} - \beta_2 PD_{t-4} - \beta_3 \Delta GDP_{t-2} + \beta_4 REER_{t-2} + \beta_5 RWALR_{t-3} + \beta_6 Dummy_t$$

10. *Basic Metal*

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

11. *Mining & Quarrying*

$$PD_t = -\alpha + \beta_1 PD_{t-1} - \beta_2 \Delta GVA(Mining)_{t-2} + \beta_3 REER_{t-2} - \beta_4 \left(\frac{Exp}{GDP}\right)_{t-2} - \beta_5 \Delta Credit_{t-1}$$

12. *Paper & Paper products*

$$PD_t = \alpha + \beta_1 PD_{t-1} - \beta_2 \Delta PD_{t-2} - \beta_3 \left(\frac{CAB}{GDP}\right)_{t-3} + \beta_4 \Delta WALR_t + \beta_5 Dummy_t$$

13. *Petroleum and Petroleum Products*

$$PD_t = \alpha + \beta_1 PD_{t-1} + \beta_2 \Delta Oilprice_{t-1} - \beta_3 \Delta Credit_{t-2} + \beta_4 RWALR_{t-4} - \beta_5 \Delta PFCE_{t-2}$$

14. *Agriculture*

$$PD_t = \alpha + \beta_1 PD_{t-1} - \beta_2 PD_{t-2} - \beta_3 \Delta PFCE_{t-1} - \beta_4 \left(\frac{Exp}{GDP}\right)_{t-2} + \beta_5 \Delta CPI_{t-1} + \beta_6 \Delta WALR_t$$

15. *Services*

$$PD_t = \alpha + \beta_1 PD_{t-1} - \beta_2 \Delta GVA(Services)_{t-2} - \beta_3 \left(\frac{Exp}{GDP}\right)_{t-2} - \beta_4 \Delta NIFTY50_{t-1}$$

16. *Retail Loan- Housing*

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

17. *Retail Loan- Other than Housing*

$$PD_t = \alpha + \beta_1 PD_{t-1} + \beta_2 RWALR_{t-3} + \beta_3 \Delta CPI_{t-3}$$

18. *Other Sectors*

$$PD_t = -\alpha + \beta_1 PD_{t-1} - \beta_2 PD_{t-3} - \beta_3 \Delta GVA(Industry)_{t-4} + \beta_4 RWALR_{t-1} - \beta_5 \left(\frac{CAB}{GDP}\right)_{t-4}$$

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 conservative assumption that only 25 per cent of PAT would be transferred to capital funds in the subsequent period, as per the minimum regulatory requirements.

The formulae used for projection of CRAR and Common Equity Tier 1 (CET1) capital ratio are given below:

$$CRAR_{t+1} = \frac{Total\ Capital_t + 0.25 * PAT_{t+1}}{RWA(credit\ risk)_{t+1} + RWA(others)_{t+1}}$$

$$CET1\ Capital\ Ratio_{t+1} = \frac{CET1_t + 0.25 * PAT_{t+1}}{RWA(credit\ risk)_{t+1} + RWA(others)_{t+1}}$$

PAT is projected using the models listed in the previous section. RWA (others), which is total RWA minus RWA of credit risk, is projected based on average growth rate observed in the past one year. RWA (credit risk) is estimated using the IRB formula given below:

***IRB Formula**: Bank-wise RWAs for credit risk were estimated using the following IRB formula;*

$$RWAs(credit\ risk) = 12.5 \times \left(\sum_{i=1}^{n} EAD_i \times K_i\right)$$

where, EAD_i is exposure at default of a bank in the sector i (i=1,2….n).

K_i is minimum capital requirement for the sector i which is calculated using the following formula:

Capital requirement (K_i)

$$= \left[LGD_i \times N\left[(1-R_i)^{-0.5} \times G(PD_i) + \left(\frac{R_i}{1-R_i}\right)^{0.5} \times G(0.999)\right] - PD_i \times LGD_i\right]$$
$$\times \left(1 - 1.5 \times b(PD_i)\right)^{-1} \times \left(1 + (M_i - 2.5) \times b(PD_i)\right)$$

where, LGD_i is loss given default of sector i, PD_i is probability of default of sector i, N(..) is cumulative distribution function of standard normal distribution, G(..) is the inverse of the cumulative distribution function of standard normal distribution, M_i is average maturity of loans of sector i (which is taken 2.5 for all sectors in this case), $b(PD_i)$ 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 slippage 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 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) Housing Price and Financial Stability – Sensitivity Analysis

Sensitivity analysis for house prices has been carried out using data of Residential Asset Price Monitoring Survey (RAPMS), a quarterly survey through which RBI collects data from select scheduled commercial banks (SCBs) and housing finance companies (HFCs) on fresh housing loans sanctioned by them in selected cities during a quarter.

I. Following assumptions and calculations have been used for the sensitivity analysis:

1. In order to account for the entire outstanding housing loans, following scaling factor was used for each bank:

$$Scaling\ Factor = \frac{Housing\ Loans\ Outstanding\ in\ Offsite\ Returns}{Housing\ Loans\ Outstanding\ estimated\ using\ RAPMS}$$

2. RAPMS data received from 20 PSBs and PVBs from Q4: 2008-09 till Q4:2021-22 are used for the analysis.
3. The property purchased is the collateral for all the loans.
4. The loan and the EMI due remain constant.
5. There is no default till date i.e. all EMIs for all loans are paid as scheduled.
6. Loan amount outstanding is calculated based on sanctioned amount, EMI, derived rate of interest and time elapsed since inception.
7. The derived rate of interest is calculated based on the loan amount sanctioned, maturity period and EMI.
8. Capital to risk-weighted assets ratio (CRAR) of each bank under a price shock scenario is computed by adjusting both the numerator (capital) and the denominator [risk-weighted assets (RWA)] of CRAR. Initial risk weights are taken as per the RBI circular in vogue at the time of origination of the loans. The following method is attempted to recompute CRAR:

(a) Housing loans where the shocked collateral value goes below the loan amount outstanding are subjected to the norms of substandard loans:

- Additional provisions and interest loss for one quarter are deducted from the numerator (capital).

$$Additional\ Provisions = \frac{(25 - 0.4) \times Amount\ Outstanding}{100}$$

$$Interest\ Loss = \frac{Amount\ Outstanding\ \times Rate\ of\ Interest}{4\ \times 100}$$

- For the same loans a part of the additional provisioning is deducted from the denominator

$$New\ RWA\ for\ Delinquent\ Loans = Old\ RWA - 0.58\ \times Additional\ Provisioning$$

RWA density being 0.58.

(b) RWA for other loans is estimated by internal rating based (IRB) formula:

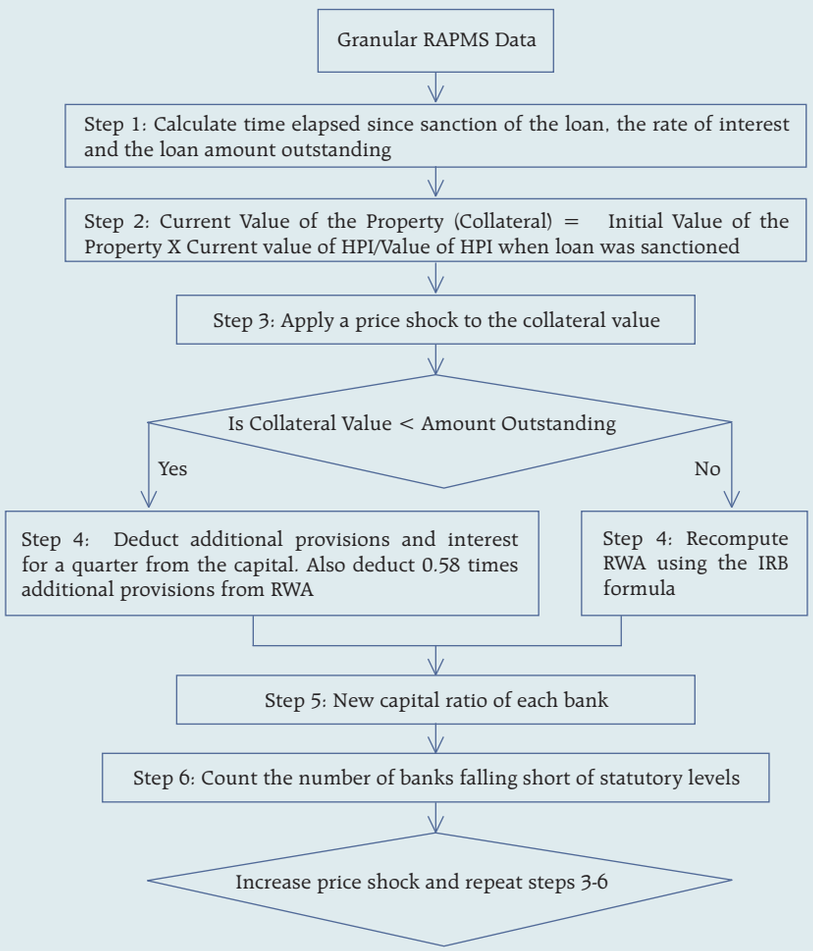
$$RWA = K \times 12.5 \times EAD$$

Exposure at default (EAD) is the loan amount outstanding, and K is the capital requirement for a defaulted exposure given by:

$$K = \left[LGD \times N\left[(1-R)^{-0.5} \times G(PD) + \frac{R}{(1-R)}^{0.5} \times G(0.999)\right] - PD \times LGD\right] \times \frac{(1+(M-2.5)\times bPD}{(1-1.5 \times bPD)}$$

N(..) is cumulative distribution function of standard normal distribution, G(..) is inverse of cumulative distribution function of standard normal distribution, M is effective maturity of loans (which is taken as 2.5), bPD is smoothed maturity adjustment and R is correlation of the sector with the general state of the economy. Calculation of both, bPD and R depend upon PD.

II. The following process is followed:



(d) 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 on individual SCBs as well as on 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 portfolios of 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 the shifting of the INR yield curve, there could be losses on account of the fall in value of the portfolio or decline in income. These estimated losses were reduced from the banks' capital to arrive at stressed CRAR.

For interest rate risk in the trading portfolio (HFT + AFS), 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 based on the applied shocks. The resultant losses/gains were used to derive the impacted CRAR.

IV. Equity price risk

Under the equity price risk, impact of a shock of a fall in the equity price index, by certain percentage points, on profit and bank capital were examined. The fall in value of the portfolio or income losses due to change in equity prices are accounted for the total loss of the banks because of the assumed shock. The estimated total losses so derived were reduced from the banks' 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:

- It is assumed that 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.

(e) Bottom-up Stress testing: Credit, Market and Liquidity Risks

Bottom-up sensitivity analyses for credit, market and liquidity risks were performed by 27 select scheduled commercial banks. A set of common scenarios and shock sizes were provided to the select banks. The tests were conducted using March 2022 data. Banks used their own methodologies for calculating losses in each case.

(f) Bottom-up stress testing: Derivatives portfolios

The stress testing exercise focused on the derivatives portfolios of a representative sample set of top 20 banks in terms of notional value of the derivatives portfolios. Each bank in the sample was asked to assess the impact of stress conditions on their respective derivatives portfolios.

In case of domestic banks, the derivatives portfolio of both domestic and overseas operations were included. In case of foreign banks, only the domestic (Indian) position was considered for the exercise. For derivatives trade where hedge effectiveness was established it was exempted from the stress tests, while all other trades were included.

The stress scenarios incorporated four sensitivity tests consisting of the spot USD/INR rate and domestic interest rates as parameters.

Table 3: Shocks for sensitivity analysis

	Domestic interest rates	
Shock 1	Overnight	+2.5 percentage points
	Up to 1yr	+1.5 percentage points
	Above 1yr	+1.0 percentage points

	Domestic interest rates	
Shock 2	Overnight	-2.5 percentage points
	Up to 1yr	-1.5 percentage points
	Above 1yr	-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 on March 31, 2022. 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.
- Arithmetic mean of annual growth rate was calculated based on reported data of NPAs between 2009 and 2020 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 stress scenario, which was further stressed by applying shocks of 1.5 Standard Deviation (SD) and 2.5 SD to generate medium and severe stress scenarios for each category separately.

- Based on the above methodology, the annual NPA growth rate matrix arrived at under the three stress scenarios was as below. These were further adjusted bank wise based on their NPA divergence level.

(per cent)

	Increase in Substandard Assets	Increase in D1 assets	Increase in D2 assets	Increase in D3 assets	Increase in Loss assets
Baseline Stress	25.33	19.95	17.78	12.73	34.80
Medium Stress	66.83	49.15	42.22	49.03	184.44
Severe Stress	94.50	68.62	58.52	73.23	284.20

II. Credit Concentration Risk

It was assumed that under the three stress scenarios the top 1, 2 and 3 single borrower exposures respectively moves from 'Standard Advances' category to 'Loss Advances' category leading to 100 per cent provisioning and its consequent impact on CRAR.

III. Interest Rate Risk in Trading Book

- The duration analysis approach was adopted for analysing upward movement of interest rates on AFS and HFT portfolio of UCBs.
- Due to absence of data with respect to modified duration (MD) for UCBs, the model used the weighted average MD of small finance banks (SFBs) given the structural similarities between SFBs and UCBs, with an increase of 50 basis points as a conservative approach.
- Upward movement of interest rates by 50 bps, 150 bps and 250 bps were assumed under the three stress scenarios and 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, 150 bps and 250 bps under three stress scenarios and impact on Net Interest Income was arrived at.

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 as below:

(per cent)

Stress Scenario	Decrease in Inflows	Increase in Outflows
Baseline	5	25
Medium	5	50
Severe	5	100

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)

Stress Testing – Single factor sensitivity analysis

Credit and liquidity risks 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 next one year time period. Thereafter, new slippages, provisions, EBPT, risk weighted assets and capital were calculated for the baseline scenario. For the medium and high risk scenarios, slippages under baseline scenario was increased by 1 SD and 2 SD and accordingly new capital and CRAR were calculated.

II. Liquidity Risk

Stressed cash flows and mismatch in liquidity position were calculated by assigning predefined stress percentage to the overall cash inflows and outflows in different time buckets over the next one year. Projected outflows and inflows as on March 2022 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 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 presenting negative cumulative mismatch were identified.

2.4 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 to equal $K = \sum_{i=1}^{N} k_i$ and N as the total number of nodes, connectivity ratio is given as $\frac{K}{N(N-1)}$.

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 ki neighbours the total number of all possible directed links between them is given by ki (ki-1). Let

Ei denote the actual number of links between agent i's ki neighbours, *viz.* those of i's ki neighbours who are also neighbours. The clustering coefficient Ci 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 C_i'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 diagrams), 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 as 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 nature of 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 CRAR goes below 7 per cent. The net receivables have been considered as loss for the receiving bank.

(b) Liquidity contagion analysis

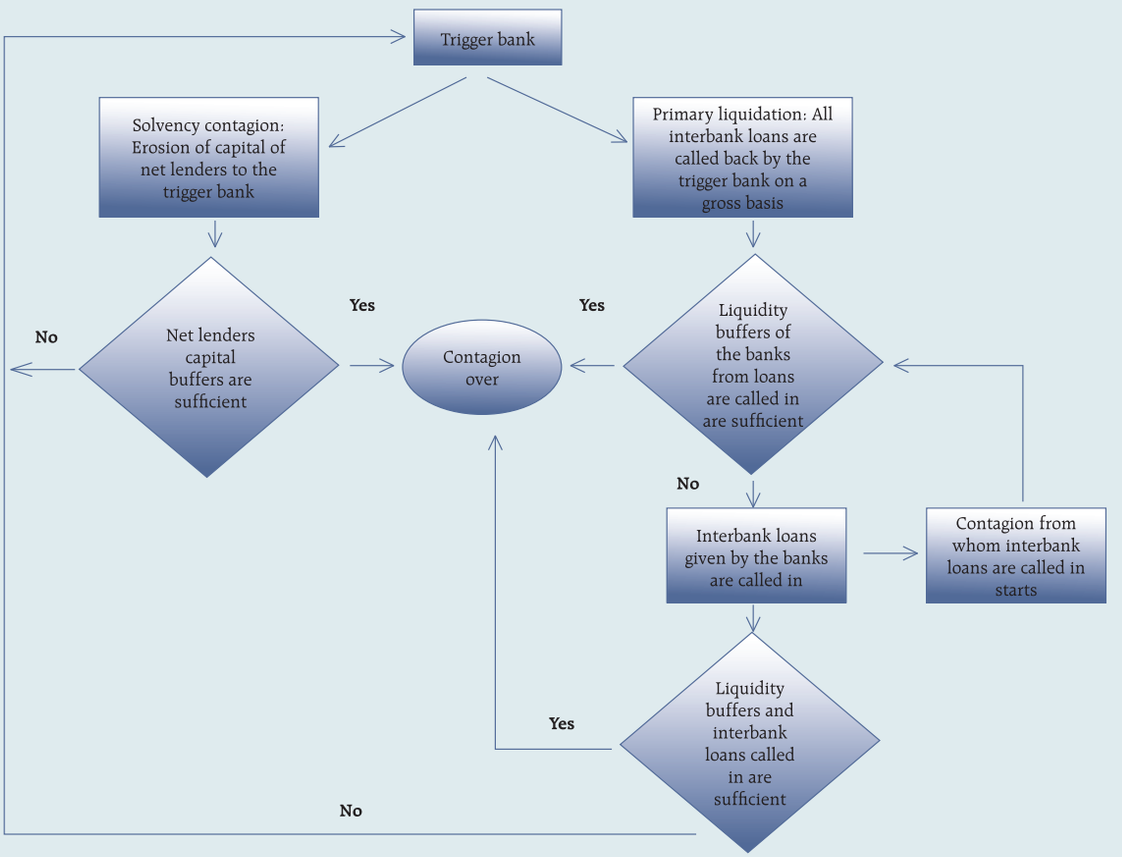
While the solvency contagion analysis assesses potential loss to the system owing to failure of a net borrower, liquidity contagion estimates potential loss to the system due to the failure of a net lender. The analysis is conducted on gross exposures between banks. The exposures include fund based and derivatives ones. 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) 17 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 crystallize in 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.

Annex 3

Important Regulatory Measures

1. Reserve Bank of India

Date	Regulation	Rationale
January 04, 2022	**Retail Direct Scheme – Market Making:** The Reserve Bank notified market-making scheme to provide liquidity in the secondary market, wherein the Primary Dealers shall be present on the NDS-OM platform (odd-lot and Request for Quotes segments) throughout market hours and respond to buy/sell requests from Retail Direct Gilt Account Holders (RDGAHs).	To promote retail participation in Government Securities market by providing prices/ quotes to Retail Direct Gilt (RDG) account holders enabling them to buy/sell securities under the RBI Retail Direct Scheme.
January 20, 2022	**Amendment to regulations under the amended Factoring Regulation Act, 2011:** In addition to NBFC-Factors, all non-deposit taking NBFC-Investment and Credit Companies (NBFC-ICCs) with asset size of ₹1,000 crore & above have been allowed to undertake factoring business, subject to satisfaction of certain conditions; and other NBFCs can undertake factoring business by converting themselves as NBFC-Factor.	To widen the scope of companies that can undertake factoring business.
February 10, 2022	**Permitting banks to deal in Offshore Foreign Currency Settled Rupee Derivatives market:** Banks in India having AD category-I license under the Foreign Exchange Management Act (FEMA), 1999, were permitted to undertake transactions in the offshore foreign currency settled overnight indexed swap (FCS-OIS) market with non-residents and other AD category-I banks.	To aid in removing the segmentation between onshore and offshore markets and improving the efficiency of price discovery.
February 10, 2022	**Voluntary Retention Route (VRR) for Foreign Portfolio Investors (FPIs) investment in debt:** The investment limit of ₹1,50,000 crore under VRR has been increased to ₹2,50,000 crore with effect from April 1, 2022. The minimum retention period shall be three years, or as decided by RBI for each allotment by tap or auction.	To facilitate stable investments by FPIs in debt instruments issued in the country.

Date	Regulation	Rationale
February 10, 2022	**Master Direction – Reserve Bank of India (Credit Derivatives) Directions, 2022:** These Directions shall apply to credit derivatives transactions undertaken in OTC markets and on recognised stock exchanges in India. Residents and Non-residents, who are eligible to invest in corporate bonds and debentures under the Foreign Exchange Management (Debt Instruments) Regulations, 2019 can participate in the credit derivatives market. Eligible market-makers in credit derivatives consist of SCBs (except SFBs, LABs and RRBs), NBFCs (including SPDs and HFCs) with a minimum NOF of ₹500 crore and subject to specific approval of the Department of Regulation, Reserve Bank, and EXIM Bank, NABARD, NHB and SIDBI. The market-makers will classify users as retail or non-retail.	To promote the development of the CDS market in India for facilitating development of a liquid market for corporate bonds, especially for the bonds of lower-rated issuers.
March 08, 2022	**Reserve Bank launched: (a) UPI123Pay**- It provides various options to enable feature phone users make payments through Unified Payments Interface (UPI); and **(b) DigiSaathi**- A 24x7 Helpline to address the queries of digital payment users across products.	To accelerate the process of digital adoption in India, by creating a richer and more inclusive ecosystem that can accommodate larger sections of the population.
March 09, 2022	**NaBFID - All India Financial Institution (AIFI):** National Bank for Financing Infrastructure and Development (NaBFID) has been set up as a Development Financial Institution. NaBFID shall be regulated and supervised as an All India Financial Institution (AIFI) by the Reserve Bank. It shall be the fifth AIFI after EXIM Bank, NABARD, NHB and SIDBI.	NaBFID has been set up by the Government to support development of long term infrastructure financing in India and the press release was issued to inform public about its position in the regulatory landscape.
March 14, 2022	**Regulatory framework for Microfinance Loans Direction:** The new regulatory framework for microfinance loans includes common definition of microfinance loan for all REs, limit on loan repayment obligations of a household, detailed guidelines on pricing of microfinance loans, conduct towards microfinance borrowers, and withdrawal of exemption for 'not for profit'	To deleverage the microfinance borrowers, enhance the customer protection measures, enable the competitive forces to bring down the interest rates, provide flexibility to the REs to meet the credit needs of the microfinance borrower

Date	Regulation	Rationale
	companies engaged in microfinance activities. The REs are required to put in place board-approved policies on assessment of household income and indebtedness, pricing of microfinance loans, conduct of employees and providing flexibility of repayment periodicity on microfinance loans as per borrowers' requirements.	comprehensively and introduce activity-based regulation in the microfinance sector.
March 25, 2022	**Framework for Geo-Tagging of Payment System Touch Points**: Reserve Bank has released a framework for capturing geo-tagging information of payment system touch points deployed by banks/ non-bank PSOs. Geo-tagging of payment system touch points will enable proper monitoring of the availability of payment acceptance infrastructures, *inter alia*, Points of Sale (PoS) terminals, and Quick Response (QR) codes. In turn, such monitoring will support policy intervention to optimise the distribution of payment infrastructure.	To facilitate the nuanced spread of acceptance infrastructure and inclusive access to digital payments.
April 07, 2022	**Establishment of Digital Banking Units (DBUs):** Domestic SCBs (other than RRBs, PBs and LABs) with past digital banking experience are permitted to open Digital Banking Units (DBUs) in Tier-1 to Tier-6 centres, without having the need to take permission from Reserve Bank of India. The DBUs of the banks will be treated as Banking Outlets (BOs). In addition to ensuring the physical security of the infrastructure of the DBU, adequate safeguards for the cyber security of the DBUs will have to be ensured by the banks.	To improve the availability of digital infrastructure for banking services and to accelerate and widen the reach of digital banking services.
April 21, 2022	**Legal Entity Identifier (LEI) for Borrowers:** Extension of guidelines on LEI to UCBs and NBFCs. Further, non-individual borrowers enjoying aggregate exposure of ₹5 crore and above from banks and financial institutions (FIs) shall be required to obtain LEI codes. As per the timeline for obtaining LEI, borrowers with total exposure above ₹25 crore are required to obtain LEI by April 30, 2023. Borrowers who fail to obtain LEI will not	To further harness the benefits of LEI *viz.* identification of financial transactions and improvement in the quality and accuracy of financial data systems for better risk management.

Date	Regulation	Rationale
	be sanctioned any new exposure nor shall they be granted renewal/enhancement of any existing exposure.	
April 21, 2022 (effective from July 01, 2022)	**Master Direction on Credit Card and Debit Card – Issuance and Conduct Directions:** These directions cover the general and conduct regulations relating to credit, debit and co-branded cards which shall be read along with prudential, payment and technology & cybersecurity-related directions applicable to credit, debit and co-branded cards, as issued by the Reserve Bank.	To set standards for card issuance and conduct business.
June 01, 2022	**Master Direction on Variation Margin:** The Reserve Bank issued Master Directions regarding the exchange of variation margin (VM) for non-centrally cleared derivatives (NCCDs). A domestic covered entity shall exchange variation margin with a counterparty to an NCCD transaction if the counterparty is a domestic covered entity or a foreign covered entity. VM shall be calculated and exchanged on an aggregate net basis, across all NCCD contracts that are executed under a single, legally enforceable netting agreement.	To strengthen the resilience of OTC derivatives markets.

2. Securities and Exchange Board of India

Date	Regulation	Rationale
November 09, 2021	Strengthening of regulatory provisions and enhancing disclosures related to Related Party Transactions (RPTs).	To expand the scope of related parties, RPTs and material RPTs and to address the issue of siphoning of funds through unlisted subsidiaries.
November 09, 2021	Backstop facility for Corporate Debt Securities.	To facilitate liquidity in the corporate bond market and to respond quickly to stress situations.
December 02, 2021	Investor Charter for Stock Brokers and Depository Participants.	To promote transparency, and enhance awareness, trust and confidence of investors in the Indian securities market.

Date	Regulation	Rationale
December 03, 2021	SOP for handling technical glitches at the end of stock brokers.	To prevent disruptions like inability to login, and failure to transact faced by clients *etc.*
December 09, 2021	Transaction in Corporate Bonds through Request for Quote (RFQ) platform by Portfolio Management Services.	To enhance price discovery and transparency in transaction of eligible securities and to increase liquidity on the exchange platform.
January 10, 2022	Framework for operationalising the Gold Exchange in India.	Government of India vide Gazette notification S.O. 5401 (E) dated December 24, 2021, notified "Electronic Gold Receipts" as 'securities' and vide Gazette notification dated December 31, 2021, SEBI (Vault Managers) Regulations, 2021, were notified, paving the way for operationalisation of Gold Exchange.
January 25, 2022	Introduction of Special Situation Fund, which shall invest only in 'stressed assets', as a new sub-category of Alternative Investment Funds (AIFs).	To enable AIFs, as a source of capital, to supplement the efforts of ARCs in buying stressed loans.
February 04, 2022	Stress Testing for open-ended debt mutual fund schemes.	To have a common methodology across the industry for stress testing and dynamic evaluation of risk parameters (*viz.* interest rate risk, credit risk and liquidity risk).
February 14, 2022	Standard Operating Guidelines for the Vault Managers and Depositories - Electronic Gold Receipts (EGR) segment.	To ensure ease of compliance for the market participants in the EGR ecosystem as well as effective implementation of the regulations.
March 24, 2022	Introduction of Options on Commodity Indices: Product Design and Risk Management Framework.	To further deepen the commodity derivatives market.

Date	Regulation	Rationale
March 29, 2022	Operational guidelines for Security and Covenant Monitoring using Distributed Ledger Technology (DLT).	To further strengthen the process of security creation, monitoring of security created, monitoring of asset cover and covenants of the non-convertible securities by Debenture Trustee using blockchain technology.
April 01, 2022	Standardisation of industry classification.	To bring uniformity in the industry classification structure in Indian securities market.
April 04, 2022	Execution of 'Demat Debit and Pledge Instruction' (DDPI) for transfer of securities towards deliveries/ settlement obligations and pledging/re-pledging of securities.	To make the process of the authorisation given by a client to stock brokers and DPs more transparent and simpler, and mitigate the possible misuse of Power of Attorney by stock brokers.
April 11, 2022	Comprehensive Risk Management Framework for Electronic Gold Receipts (EGR) segment.	To have appropriate provisions for risk management for trading in the EGR segment.

3. Insurance Regulatory and Development Authority of India

Date	Regulation	Rationale
December 30, 2021	IRDAI releases 2021-22 - List of Domestic Systemically Important Insurers (D-SIIs): 1. Life Insurance Corporation of India; 2. General Insurance Corporation of India, and 3. New India Assurance Co. Ltd.	To identify systemically important insurers for enhanced regulatory supervision.
January 03, 2022	IRDAI (Surety Insurance Contracts) Guidelines, 2022.	To regulate and develop the Surety Insurance business.
April 29, 2022	Exposure of Insurers to Financial and Insurance Activities.	To permit all Insurers to have exposure to Financial and Insurance activities up to 30% of investment assets.

4. Pension Fund Regulatory and Development Authority

Date	Regulation	Rationale
December 23, 2021	Guidelines for Operational Activities - to be followed by Point of Presence (PoPs-APY).	To smoothen the operations for the Points of Presence under the NPS, the guidelines were issued for compliance by all PoPs.
January 27, 2022	Change of Pension Fund and Asset Allocation by NPS subscribers.	Under the All Citizen Model and NPS Corporate Sector Model, the subscriber or the employer has been provided with the option to change the investment choice and the asset allocation four times in a financial year.
January 31, 2022	Revision of Services charges for PoP under NPS (All Citizen Model and Corporate sector).	To incentivize the PoPs to actively promote and distribute NPS and provide better customer service.
March 16, 2022	Guidelines for Operational Activities - to be followed by Point of Presence (PoPs-NPS-Lite).	To streamline the processes covering, *inter alia*, service standards, standard operating procedures, contribution management procedures, reports and disclosures, and redressal of grievances.

5. Insolvency and Bankruptcy Board of India

Date	Regulation	Rationale
February 09, 2022	**Amendment to CIRP Regulations:** The Insolvency and Bankruptcy Board of India (IBBI/Board) notified the Insolvency and Bankruptcy Board of India (Insolvency Resolution Process for Corporate Persons) (Amendment) Regulations, 2022 (CIRP Regulations).	For integrating directions given by IBBI's circulars on the subjects 'Clarification - Consideration of matters/issues by the committee of creditors on request by members of the committee' and 'Retention of records relating to Corporate Insolvency Resolution Process' into the CIRP regulations.

Date	Regulation	Rationale
April 05, 2022	**Amendment to Voluntary Liquidation Process Regulations:** The IBBI amended the IBBI (Voluntary Liquidation Process) Regulations, 2017 to modify timelines for some stipulated activities undertaken by the liquidator during the voluntary liquidation process such as preparation of a list of claims, distribution of proceeds from realisation to stakeholders and completion of the liquidation process. It is also provided for submission of a compliance certificate by the liquidator to the Adjudicating Authority, summarising the actions taken by the liquidator during the process.	To curtail delay in completion of the voluntary liquidation process and ensure faster exit for firms.
April 28, 2022	**Amendment to Liquidation Process Regulations:** The IBBI amended the IBBI (Liquidation Process) Regulations, 2016 to insert explanations after regulations 2A, 21A and 31A to clarify that the requirements of these regulations shall apply to the liquidation processes commencing on or after the date of the commencement of the IBBI (Liquidation Process) (Amendment) Regulations, 2019. It also inserted an explanation after regulation 44 to clarify that in relation to the liquidation processes commenced prior to the commencement of the IBBI (Liquidation Process) (Amendment) Regulations, 2019, the requirements of this regulation as existing before such commencement, shall apply.	To provide clarity on the application of IBBI (Liquidation Process) (Amendment) Regulations, 2019 on certain aspects of the liquidation process.
June 14, 2022	**Amendment to CIRP Regulations:** The IBBI amended the CIRP Regulations to *inter alia* provide for the following: (a) OCs can furnish extracts of Form GSTR-1, Form GSTR-3B and e-way bills, wherever applicable along with the application filed under section 9 of the Code, as evidence of transaction with the CD; (b) Place a duty on CD, its promoters or any other person associated with the management of the CD to provide the information sought by the RP; (c) Duty on the creditors to share all relevant financial information of the CD from their records with RP in preparation of the information memorandum and avoidance	To improve information sharing among stakeholders and further streamline the CIRP process.

Date	Regulation	Rationale
	transactions application; (d) Resolution plan shall provide for the manner in which avoidance applications will be pursued after the approval of the resolution plan and the manner in which the proceeds, if any, from such proceedings shall be distributed; and (e) Enables the CoC to make a request to the RP regarding the appointment of a third valuer if there is significant difference in valuations during CIRP.	
June 14, 2022	**Amendment to IBBI (Grievance and Complaint Handling Procedure) Regulations, 2017 and the IBBI (Inspection and Investigation) Regulations, 2017:** The Amendment Regulations provides for following: (a) Revisions in various timelines related to enforcement process provided in the said regulations for addressing the issue of delay in present mechanism; (b) Effective participation of IPAs in regulating the IPs through examination of grievances received against IPs; and (c) Intimation to CoC/AA about the outcome of Disciplinary Committee (DC) order.	To facilitate expeditious redressal and avoid placing undue burden on the service providers.
June 14, 2022	**Amendment to IBBI (Information Utilities) Regulations, 2017:** The amendment *inter alia* provides for the following: (a) Expansion of the list of documents evidencing the debt or default information in the Form C under the Schedule of the Information Utilities (IU) Regulations; (b) The category of record of default issued by an IU with "deemed to be authenticated status" has been removed in case of FCs which are banks included in the second schedule of the Reserve Bank of India Act, 1934; (c) To enhance effectiveness and admissibility of the Record of Default (ROD), a format of ROD has been specified; and (d) Before filing an application to initiate CIRP under section 7 or 9, the creditor shall file the information of default, with the IU and the IU shall process the information for the purpose of issuing ROD in accordance with regulation 21.	To strengthen the IU, reduce delay in initiation of insolvency resolution process and bring information symmetry amongst various stakeholders.

6. International Financial Service Centres Authority

Date	Regulation	Rationale
November 12, 2021	**Version 2.0 of IFSCA Banking Handbook.**	To improve the regulatory framework.
November 25, 2021	**Circular on Global Access to broker Dealers in IFSC:** Vide this circular, IFSCA laid down the regulatory framework for various categories of capital market intermediaries operating in IFSC, including broker-dealers.	To permit registered broker-dealers incorporated in IFSC to access exchanges in jurisdictions outside IFSC.
January 19, 2022	**Circular on Qualified Jewellers importing gold through India International Bullion Exchange:** The Directorate General of Foreign Trade, Ministry of Commerce & Industry specified that the import of gold under ITC(HS) Codes 71081200 and 71189000, shall be permitted by Qualified Jewellers through India International Bullion Exchange (IIBX).	To lay down conditions for entities to be considered as 'Qualified Jewellers' for transacting as trading members/ clients of trading members on IIBX for import of gold.
January 31, 2022	**IFSCA (Insurance Web Aggregator) Regulations, 2022:** The IFSCA notified a comprehensive regulatory framework for the Insurance Web Aggregator (IWA), which *inter alia* provides liberalised minimum capital and net-worth requirements and a light-touch regulatory framework for operations of IWAs from the IFSC.	To cater to the insurance requirements of the Indian diaspora and to promote such retail businesses through technology at IFSC.
April 19, 2022	**IFSCA (Fund Management) Regulations, 2022:** The internationally aligned regulations, *inter alia*, provide for registration and regulations of Fund Management Entity (FME), single registration for multiple activities such as management of retail schemes (Mutual Funds, ETFs), non-retail schemes (AIFs), Portfolio Management Services, InvITs, REITs, Family Offices, Investment Advisors, Fund Administrators and Fund Labs.	To streamline and consolidate all existing regulations on Fund Management in IFSC.

Date	Regulation	Rationale
April 27, 2022	**Framework for FinTech Entity in the International Financial Services Centres (IFSCs):** The framework covers FinTech and TechFin solutions and, *inter alia*, provides for Direct Entry Authorisation to eligible FinTechs, dedicated Regulatory Sandbox to test FinTech solutions under IFSCA FinTech Regulatory Sandbox and Innovation Sandbox. It also incorporates the Inter-Operable Regulatory Sandbox (IORS) mechanism - a mechanism to facilitate the testing of innovative hybrid financial products/services falling within the regulatory ambit of more than one financial sector regulator.	The framework is aimed at giving a boost to the establishment of a world-class FinTech Hub at GIFT IFSC comparable with other International Financial Centers (IFCs).
May 18, 2022	**Framework for Aircraft Lease:** The revised framework consolidates the guidelines relating to the business of operating and/or financial lease of aircraft or helicopter and engines of aircraft or helicopter or any part thereof and/or Aircraft Ground Support Equipment by the aircraft leasing entities registered with the IFSCA.	To grow aircraft financing and leasing activities within Indian shores for the development of the aviation industry.