# Financial Stability Report
Issue No. 23

Reserve Bank of India
July 2021

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 global financial system has so far largely withstood the shocks from waves of the COVID-19 pandemic, even as the incidence and sheer scale of human misery and loss is unprecedented. Governments, central banks and financial regulators have mounted an extraordinary defence to mitigate the impact of the pandemic. By and large, these policy responses have contained the severity of the pandemic's toll on financial markets and institutions, and cushioned the shock to economic activity.

With vaccination drives and access being ramped up, globally a hesitant and uneven recovery is gaining ground under the protective cover of policy support. What has stood out as remarkable is the determination and the courage to fight the virus and its mutants and restore pre-pandemic normalcy.

In India, the second wave of the pandemic has taken a grievous toll. The recovery that had commenced in the second half of 2020-21 was dented in April-May 2021, but with the wave of infections abating as rapidly as it had set in, economic activity has started to look up in late May and early June. The stepped-up pace and scale of vaccination is catalysing the insulation of our communities from infections and gradually releasing the economy from regional and localised containment measures. Nonetheless, scarred as we are, there is no letting down of the guard against the rapidly mutating and transmissible virus.

With the scent of recovery, global financial markets are upbeat on reflation trade. Domestic financial markets are also boosted by the strengthening signs of the pandemic's abatement, the growing pace and breadth of the vaccination drive and renewed hopes of the economy clawing back lost ground as it unlocks. As this issue of the Financial Stability Report highlights, the dent on balance sheets and performance of financial institutions in India has been much less than what was projected earlier, although a clearer picture will emerge as the effects of regulatory reliefs fully work their way through. Yet, capital and liquidity buffers are reasonably resilient to withstand future shocks, as the stress tests presented in this report demonstrate.

It is important to note in this context that while the recovery is underway, new risks have emerged on the horizon and these include the still nascent and mending state of the upturn, vulnerable as it is to shocks and future waves of the pandemic; international commodity prices and inflationary pressures; global spillovers amid high uncertainty; and rising incidence of data breaches and cyber attacks. Accordingly, sustained policy support accompanied by further fortification of capital and liquidity buffers by financial entities remains vital.

Even as our financial system remains on the front foot and prepares to intermediate in meeting the resource needs of an economy on the move towards a brighter post-pandemic future, the priority is to maintain and preserve financial stability. In a situation in which economic activity has been disrupted by the pandemic, the financial system can take the lead in creating the conditions for the economy to recover and thrive. Stronger capital positions, good governance and efficiency in financial intermediation can be the touchstones of this endeavour so that financing needs of productive sectors of the economy are met while the integrity and soundness of banks and financial institutions are secured on an enduring basis.

**Shaktikanta Das**
Governor

July 1, 2021

# Contents

**LIST OF BOXES**



**LIST OF CHARTS**

**LIST OF TABLES**

# List of Select Abbreviations

| | |
|---|---|
| AEs | Advanced Economies |
| AFS | Available For Sale |
| AIFI | All-India Financial Institutions |
| AIFs | Alternative Investment Funds |
| AMC-MFs | Asset Management Companies/ Mutual Funds |
| APY | Atal Pension Yojana |
| AT-1 | Additional Tier 1 |
| AUD | Australian Dollar |
| AUM | Assets Under Management |
| BIFR | Board for Industrial and Financial Reconstruction |
| BIS | Bank for International Settlement |
| BoE | Bank of England |
| BSI | Banking Stability Indicator |
| CASA | Current Account and Saving Account |
| CBDC | Central Bank Digital Currency |
| CCIL | Clearing Corporation of India Limited |
| CCP | Central Counter Party |
| CD | Corporate Debtor |
| C-D | Credit to Deposits |
| CDS | Credit Default Swap |
| CET-1 | Common Equity Tier I |
| CHF | Swiss Franc |
| CIRP | Corporate Insolvency Resolution Process |
| COVID-19 | Corona Virus Disease 2019 |
| CP | Commercial Paper |
| CPS | Centralised Payment Systems |
| CRA | Credit Rating Agencies |
| CRAR | Capital to Risk-weighted Assets Ratio |
| CRISIL | Credit Rating Information Services of India Limited |
| DICGC | Deposit Insurance and Credit Guarantee Corporation |
| DNB | De Nederlandsche Bank |
| EBA | European Banking Authority |
| ECB | European Central Bank |
| ECLGS | Emergency Credit Line Guarantee Scheme |
| EMDEs | Emerging Market and Developing Economies |
| EMEs | Emerging Market Economies |
| ESRB | European Systemic Risk Board |
| EU | European Union |
| FB | Foreign Banks |
| FCs | Financial Creditors |
| FPI | Foreign Portfolio Investment |
| FSB | Financial Stability Board |
| FSDC-SC | Financial Stability and Development Council- Sub Committee |
| FSR | Financial Stability Report |
| GBP | Pound Sterling |
| GDP | Gross Domestic Product |
| GFMA | Global Financial Markets Association |
| GNPA | Gross Non Performing Assets |
| GSAP | Government Securities Acquisition Program |
| G-Secs | Government Securities |
| GSMs | Government Support Measures |
| HFCs | Housing Finance Companies |
| HFT | Held for Trading |
| HQLA | High Quality Liquid Assets |
| HTM | Held-to-Maturity |
| IBC | Insolvency and Bankruptcy Code |
| IFSC | International Financial Services Centre |

| | |
|---|---|
| IFSCA | International Financial Services Centres Authority |
| IIF | Institute of International Finance |
| IMF | International Monetary Fund |
| IOSCO | International Organization of Securities Commissions |
| IRB | Internal Ratings Based |
| IRDAI | Insurance Regulatory and Development Authority of India |
| ISDA | International Swaps and Derivatives Association |
| LIBOR | London Interbank Offer Rate |
| MCLR | Marginal Cost of fund based Lending Rate |
| MFs | Mutual Funds |
| MIFOR | Mumbai Interbank Forward Offer Rate |
| MMFs | Money Market Funds |
| MSF | Marginal Standing Facility |
| MSME | Micro, Small and Medium Enterprises |
| MTM | Mark To Market |
| NBFCs | Non Banking Financial Companies |
| NBFI | Non Banking Financial Intermediaries |
| NCLT | National Company Law Tribunal |
| NDTL | Net Demand and Time Liabilities |
| NGFS | Central Banks and Supervisors Network for Greening the Financial System |
| NNPA | Net Non Performing Assets |
| NPLs | Non Performing Loans |
| NPS | National Pension System |
| OECD | Organisation for Economic Cooperation and Development |
| OIS | Overnight Index Swap |
| OOI | Other Operating Income |
| OPEC+ | Organisation of Petroleum Exporting Countries Plus |
| PCR | Provision Coverage Ratio |
| PD | Probability of Default |
| PMI | Purchasing Managers' Index |
| PSB | Public Sector Bank |
| PSU | Public Sector Undertaking |
| PVB | Private Sector Bank |
| PWG | President's Working Group on Financial Markets |
| QIPs | Qualified Institutional Placements |
| RBNZ | Reserve Bank of New Zealand |
| RE | Revised Estimates |
| RFR | Risk Free Rate |
| RoA | Return on Assets |
| RoE | Return on Equity |
| RRBs | Regional Rural Banks |
| RS | Regulatory Sandbox |
| RWA | Risk Weighted Assets |
| SCB | Scheduled Commercial Bank |
| SD | Standard Deviation |
| SDLs | State Development Loans |
| SEBI | Securities and Exchange Board of India |
| SFBs | Small Finance Banks |
| SIP | Systematic investment plans |
| SLR | Statutory Liqudity Ratio |
| SMA | Special Mention Account |
| SMEs | Small and Medium Enterprises |
| STP | Systematic Transfer Plan |
| SUCBs | Scheduled Urban Cooperative Banks |
| T-Bill | Treasury Bill |
| UCBs | Urban Cooperative Banks |
| US Fed | US Federal Reserve |
| VaR | Value at Risk |

# 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 financial stability.

## Macro-Financial Risks

With vaccination drives gathering momentum and policy support maintained, the global economy is gradually recovering from the ravages of the COVID-19 pandemic, though divergently and unevenly across countries. Capital flows have plotted a cautious return to emerging market economies (EMEs). Meanwhile, commodity prices have recorded a broad-based upswing in the recent period, portending inflationary implications as well as welfare losses for low income countries. Globally, government debt has scaled unprecedented levels, driven by a decline in government revenues and increased spending to safeguard economic and social welfare in the face of the pandemic. While banks have remained relatively unscathed by pandemic-induced disruptions, cushioned by regulatory, monetary and fiscal policies, they face prospects of a possible rise in non-performing loans, particularly in their small and medium enterprises (SME) and retail portfolios, especially as regulatory support starts getting wound down.

## Domestic Economy and Markets

On the domestic front, the ferocity of the second wave has dented economic activity, though policy measures have ensured the smooth functioning of markets and financial institutions. Finances of the centre and states have been impacted by shortfalls and additional expenditure on health care and welfare measures. With a quantum jump in market borrowings, a significant share of public debt has been absorbed by banks; going forward, however, their absorptive capacity may be circumscribed by the likely expansion of bank credit in the wake of the recovery. Moreover, the sizable holdings of government securities required to be marked to market renders them sensitive to valuation changes.

For net commodity importers like India, the uptrend in the international prices of crude oil and other key commodities has emerged as a source of risk, fuelling inflation expectations and also translating into terms of trade losses. Within the domestic financial system, credit flow from banks and capital expenditure of corporates remain muted. While banks' exposures to better rated large borrowers are declining, there are incipient signs of stress in the micro, small and medium enterprises (MSMEs) and retail segments. The demand for consumer credit across banks and non-banking financial companies (NBFCs) has dampened, with some deterioration in the risk profile of retail borrowers becoming evident.

## Financial Institutions: Soundness and Resilience

Bank credit growth has remained tepid, impacted by lockdowns and associated restrictions. On the other hand, deposit growth maintained its upward trajectory, with current account and savings account (CASA) deposits leading the way, reflecting continued preference for precautionary savings.

SCBs' return on assets (RoA) and return on equity (RoE) maintained a positive uptrend through 2020-21 and their capital to risk-weighted assets ratio (CRAR) improved by 130 bps year-on-year to reach 16 per cent in March 2021. The gross non-performing assets (GNPA) and net NPA (NNPA) ratios remained stable during the second half of 2020-21, amounting to 7.5 per cent and 2.4 per cent respectively in March 2021. On the other hand, special mention account (SMA) ratios deteriorated. The overall provisioning

coverage ratio (PCR) increased from 66.2 per cent in March-2020 to 68.9 per cent in March 2021.

Macro-stress tests for credit risk show that SCBs' GNPA ratio may increase from 7.48 per cent in March 2021 to 9.80 per cent by March 2022 under the baseline scenario and to 11.22 per cent under a severe stress scenario. Stress tests also indicate that SCBs have sufficient capital, both at the aggregate and individual level, even in the severe stress scenario.

At the aggregate level, the CRAR of scheduled urban co-operative banks (SUCBs) improved to 9.5 per cent in March 2021. NBFCs recorded credit growth at 8.8 per cent during the year while their GNPA ratio declined marginally to 6.4 per cent.

Network analysis indicates that the total outstanding bilateral exposures among constituents of the financial system have been rising out of the sharp contraction in Q1:2020-21. SCBs continued to have the largest bilateral exposures in the Indian financial system at end-March 2021. In terms of inter-sectoral exposures, asset management companies/mutual funds (AMC-MFs), followed by insurance companies, remained the most dominant fund providers in the system, while NBFCs were the biggest receivers of funds, followed by housing finance companies (HFCs).

### Regulatory Initiatives and Other Developments in the Financial Sector

As the global economy begins its recovery, regulatory attention has moved towards addressing the vulnerabilities in the prevailing market microstructures. In India, extraordinary measures taken by the Reserve Bank, other financial regulators and the government helped curtail the solvency risk of financial entities, stabilised the markets and provided the necessary impetus for economic revival, while maintaining financial stability. Alongside these actions, efforts to bolster the resilience of the financial system continue apace.

### Assessment of Systemic Risk

In the latest systemic risk survey (SRS), all broad categories of risks to the financial system - global, macroeconomic, financial market, institutional and general - were perceived as 'medium' by the respondents. Within the above categories, commodity price risk, domestic growth and inflation, fiscal deficit, corporate vulnerabilities, equity price volatility, banks' asset quality and capital requirement, credit growth and cyber risk were rated as 'high'.

# Chapter I

## Macrofinancial Risks

*As the global economy recovers from the ravages of the COVID-19 pandemic, economic activity has been gaining momentum, but unevenly. Rising crude oil prices, emerging inflationary pressures and global policy uncertainty are the key risks. Domestically, high frequency indicators of activity are ticking up as the second wave abates. While banks and other financial institutions have resilient capital and liquidity buffers, and balance sheet stress remains moderate in spite of the pandemic, close monitoring of MSME and retail credit portfolios is warranted alongside the need for banks to reinforce buffers, improve governance and remain vigilant in the context of global spillovers.*

**Introduction**

1.1 Powered by the gathering pace of vaccination drives and large policy support, global economic activity is regaining momentum, although at an uneven and halting pace that is widely differentiated across national jurisdictions. Global trade is also recovering on the strength of rising demand amidst elevated freight rates and logistics costs, and slowly mending supply chains. Meanwhile, commodity prices, especially of crude, food and base metals, have surged to new highs, with inflationary implications as well as welfare losses for low income countries.

1.2 Monetary and fiscal stimulus and regulatory relief have engendered generally benign financial conditions globally. Accordingly, financial markets have extended gains with intermittent corrections. This has stretched equity valuations, with market-based inflation expectations pushing up bond yields, and as capital flows cautiously return to emerging market economies (EMEs) on the tailwinds of rekindled risk appetite, they have lifted currencies against a generally weakening US dollar.

1.3 Up until now, banking systems across the world have weathered the pandemic. Although credit growth is subdued, banks have been maintaining flows, supported by capital and liquidity buffers. The insurance sector has been buffeted by business continuity claims related to COVID-19 induced business disruption, cyber insurance and conduct risk as employees access corporate systems remotely. Banks and financial intermediaries, more generally, are bracing up to deal with the scars of the pandemic as well as pre-existing vulnerabilities, including the uncertain outlook for corporate finances, the balance of risks around sectors like commercial real estate, rising sovereign exposures and low interest rates that will test the financial sector's resilience.

1.4 In India, the ferocity of the second wave has been unprecedented, but there are signs of its ebbing in several parts of the country, especially in the large cities. Economic activity has been dented by the shock to aggregate demand, especially in April and May 2021, but supply conditions in the farm sector, organised manufacturing and contact-lite services have shown resilience and adaptation to pandemic protocols. The improvement in global trade has enabled exports to recover on a sequential basis, while the hardening of international crude prices has translated into terms of trade losses. Inflation prints are increasingly reflecting cost push pressures although weak demand tempers a fuller pass through.

1.5 Domestic financial markets have been buoyed by the Reserve Bank's systemic and targeted liquidity measures and sector-specific programmes of the Government, including guarantee support. Equity

markets have recouped losses during the height of the second wave, bond markets are range-bound, and the Indian rupee is moving both ways in reaction to global spillovers. The credit market continues to see muted offtake in the face of persisting risk aversion and weak demand.

1.6 The banking system's pre-pandemic capital and liquidity buffers have imparted resilience, with some of them accessing the market for fresh capital, and public sector banks having been allocated budgetary recapitalisation. Under this protective cover, banks have improved their financial performance and profitability. The true state of their balance sheets will be revealed once the effects of regulatory forbearances have fully played out. Among other financial intermediaries, liquidity stress has eased considerably among non-banking financial companies and the Reserve Bank is reaching out to smaller and vulnerable entities among them with targeted measures to shield them from the ravages of the second wave. In the insurance sector, premia collections in life and health insurance business have generally held up well. The mutual funds (MFs) industry is regaining lost ground; while the volume of fund mobilisation and redemption is muted in relation to a year ago, the investor base has increased substantially, and liquid asset buffers have shown a steady rise.

1.7 In this milieu, this chapter sets out global macroeconomic and financial market developments in Section I.1 as a backdrop for an overview of domestic macrofinancial developments and the evolving balance of risks with a focus on the corporate sector, the banking system and non-bank financial intermediation. As in the past, the chapter concludes with an analysis of the responses to the Reserve Bank's half-yearly systemic risk survey.

## I.1 Global Backdrop

### I.1.1 Macrofinancial Developments and Outlook

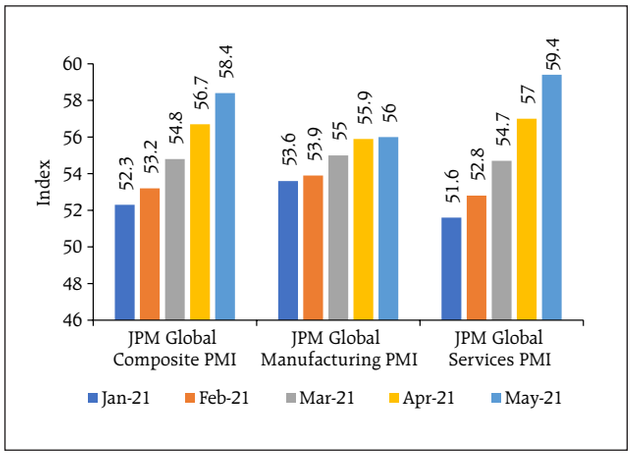
1.8 Global economic performance improved in the first half of 2021, but in a manner so widely divergent across countries that unequal participation in the recovery could emerge as a downside risk going forward. A supportive financial environment and continued policy support have contributed to nurturing the recovery; the gamechanger has, however, been the speed and scale of vaccination and the consequent unlocking of advanced economies and some EMEs, including contact-intensive activities. In many EMEs, however, sheer lack of access to vaccines, the slow pace of vaccine deployment, new surges of infections and associated containment measures are operating as drags on the recovery, with a disproportionately high toll on the poorest and most vulnerable. Amidst these stark disparities, the Organisation for Economic Cooperation and Development (OECD) estimates that the pace of global economic activity moderated in the first quarter of 2021, with global GDP growth easing to 0.5 per cent (quarter-on-quarter, non-annualised).

1.9 Turning to the second quarter, global mobility stalled in April, but improved in May, especially in respect of recreation and retail in the advanced economies where containment is being eased. In contrast, there were declines in mobility in parts of Europe, Latin America and India where infections had recorded renewed surges. The global composite purchasing managers' index (PMI) rose to a 11-year high in April, with services expanding at a higher pace than manufacturing for the first time since July 2020. In May 2021, the composite PMI increased to its highest level in over 15 years, with the services PMI at a 181-month high and above the manufacturing PMI for the second successive month (Chart 1.1).

1.10 Global retail sales volumes have picked up again, after remaining unchanged for several months and business confidence has continued to improve. After growing by 3.5 per cent in the first quarter, global merchandise trade is continuing to recover, with the May 2021 reading of the World Trade Organisation's (WTO) goods trade barometer at 109.7, almost 10 points higher than the baseline and 21.6 per cent higher than a year ago. On the downside, shipping costs continue to spiral – the Baltic Dry Index (BDI) surged to its highest level in more than a decade as supply disruptions continue to co-exist with a bounce back in demand (Chart 1.2).

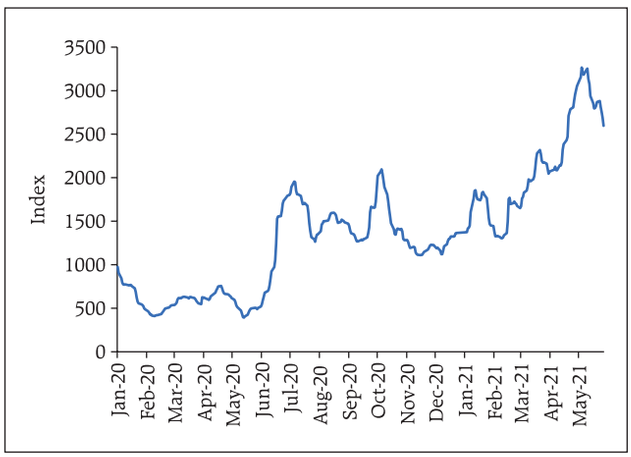
1.11 Alongside these developments, several risks have emerged on the horizon. The dominant one is the evolution of the virus, especially as more contagious and lethal variants emerge and test vaccine efficacy. Second, input cost pressures are elevated. The recent upturn in inflation reflects these pressures stemming from commodity price increases, apart from steepening shipping costs, and the ongoing normalisation of prices in pandemic-hit sectors, including one-off tax and margin increases. While the current assessment is that this pick-up will ease in the near-term in view of the substantial slack around the world and employment still way below pre-pandemic levels, close vigil is warranted. Third, tensions are building between policy authorities and markets on the timing and pace of normalisation of ultra-accommodative policies, with the latter anticipating that inflationary pressures will force the hand of authorities despite their forward guidance of extended accommodation. For the former, the dilemma of the trade-off between cliff effects of withdrawing stimulus too soon and ramp effects of a more gradual withdrawal but associated with the moral hazard of too prolonged a stimulus gets sharper by the day.

**Chart 1.1: Global Purchasing Managers' Indices (PMI)**




**Source:** Bloomberg.

**Chart 1.2: Baltic Dry Index**




**Source:** Bloomberg.

1.12 Against this backdrop, as per the International Monetary Fund (IMF), after an estimated contraction of –3.3 percent in 2020, the global economy is projected to grow at 6 percent in 2021 before moderating to 4.4 percent in 2022 and 3.3 per cent over the medium-term[1]. In advanced economies, the strong pace of vaccination is expected to boost contact-intensive services as pent-up demand is released and funded by accumulated savings. Output is expected to emerge out of the decline of (-) 4.7 per cent in 2020 and grow by 5.1 per cent in 2021 and by 3.6 per cent in 2022. In emerging and developing countries, effective vaccine protection is likely to become available for most of the population only by late 2021 and hence containment measures may be needed in 2021 and 2022. Accordingly, GDP growth is projected to recover from (-) 2.2 per cent in 2020 to 6.7 per cent in 2021 and 5.0 per cent in 2022. As the recovery strengthens in 2021, global trade growth is projected to accelerate to 8.4 percent, mainly because of the rebound in merchandise volumes. Cross-border services trade is expected to remain subdued until the pandemic is brought under control everywhere. Although commodity prices (particularly for oil) are expected to firm up further in the months ahead, the increase is widely regarded as transitory. Hence, inflation is expected to revert to its long-term average – remaining below target in advanced economies and averaging below 5 per cent in emerging and developing economies in 2021 and 2022 (Table 1.1).

1.13 In the second quarter of 2021, financial markets have remained buoyant and financial conditions easy in a historical perspective. Advanced economy equity prices hit new all-time highs in late April on strong first quarter corporate results and reflation trade. Bond yields have traded range-bound on encouraging economic data, but the episode of sell-offs in the first quarter of 2021 is a reminder that bond yield surges could become more frequent, amplified by changes in financial systems. In the US Treasury market, the provision of liquidity has shifted away from traditional market-makers to so-called principal trading firms (PTFs), which create an illusion of ample liquidity during normal times but that liquidity has become more fragile during stress episodes. In EMEs, investor bases have broadened to encompass a larger domestic investor participation, contributing to greater liquidity and depth. Greater openness to international investors and issuers has also helped develop hedging markets.

1.14 The US dollar has weakened by 3.2 per cent in the second quarter of 2021 (up to June 6) on a trade-weighted basis, with opposite movements in other currencies. In EMEs, financial conditions have tightened with a rise in bond yields and in spreads. Net capital flows have returned to these economies since April and partly eased financial conditions. Moreover, stronger fundamentals in the form of current account surpluses or smaller deficits and higher international reserves have reduced external vulnerabilities for several of them. At the same time, risks remain. Greater international openness may make these economies vulnerable to future shocks, especially with the large presence of typically unhedged international investors in local currency

**Table 1.1: Growth Projections for 2021 and 2022**

(per cent)

| | 2020 | 2021* | 2022* |
|---|---|---|---|
| Advanced Economies | -4.7 | 5.1 | 3.6 |
| Emerging Markets and Developing Economies | -2.2 | 6.7 | 5.0 |
| World | -3.3 | 6.0 | 4.4 |

**Source**: World Economic Outlook, April 2021, International Monetary Fund (IMF).

**Note *:** Projections

[1] The OECD's Economic Outlook released in May 2021 projects global growth at 5.8 per cent in 2021 and 4.4 per cent in 2022. The World Bank's Global Economic Prospects of June 2021 pegs global GDP growth at 5.6 per cent, followed by 4.3 per cent in 2022.

bond markets. Also, mutual funds remain important players in EMEs. Since they tend to liquidate assets when their end investors redeem units, their actions may amplify portfolio flows as well as swings in emerging market yields, currencies and other asset prices in times of stress.

1.15 With the onset of the pandemic and its evolution, policy authorities across the world have sought to sustain the flow of credit to the private sector to alleviate liquidity strains among firms and households and mitigate economic scarring. A wide variety of measures have been implemented, as the country experience shows. Policy makers have sought to increase banks' capacity to lend by either conserving or freeing up capital through measures such as restrictions on dividends, share buybacks and bonus payments; access to low cost financing from central banks; flexibility in provisioning standards; reducing regulatory capital buffer requirements; allowing temporary breaches of the liquidity coverage ratio. They have also endeavoured to increase the willingness of banks to lend by addressing the risk-adjusted return on loans (flexibility in asset classification; incentivising restructuring; direct fiscal transfers to borrowers to help reduce their credit risk; moratoriums on loan payments; prohibitions on foreclosures; loan guarantees; funding-for-lending schemes; and moral suasion) (Table 1.2).

1.16 Overall, these policy responses mitigated the risk of a credit crunch and eased lending conditions. While guarantees provided an impetus to lending, particularly corporate lending, the impact of moratoriums on bank lending is less clear, except when implemented jointly with guarantees. Restrictions on bank capital distributions are also correlated with increased loan growth. Country-level evidence suggests that a large share of incentivised lending went to new loans and even first-time borrowers. As a result of fiscal and monetary support measures, banks' funding costs and lending rates have declined to historical lows. In the case of funding-for-lending schemes, small and medium enterprises were typically the beneficiaries, but such policies, especially moratoriums, seem effective only in the short term and could have created incentives for the zombification of some firms.

1.17 Banks entered the pandemic with relatively strong balance sheets, benefiting from the reforms undertaken in the aftermath of the global financial crisis (GFC). Armed with higher levels and quality of capital, better liquidity and more stable funding, the banking sector is in a better position to cushion shocks and absorb losses than in the past. Extensive measures taken by governments, central banks and prudential authorities to support the economy also helped to shield banks from the initial impact of the pandemic and to keep insolvencies low. As a result,

**Table 1.2: Channels for Policy Measures to Support Bank Lending**

| Type of policy measure | Channel | | | |
|---|---|---|---|---|
| | Increase banks' capacity to lend | | Increase banks' willingness to lend | |
| | Conserve capital | Free up resources | Maintain existing loans | Stimulate new loans |
| Monetary | Central bank funding and liquidity facilities | | | Funding-for-lending schemes |
| Prudential | Restrict capital distributions | Release buffers | Restructuring loans/NPLs | Moral suasion |
| | Treatment of expected losses | Increase flexibility of capital and liquidity requirements<br>Increase flexibility of risk weight classifications | | |
| Fiscal or other | | | Payment moratoriums<br>Transfers to borrowers | Loan guarantees |

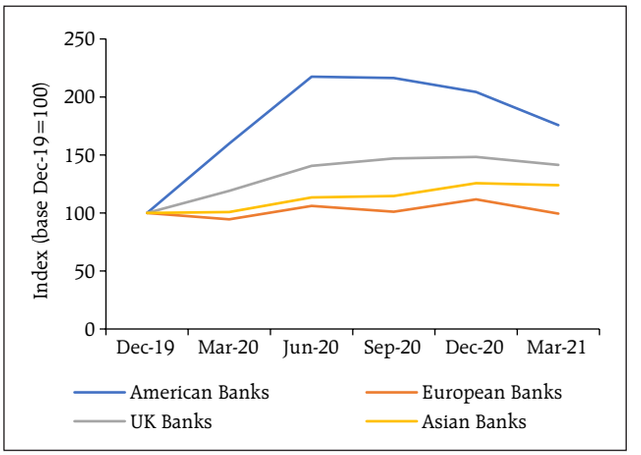
**Note:** Measures might work through multiple channels, but each is shown once for illustration.
**Source:** Bank for International Settlements (BIS)

banks' asset quality has not deteriorated as much as would have been expected from the sharp drop in economic activity in 2020. Furthermore, during the early months of the crisis, banks substantially increased provisions for expected losses (Chart 1.3).

1.18 Banks with higher pre-provision earnings tended to announce higher provisions. In contrast to the positive relationship observed with earnings, provisions were not positively related to bank capital. In fact, banks with higher capital ratios announced lower provisions, indicating that they were not motivated as much by capital preservation as by the change in accounting standards to provision on the basis of expected credit losses (ECL). Lower provisions helped the return on assets (ROA) to recover from the lows hit in the initial stages of the pandemic. Despite lower profits, capital ratios rose in developed market banking systems (Chart 1.4). Banks in countries that implemented restrictions on dividends or share buybacks saw the largest increases in capital ratios. Temporary exemptions from prudential rules also mitigated declines in capital ratios in some countries.

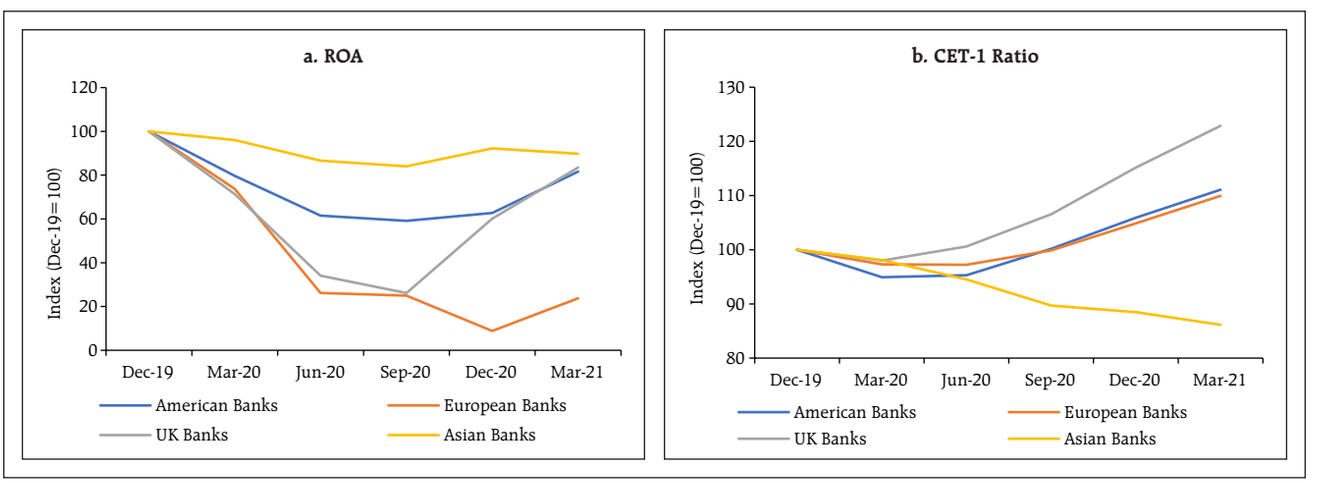
1.19 Concerns about banks' profitability led credit rating agencies to downgrade or assign a negative outlook to many banks. As of April 2021, those on

**Chart 1.3: Banks' Loan Loss Provisions (Rebased to 100)**



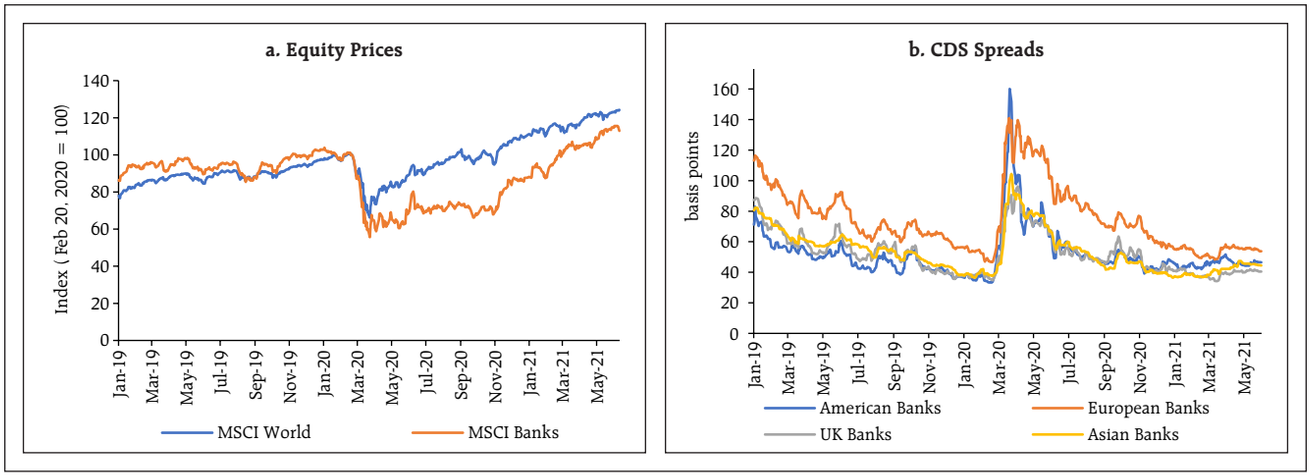

**Source:** Bloomberg.

**Chart 1.4: Profitability and Capital Ratios of Banks (Rebased to 100)**




**Source:** Bloomberg

**Chart 1.5: Equity Prices and CDS spreads**




**Source:** Bloomberg and Refinitiv.

negative outlook still outnumbered those with stable or positive outlooks. While equity prices and credit default swap (CDS) spreads for banks lagged the broad market rebound, they largely recovered to their pre-crisis levels by early 2021 (Chart 1.5). A notable exception was banks in a number of EMEs, where CDS spreads drifted wider starting from late February 2021 because of the tightening of global financial conditions and country risk. In general, the crisis has not caused investors to fundamentally reassess banks' prospects.

1.20 The most immediate challenge for banks worldwide is a possible rise in corporate insolvencies and non-performing assets (NPLs). The outlook remains uncertain, though. The health of their balance sheets is tied closely to the strength of the recovery and the continuation of policy support. Historical experience shows that credit losses remain elevated for several years after recessions end. Indeed, in EMEs, non-performing assets typically peak six to eight quarters after the onset of a severe recession (BIS, 2021). Eventually, support measures will be phased out. The longer that blanket support is continued, the higher the risk that it props up persistently unprofitable firms ("zombies"), with adverse consequences for future economic growth. Prolonging support also risks undermining the sustainability of public finances. Furthermore, it might delay the recognition of losses, which could reduce confidence in banks' asset quality and capitalisation and may raise their funding costs. If support measures are phased out before firms' cash flows recover, however, banks will have to increase provisions and might tighten lending standards to preserve capital which might, in turn, undermine the recovery. Banks need sufficient buffers to absorb losses along the entire path to full recovery. Another looming concern is banks' sovereign exposures, especially with debt/GDP ratios rising to historically high levels. Moreover, banks' exposure to highly leveraged non-bank financial intermediaries (NBFIs) and hedge funds can turn adverse, as the events of March 2021 showed. A contingent risk is the environment of "low-for-long" interest rates which tends to depress net interest margins and thus profitability. Other pre-existing challenges facing banks include climate-related risks, cyber attacks, increased competition from the entry of fintechs and the growing presence of big techs in financial services.

1.21 Big techs offer a wide range of digital financial services and have a substantial footprint in the payment systems, crowdfunding, asset management, banking and insurance of several

advanced and emerging market economies. While this holds the promise of supporting financial inclusion and generating lasting efficiency gains, including by encouraging the competitiveness of banks, important policy issues arise. Specifically, concerns have intensified around a level playing field with banks, operational risk, too-big-to-fail issues, challenges for antitrust rules, cyber security and data privacy[2]. Big techs present at least three unique challenges. First, they straddle many different (non-financial) lines of business with sometimes opaque overarching governance structures. Second, they have the potential to become dominant players in financial services. Third, big techs are generally able to overcome limits to scale in financial services provision by exploiting network effects. For central banks and financial regulators, financial stability objectives may be best pursued by blending activity and entity-based prudential regulation of big techs (an activity-based approach is already applied in areas such as anti-money laundering [AML] /combating the financing of terrorism [CFT]; an activity-based approach is the provision of cloud services, where minimising operational and in particular, cyber risk is paramount). Furthermore, as the digital economy expands across borders, international coordination of rules and standards becomes more pressing.

1.22 The pandemic response saw a tight interaction of monetary and fiscal policy. As monetary policy has sought to control a larger segment of the yield curve, the overlap with public debt management has grown. With monetary policy committed to an easy stance for some time in many countries, the fiscal stance becomes important. Too loose a fiscal stance could cause inflation surprises and financial conditions could tighten. A more constrained fiscal policy would add pressure on monetary policy. It would test the efficacy of further monetary expansion and could heighten intertemporal trade-offs. The extraordinary combination of high debt-to-GDP ratios and ultra-low interest rates raises three challenges: the risk of fiscal dominance; the risk that fiscal positions may ultimately prove unsustainable; and the complications of the possible joint "normalisation" of fiscal and monetary policies. Growth-friendly fiscal policy can help by effectively targeting public infrastructure and productivity.

1.23 Global public debt rose to an all time high as the pandemic-induced decline in government revenues and increased spending to support growth-oriented policies and other pandemic related measures led to a sharp increase in fiscal gaps (Table 1.3).

**Table 1.3: General Government Fiscal Balance and Gross Debt, 2019-22**

(per cent of GDP)

| | Overall Fiscal Balance | | | | Gross Debt | | | |
|---|---|---|---|---|---|---|---|---|
| | Actual | | Current Projections | | Actual | | Current Projections | |
| | 2019 | 2020 | 2021 | 2022 | 2019 | 2020 | 2021 | 2022 |
| **World** | -3.7 | -10.8 | -9.2 | -5.4 | 83.7 | 97.3 | 98.9 | 99.0 |
| **Advanced Economies** | -2.9 | -11.7 | -10.4 | -4.6 | 103.8 | 120.1 | 122.5 | 121.7 |
| **Emerging Markets and Developing Economies** | -4.7 | -9.8 | -7.7 | -6.7 | 54.7 | 64.4 | 65.1 | 67.3 |
| Asia | -6.0 | -10.8 | -9.2 | -8.2 | 57.3 | 67.6 | 69.9 | 73.0 |
| Europe | -0.7 | -5.9 | -3.5 | -2.7 | 29.2 | 37.6 | 36.9 | 37.2 |
| **Low-Income Developing Countries** | -3.9 | -5.5 | -4.9 | -4.4 | 44.3 | 49.5 | 48.6 | 48.2 |

**Source:** IMF Fiscal Monitor, April 2021 update

[2] Bank for International Settlements (2021): "Big techs in finance: regulatory approaches and policy options", March.

1.24 Aggregate public and private debt for a sample of 61 countries rose by USD 24 trillion in 2020 alone (Chart 1.6), making up over a quarter of the USD 88 trillion rise over the past decade. The pandemic also took its toll on private sector and household indebtedness and the debt of the private non-financial sector stood at USD 214 trillion in 2020, up from USD 194 trillion in 2019.

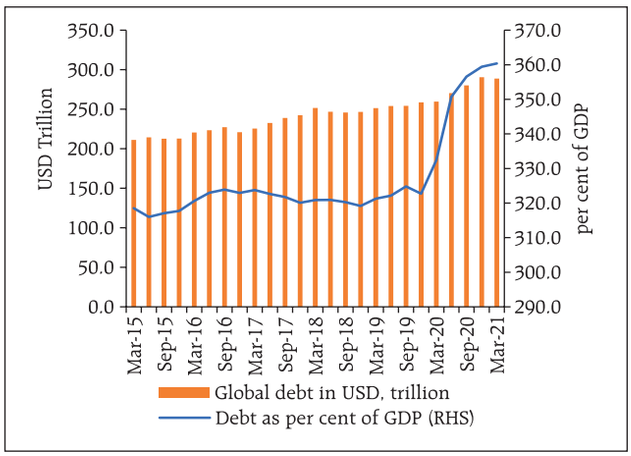
### I.1.2 Capital Flows and Exchange Rate Volatility

1.25 The episode of capital outflows from emerging market economies (EMEs) triggered by the outbreak of the pandemic, was followed by a resumption that began in June 2020. Capital flows picked up strongly in the ensuing months as risk appetite returned with positive news on COVID-19 vaccines (Chart 1.7).

1.26 EMEs' local currency bond portfolio returns in USD terms have outperformed local currency returns, benefiting from exchange rate gains (Chart 1.8) and hence attractive carry for risk taking.

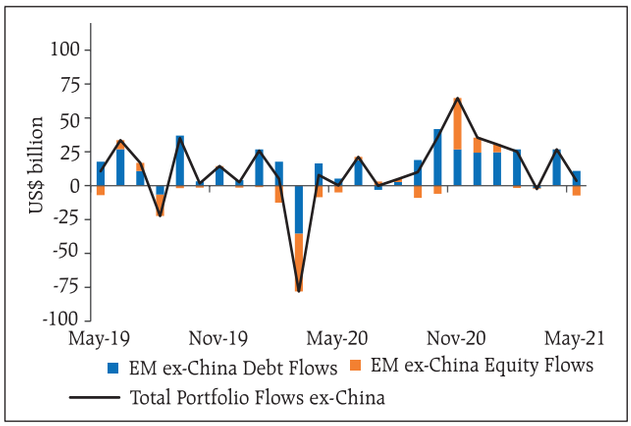
1.27 Cross-currency (CCY) basis swaps remain a major hedging tool. Hence, the basis in such swaps is a good indicator of the underlying demand for US dollar assets (funding) from non-US participants. The movement in cross-currency basis swaps for Euro and JPY (1 and 3-year tenors) shows that the spike in underlying demand for US dollar funding following the COVID-19 pandemic in March and April, 2020 normalised in subsequent months, largely owing to

**Chart 1.6: Global Debt**



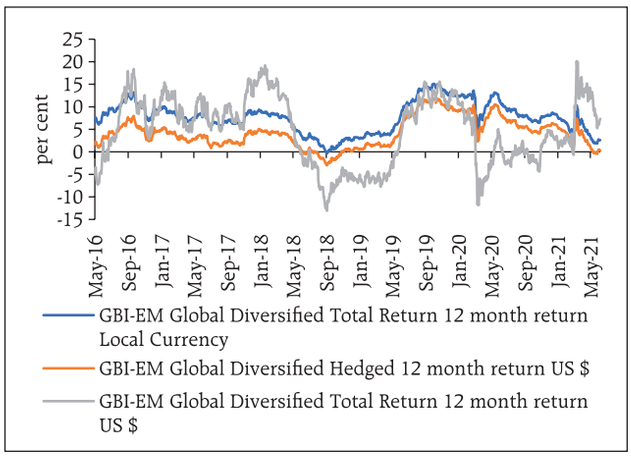

**Source:** The Institute of International Finance (IIF)

**Chart 1.7: Total Portfolio Flows into Emerging Market Economies**




**Source:** The Institute of International Finance (IIF)

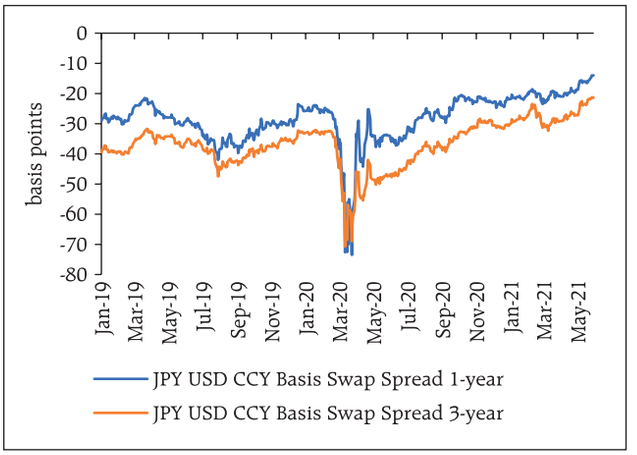
**Chart 1.8: Emerging Market Economies' Bond Portfolio Returns (Annualised)**




**Note:** Information has been obtained from sources believed to be reliable, but J.P. Morgan does not warrant its completeness or accuracy. The Index is used with permission. The Index may not be copied, used, or distributed without J.P. Morgan's prior written approval. Copyright 202[0], J.P. Morgan Chase & Co. All rights

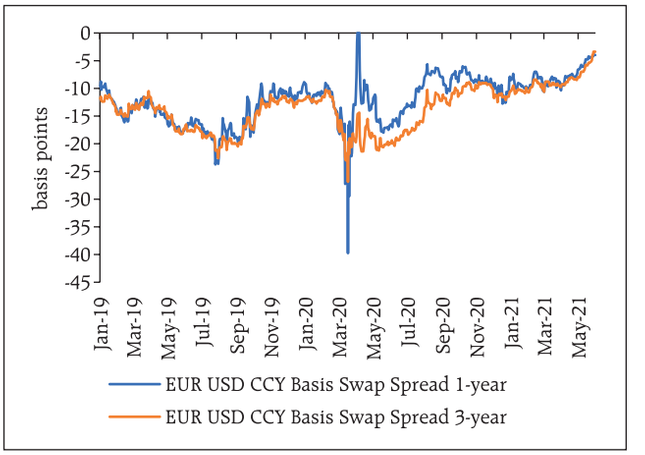
**Source:** JP Morgan.

**Chart 1.9: JPY USD Cross Currency Basis Swaps**




**Source:** Bloomberg.

**Chart 1.10: EUR USD Cross Currency Basis Swaps**




**Source:** Bloomberg.

the bilateral currency swap facility instituted by the US Fed (Charts 1.9 and 1.10).

### I.1.3 COVID-19 and Impact on Asset Quality of Banks

1.28 Some insights into the impact of COVID-19 on banks' asset quality can be gleaned from the European Banking Authority (EBA)'s published list of credit risk metrics that are based on supervisory returns of European Union (EU) banks, including the health of the banks' corporate and non-corporate counterparties across major EU and non-EU regimes. The median default rate observed for corporate obligors showed a year-on-year increase in Q4:2020, led by small and medium enterprises (SMEs) (Table 1.4).

**Table 1.4: Default Rates by Country of Counterparty for EU IRB[3] Banks – Corporate Obligors**

| | | Default Rate | | | | | |
|---|---|---|---|---|---|---|---|
| | | Q4: 2019 | | | Q4:2020 | | |
| | | 50TH percentile | 75TH percentile | Weighted Average | 50TH percentile | 75TH percentile | Weighted Average |
| **France** | **Corporates** | **0.61** | **1.12** | **1.09** | **0.88** | **1.51** | **0.90** |
| | Of which: SME | 0.83 | 3.23 | 2.18 | 0.82 | 2.73 | 1.55 |
| **Germany** | **Corporates** | **0.40** | **0.98** | **0.84** | **0.61** | **1.32** | **0.85** |
| | Of which: SME | 0.58 | 1.39 | 0.70 | 1.07 | 2.07 | 0.85 |
| **Italy** | **Corporates** | **0.19** | **1.20** | **1.38** | **0.58** | **0.77** | **0.69** |
| | Of which: SME | 1.53 | 2.32 | 2.73 | 1.21 | 5.13 | 1.16 |
| **United Kingdom** | **Corporates** | **0.98** | **2.17** | **1.27** | **0.99** | **3.67** | **1.18** |
| | Of which: SME | 0.21 | 2.52 | 2.50 | 2.62 | 7.88 | 4.07 |
| **Canada** | **Corporates** | **0.00** | **0.27** | **0.34** | **0.02** | **0.64** | **0.64** |
| | Of which: SME | 0.00 | 1.31 | 2.36 | | | |
| **United States** | **Corporates** | **0.49** | **1.01** | **0.62** | **0.92** | **2.81** | **1.13** |
| | Of which: SME | | | | 0.16 | 1.51 | 0.35 |
| **India** | **Corporates** | **0.35** | **3.22** | **1.55** | **3.27** | **6.91** | **2.86** |
| | Of which: SME | | | | | | |

**Source:** EBA risk dashboard

[3] Banks using internal ratings based (IRB) approach in credit risk capital requirements.

**Table 1.5: Default Rate by Country of Counterparty for EU IRB Banks- Retail Obligors**

| | | Default Rate | | | | | |
|---|---|---|---|---|---|---|---|
| | | Q4: 2019 | | | Q4:2020 | | |
| | | 50TH percentile | 75TH percentile | Weighted Average | 50TH percentile | 75TH percentile | Weighted Average |
| **France** | **Retail** | **0.66** | **1.76** | **0.69** | **0.77** | **1.46** | **0.58** |
| | Of which: Other Retail | 1.32 | 3.74 | 1.05 | 1.38 | 3.13 | 0.89 |
| **Germany** | **Retail** | **0.63** | **1.08** | **0.57** | **0.75** | **2.02** | **0.62** |
| | Of which: Other Retail | 0.86 | 2.05 | 1.09 | 1.12 | 2.34 | 1.26 |
| **Italy** | **Retail** | **0.57** | **1.53** | **4.63** | **1.05** | **1.97** | **4.17** |
| | Of which: Other Retail | 1.07 | 2.67 | 6.32 | 1.68 | 3.32 | 5.35 |
| **United Kingdom** | **Retail** | **0.84** | **2.48** | **0.63** | **0.80** | **1.67** | **0.66** |
| | Of which: Other Retail | 1.20 | 3.11 | 2.26 | 1.21 | 2.81 | 2.30 |
| **Canada** | **Retail** | **0.26** | **0.94** | **0.37** | **0.25** | **1.41** | **0.43** |
| | Of which: Other Retail | 0.76 | 2.86 | 1.42 | 0.40 | 3.16 | 2.00 |
| **United States** | **Retail** | **0.30** | **1.30** | **1.06** | **0.38** | **1.75** | **1.29** |
| | Of which: Other Retail | 0.48 | 1.66 | 3.09 | 0.83 | 3.74 | 3.71 |
| **India** | **Retail** | **0.25** | **0.86** | **0.22** | **0.36** | **2.68** | **2.17** |
| | Of which: Other Retail | 0.25 | 5.64 | 0.23 | 4.43 | 12.73 | 5.04 |

**Note:** 'Other retail' excludes (i) retail exposure secured on real estate and (ii) qualifying revolving retail exposure as per IRB asset classification under CRE 30.
**Source:** EBA risk dashboard

1.29 The performance of the retail portfolio also deteriorated in five of the seven countries listed, with the segment "other retail" (*i.e.*, excluding (a) retail exposure secured on real estate and (b) qualifying revolving retail exposure as per Basel norms) driving the rise in impairments (Table 1.5).

1.30 Additionally, a comparison of the adjusted probability of default (PD) for the credit portfolio for corporate and retail borrowers indicates that the median as well as the weighted average PD for corporate obligors have generally risen across countries, led by the SME portfolio (Table 1.6).

**Table 1.6: Adjusted probability of default (PD) by Country of the Counterparty for EU IRB Banks - Corporate Obligors**

| | | Probability of Default (PD) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Q4: 2019 | | | Q4:2020 | | |
| | | 50TH percentile | 75TH percentile | Weighted Average | 50TH percentile | 75TH percentile | Weighted Average |
| **France** | **Corporates** | **0.55** | **1.55** | **1.63** | **0.65** | **1.75** | **1.84** |
| | Of which: SME | 2.14 | 3.36 | 2.62 | 2.23 | 4.80 | 3.04 |
| **Germany** | **Corporates** | **0.66** | **1.43** | **1.01** | **0.75** | **1.31** | **1.09** |
| | Of which: SME | 1.78 | 3.63 | 1.22 | 1.22 | 2.71 | 1.19 |
| **Italy** | **Corporates** | **1.12** | **2.69** | **5.90** | **1.28** | **2.64** | **4.84** |
| | Of which: SME | 3.14 | 8.21 | 9.30 | 2.67 | 8.69 | 9.74 |
| **United Kingdom** | **Corporates** | **0.73** | **1.21** | **1.22** | **0.87** | **1.99** | **1.60** |
| | Of which: SME | 1.68 | 4.40 | 2.26 | 2.13 | 3.97 | 2.40 |
| **Canada** | **Corporates** | **0.48** | **1.05** | **1.02** | **1.00** | **1.70** | **1.52** |
| | Of which: SME | 1.78 | 3.56 | 1.76 | 1.53 | 3.24 | 1.87 |
| **United States** | **Corporates** | **0.54** | **1.04** | **0.96** | **0.75** | **1.48** | **1.20** |
| | Of which: SME | 1.19 | 2.97 | 2.62 | 1.30 | 4.04 | 2.55 |
| **India** | **Corporates** | **0.71** | **1.96** | **2.88** | **1.27** | **4.55** | **3.94** |
| | Of which: SME | 2.52 | 4.44 | 4.81 | 2.57 | 12.47 | 7.01 |

**Source:** EBA risk dashboard.

**Table 1.7: Adjusted probability of default (PD) by Country of the Counterparty for EU IRB Banks - Retail Obligors**

| | | Probability of default (PD) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Q4: 2019 | | | Q4:2020 | | |
| | | 50TH percentile | 75TH percentile | Weighted Average | 50TH percentile | 75TH percentile | Weighted Average |
| **France** | **Retail** | **1.37** | **1.98** | **1.69** | **1.25** | **1.99** | **1.47** |
| | Of which: Other Retail | 2.26 | 4.05 | 2.07 | 2.37 | 4.10 | 1.88 |
| **Germany** | **Retail** | **1.51** | **2.27** | **1.04** | **1.31** | **2.67** | **0.88** |
| | Of which: Other Retail | 2.38 | 3.67 | 1.92 | 2.22 | 4.03 | 1.72 |
| **Italy** | **Retail** | **1.56** | **2.47** | **2.43** | **1.18** | **2.26** | **2.28** |
| | Of which: Other Retail | 2.30 | 4.34 | 5.44 | 2.52 | 4.99 | 5.42 |
| **United Kingdom** | **Retail** | **1.60** | **3.02** | **1.53** | **1.40** | **2.90** | **1.51** |
| | Of which: Other Retail | 2.64 | 4.54 | 2.90 | 2.41 | 3.86 | 4.05 |
| **Canada** | **Retail** | **1.03** | **1.73** | **0.64** | **0.90** | **1.84** | **0.68** |
| | Of which: Other Retail | 1.74 | 3.24 | 2.03 | 1.57 | 3.00 | 2.16 |
| **United States** | **Retail** | **1.25** | **2.19** | **1.86** | **1.17** | **2.50** | **1.91** |
| | Of which: Other Retail | 2.17 | 4.04 | 2.41 | 2.38 | 4.62 | 2.75 |
| **India** | **Retail** | **0.85** | **2.62** | **5.02** | **0.99** | **2.50** | **8.57** |
| | Of which: Other Retail | 2.39 | 5.55 | 3.88 | 2.80 | 6.70 | 6.30 |

**Source:** EBA risk dashboard.

1.31 In contrast, these indicators have held up well for the retail portfolio (with the exception of India), underlining the significant fiscal support extended to protect retail credit in the wake of the pandemic (Table 1.7).

### I.1.4 London Inter Bank Offered Rate (LIBOR) Transition

1.32 On March 5, 2021 the UK's Financial Conduct Authority (FCA), announced that all LIBOR settings for all currencies will either cease or no longer be representative after (a) 31st December 2021, for the Pound Sterling, Euro, Swiss Franc and Japanese Yen in all tenors, and for US Dollar 1-week and 2-month settings; and after (b) 30th June 2023, for US Dollar overnight, 1-month, 3-month, 6-month and 12-month settings.

1.33 Regulatory authorities and public and private sector working groups in several jurisdictions, including the International Swaps and Derivatives Association (ISDA), the Sterling Risk-Free Rates Working Group, the Working Group on Euro Risk-Free Rates and the Alternative Reference Rates Committee (ARRC), have been discussing alternative risk-free rate (RFR) based benchmark rates to replace the LIBOR as well as to manage the transition. Of the major currencies transitioning to RFR regime by end-December 2021, only the Pound Sterling (GBP) has a significant proportion (51 per cent) of its interest rate risk in the interest rate derivative portfolio being generated out of an RFR linked index as on April 2021, with the Swiss franc (CHF) being a distant second (16.7 per cent) (Table 1.8).

**Table 1.8: Percentage DV01 Contributed by RFRs - Currency Wise**

| Month | USD | EUR | GBP | JPY | AUD | CHF |
|---|---|---|---|---|---|---|
| Jan-20 | 1.8 | 0.2 | 41.1 | 1.8 | 61.8 | 6.0 |
| Feb-20 | 2.1 | 0.2 | 34.8 | 2.9 | 66.3 | 8.1 |
| Mar-20 | 1.7 | 0.2 | 28.8 | 4.2 | 49.0 | 4.7 |
| Apr-20 | 1.6 | 0.1 | 21.0 | 3.0 | 13.1 | 6.9 |
| May-20 | 1.9 | 0.0 | 29.8 | 1.3 | 31.3 | 7.1 |
| Jun-20 | 3.1 | 0.3 | 24.4 | 2.6 | 9.2 | 7.6 |
| Jul-20 | 4.9 | 0.2 | 31.8 | 1.7 | 17.1 | 6.4 |
| Aug-20 | 4.4 | 0.2 | 30.4 | 2.1 | 13.2 | 7.6 |
| Sep-20 | 5.8 | 0.5 | 39.2 | 2.5 | 31.7 | 7.0 |
| Oct-20 | 9.7 | 0.4 | 40.4 | 4.7 | 36.4 | 4.6 |
| Nov-20 | 5.6 | 1.0 | 33.6 | 5.1 | 18.4 | 6.2 |
| Dec-20 | 5.6 | 0.7 | 40.5 | 2.8 | 17.5 | 5.9 |
| Jan-21 | 5.6 | 1.2 | 45.9 | 3.5 | 3.1 | 7.7 |
| Feb-21 | 5.1 | 1.3 | 45.8 | 3.5 | 5.2 | 8.8 |
| Mar-21 | 4.7 | 0.9 | 44.9 | 2.4 | 5.1 | 6.3 |
| Apr-21 | 7.5 | 1.3 | 51.0 | 3.9 | 6.0 | 16.7 |

**Note:** DV01 measures the risk of bond portfolio (*viz.*, the price change in response to one basis point change in yield).
**Source:** International Swaps and Derivatives Association (ISDA) Clarus RFR adoption indicator.

1.34 For risk generated in interest rate derivatives beyond two years, however, RFR linked indices contribute a significant proportion across currencies, with the exception of the Australian dollar (AUD) (Table 1.9).

### I.1.5 Commodity Markets

1.35 Global commodity markets have recorded a broad-based upswing in prices in the recent period. Sharp rebounds in key economies and improvement in global trade, combined with shortfalls in key food items, have propelled the upsurge, with ample global liquidity contributing to financialisation of commodity markets.

1.36 Crude prices continue to rise, supported by strong economic fundamentals in the US and China, and supply-side concerns. Crude futures rallied after bottoming out on April 5 and went into backwardation (Chart 1.11). In May 2021 the International Energy Agency (IEA) noted a rise in the world oil supply and projected further increases as the Organisation of Petroleum Exporting Countries plus (OPEC+) alliance continues to ease output cuts. It expects oil demand to take a temporary knock due to the sharp rise in India's COVID-19 infections in Q2:2021, but it has kept its oil demand projections for H2:2021 unaltered, based on expectations of the pandemic being brought under control.

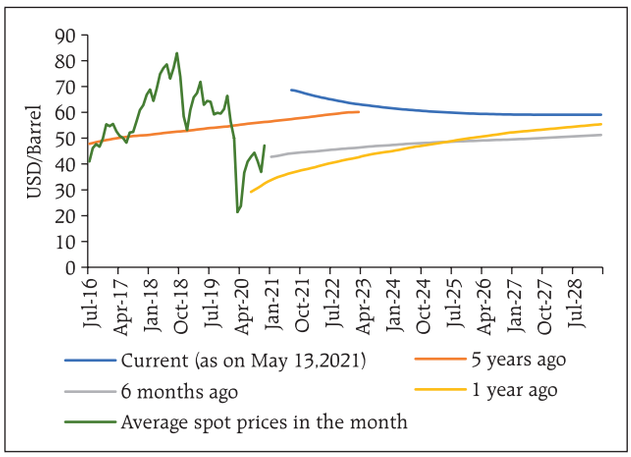
1.37 Industrial metals and base metals made strong gains backed by fundamentals and investor demand for commodity assets (Chart 1.12). Their prices have been supported by strong demand from China, the ongoing global economic recovery, supply disruptions, and a weaker U.S. dollar. China's import demand rose 51.1 per cent y-o-y in May 2021 and

**Table 1.9: Percentage DV01 Contributed by RFRs for Tenors Greater than 2 Years - Currency Wise**

| Month | USD | EUR | GBP | JPY | AUD | CHF |
|---|---|---|---|---|---|---|
| Jan-20 | 4.3 | 30.3 | 12.1 | 56.8 | 0.1 | 31.2 |
| Feb-20 | 7.0 | 51.1 | 15.8 | 65.1 | 0.1 | 21.2 |
| Mar-20 | 4.4 | 87.2 | 18.6 | 59.8 | 0.3 | 28.3 |
| Apr-20 | 5.2 | 49.6 | 33.4 | 41.4 | 0.4 | 32.1 |
| May-20 | 5.1 | 42.7 | 23.0 | 43.3 | 0.1 | 47.3 |
| Jun-20 | 8.9 | 78.6 | 27.3 | 62.1 | 2.0 | 38.8 |
| Jul-20 | 28.0 | 41.9 | 18.5 | 44.6 | 0.5 | 21.9 |
| Aug-20 | 22.8 | 72.4 | 23.5 | 58.8 | 1.1 | 34.9 |
| Sep-20 | 36.2 | 87.8 | 15.2 | 39.8 | 0.8 | 32.6 |
| Oct-20 | 62.1 | 73.6 | 23.2 | 73.3 | 0.1 | 30.6 |
| Nov-20 | 27.7 | 89.4 | 36.5 | 77.3 | 0.3 | 36.7 |
| Dec-20 | 24.7 | 66.2 | 24.4 | 62.1 | 1.3 | 16.6 |
| Jan-21 | 27.1 | 88.2 | 29.0 | 58.6 | 6.5 | 84.8 |
| Feb-21 | 32.0 | 89.0 | 44.1 | 54.2 | 7.3 | 75.9 |
| Mar-21 | 30.1 | 67.7 | 59.9 | 48.5 | 10.2 | 61.4 |
| Apr-21 | 30.1 | 65.6 | 65.3 | 73.1 | 2.6 | 70.9 |

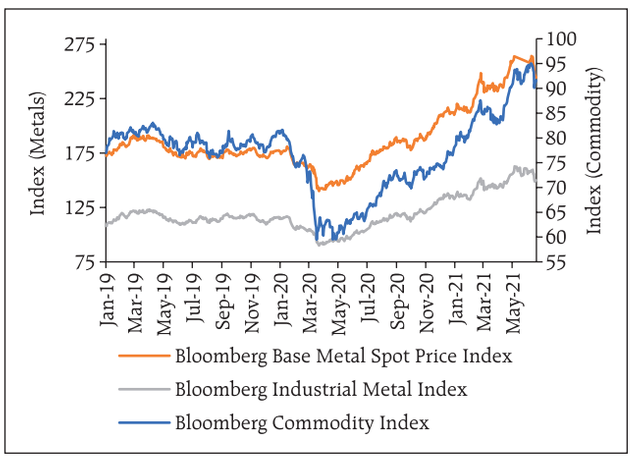
**Source:** ISDA Clarus RFR adoption indicator.

**Chart 1.11: Brent Crude Spot and Futures - Price Trends**




**Source:** Bloomberg.

**Chart 1.12: Movement in Commodity Indices**



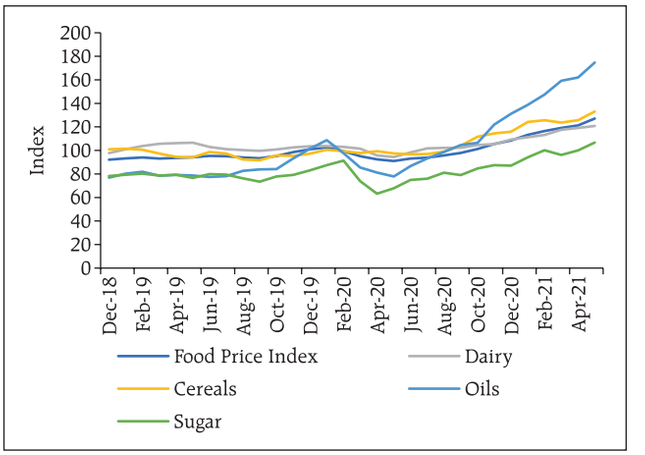

**Source:** Bloomberg.

was at its highest since 2011[4]. Of late, however, industrial metals and base metals have retraced some of the earlier gains in prices.

1.38 Global food prices rose for the twelfth month in a row in May 2021. The FAO Food Price Index (FFPI)[5] rose by nearly 40 per cent in April 2021 (y-o-y) to its highest level since May 2014, led by strong increases in the prices of sugar, oils, meat, dairy and cereals (Chart 1.13).

1.39 The sustained buoyancy in commodity prices has fuelled expectations of a commodity super cycle building up, with the peak not yet in sight. These spiralling prices are also fuelling concerns about the potential impact on inflation across commodity importing countries. The rise in food prices could pose grave risks of increase in food insecurity and undernourishment in some low-income economies[6]. Meanwhile, climate change risks are ascending the hierarchy of threats to financial stability across advanced and emerging economies alike (Box 1).

**Chart 1.13: FAO Monthly Food Price Index**




**Source:** Food and Agriculture Organisation, United Nations.

**Box 1.1: Climate Change and Financial Stability: A Perspective**

The climate change debate is on the move, its focus now on financial stability. Consequently, the need for an appropriate framework to identify, assess and manage climate-related risk has become an imperative.

For central banks, the impact of climate change on the financial system entails two major dimensions: monitoring financial entities' exposure to climate risks as part of supervisory functions on an ongoing basis; and, stress testing to measure the resilience of the system against such risks. With regard to supervision of climate risks to the financial system, the Financial Stability Board (FSB) established the Task Force on Climate-related Financial Disclosures (TCFD), which has formulated guidelines to help firms include climate-related risks in their existing reporting processes. Overall, there has been an increased push towards integrating climate risks into the existing risk management framework of financial firms.

Climate risk stress tests are different from the traditional regulatory stress-testing framework in terms of time horizon, reporting frequency, sectoral specificity, modelling approach and nature of output. With regard to approaches, attempts to quantify climate risks to the financial system can take two forms – top down and bottom up. Under a top down approach, the magnitude of risks can be estimated by using the sensitivity of exposures of the banking system to physical risk (based on geography) and transition risk (mostly based on carbon emissions of the sector). This provides a useful approximation of losses in a worst-case scenario across various sectors at a broad level, based on emission reduction. In the alternative bottom up approach, financial institutions themselves compute the impact of climate risk on their respective portfolios based on a common scenario (or scenarios) specified by the central bank. The systemic impact of climate stress induced losses can be estimated by aggregating the impact of climate risks of individual financial firms.

Some central banks have already started to prepare to monitor and manage climate risks. The Bank of England has announced plans to launch its 2021 Biennial

*(Contd.)*

[4] Bloomberg and RBI staff calculations

[5] The FAO Food Price Index (FFPI) is a measure of the monthly change in international prices of a basket of five food commodity groups, viz., vegetables, sugar, cereals, dairy and meat. It consists of the average of five commodity group price indices weighted by the average export shares of each of the groups over 2014-2016.

[6] IMF WEO April 2021

Exploratory Scenario in order to test the resilience of the UK financial system to the physical and transition risks associated with different climate pathways. A similar bottom-up approach is also being undertaken by Banque de France, taking into account the high-level scenarios given by the Central Banks and Supervisors Network for Greening the Financial System (NGFS) (Chart 1). The IMF has already begun working on macro-relevant climate data. In April 2021, it launched the experimental Climate Change Indicators Dashboard (CID) covering a) economic activity and climate indicators; b) cross border indicators; c) financial, physical, and transition risks indicators; and d) government policy indicators. The Reserve Bank joined NGFS as a member central bank in April 2021.

A top-down impact assessment of technology-related transition costs in India's iron and steel sector, based on sales turnover and incorporating the goals and the cost estimates envisaged by the Ministry of Steel[7], shows that the operating profit coverage ratio (operating profit / interest cost) of the entire sector reduced from 3.8 to 3.5 (Chart 2).

A cross industry cross disciplinary forum is required to launch a comprehensive climate risk assessment exercise for India. A key prerequisite is to develop emission reduction pathways for energy intensive sectors and map them onto macroeconomic and financial variables and integrate them with quantitative climate risk related disclosures to develop a holistic approach to addressing the financial stability risks arising out of climate change.

**Chart 1: NGFS Climate Scenarios Framework**

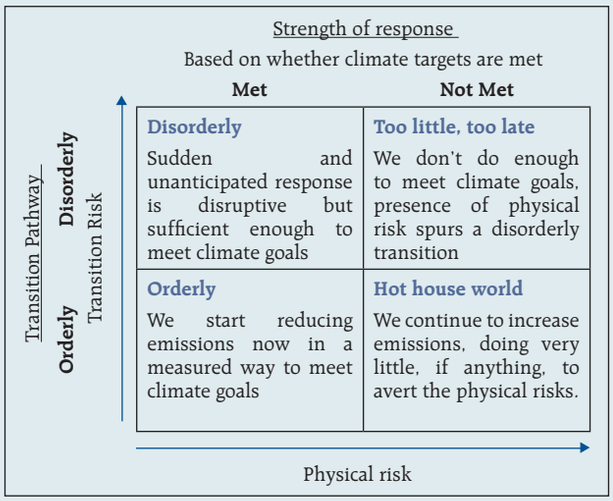
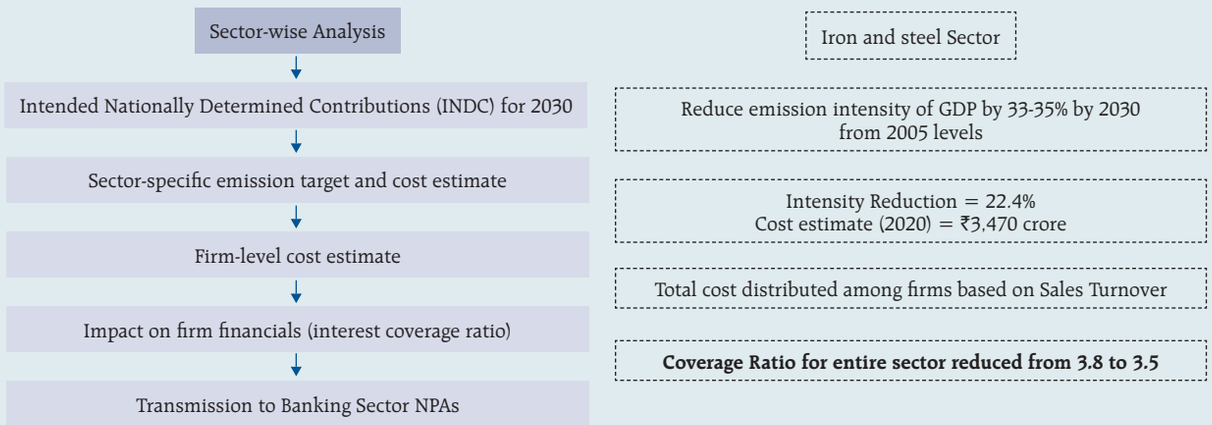



**Chart 2: Iron and Steel Industry Impact Assessment Process**




**References:**

Bank of England (2019), 'The 2021 Biennial Exploratory scenario on the Financial Risks from Climate Change' (December 18)

Banque De France (2020), 'Scenarios and Main Assumptions of the ACPR Pilot Climate Exercise' (July 17)

The Central Banks and Supervisors Network for Greening the Financial System (2020), 'NGFS Climate Scenarios for Central Banks and Supervisors' (June 24)

The Central Banks and Supervisors Network for Greening the Financial System (2021): Progress Report on Bridging Data Gaps' (May 26)

[7] https://steel.gov.in/sites/default/files/TEMPLATES-%20MITIGATION_0.pdf

## I.2 Domestic Macrofinancial Risks

1.40 The ferocity and speed of transmission of the second wave of COVID-19 in India has imposed a deleterious human toll, severely stretching the medical infrastructure. It has also interrupted the recovery of the Indian economy that was underway during the second half of 2020-21. Although it has started subsiding after mid-May 2021, the destruction wrought by it has dwarfed the first wave in terms of infections and loss of lives. Business disruptions have, however, remained more contained as region-centric restrictions were preferred over a nation-wide lockdown. As large swathes of the population remain to be vaccinated, there are downside risks and potential externalities of global spillovers.

### I.2.1 Public Finances

1.41 The provisional accounts of the Controller General of Accounts (CGA) reveal that the gross fiscal deficit of the central government amounted to 9.3 per cent of GDP, undershooting the revised estimated (9.5 per cent). Apart from substantial loss of tax revenue, increased expenses towards social welfare measures and fiscal stimulus requirements in the wake of the pandemic impacted the fiscal accounts adversely and also resulted in the build-up of public debt (Table 1.10).

1.42 Notwithstanding the contraction in GDP during the year, net tax revenue (provisional actual) was 5.9 per cent higher than the revised estimates (RE) due to buoyancy in the last quarter under corporation tax, other direct taxes, customs, excise duties and GST collections (centre).

1.43 With the expansion in the fiscal deficit, there was a quantum jump in market borrowings during 2020-21 and elevated levels persist into 2021-22 (Table 1.11). Given the revenue sharing arrangements between central and state governments, any revenue shortfall at the centre is likely to have a direct and

**Table 1.10: Fiscal Indicators**
(per cent of GDP at market prices)

| | 2019-20 (Actuals) | 2020-21 (Provisional Actuals) |
|---|---|---|
| Tax Revenue (Net) | 6.7 | 7.2 |
| Non-Tax Revenue | 1.6 | 1.1 |
| Revenue Expenditure | 11.6 | 15.6 |
| Capital Expenditure | 1.6 | 2.2 |
| Fiscal Deficit | 4.6 | 9.2 |

**Source:** Comptroller General of Accounts (CGA).

**Table 1.11: Market Borrowings by the Central and State Governments**
(face value in ₹ crore)

| Item | Gross Amount | | | Net Amount | | |
|---|---|---|---|---|---|---|
| | 2019-20 | 2020-21 | 2021-22 | 2019-20 | 2020-21 | 2021-22* |
| Government of India | 7,10,000 | 13,70,324 | 12,05,500 | 4,73,972 | 11,43,114 | 9,67,708 |
| State Governments | 6,34,521 | 7,98,816 | NA | 4,87,454 | 6,51,777 | NA |

**Note** *: Budget estimates
**Source:** RBI.

**Table 1.12: Central Government Securities and State Development Loans – Key Investor Profile**

(per cent)

| End-March | SDL as a proportion of total SCBs' domestic assets | GOI Securities as a proportion of SCBs' domestic assets | Aggregate SLR securities as a proportion of SCBs' domestic assets | SCBs' aggregate holding of G-Secs as a proportion of total outstanding G-Secs | SCBs' aggregate holding of SDL as a proportion of total outstanding SDL | Aggregate SLR holding by SCBs as a proportion of outstanding SLR-eligible securities | RBI holding as a proportion of total outstanding GOI securities |
|---|---|---|---|---|---|---|---|
| 2021 | 7.3 | 16.2 | 23.5 | 37.8 | 33.7 | 36.4 | 16.2 |
| 2020 | 6.7 | 15.1 | 21.8 | 39.8 | 34.9 | 38.2 | 15.1 |
| 2015 | 5.0 | 16.5 | 21.6 | 43.3 | 42.9 | 43.2 | 13.5 |
| 2008 | 3.8 | 19.2 | 23.0 | 50.7 | 52.3 | 51.0 | 7.8 |

**Note:** As of end-March for all the years
**Source:** Reserve Bank of India

proportionate effect on the fiscal position of state governments.

1.44 In the absence of robust demand for credit, banks' holdings of SLR securities (mainly government securities [G-secs] and state development loans [SDLs]) in March 2021 stood at their highest level since March 2010. During 2008-21, however, the share of banks in total G-Sec and SDL holdings has gradually declined, falling steadily from 51.0 per cent in 2008 to about 36.4 per cent in 2021 (Table 1.12). Insurance companies and provident funds' holdings[8], by contrast, grew at 15.4 per cent and 21.5 per cent[9], respectively, during 2008-2021 and they held nearly 37 per cent of total SLR-eligible securities by March 2021.

1.45 From an active interest rate risk management perspective, the accounting classification of new securities in banks' portfolio indicates that the held-to-maturity (HTM) holdings of G-Secs have not risen commensurate with their acquisition by public sector banks (PSBs) (Table 1.13). As a significant part of the newly acquired securities are held in the fair value portfolio of available for sale (AFS) / held for trading (HFT) (predominantly AFS for PSBs), it renders the profitability of PSBs particularly sensitive to secondary market yields (Table 1.14).

**Table 1.13: Change in Holdings of G-Secs and SDLs, H2: 2020-21**

(₹ crore)

| | G-Sec | SDLs |
|---|---|---|
| SCBs | 1,32,704 | 73,573 |
| Insurance Companies | 1,24,142 | 86,688 |
| Provident Funds | -1,205 | 93,789 |
| RBI | 1,65,820 | 30,000 |

**Source:** RBI.

**Table 1.14: Bank-group wise increase in HTM holdings, H2:2020-21**

(₹crore)

| | G-Sec | SDLs | Others | Total |
|---|---|---|---|---|
| Public Sector Banks (PSBs) | 63,357 | 1,14,317 | 54,074 | 2,31,747 |
| Private Sector Banks (PVBs) | 47,236 | 37,621 | -10,132 | 74,726 |
| Foreign Banks (FBs) | -771 | - | - | -771 |
| All SCBs | 1,09,822 | 1,51,938 | 43,942 | 3,05,702 |

**Note:** Based on 46 SCBs which account for about 98 per cent of the total assets of the banking system.
**Source:** Individual bank submissions to RBI.

[8] RBI's Database of Indian Economy (DBIE) and staff calculations

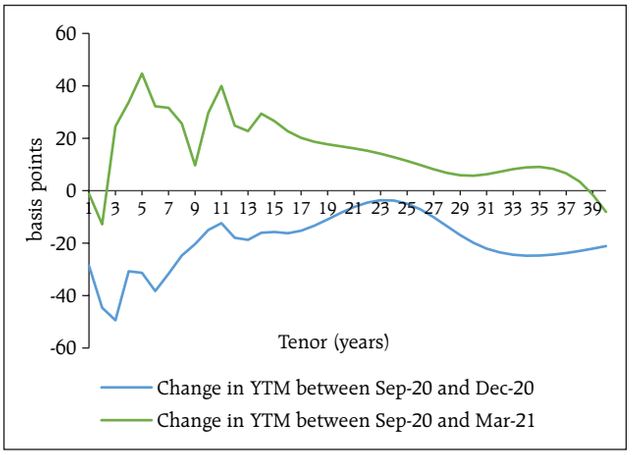
[9] CAGR – compound annual growth rate

### I.2.2 Developments in Government Securities and Fixed Income Derivatives Markets

1.46 Shifts in yields of various tenors between September 2020 and December 2020 / May 2021 showed notable divergences, almost mirroring each other (Chart 1.14). While the sub 1-year tenor yields plunged during both the periods, they rose sharply till May 2021 in the above 1-year tenor, specifically in the tenors which witnessed large supplies owing to increased government borrowing. Yield movements across tenors were also non-parallel in both the periods, with the 10-year segment showing relatively smaller adjustments. Such idiosyncratic tenor specific yield adjustments make risk management challenging. The smoothened government securities turnover also indicates a general ebbing of trading interest, *albeit* with some recovery in 2021-22 (Chart 1.15).

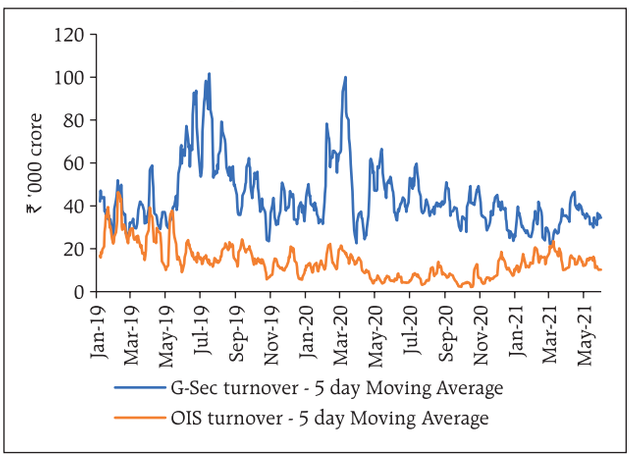
1.47 Measuring market depth through the differential price impact (sale versus buy[10]) of a ₹25 crore buy and sell order in the 10-year on the run benchmark (Chart 1.16), it is found that during 2020-21, there were sharp peaks in February-March 2021 and a disproportionate price impact of sale relative to purchase. During the current financial year so far, however, the price impact of sell and buy has been offsetting, and no net price impact has been observed.

**Chart 1.14: Yield Curve Shifts between September 2020 and December 2020 / May 2021**



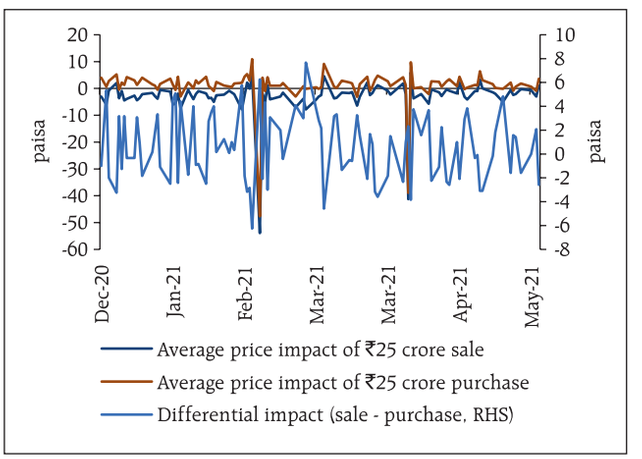

**Source:** Bloomberg

**Chart 1.15: Smoothened Government Securities and Overnight Index Swap (OIS) Turnover**




**Source:** Clearing corporation of India ltd. (CCIL) and staff calculation

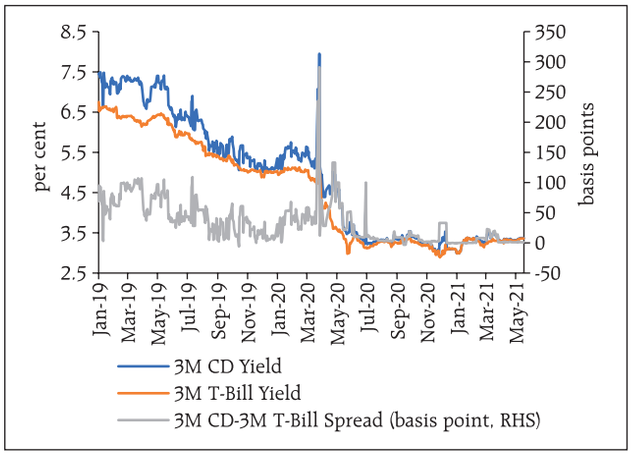
**Chart 1.16: Price Impact of ₹25 crore buy and sell order in 10-year benchmark**




**Source:** Bloomberg

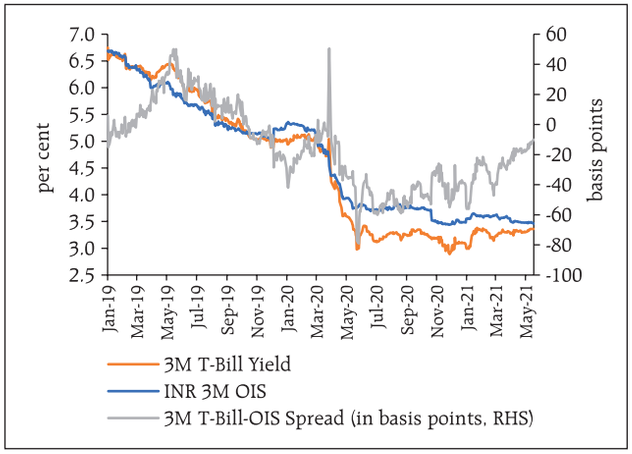
[10] A negative differential impact implies a higher price impact of purchase relative to sale and hence implies bullish undertones.

**Chart 1.17: Spread between 3-month Unsecured and Risk-free Rate**




**Source:** Bloomberg

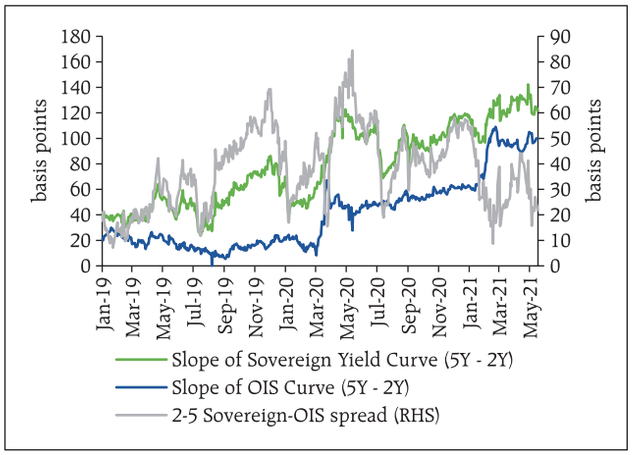
**Chart 1.18: Spread between 3-month Risk-free Rate and OIS**




**Source:** Bloomberg

1.48 Surplus liquidity conditions and the accommodative monetary policy stance have driven down short-term interest rate expectations and kept the near end of the risk-free curve well anchored. As a result, the spread between the 3-month Treasury bill rate and both OIS and unsecured CD rates have narrowed down significantly (Charts 1.17-1.18). The risk-free and the OIS spread has also narrowed across the term structure, although the slope of both the risk-free and the OIS curves continues to steepen (Chart 1.19).

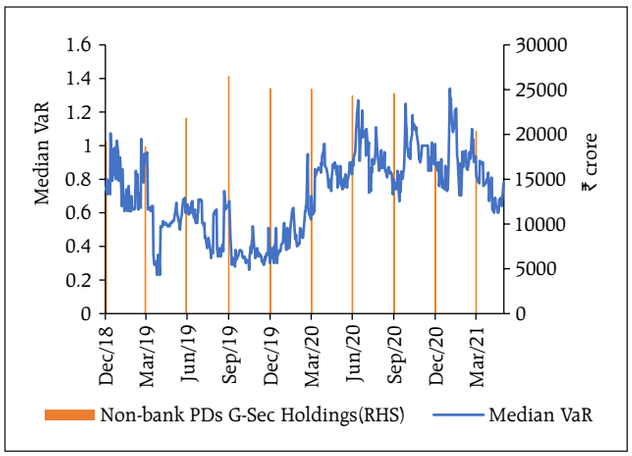
**Chart 1.19: Slope of Risk-free and OIS Curves**




**Source:** Bloomberg

1.49 Aggregate portfolio holdings of non-bank primary dealers (PD) were also lower at end-March, 2021 relative to all the prior quarters since June 2019, except the quarter ending December 2020. The challenges in managing price risk in a relatively illiquid market is reflected in their capital deployment (represented as median non-bank PD portfolio VaR as a proportion to the portfolio), which has dipped in the current financial year (Chart 1.20).

**Chart 1.20: Non-bank PDs' Median Risk Limit Utilisation (as a per cent of portfolio) and Aggregate Quarter end Portfolio Holdings**




**Source:** RBI

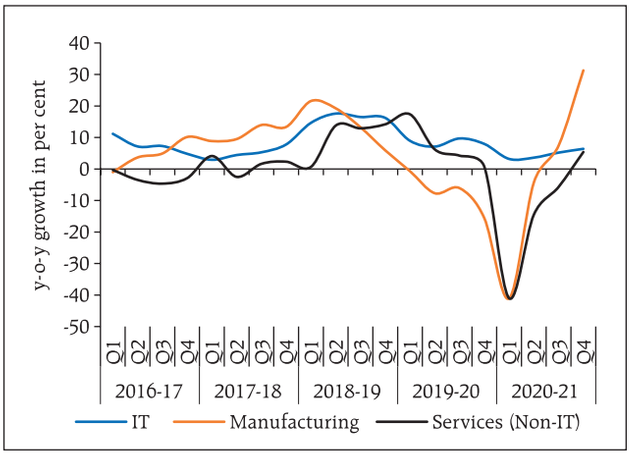
### I.2.3 Corporate Sector

1.50 After nosediving in H1:2020-21 due to pandemic-related restrictions, private corporate activity revived during H2:2020-21 after the gradual opening up of the economy. Nominal sales of 724 listed private manufacturing companies increased by 6.8 per cent and 31.7 per cent in Q3 and Q4:2020-21, respectively, and the rise was broad-based. IT companies remained in expansion zone throughout the pandemic period and recorded 6.5 per cent growth in sales during Q4:2020-21. The non-IT services sector, which recorded the maximum contraction during the pandemic, also witnessed signs of recovery in sales (Chart 1.21).

1.51 Operating profit margins of these companies remained nearly flat across sectors. Higher expenditure (*e.g.*, raw materials) growth was compensated by increase in sales of manufacturing companies (Chart 1.22).

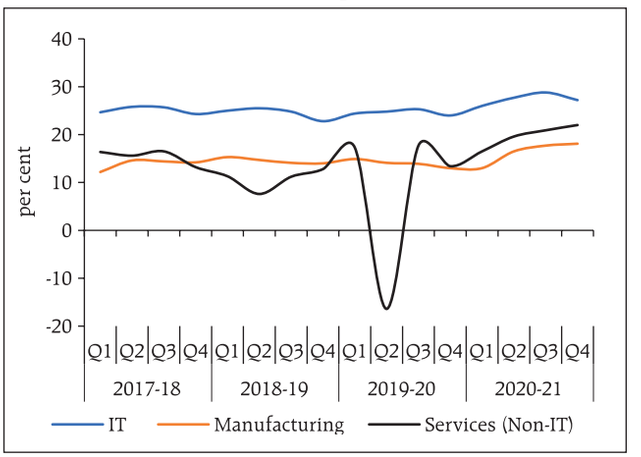
1.52 Leverage[11] of 1360 listed private non-financial companies declined during H2:2020-21, relative to the previous period (Chart 1.23a). Also, as compared to pre-pandemic levels, cash holdings of these companies remained elevated, indicating precautionary savings by these companies in the face

**Chart 1.21:** Sales of Listed Non-financial Private Companies – Growth (y-o-y)



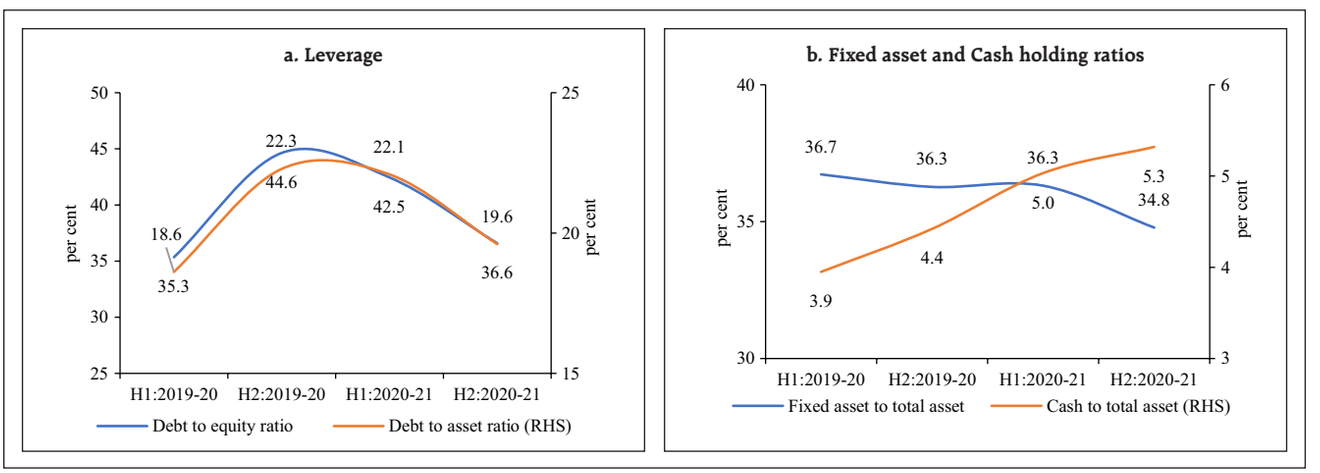

**Source:** Capitaline and RBI staff calculations

**Chart 1.22: Operating Profit Margin – Listed Non-financial Private Companies**




**Source:** Capitaline and RBI staff calculations

**Chart 1.23: Leverage, Fixed Assets and Cash Holdings of Listed Non-financial Private Companies – Growth (y-o-y)**




**Note:** Sample of 1360 companies
**Source:** Capitaline and RBI staff calculations

[11] Leverage is measured by debt to equity ratio and debt to asset ratio.

of heightened uncertainty. Their capital expenditure remained muted during this period, which was reflected in lowering of the ratio of fixed assets to total assets (Chart 1.23 b).

1.53 An analysis of sources and uses of funds for 794 listed private manufacturing companies, where more detailed information is available, indicates higher profitability during H2:2020-21 and reinvestment of retained earnings as reserves and surplus, which became their major source of funds, which were mainly used for deleveraging, increasing cash holdings and inventory formation.

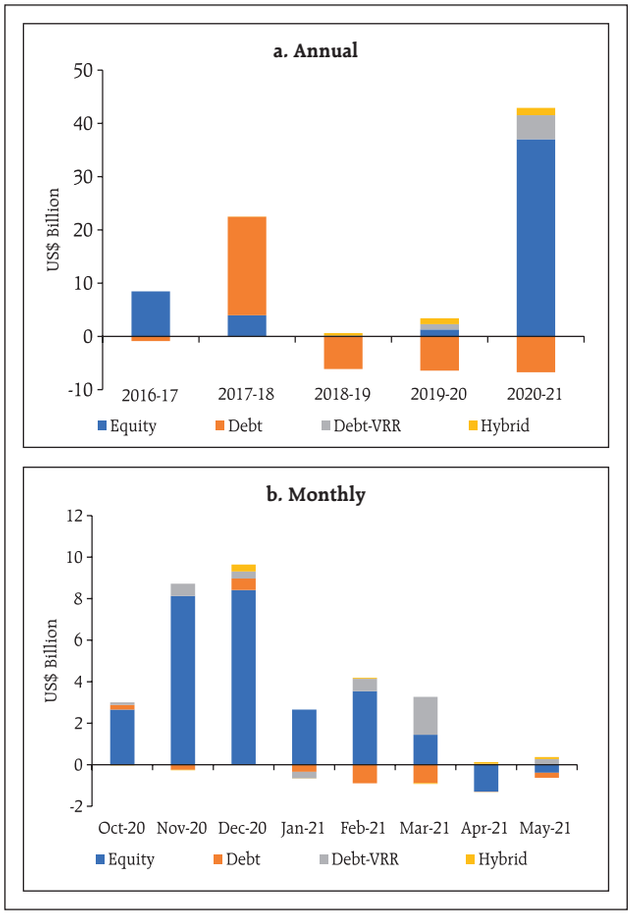
### I.2.4 Developments in External Sector and Foreign Exchange Derivative Market

1.54 Despite the adverse impact of the COVID-19 pandemic, India received strong interest from foreign portfolio investors on the back of stable financial market conditions, favourable economic prospects and easy liquidity conditions in the global financial markets. Powered by record receipts in the equity segment, net Foreign Portfolio Investment (FPI) inflow during 2020-21 stood at US$ 36.2 billion as against a net outflow of US$ 3.0 billion in the previous year. During the first two months of 2021-22 however, FPI recorded net outflows (Chart 1.24).

1.55 After a surplus of 3.0 per cent in H1: 2020-21, the current account balance reverted to a deficit of 0.7 per cent of GDP in H2: 2020-21 (Chart 1.25). The turnaround was led by a widening trade deficit and an increase in net investment income payments. There was an accretion to foreign exchange reserves to the tune of US$ 87.3 billion on balance of payments (BoP) basis during the year. The current level of foreign exchange reserves exceeds US$ 600 billion and provides some cushion against global spillovers.

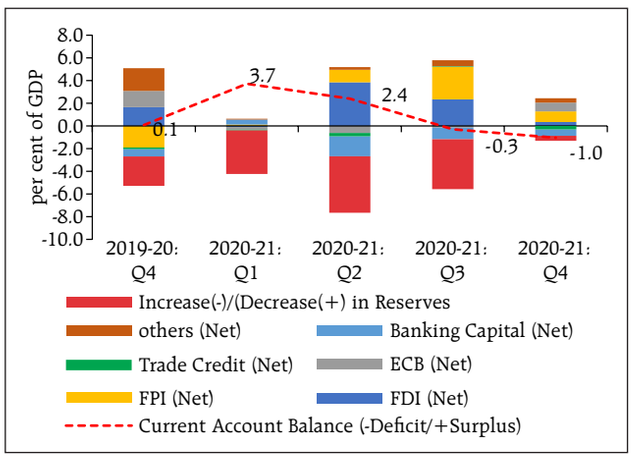
1.56 India's merchandise exports and imports contracted by 7.3 per cent and 18.0 per cent, respectively, during 2020-21 which reflected deep recessionary conditions and collapse in world trade.

**Chart 1.24: Foreign Portfolio Investment (FPI) Flows**



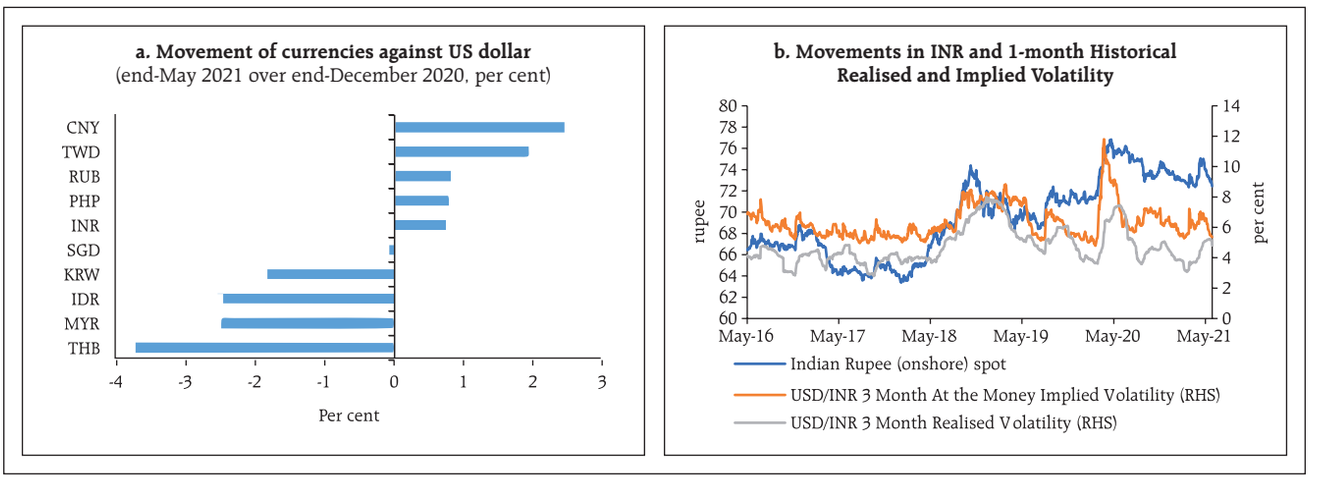

**Source:** National Securities Depository Limited (NSDL)

**Chart 1.25: India's Balance of Payments**




**Source:** RBI

**Chart 1.26: Exchange Rate Movements and Volatility**



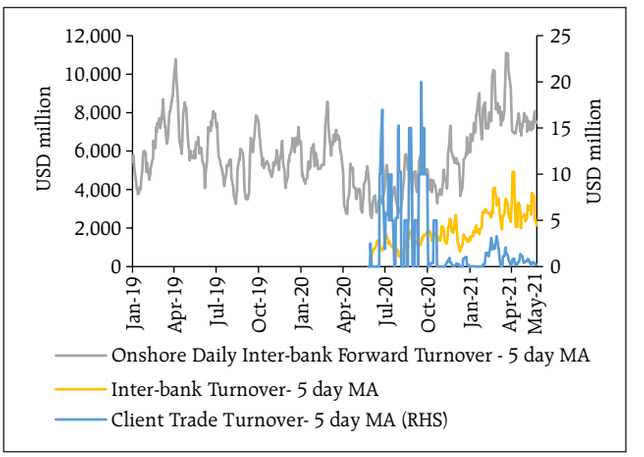

**Source:** Bloomberg

External trade, however, witnessed a rebound in growth since Q3:2020-21 but the global trade environment is still uncertain under the pandemic. Risks have also emerged from the uptrend in prices of crude oil, edible oils and other commodities and rising inflation expectations in advanced economies.

1.57 After depreciating to touch a historical low of ₹76.91 per US dollar on April 22, 2020 coinciding with large FPI outflows induced by the pandemic, the Indian rupee appreciated on the back of FPI inflows amidst revival of economic activity, positive developments on vaccines and easing of COVID-19 related restrictions. The Indian rupee has moved both ways in 2021-22 so far, largely reflecting changes in global risk perceptions on capital flows to EMEs and evolution of monetary policy in few advanced economies. While implied volatility has generally been range bound, realised volatility has moved higher (Chart 1.26).

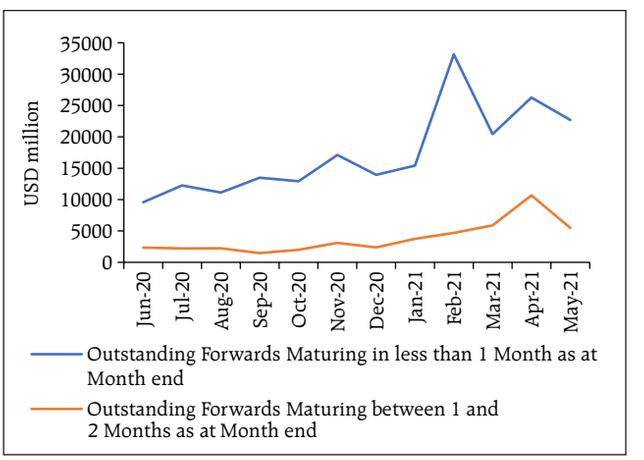
1.58 Banks in India which operate IFSC Banking Units (IBUs) were permitted to participate in the non-deliverable forwards (NDF) market with effect from June 1, 2020. The non-deliverable trading volumes and monthly outstanding amount have generally increased, although turnover in client positions indicate no discernible trend (Charts 1.27-1.28). In the meanwhile,

**Chart 1.27: Deliverable and Non-deliverable Daily Forward Trade Turnover** (US$ million)



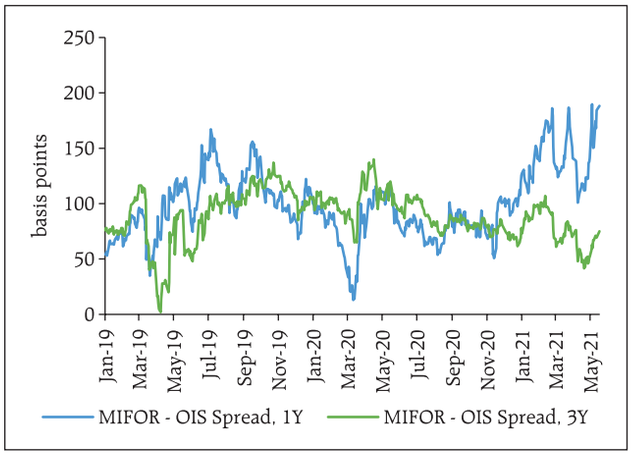

**Source:** RBI & CCIL

**Chart 1.28: Offshore Outstanding Forwards at Month ends (US$ million)**



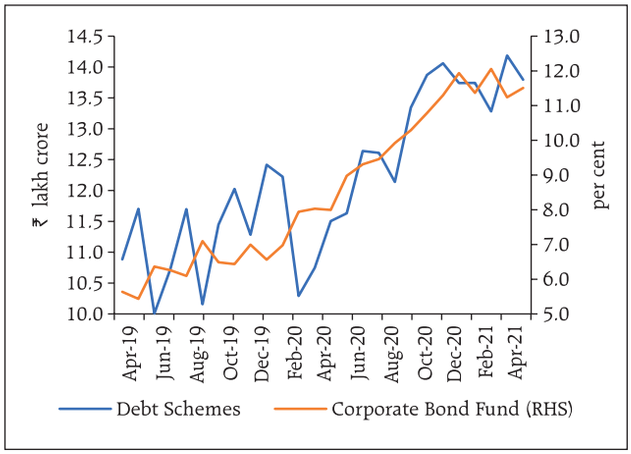

**Source:** RBI and CCIL

**Chart 1.29: MIFOR-OIS Spread of Key Tenors**




**Source:** Bloomberg

**Chart 1.30: Open-ended Debt Fund AUMs**




**Source:** AMFI

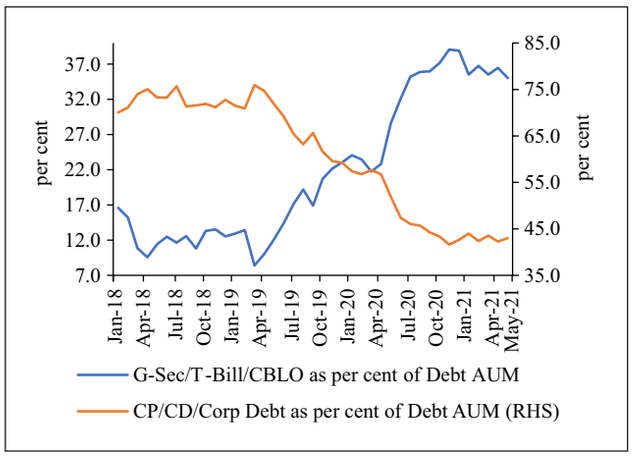
MIFOR-OIS spread[12] remains wide, which has implications for hedging behaviour of entities with foreign exchange liabilities (Chart 1.29).

### I.2.5 Developments in Debt Mutual Funds (MFs)

1.59 Resource mobilisation by debt mutual funds (MFs) suffered from idiosyncratic shocks such as corporate defaults during Q4: 2019-20, with pressure intensifying in March 2020 but, in the subsequent period, assets under management (AUM) of open-ended debt-oriented schemes and liquid asset holding of MFs have grown (Charts 1.30 and 1.31). Income/debt-oriented schemes are of systemic importance as the size of the debt mutual fund corpus is significant, with attendant spillover risk.

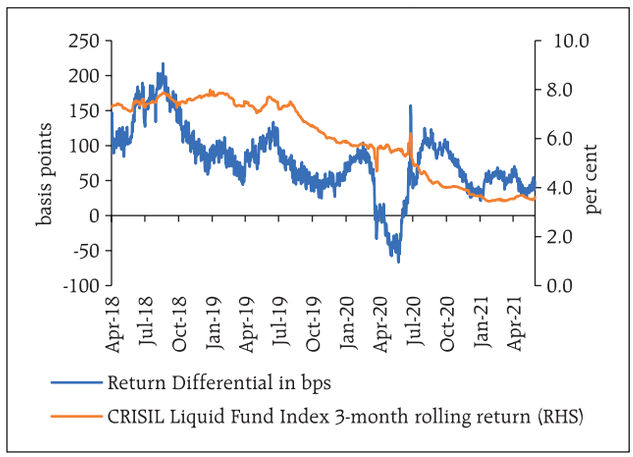
1.60 For money market instruments, excess returns may potentially mask illiquidity premia. In the case of liquid funds, excess returns, which turned negative in the wake of COVID-19 pandemic, are now in positive terrain (Chart 1.32). Given the size of the debt MFs, the embedded liquidity risk, which is an important ingredient of excess returns, is relevant.

**Chart 1.31: MFs' Investment in G-Sec/T-Bills/ CBLO and Spread Products**




**Source:** SEBI

**Chart 1.32: Excess Return in Money Market Fund**




**Source:** Bloomberg and staff calculations.

[12] Spread between 3-month Mumbai Inter-Bank Offer Rate (MIBOR) and the 3-month Overnight Index Swap (OIS) rate.

### I.2.6 Valuation of Perpetual Bonds

1.61 Debt Mutual Funds (MFs) invest in certain debt instruments such as perpetual bonds (which are treated as additional tier-1 [AT-1] capital under extant banking regulations). AT-1 bonds are issued with special features like subordination to equity, whereby 100 per cent of the bonds can be written off even before equity capital is written off, and / or the bonds can be converted to equity upon trigger of a pre-specified event for loss absorption. However, the said bonds were being treated by the market as a nominal bond and were valued considering the first call date as a maturity date thereby leading to possible serious mispricing of risk. This was highlighted when the AT-1 bonds of a bank were written off while the equity capital was not. Therefore, in order to address potential mispricing of risk in the valuation of perpetual bonds, the Securities and Exchange Board of India (SEBI), reviewed the norms regarding investment in debt instruments with special features in March 2021 and introduced a standardised valuation regime for perpetual bonds to be implemented from April 01, 2021. Based on the representations from the mutual fund industry and other stakeholders, the SEBI subsequently introduced some modifications in the valuation norms (Table 1.15).

1.62 SEBI guidelines on valuation give primacy to the traded price. For the purpose of valuation of these perpetual bonds, valuation agencies look back 15 days for benchmark securities and 30 days for non-benchmark securities. If the security or similar security has traded during the look back period, it is valued at the traded price with necessary adjustment of spread.

1.63 The implications of the revised valuation norms on actual bond prices were analysed by using related bond prices of one large public sector bank and one large private sector bank. The prices of Additional Tier 1 (AT-1) bonds (callable in October, 2022) and Tier-2 bonds (maturity in December, 2022) of the private bank indicated a simultaneous dip around the event of write off, implying that credit events affected both the bonds, although given

**Table 1.15: Glide Path for Valuation**

| Time Period | Deemed Residual Maturity of Basel III AT-1 bonds (years) | Deemed Residual Maturity of Basel III Tier 2 Bonds (years) |
|---|---|---|
| **Till March 31, 2022** | 10 | 10 years or contractual maturity whichever is earlier |
| **April 01, 2022 – September 30, 2022** | 20 | Contractual Maturity |
| **October 01, 2022 – March 31, 2023** | 30 | Contractual Maturity |
| **April 01, 2023 onwards** | 100 * | Contractual Maturity |

**Note** * :100 years from the date of issuance of the bond.

**Source** : SEBI

the differential seniority, prices of Tier-2 bonds recovered faster (Charts 1.33 a & b). Since the equity price of the entities are well above the book value, the decline is unlikely to have been caused by the loss absorbency provisions of the AT-1 instrument.

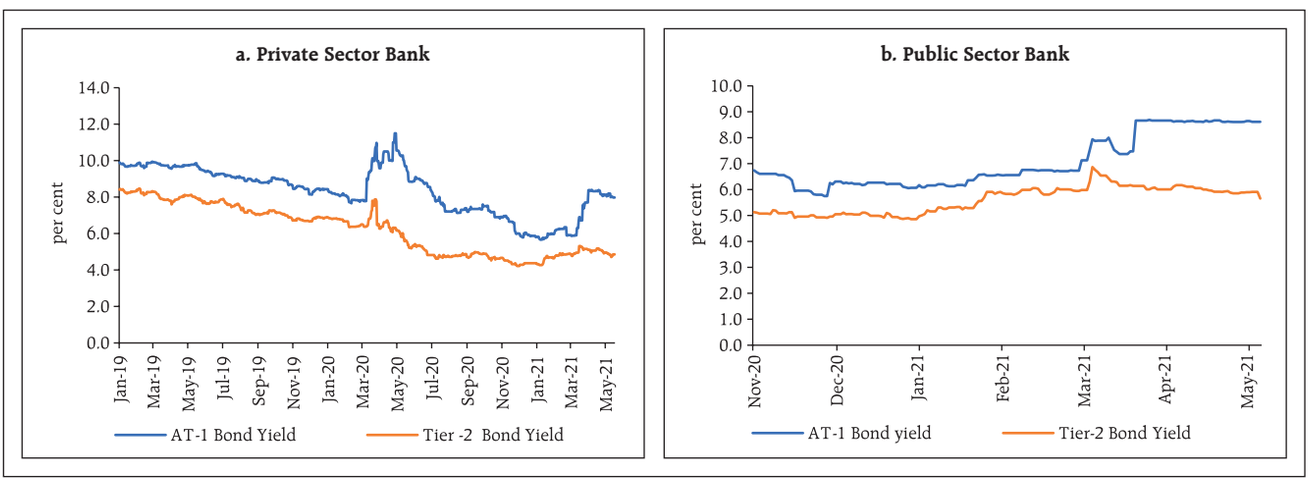
1.64 Following the revised valuation norms, prices of AT-1 instruments had dipped, but this was succeeded by a sharp recovery for both PSB and PVB (Charts 1.33 a & b) possibly underlining the fact that their valuation is not fundamentally affected by regulatory dispensations on maturity. This shows that the basis for valuation by the investors of the underlying risk of the instrument has not fundamentally changed following the implementation of the new valuation norms.

1.65 However, the yields of the perpetual bond instruments of both the PVB and the PSB show a sharp rise from April 01, 2021. This has led to distortion between the relative costs of Tier-I and Tier-2 bonds (Charts 1.34 a & 1.34 b), although such repricing of risks have no relation to the underlying movements in their respective prices (Charts 1.33 a & 1.33 b).

**Chart 1.33: Evolution of Price of AT-1 and Tier-2 Instruments**

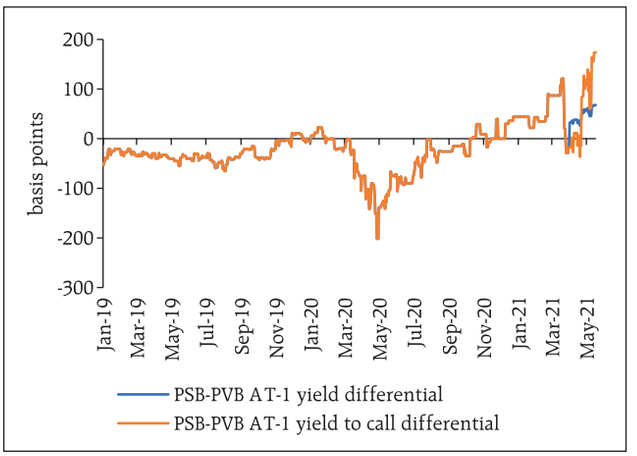

**Source:** CRISIL and RBI staff calculations

**Chart 1.34: Evolution of Yield of AT-1 and Tier-2 Instruments**



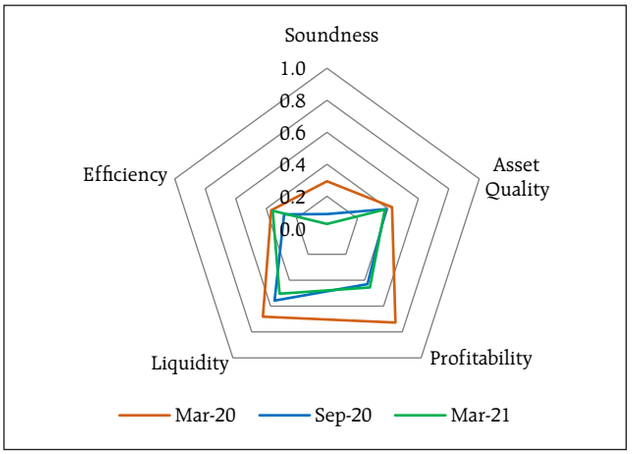

**Source:** CRISIL and RBI staff calculations

**Chart 1.35: Yield Differential between AT-1 Bonds of a PSB and PVB**




**Source:** CRISIL and RBI staff calculations

**Chart 1.36: Banking Stability Map**




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

1.66 The valuation norms also appear to have led to distortions in relative yields between these two entities. A comparison of the yield differential between a PSB AT-1 (callable on December 2023) and a PVB AT-1 (callable on October 2022) indicates that the yield differential between the two instruments has narrowed following the implementation of the valuation guidelines (Chart 1.35).

### I.2.7 Banking Stability Indicator

1.67 The banking stability indicator (BSI)[13] of SCBs exhibited improvement in all five dimensions in March 2021 as compared to the previous year (Chart 1.36). In particular, soundness, profitability and liquidity components revealed noteworthy reduction in risk due to banks' improved capital positions, better returns on assets and higher customer deposits to total assets ratio, respectively.

### I.2.8 Bank Credit

1.68 The environment for bank credit remains lacklustre in the midst of the pandemic, with credit supply muted by persisting risk aversion and subdued loan demand. Within this overall setting, underlying shifts are becoming more evident than before. Over recent years, the share of the industrial sector in total bank credit has declined whereas that of personal loans has grown (Table 1.16). Bank credit

**Table 1.16: Sectoral Share in Credit by SCBs** (per cent, end-March)

| Sector | 2014 | 2021 |
|---|---|---|
| **Economic Sector** | | |
| a) Agriculture | 12.0 | 12.0 |
| b) Industry | 42.7 | 28.9 |
| c) Transport operators | 2.1 | 2.1 |
| d) Professional and other Services | 7.6 | 7.4 |
| e) Personal Loans | 16.2 | 26.3 |
| *of which*, Housing Loan | 8.5 | 13.8 |
| f) Trade | 9.2 | 10.8 |
| g) Finance | 8.2 | 9.8 |
| h) Others | 2.0 | 2.7 |
| **Total credit** | **100.0** | **100.0** |
| **Organisational Sector** | | |
| i) Public Sector | 18.2 | 16.8 |
| ii) Private Corporate Sector | 37.6 | 27.7 |
| iii) Households Sector - *Individuals* | 33.4 | 43.2 |
| iv) Household Sector – *Others* (including proprietary concerns, partnership firms, Hindu undivided families) | 9.2 | 10.3 |
| v) Others (MFIs, NPISHs and NRIs) | 1.6 | 2.0 |
| **Total credit** | **100.0** | **100.0** |

MFI – Micro finance institution
NPISH – Non-profit institution serving household
NRI – Non-resident Indian
**Source:** Basic Statistical Returns, RBI

[13] For a detailed methodology and basic indicators used under different BSI dimensions please refer to Annex 2.

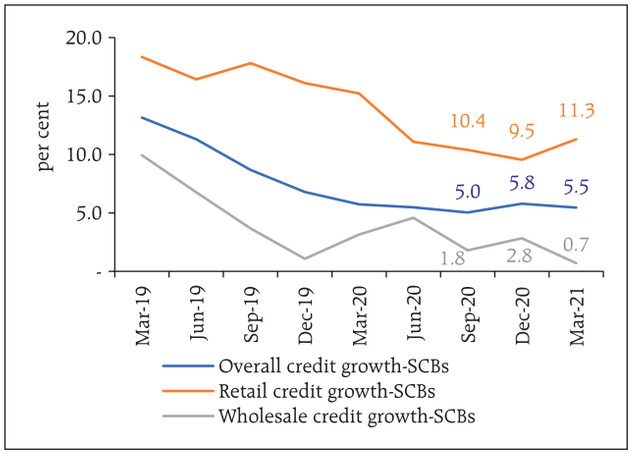
to the private corporate sector recorded a decline for the second successive year in 2020-21: its share in total bank credit has come down from 37.6 per cent to 27.7 per cent during the 7-year period 2014-2021. Also, the housing segment within personal loans has longer tenor loans for which stress tends to get reflected with a lag.

### I.2.9 Wholesale Bank Credit[14]

1.69 The second wave of COVID-19 has accentuated the slowdown in wholesale credit relative to retail credit[15] (Chart 1.37).

1.70 Aggregate mobilisation of funds by wholesale corporate borrowers (from the banking sector as also through market instruments) has risen in relation to a year ago, largely driven by funding through market instruments, although efforts are underway to ease risk-related credit constraints through schemes such as the Emergency Credit Line Guarantee Scheme (ECLGS) and its recent expanded versions[16] (Table 1.17).

**Chart 1.37: Credit growth in SCBs (y-o-y, per cent)**




**Source:** RBI supervisory returns and staff calculations

**Table 1.17: Aggregate Mobilisation of Funds**

(₹ thousand crore)

| Outstanding Amount under | Dec-19 | Mar-20 | Jun-20 | Sep-20 | Dec-20 | Mar-21 |
|---|---|---|---|---|---|---|
| Commercial Papers (CPs) | 415 | 346 | 391 | 362 | 365 | 365 |
| Non-convertible Debentures (NCDs)[17] | 2,600 | 2,712 | 2,783 | 2,825 | 2,902 | 3,017 |
| Wholesale credit[18] | 5,290 | 5,582 | 5,507 | 5,410 | 5,439 | 5,620 |
| **Total** | **8,305** | **8,640** | **8,681** | **8,597** | **8,706** | **9,002** |

**Source:** NSDL, Prime Database and CRILC

[14] Wholesale loans comprise gross loans and advances of the banking sector wherein aggregate exposure of the obligor is ₹5 crore and above.

[15] Loans to individuals that include housing loans, consumption loans for purchase of durables, auto loans, credit cards and educational loans.

[16] Emergency credit line guarantee scheme (ECLGS) aims to provide collateral-free and government-guaranteed loans to mitigate the economic distress faced by MSMEs and other entities due to COVID-19 induced lockdown. The government has extended the scope of ECLGS scheme from time to time through introduction of ECLGS 2.0, 3.0 and 4.0, and the scheme is valid till September 30, 2021.

[17] Include private debt placements from April 2013 onwards with tenor and put/call option of above 365 days

[18] Wholesale credit numbers are for PSBs, PVBs and FBs combined based on CRILC data.

**Table 1.18: Growth in Wholesale Credit to Companies**
(y-o-y, per cent unless otherwise stated)

| | Non-PSU | | | PSU | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2019-20 | 2020-21 | April-2021* | 2019-20 | 2020-21 | April-2021 (q-o-q) | 2019-20 | 2020-21 | April-2021* |
| PSBs | -4.3 | -6.3 | -3.1 | 19.4 | 3.7 | -4.8 | 2.6 | -2.9 | -3.7 |
| PVBs | -0.9 | -1.9 | -6.6 | 44.4 | 58.5 | -7.5 | 2.2 | 3.8 | -6.7 |
| PSBs+PVBs | -3.0 | -4.6 | -4.5 | 21.8 | 10.1 | -5.2 | 2.5 | -0.8 | -4.7 |

**Note *:** Growth over March-2021
**Source:** CRILC and RBI staff calculations

1.71 An analysis of the funded amount extended to companies (which accounts for 86 per cent of the total funded amount to wholesale borrowers) indicates that the banking sector's exposure to this cohort remained flat over the year as increased flow of funds to PSUs by both PSBs and PVBs was more than offset by subdued lending to non-PSUs, particularly by PSBs (Table 1.18). During the current financial year so far, growth in wholesale credit to corporates has decelerated sequentially. Significantly lower rates on market instruments may have enabled the private corporate sector to reduce its aggregate banking sector exposure by accessing markets.

1.72 An analysis of wholesale credit to companies (excluding PSUs) based on rating grades reveals that there was sharp decline in exposures to well rated borrowers by both PSBs and PVBs. Credit growth to other investment grades was relatively lukewarm, which may also imply a somewhat uncertain risk profile for this segment.

1.73 The upgrades to downgrades ratio, which made a slow recovery from its trough in Q1:2019-20, reversed direction in Q1:2021-22 (Tables 1.19 and 1.20, Chart 1.38).

**Table 1.19: Growth in Wholesale Credit to Non-PSU obligors**
(y-o-y, per cent unless otherwise stated)

| | PVBs | | | PSBs | | |
|---|---|---|---|---|---|---|
| | 2019-20 | 2020-21 | April-2021* | 2019-20 | 2020-21 | April-2021* |
| AA and above | 9.70 | -2.72 | -7.47 | 8.00 | -11.08 | -6.66 |
| Other Investment Grade | -6.93 | 0.77 | -6.34 | -6.18 | 1.48 | -5.38 |
| Below Investment Grade | 8.63 | -6.48 | -2.55 | -7.26 | -4.31 | 0.55 |
| Unrated/NA | -8.43 | -1.35 | -7.76 | -12.42 | -9.25 | -0.11 |

**Note *:** Growth over March-2021
**Source:** CRILC, Prime Database and RBI staff calculations

**Table 1.20: Growth in Wholesale Credit to Non-PSU Non-financial Obligors** (y-o-y, per cent unless otherwise stated)

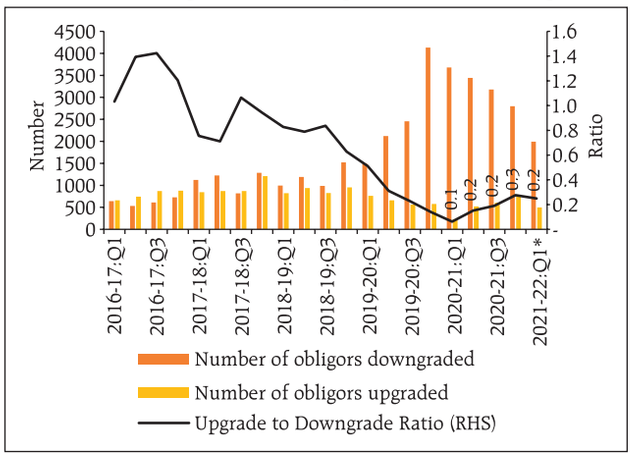
| | PVBs | | | PSBs | | |
|---|---|---|---|---|---|---|
| | 2019-20 | 2020-21 | April-2021* | 2019-20 | 2020-21 | April-2021* |
| AA and above | 13.63 | -6.60 | -8.29 | 7.22 | -5.78 | -1.98 |
| Other Investment Grade | -6.72 | 0.37 | -6.10 | -2.72 | 3.66 | -3.45 |
| Below Investment Grade | 5.95 | -5.08 | -2.75 | -13.66 | -5.84 | -1.80 |
| Unrated/NA | -7.94 | -0.82 | -7.56 | -12.08 | -9.31 | -2.02 |

**Note *:** Growth over March-2021
**Source:** CRILC, Prime Database and RBI staff calculations

1.74 A size-wise disaggregation of wholesale credit growth points to decline in banks' exposure to large wholesale borrowers while the relatively smaller borrowers (loans size: ₹5 - ₹100 crore) maintained a sustained appetite for credit (Chart 1.39).

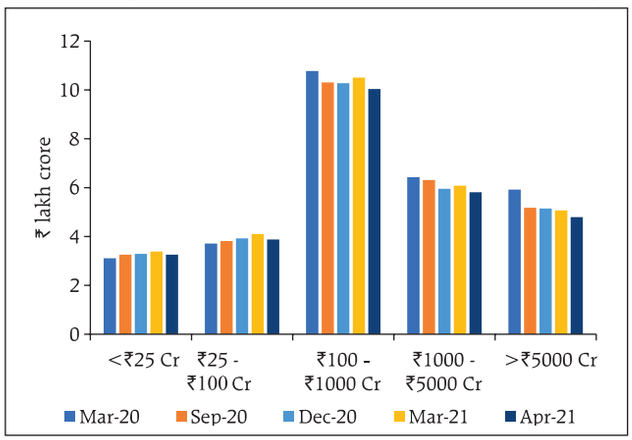
1.75 An examination of the transition in asset quality[19] of a constant sample of wholesale performing exposures (non-PSU non-financial companies) shows that between September 2020 and April 2021, there was considerable deterioration, with migration to impaired status across all SMA categories (Table 1.21). Over half of SMA-2 loans moved to the NPA category in April 2021, pursuant to the vacation of the Supreme Court order on asset classification standstill.

**Chart 1.38: Long term Loan ratings and Number of Obligors**




**Note*:** Till May 31, 2021
**Source:** Prime Database

**Chart 1.39: Exposure distribution of Non-PSU Non-Financial Obligors**




**Source:** CRILC and RBI staff calculations

**Table 1.21: SMA Transition Matrix for Wholesale Portfolio of a Constant Sample of Non-PSU Non-financial Obligors between September 2020 and April 2021**

| | Outstanding as on September 30, 2020 (₹ crore) | Growth in exposure over September 2020 (in per cent) | April 30, 2021 Percentage of assets in various cohorts | | | | |
|---|---|---|---|---|---|---|---|
| | | | 0 dpd | SMA-0 | SMA-1 | SMA-2 | NPA |
| Standard (0 dpd) | 19,21,009.15 | -3.66 | 90.8 | 5.8 | 1.3 | 1.2 | 0.9 |
| SMA-0 | 2,74,750.89 | -3.42 | 53.5 | 13.8 | 8.4 | 12.1 | 12.2 |
| SMA-1 | 75,116.42 | -4.51 | 51.2 | 11.8 | 16.9 | 8.1 | 12.0 |
| SMA-2 | 38,822.20 | -0.84 | 11.0 | 7.4 | 6.8 | 19.6 | 55.3 |
| Grand Total | 23,09,698.66 | -3.61 | 83.7 | 7.0 | 2.8 | 3.0 | 3.6 |

**Note:** Data as on April 2021 is provisional and not audited.
**Source:** CRILC and RBI staff calculations.

[19] For SMA classification of a borrower with exposure across multiple banks, the worst reported SMA status is considered as the applicable SMA position as on a given date.

### 1.2.10 Bank Credit to MSME Sector

1.76 Growth in credit to MSMEs during 2020-21 was aided by the ECLGS scheme, with aggregate sanctions at ₹2.46 lakh crore at end-February 2021. PSBs' credit to the sector remained flat and new disbursements turned negative, after adjusting for interest accretion on past loans; PVBs, on the other hand, showed relatively robust increase in exposure (Table 1.22).

1.77 Since 2019, weakness in the MSME portfolio of banks and NBFCs has drawn regulatory attention, with the Reserve Bank permitting restructuring of temporarily impaired MSME loans (of size upto ₹25 crore) under three schemes. While PSBs have actively resorted to restructuring under all the schemes, participation by PVBs was significant only in the COVID-19 restructuring scheme offered in August 2020 (Table 1.23).

1.78 Despite the restructuring, however, stress in the MSME portfolio of PSBs remains high (Table 1.24).

1.79 Boosted by ECLGS disbursements to eligible categories, net credit flow to stressed MSMEs[20] during March 2020-February 2021 rose to ₹50,535 crore with the shares of PSBs and

**Table 1.22: Growth in Bank Credit to MSME Sector - March 2021**

(y-o-y, per cent)

| | PSB | PVB |
|---|---|---|
| Exposures < ₹25 crore | 8.08 | 8.04 |
| Aggregate MSME exposures | 0.89 | 9.23 |

**Source:** RBI supervisory returns and staff calculations.

**Table 1.23: Restructuring of MSME Portfolios – Bank Group wise**

| Restructuring Scheme | Aggregate Restructured Portfolio (₹ crore) | |
|---|---|---|
| | PSBs | PVBs |
| Restructuring - January 2019 scheme | 26,190 | 2,174 |
| Restructuring - February 2020 scheme | 5,860 | 1,364 |
| Restructuring - August 2020 scheme | 24,816 | 11,027 |

**Source:** RBI supervisory returns and staff calculations.

**Table 1.24: SMA Distribution of MSME Portfolio – Bank Group Wise**

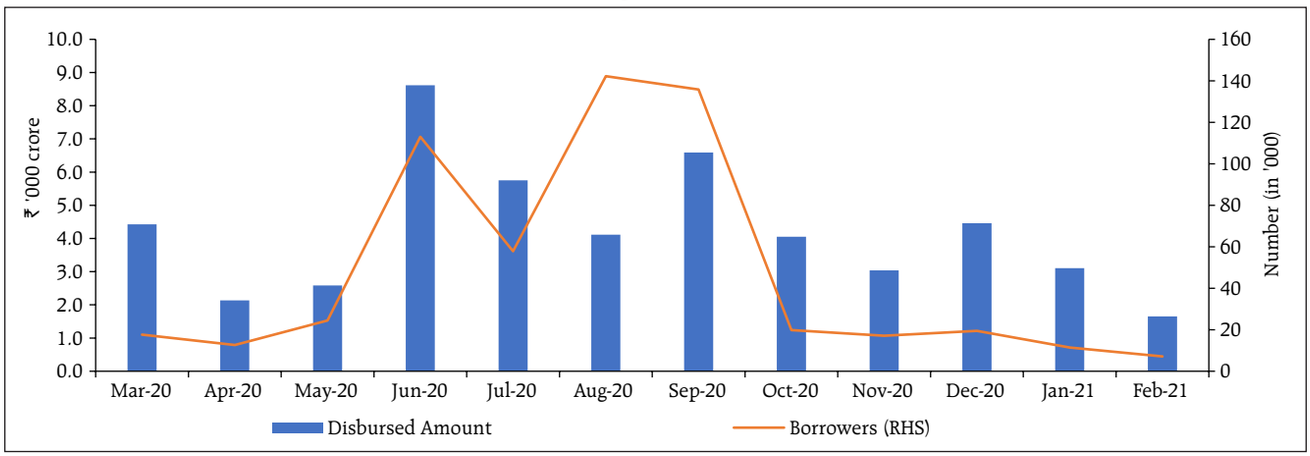
(per cent)

| | PSBs | | | | | PVBs | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 days past due | SMA-0 | SMA-1 | SMA-2 | NPA | 0 days past due | SMA-0 | SMA-1 | SMA-2 | NPA |
| Mar-20 | 65.0 | 6.9 | 5.7 | 4.2 | 18.2 | 88.6 | 4.4 | 1.9 | 0.7 | 4.3 |
| Jun-20 | 63.3 | 18.2 | 2.2 | 2.6 | 13.7 | 88.6 | 7.0 | 0.9 | 0.6 | 2.9 |
| Sep-20 | 65.9 | 13.4 | 3.2 | 2.6 | 14.9 | 87.9 | 8.1 | 0.9 | 0.6 | 2.6 |
| Dec-20 | 65.7 | 7.8 | 5.6 | 7.8 | 13.1 | 88.1 | 4.8 | 2.6 | 2.4 | 2.0 |
| Mar-21 | 60.7 | 10.6 | 9.2 | 3.6 | 15.9 | 89.6 | 3.7 | 2.4 | 0.8 | 3.6 |

**Note:** MSME exposures of up to ₹25 crore only are included.
**Source:** RBI supervisory returns and staff calculations.

[20] Stressed MSME for the purpose of this analysis has been defined as MSME with CMR rating between 7-10 (high risk) as also MSMEs with 90+ dpd.

**Chart 1.40: Loan Origination to Stressed MSMEs**




**Source:** TransUnion CIBIL

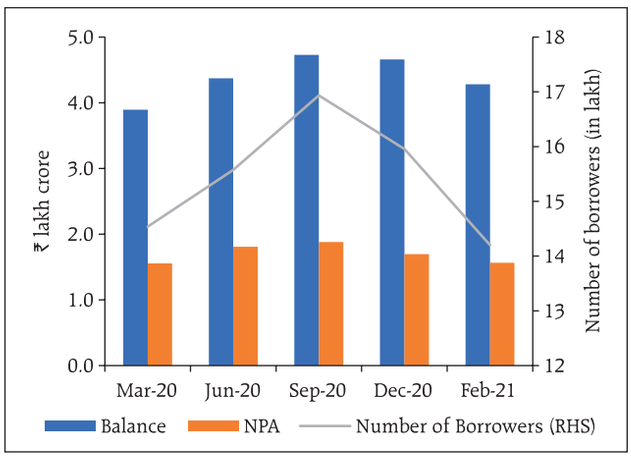
PVBs at 54 per cent and 35 per cent, respectively. (Chart 1.40 and 1.41).

1.80 The transition from low and medium risk MSME borrowers (y-o-y) to the high-risk segment was noteworthy, as per information available for February 2021 (Table 1.25). Given the elevated level of debt of the stressed cohort, the implications of business disruptions following the resurgence of the pandemic could be significant.

### 1.2.11 Bank Credit to NBFCs/HFCs

1.81 Banking sector exposure to the NBFCs/HFCs cohort showed contrasting movements during 2020-21. Exposure to private NBFC sector declined whereas lending to private housing finance companies (HFCs) rose during the last two quarters coinciding with the surge in sale of residential houses during H2:2020-21. In April 2021, however,

**Chart 1.41: Balances of Stressed MSMEs**




**Source:** TransUnion CIBIL

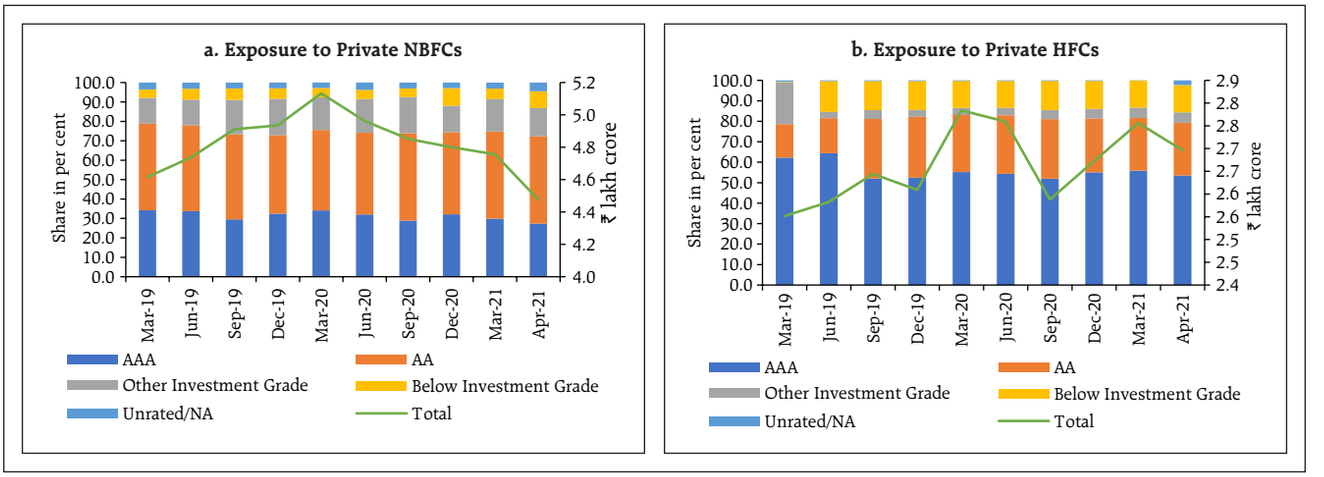
**Table 1.25: Borrower Transition Matrix**

(February 2020 - February 2021) (per cent)

| CMR as of February 2020 | CMR as of February 2021 | | | |
|---|---|---|---|---|
| | CMR 1-3 | CMR 4-5 | CMR 6-7 | CMR 8-10 |
| CMR 1-3 | 67 | 21 | 7 | 5 |
| CMR 4-5 | 17 | 50 | 22 | 11 |
| CMR 6-7 | 5 | 22 | 58 | 15 |
| CMR 8-10 | 1 | 3 | 15 | 80 |

**Note:** Low Risk (CMR 1-3), Medium Risk (4-6), High Risk (CMR 7-10)
**Source:** TransUnion CIBIL

**Chart 1.42: Outstanding Funded Exposure of the Banking Sector to Private NBFCs/HFCs**




**Source:** CRILC and Prime Database

bank exposure to HFCs too contracted (Charts 1.42 a-b).

### I.2.12 Heterogeneity in Credit Exposures across PVBs

1.82 The credit portfolios of private sector banks indicate significant difference between old and new private sector banks (regulatory classification based on dates of incorporation)[21]. The expansion in wholesale advances generally lagged retail loans growth for both the cohorts, but new PVBs recorded higher growth compared to old PVBs, especially in the wholesale portfolio (Table 1.26).

1.83 The average risk weighted assets[22] (RWA) of the wholesale segment are largely comparable for the two cohorts (Chart 1.43).

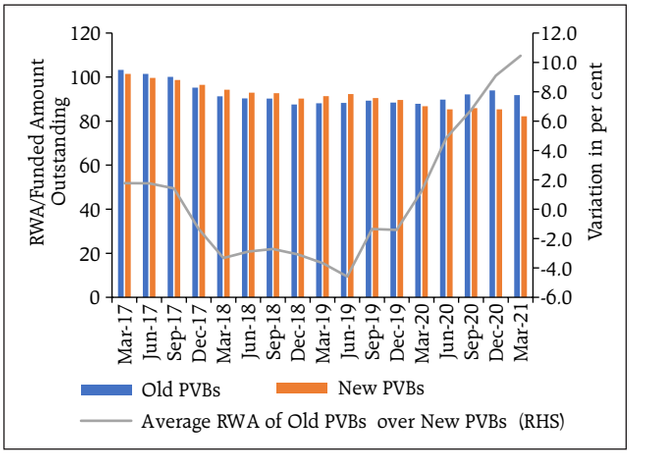
**Table 1.26: Asset Growth: Old and New PVB Cohorts**

(y-o-y, per cent)

| | Gross Loans and Advances | | Retail Loans and Advances | | Wholesale Advances | |
|---|---|---|---|---|---|---|
| | Old PVBs | New PVBs | Old PVBs | New PVBs | Old PVBs | New PVBs |
| Mar-20 | 4 | 12 | 18 | 25 | 0 | 6 |
| Jun-20 | 3 | 9 | 14 | 22 | 0 | 4 |
| Sep-20 | 3 | 8 | 15 | 15 | -1 | 5 |
| Dec-20 | 2 | 8 | 15 | 11 | -2 | 6 |
| Mar-21 | 3 | 11 | 15 | 14 | -1 | 9 |

**Source:** RBI supervisory returns.

**Chart 1.43: Average Risk-weighted Assets (RWA) of Old and New PVBs**

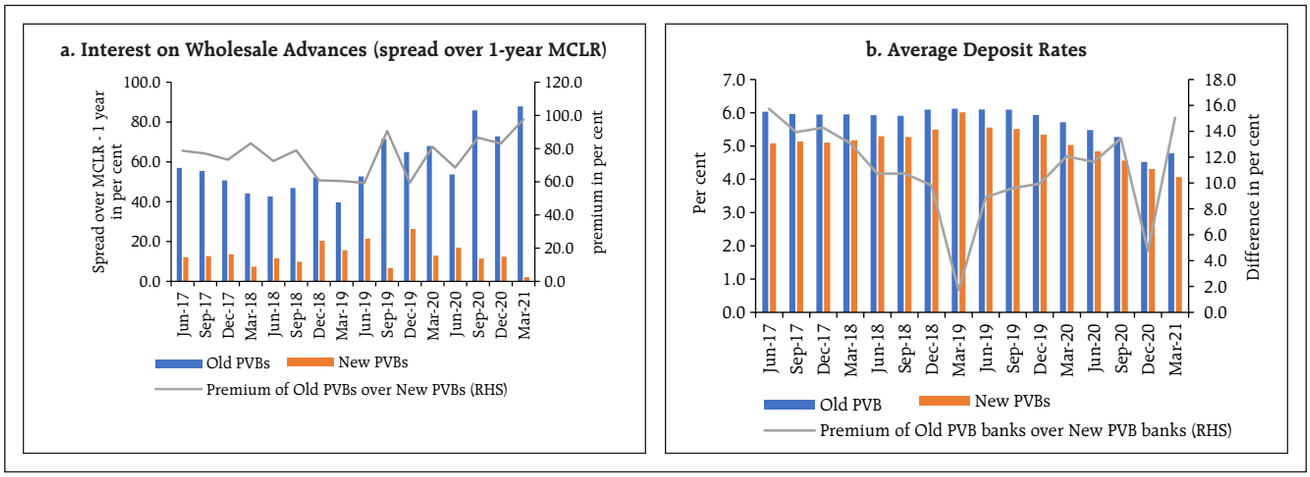



**Source:** CRILC and staff calculations

[21] *Cohort 1 (Old private sector banks)* include Catholic Syrian Bank, City Union Bank, Dhanlakshmi Bank, Federal Bank, Jammu and Kashmir Bank, Karnataka Bank, Karur Vysya Bank, Lakshmi Vilas Bank (up to November 2020), Nainital Bank, RBL Bank, South Indian Bank and Tamilnad Mercantile Bank and *Cohort 2 (new private sector banks)* include Axis Bank, Bandhan Bank, DCB Bank Limited, HDFC Bank, ICICI Bank, IDBI Bank Limited, IDFC First Bank, IndusInd Bank Ltd, Kotak Mahindra Bank and Yes Bank.

[22] Total RWAs have been determined by applying regulatory prescribed ratings-based risk weight percentages to the funded amount outstanding as shown in CRILC. Average RWAs has been calculated as total RWAs divided by total funded amount outstanding for each quarter. The latest available long-term rating at the end of the quarter is applied for the entire credit portfolio (across banks) of the borrower for that quarter.

**Chart 1.44: Interest Rate Movements - Old and New PVBs**




**Source:** RBI supervisory returns and staff calculations

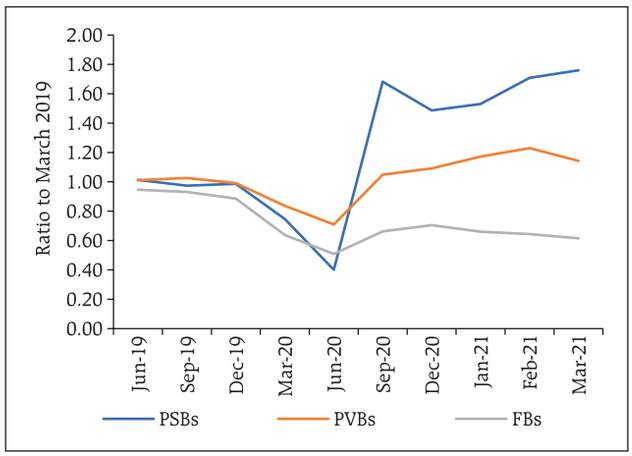
1.84 A comparison of the wholesale portfolio assets' yield spread over the 1-year marginal cost of lending rate (MCLR) across both the cohorts shows that old PVBs have been able to charge their customers a consistently higher premium over their MCLRs even though the risk profile of both categories of banks are largely similar in terms of average RWA (Chart 1.44 a). As the deposit cost structure for old PVBs is higher relative to new PVBs (Chart 1.44 b), the bigger margin may reflect the general adverse selection bias in the former's asset portfolios.

### I.2.13 Liquidity Risk in the Banking Sector

1.85 Liquidity in the banking system has remained in large surplus. The Reserve Bank's average daily net liquidity absorption stood at ₹4,96,154 crore during 2020-21 and ₹5,09,098 crore during 2021-22 so far (up to June 28). It amounted to nearly 3.2 per cent of SCBs' net demand and time liabilities (NDTL) during the latest reporting fortnight (June 4, 2021).

1.86 An analysis of bank group-wise estimated 30-day cash flows indicated a significant uptick relative to pre-COVID-19 levels for PSBs, specifically from retail and small business counterparties after expiry of the loan moratorium, though the standstill on asset classification continued up to March 2021 (Chart 1.45).

**Chart 1.45: Cash Inflows from Retail and Small Business Counterparties**




**Source:** RBI supervisory returns and staff calculations.

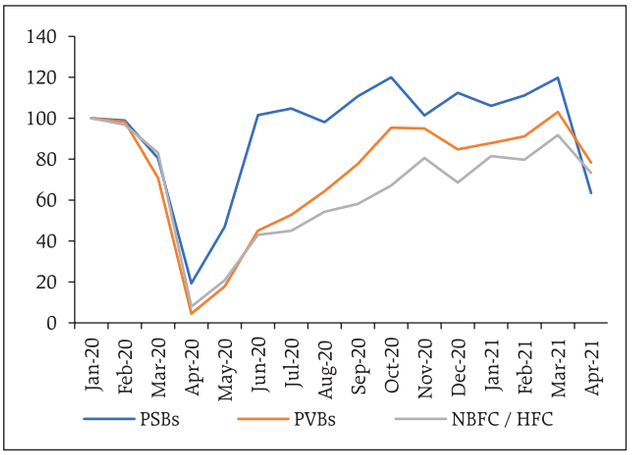
### I.2.14 Consumer Credit[23]

1.87 The overall demand for consumer credit, as reflected in inquiry volumes[24], had stabilised in Q4:2020-21 after a sharp rebound during the festive

[23] Consumer credit includes home loans, loans against property, auto loans, two-wheeler loans, commercial vehicle loans, construction equipment loans, personal loans, credit cards, business loans, consumer durable loans, education loans and gold loans.

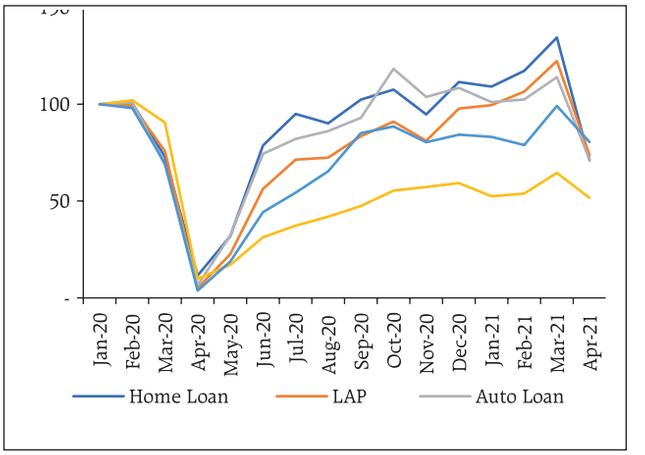
[24] A credit inquiry is created when any borrower applies for a loan and permits the lender to pull their credit record. Inquiries are among the first credit market measures to change in credit record data in response to changes in economic activity.

**Chart 1.46: Inquiry Volumes by Lender Category**
(Indexed to January 2020=100)




**Source:** TransUnion CIBIL

**Chart 1.47: Inquiry Volumes by Product**
**(Indexed to January 2020=100)**

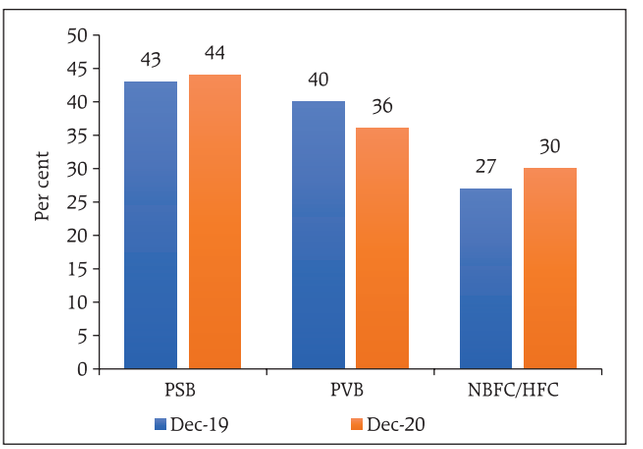



**Source:** TransUnion CIBIL

season in Q3:2020-21 after the first COVID-19 wave receded. The second wave, however, has sharply affected credit demand, with a steep fall in inquiries across product categories in April 2021 (Charts 1.46 and 1.47).

1.88 Loan approval rates remain healthy as the risk tier composition of inquiries shows a distinct tilt towards better rated customers. Growth in credit active consumers (i.e consumers with at least one outstanding credit account) and, outstanding balances, however, remains sluggish vis-a-vis a year ago (Charts 1.48 -1.50 and Table 1.27).

**Chart 1.48: Approval Rates by Lender Category (per cent)**




**Source:** TransUnion CIBIL

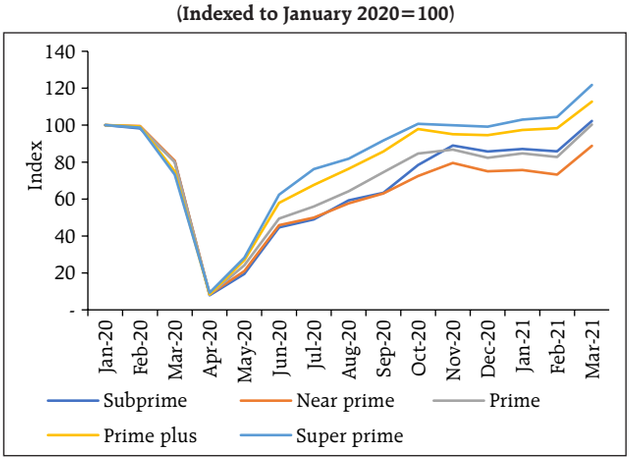
**Table 1.27: Growth in Credit Active Consumers (number) by Product Type**

(per cent)

| Product | January 2020 | January 2021 |
|---|---|---|
| Home Loans | 12.3 | 0.3 |
| Loans against property | 31.6 | 10.5 |
| Auto Loans | 9.7 | -3.6 |
| Personal Loans | 39.4 | 6.5 |
| Credit Cards | 22.9 | 6.3 |

**Source:** TransUnion CIBIL

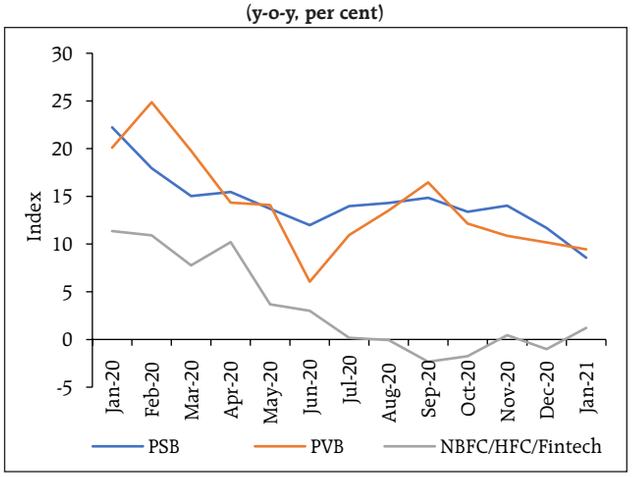
**Chart 1.49: Inquiry Volumes by Risk Tier[25]**
**(Indexed to January 2020=100)**




**Source:** TransUnion CIBIL

[25] 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.

**Chart 1.50: Growth in Outstanding Balances by Lender Category (y-o-y, per cent)**




**Source:** TransUnion CIBIL

1.89 Consumer credit deteriorated after the loan moratorium programme came to an end in September 2020. Customer risk distribution of the credit active population underwent a marginal shift towards the high-risk segment in January 2021 relative to January 2020. In terms of credit risk migration, even low risk tiers are showing downward momentum (Table 1.28). Consumer credit portfolios of non-PSBs are seeing incipient signs of stress (Table 1.29).

### I.2.15 Housing Market

1.90 The slowdown in the housing market witnessed even before the onset of the pandemic bottomed out in Q1:2020-21. During Q3 and Q4: 2020-21, residential housing property registration and sales across major cities exceeded their pre-pandemic average levels (Chart 1.51). This was largely aided by (a) stamp duty cuts by some states; (b) unmet demand during the COVID-19 related restrictions in H1:2020-21; and (c) moderation in interest rates. All-India House Price Index (HPI) increased (y-o-y) by 2.7 per cent in Q4:2020-21 *vis-a-vis* 3.9 per cent growth a year ago. On a sequential (q-o-q) basis, all-India HPI growth rate moderated to 0.2 per cent in Q4:2020-21.

**Table 1.28: Score Migration for Risk Categories**

(per cent)

| Risk Tier Jan-20 | Risk Tier Jan-21 | | | | |
|---|---|---|---|---|---|
| | Sub prime | Near prime | Prime | Prime plus | Super prime |
| Sub prime | 73.0 | 18.0 | 7.6 | 1.2 | 0.2 |
| Near prime | 28.0 | 30.4 | 31.4 | 8.9 | 1.2 |
| Prime | 12.7 | 15.6 | 44.3 | 23.3 | 4.1 |
| Prime plus | 5.4 | 7.5 | 25.5 | 49.8 | 11.8 |
| Super prime | 2.1 | 4.3 | 12.3 | 19.6 | 61.7 |

**Source:** TransUnion CIBIL.

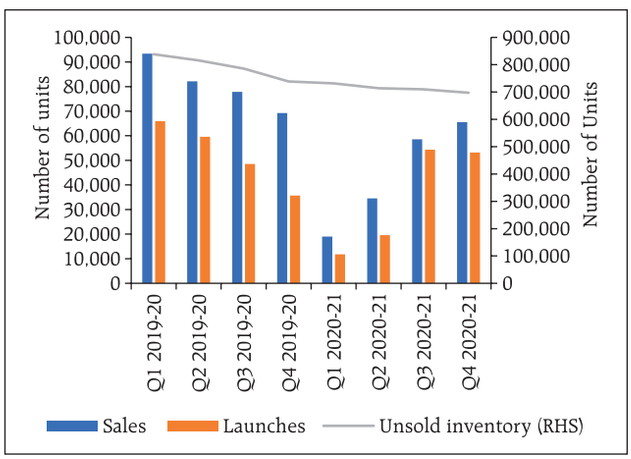
**Table 1.29: Delinquency Rates in Aggregate Consumer Credit**

(per cent)

| | PSB | PVB | NBFC / HFC |
|---|---|---|---|
| Jan-20 | 2.9 | 1.2 | 5.3 |
| Feb-20 | 2.9 | 1.1 | 5.2 |
| Mar-20 | 3.0 | 1.0 | 4.8 |
| Apr-20 | 3.2 | 1.1 | 5.2 |
| May-20 | 3.2 | 1.0 | 5.2 |
| Jun-20 | 3.0 | 1.2 | 5.0 |
| Jul-20 | 2.8 | 1.1 | 5.1 |
| Aug-20 | 2.7 | 1.1 | 5.2 |
| Sep-20 | 2.8 | 1.4 | 5.4 |
| Oct-20 | 2.6 | 1.4 | 5.3 |
| Nov-20 | 2.2 | 1.6 | 5.8 |
| Dec-20 | 2.0 | 2.2 | 6.3 |
| Jan-21 | 1.8 | 2.4 | 6.7 |

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

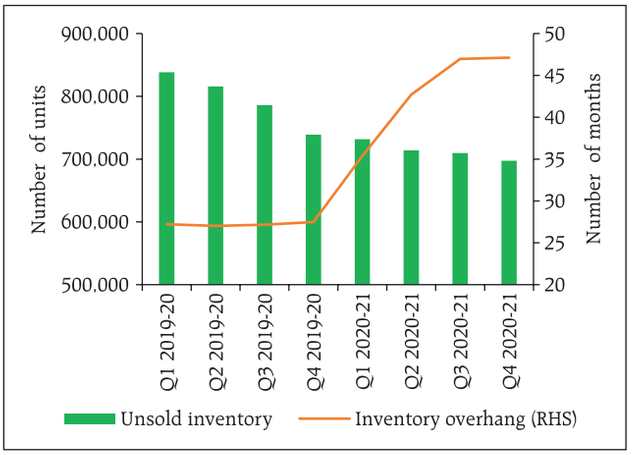
**Chart 1.51: House Launches and Sales**




**Source:** PropTiger DataLabs.

1.91 Although the level of housing inventory remains elevated, it has come down in the recent period due to lower new launches in relation to sales; new launches in premium and sub-premium categories, however, remain robust (Chart 1.52).

**Chart 1.52: Unsold Inventory and Inventory Overhang**




**Source:** PropTiger DataLabs

### I.2.16 Systemic Risk Survey[26]

1.92 In the latest round of the systemic risk survey (SRS) conducted during April-May 2021, all the broad categories of risks to the financial system (*viz.*, global; macroeconomic; financial market; institutional; and general risks) were perceived as 'medium' by the panellists. The risks for several sub-categories (*viz.*, commodity price risk; domestic growth and inflation; fiscal deficit; corporate vulnerabilities; equity price volatility; credit growth; banks' assets quality; capital requirements; and cyber risk) were, however, rated as 'high'.

1.93 A majority of the respondents expected deterioration in the growth prospects of the Indian banking sector over the next one year. They also expected a decline in credit demand over the next three months due to pandemic-related restrictions in different parts of the country and postponement of discretionary spending by consumers. The impact of shutdown of economic activity across states may moderate consumer demand, reduce income and payment capacity of borrowers, which might lead to deterioration in average credit quality and weigh on balance sheet of banks.

1.94 Respondents were unequivocal that the second wave of the COVID-19 pandemic would adversely impact employment, productivity and wages in the short-term. Construction and real estate, tourism and hospitality, aviation, retail and entertainment are assessed to have borne the brunt of the second wave. Over 60 per cent of the respondents predicted that the economic recovery after the second wave is likely to be K-shaped, *i.e.*, different parts of the economy recovering at different rates.

### Summary and Outlook

1.95 The impact of the pandemic on global and domestic economic conditions was, to an extent, moderated by a combination of unprecedented macroeconomic and regulatory policy support. As the global economy recovers, however, it remains uneven and divergent, warranting sustained policy support. A hastened pace and ramped up scale of the vaccination drive and quick bridging of gaps in the healthcare infrastructure across both urban and rural areas would make the recovery more durable.

1.96 Domestically, the near-term growth outlook faces headwinds from supply side constraints, surging global commodity prices, large swings in capital flows and global spillovers from financial market volatility that is in turn contingent upon policy stances of systemic economies. Hasty withdrawal of policy stimulus to support growth before sufficient coverage of the vaccination drive can sap macrofinancial resilience and have adverse unintended consequences.

[26] Details are given in Annex 1.

1.97 Reduction in banks' exposure to better rated borrowers and a somewhat uncertain risk profile for their other investment grade obligors have visibly impacted wholesale credit growth. Consumer credit demand, too, appears to have been dented by the second wave of the pandemic. Going forward, close monitoring on asset quality of MSME and retail portfolios of banks is warranted. This calls for banks to shore up capital positions while favourable market conditions prevail. The banking sector will be required to specifically guard against adverse selection bias while being alive to the credit demand from productive and viable sectors. In the most optimistic scenario, the impact of the second wave should be contained within the first quarter of the year, while frictional inflation pressures work their way out over the first half of the year. Financial intermediaries need to internalise these expectations into their outlook while staying on guard against potential balance sheet stress with sufficient capital and liquidity buffers and appropriate governance structures.

# Chapter II

## Financial Institutions: Soundness and Resilience

*Across the world, central banks, governments and financial regulators mobilised a war effort to contain the adverse impact of COVID-19. In India, banks were cushioned by policy support and were able to bolster their capital positions during 2020-21. Stress tests indicate that banks remain well capitalised and able to sustain a severe stress scenario. Financial network analysis for March 2021 reveals that outstanding bilateral exposures among the entities in the financial system grew, led by increased exposures of banks to NBFCs / HFCs, and of mutual funds to the financial system. Joint solvency-liquidity contagion analysis indicates a decline in the losses to the banking system due to idiosyncratic failure of banks.*

### Introduction

2.1 The COVID-19 pandemic has increased the risks to financial stability, especially when the unprecedented measures taken to mitigate the pandemic's destruction are normalised and rolled back. A key desideration will be the strength and durability of the economic recovery. Central banks across the world are bracing up to deal with the expected deterioration in asset quality of banks in view of the impairment to loan servicing capacity among individuals and businesses.

2.2 The initial assessment of major central banks is that while banks' financial positions have been shored up, there has been no significant rise in non-performing loans (NPLs) and policy support packages helped in maintaining solvency and liquidity (Table 2.1). The economic recovery, however, remains fragmented and overcast with high uncertainty.

**Table 2.1: Stress Test Results of COVID-19 pandemic by Central Banks** *(Contd.)*

| Central Bank | Earlier Assessment | Latest Position |
|---|---|---|
| Bank of England (BoE) | BoE's 'Desktop' stress test in the Interim FSR (May 2020) projected that, under appropriately prudent assumptions, aggregate CET-1 capital ratio of banks would decrease from 14.8 per cent at end-2019 to 11.0 per cent by the second year of test scenario (*i.e.*, 2021) and banks would remain well above their minimum regulatory capital requirements. | The CET-1 capital ratio increased to 15.8 per cent over the course of 2020. |
| De Nederlandsche Bank (DNB) | In the DNB's FSR for Spring 2020, the CET-1 ratio was projected to deplete from 16.5 per cent at the onset on the pandemic to 11.0 per cent by end 2022. | The CET1 ratio improved during the crisis to 17.3 per cent by end-2020. |
| European Central Bank (ECB) | In its COVID-19 vulnerability analysis results (June 2020) for 86 banks comprising about 80 per cent of total assets in the Euro Area, the ECB estimated that banks' aggregate CET-1 ratio would deplete by 1.9 percentage points to 12.6 per cent under the central scenario, and by 5.7 percentage points to 8.8 per cent under the severe scenario by end-2022. | The CET-1 ratio of Euro area banks on aggregate improved to 15.4 per cent in 2020. |
| Reserve Bank of New Zealand (RBNZ) | In its FSR of May 2020, the RBNZ anticipated (a) elevated level of impairment during the course of the pandemic from the prevailing GNPA ratio of 0.62 per cent and (b) banks' capital to fall below their minimum regulatory capital requirements in the very severe stress scenario. | As per its FSR of May 2021, the pandemic has had only a limited impact on the financial system soundness, due to government support as well as banks' strong capital and liquidity buffers.<br>The GNPA ratio reduced to 0.57 per cent whereas profitability and restrictions on dividend distribution facilitated banks in building up capital, raising the Tier-I capital ratio from 13.6 to 14.7 per cent. |

**Table 2.1: Stress Test Results of COVID-19 pandemic by Central Banks** *(Concld.)*

| Central Bank | Earlier Assessment | Latest Position |
|---|---|---|
| US Federal Reserve | In its June 2020 stress test and additional analysis in the light of the COVID-19 event, the US Fed found that banks generally had strong levels of capital, but considerable economic uncertainty remained. It projected that, under severely adverse scenario, the CET-1 ratio of large banks would decline from an average starting point of 12.0 per cent in the fourth quarter of 2019 to 10.3 per cent in first quarter of 2022. | CET-1 ratio for large banks increased to 13.0 per cent as at end-2020. |

2.3 This chapter presents an evaluation of the soundness and resilience of the financial intermediaries in India by analysing their recent performance as reflected in audited balance sheets and offsite returns. Section II.1 provides an assessment of recent performance, asset quality, capital adequacy and risks for SCBs. It also examines their resilience against macroeconomic shocks through stress tests and sensitivity analysis. Sections II.2 and II.3 cover the recent performance and the results of stress tests on scheduled urban cooperative banks (SUCBs) and NBFCs. The concluding Section II.4 presents a detailed analysis of the network structure and connectivity of the Indian financial system and the results of contagion analysis under adverse scenarios.

## II.1 Scheduled Commercial Banks[1] [2]

2.4 Aggregate deposits of SCBs rose 11.9 per cent y-o-y during 2020-21, but they have moderated during 2021-22 so far, growing by 9.7 per cent by June 4, 2021 (Chart 2.1 a). Current account and savings account (CASA) deposits grew at a faster pace than term deposits, possibly reflecting the propensity of savers to hold more liquid assets in the highly uncertain pandemic situation (Chart 2.1 b).

2.5 Bank credit growth remains subdued. During 2020-21, bank credit increased by 5.4 per cent (y-o-y), which was the lowest in the last four financial years (Chart 2.1 a) and it remains subdued in Q1:2021-22 (up to June 4). Credit by public sector banks (PSBs) and private sector banks (PVBs) increased by 3.2 per cent and 9.9 per cent (y-o-y), respectively, whereas the loan book of foreign banks (FBs) remained flat as on June 4, 2021. The overall credit to deposit (C-D) ratio continued on its declining trajectory. The incremental C-D ratio recorded an improvement during Q4:2020-21 (Chart 2.1 c) but turned negative in Q1:2021-22 (up to June 4).

2.6 Agriculture and personal loan[3] books remained bright spots and recorded double digit growth in March 2021 (Chart 2.1 d). Since then (till April 2021), however, loans to these sectors have contracted by less than one per cent. In the personal loan category, housing and vehicle loans witnessed encouraging growth; vehicle loan growth exceeded its pre-COVID-19 levels for both PSBs and PVBs (Chart 2.1 e). SCBs' credit outstanding to the

[1] Analyses are mainly based on RBI's supervisory returns which cover only domestic operations of SCBs, except in the case of data on large borrowers, which are based on banks' global operations. For CRAR projections, a sample of 46 SCBs (including public sector banks (PSBs), private sector banks (PVBs) and foreign banks (FBs)) 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 11, 2021 which are provisional. SCBs include public sector banks, private sector banks and foreign banks.

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

**Chart 2.1: Select Performance Indicators** *(Contd.)*

**Chart 2.1: Select Performance Indicators** *(Concld.)*


**Source:** RBI supervisory returns and staff calculations.

industrial sector, which had contracted over the past five quarters (Chart 2.1 d), turned a corner during Q4:2020-21 but the sector's share in total credit declined during the year (Chart 2.1 f). Growth in bank loans to the services sector remained tepid across all bank groups since the onset of the pandemic and slipped into negative zone in Q4:2020-21, with PSBs being the major contributors to the fall (Chart 2.1 d). In 2021-22 so far (till April 2021), outstanding loans to the services sector have contracted by more than one per cent as compared to end-March 2021 level.

2.7 New loans extended by SCBs showed recovery in the second half of 2020-21, especially for agricultural and personal purposes (Table 2.2). New loans to the private corporate and household sectors, which nosedived during the first half, recovered in the subsequent period. Loan demand exhibited signs of revival during Q4:2020-21, especially in the share of new loans in total loans.

2.8 During 2020-21, the net interest margin (NIM) of SCBs stood at 3.3 per cent, similar to the previous year (Chart 2.1 g). The amount of provisions made during 2020-21 declined by 20 per cent (y-o-y), with risk provisions falling by 28.1 per cent. Net interest income (NII) of SCBs clocked a 13.1 per cent increase (y-o-y) in March 2021 (Chart 2.1 h). The return on assets (RoA) and return on equity (RoE) maintained their positive upturn, with PSBs recording multi-year highs whereas these ratios dipped marginally for PVBs and FBs on a sequential basis (Chart 2.1 i and Chart 2.1 j).

2.9 Further easing of monetary conditions since the onset of the pandemic was transmitted to the spectrum of interest rates. The cost of funds and yield on assets declined across bank groups to reach their lowest levels in the last two decades (Chart 2.1 k and l).

**Table 2.2: Growth in New Loans by SCBs: Economic Sectors and Organisations***

(per cent)

| Sector | Q4: 2019-20 | Q1: 2020-21 | Q2: 2020-21 | Q3: 2020-21 | Q4: 2020-21 |
|---|---|---|---|---|---|
| | Growth (Y-o-Y) | | | | |
| **Economic sector wise** | | | | | |
| Agriculture | -2.0 | -22.3 | 18.0 | 4.8 | 20.5 |
| Industry | 19.3 | -20.2 | -15.4 | 15.0 | -8.6 |
| Services | 14.3 | -12.3 | -9.8 | -0.6 | 4.1 |
| Personal loans | 11.3 | -59.1 | 4.2 | 10.6 | 35.5 |
| **Organisation wise** | | | | | |
| Public sector | 36.9 | 1.4 | 26.8 | 8.4 | -11.5 |
| Private corporate sector | 4.8 | -21.6 | -28.9 | 8.7 | 2.9 |
| Household sector | 3.8 | -43.5 | 5.9 | 5.1 | 26.3 |
| *of which*, Individuals | *8.0* | *-50.1* | *3.8* | *4.7* | 27.4 |
| Other sectors | 4.4 | 2.1 | 2.8 | 15.5 | -26.4 |
| **All new loans** | **11.4** | **-24.6** | **-7.4** | **7.3** | **6.0** |
| **New loans in total loans** (Share) | **16.6** | **10.9** | **14.4** | **15.1** | **16.7** |

**Note:** * excluding regional rural banks (RRBs).
**Source:** Basic Statistical Returns -1, RBI.

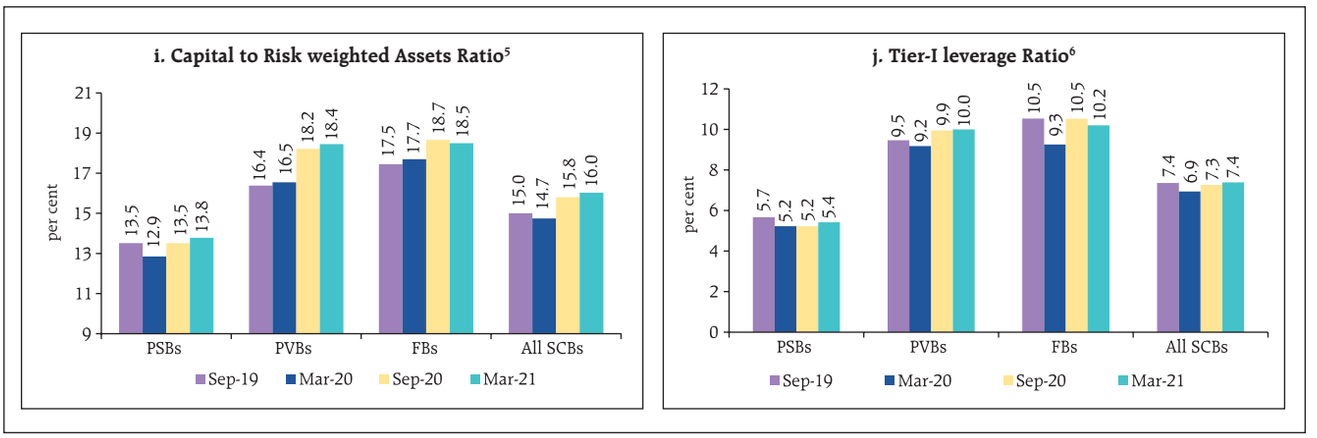
### II.1.1 Asset Quality and Capital Adequacy

2.10 With the asset classification standstill lifted in March 2021, a clearer picture of the quality of banks' balance sheets has emerged. SCBs' gross non-performing assets (GNPA) and net NPA (NNPA) as ratios of gross advances settled at 7.5 per cent and 2.4 per cent, respectively at the end of March 2021 (Charts 2.2 a and b). Furthermore, banks' resort to restructuring under the COVID-19 resolution framework was not significant (Chart 2.2 c) and write-offs as a percentage of GNPA at the beginning of the year, fell sharply as compared to 2019-20, except for PVBs (Chart 2.2 d). Overall, GNPAs declined by 5.9 per cent, mainly due to a fall of 8.4 per cent in bad loans of PSBs (Chart 2.2 e).

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


[4] Provisioning coverage ratio (without write-off adjustment) = Provisions held for NPA * 100 / GNPAs.

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




**Source:** RBI supervisory returns and staff calculations.

2.11 The annual slippage ratio of all SCBs, measuring new accretions to NPAs as a share of standard advances at the beginning of the year, fell to 2.5 per cent in 2020-21, but rose for FBs (Chart 2.2 f).

2.12 SCBs' overall NPA provisions contracted by 2.2 per cent (y-o-y) in March 2021, with the decline being accounted for in varying degrees by all bank groups (Chart 2.2 g). The provisioning coverage ratio (PCR) - the proportion of provisions (without write-offs) held for NPAs to GNPA - increased from 66.2 in March 2020 to 68.9 per cent in March 2021, primarily due to a relatively higher decline in GNPA. The PCR for PSBs increased, but declined for PVBs and FBs during the year (Chart 2.2 h).

2.13 Banks were able to bolster their capital positions during 2020-21 by raising equity through various modes, such as preferential allotment, qualified institutional placement (QIP), public issue, and capital infusion by the Government of India as well as through retention of profits. As a result, the capital to risk-weighted assets ratio (CRAR) of SCBs increased by 130 bps from 14.7 per cent in March 2020 to 16.0 per cent in March 2021, with PVBs improving their ratios even further (Chart 2.2 i). The tier-I leverage ratio, which is the ratio of tier 1 capital to total assets, improved marginally to 7.4 per cent in March 2021 from 6.9 per cent in March 2020, contributed by PVBs and FBs (Chart 2.2 j).

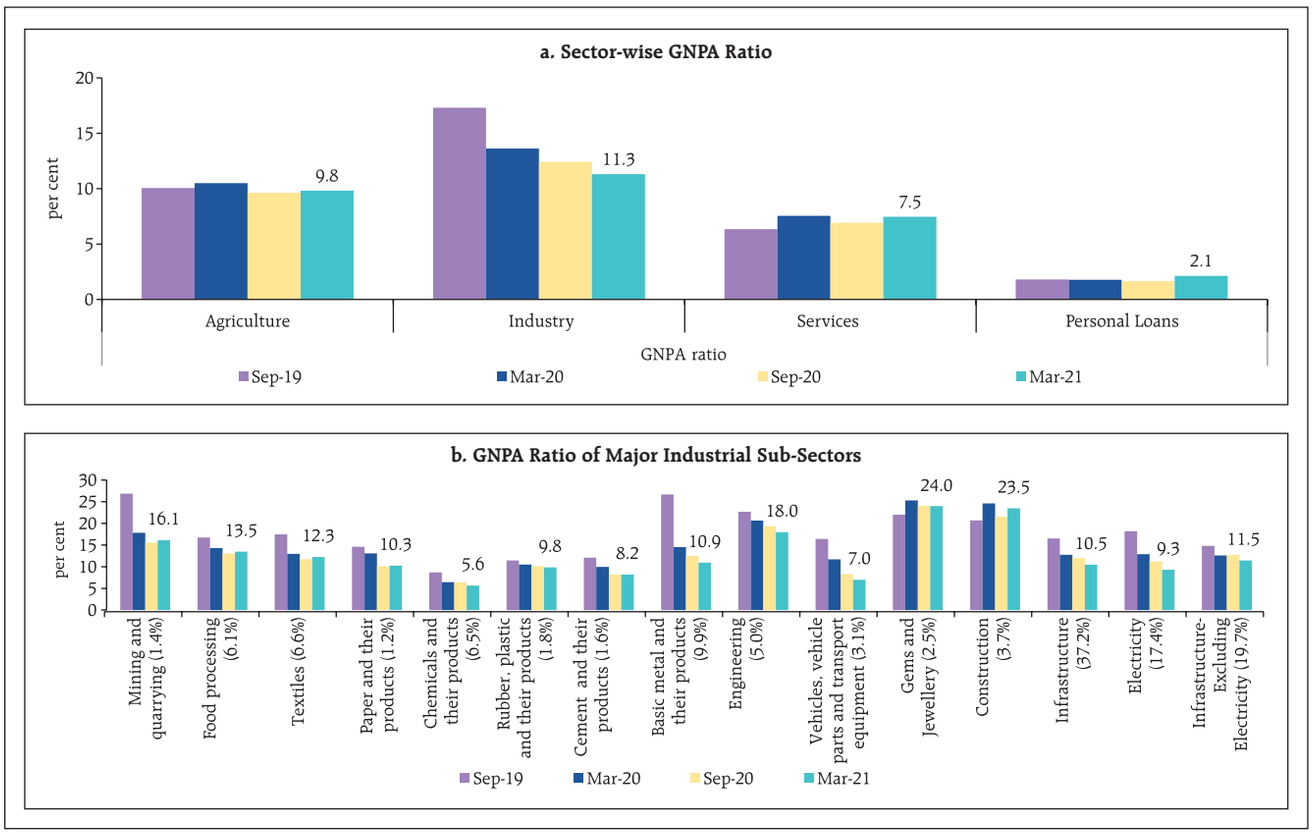
### II.1.2 Sectoral Asset Quality

2.14 SCBs' GNPA ratios for two major sectors, *viz.*, agriculture and industry declined during 2020-21, but rose for the personal loan sector (Chart 2.3 a). Within the industrial sector too, the ratio reduced for all the sub-sectors in March 2021 relative to a year ago (Chart 2.3 b).

[5] The CRAR pertains to all SCBs.

[6] Tier I leverage ratio is the ratio of Tier I capital to total assets.

**Chart 2.3: Sectoral Asset Quality Indicators**




**Note:** Numbers given in parentheses with the legend are the shares of the respective sub-sector's credit in total credit to industry.
**Source:** RBI supervisory returns and staff calculations.

### II.1.3 Credit Quality of Large Borrowers[7]

2.15 The share of large borrowers in the aggregate loan portfolio of SCBs stood at 52.7 per cent in March 2021, but they accounted for a share of 77.9 per cent of the total GNPAs (73.5 per cent in September 2020) (Chart 2.4 a).

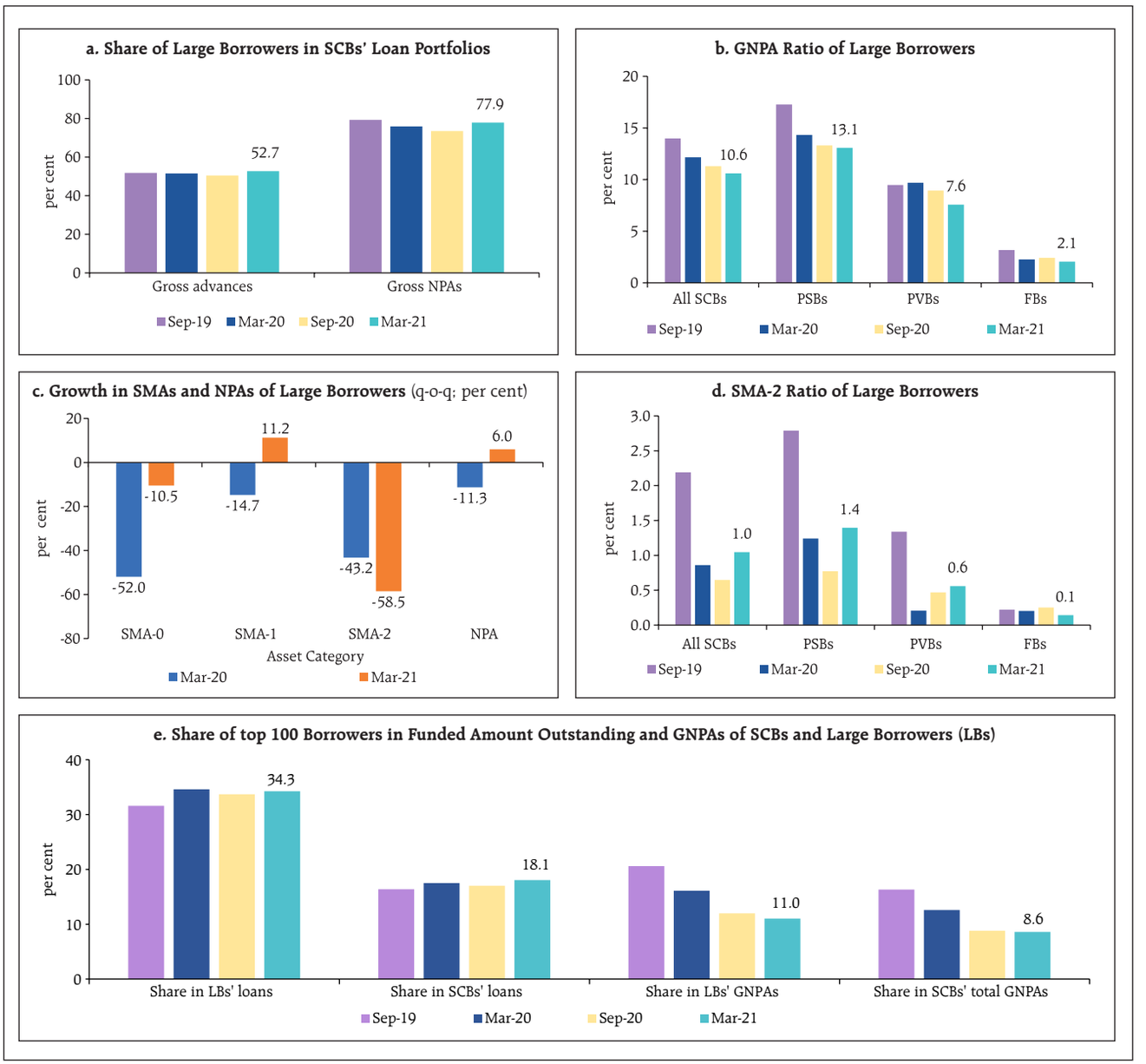
2.16 The GNPA ratio for large borrowers declined across all categories of banks during H2:2020-21 (Chart 2.4 b) though there was a sequential uptick in the growth of loans in the SMA-1[8] category. SMA-2 category loans registered a sharp contraction after a significant chunk was recognised as NPAs following vacation of the freeze on asset classification

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

[8] SMA-0: Principal or interest payment or any other amount wholly or partly overdue between 1-30 days;
SMA-1: Principal or interest payment or any other amount wholly or partly overdue between 31-60 days;
SMA-2: Principal or interest payment or any other amount wholly or partly overdue between 61-90 days.

(Chart 2.4 c). Even so, SMA-2 ratios of large borrowers of both PSBs and PVBs were higher *vis-à-vis* in March 2020 and in September 2020 (Chart 2.4 d). The share of the top 100 large borrowers in aggregated SCBs' GNPAs declined y-o-y, but with a rising profile during 2020-21 (Chart 2.4 e).

**Chart 2.4: Select Asset Quality indicators of Large Borrowers**




**Source:** RBI supervisory returns and staff calculations.

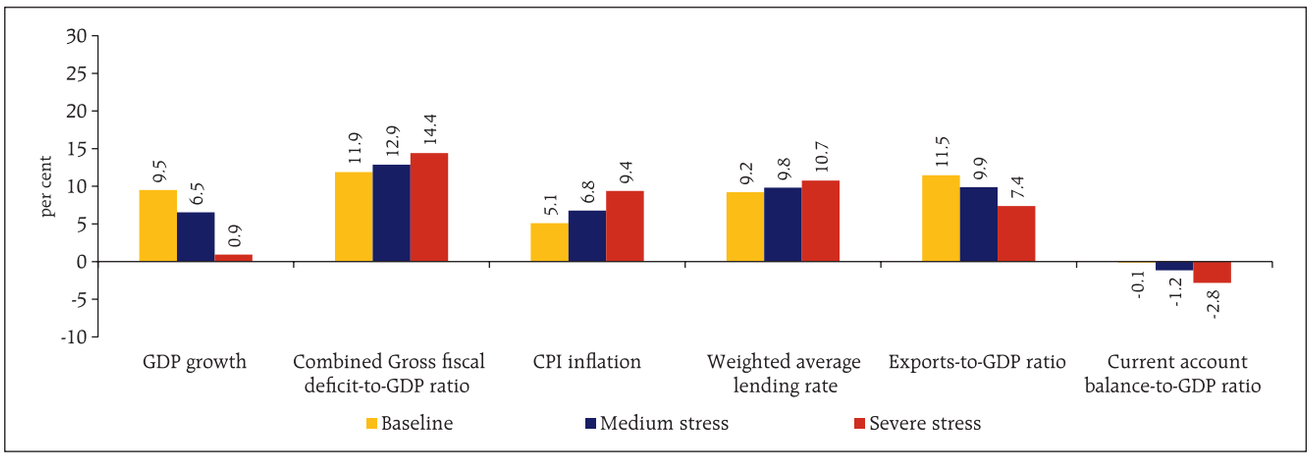
### II.1.4 Resilience – Macro Stress Tests

2.17 The resilience of SCBs' balance sheets to unforeseen shocks emanating from the macroeconomic environment has been assessed through macro-stress tests. By design, these stress tests have simulated hypothetical adverse configurations of the underlying macroeconomic conditions and their results are presented as stringent conservative assessments. In essence, capital and impairment ratios are simulated over a one-year horizon under a baseline, and two adverse (medium and severe) scenarios. **It is emphasised that model outcomes do not amount to forecasts. They are indicative of the possible economic impairment latent in banks' portfolios, with implications for capital planning.**

2.18 The baseline scenario is derived from the steady state values of macroeconomic variables[9] and indicates the central path. The medium and severe adverse scenarios were arrived at by applying 0.25 to one standard deviation (SD) and 1.25 to 2 SD negative shocks, respectively, to each of the macroeconomic variables, increasing the shocks by 25 basis points for each successive quarter (Chart 2.5).

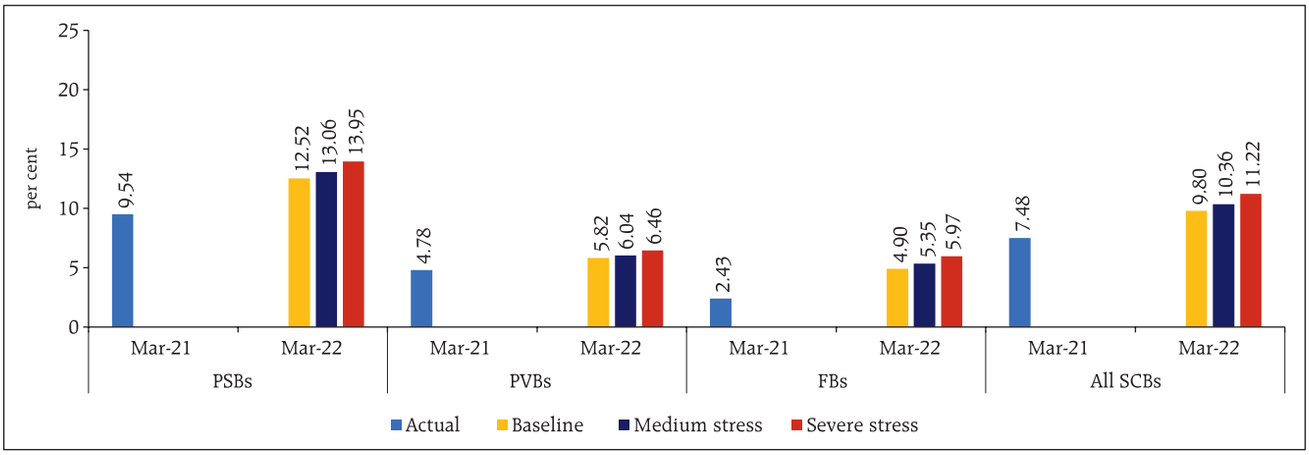
2.19 The stress test results published in the FSR January 2021 were arrived at by employing an estimation process using slippage ratios and GNPA ratios for December 2019 as the starting point, as data for the quarter ended September 30, 2020 had been affected by the standstill on asset classification. With the vacation of standstill on asset classification in March 2021 and the data reflecting the updated asset quality position being available, stress tests presented here are based on the regular methodology (Annex 2), with the exception that reported slippages for Q4:2020-21 have been distributed between Q3 and Q4 to offset the incidence of the entire slippage resulting from removal of asset classification standstill on the results for Q4 alone.

**Chart 2.5: Macroeconomic Scenario Assumptions – FY:2021-22**




[9] GDP growth, combined fiscal deficit-to-GDP ratio, CPI inflation, weighted average lending rate, exports-to-GDP ratio and current account balance-to-GDP ratio

**Chart 2.6: Projection of SCBs' GNPA Ratios under Stressed Scenarios**

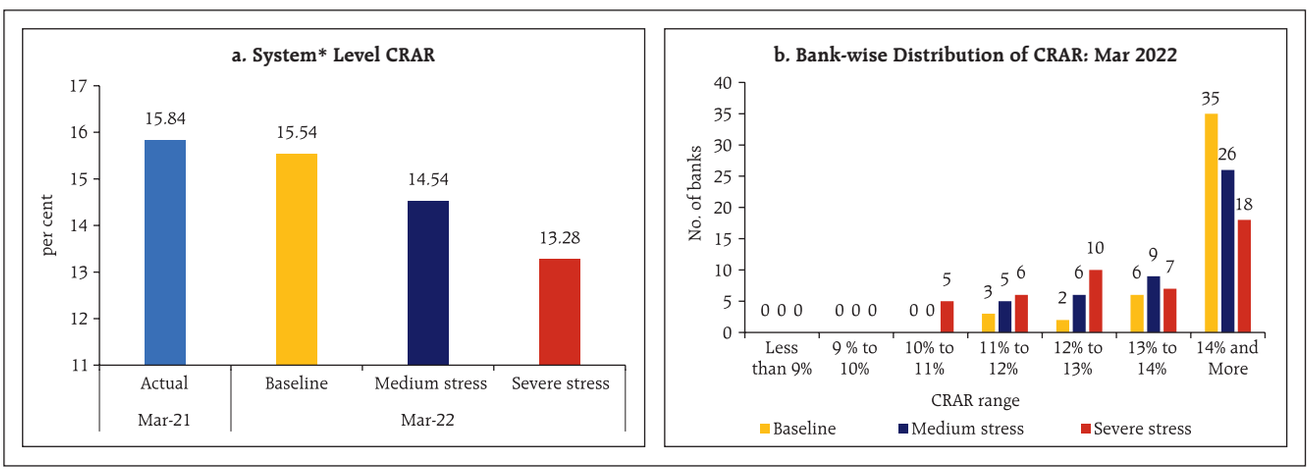



**Note:** GNPAs are projected using three complementary econometric models- multivariate regression; vector autoregression (VAR) and quantile regression; the resulting GNPA ratios are averaged.
**Source:** RBI supervisory returns and staff calculations.

2.20 The stress tests indicate that the GNPA ratio of all SCBs may transition to 9.80 per cent in the baseline scenario by March 2022 and can increase to 10.36 per cent and 11.22 per cent under the two stress scenarios defined earlier (Chart 2.6). Within the bank groups, PSBs' GNPA ratio of 9.54 per cent in March 2021 edging up to 12.52 per cent by March 2022 under the baseline scenario is an improvement over earlier expectations and indicative of pandemic proofing by regulatory support. For PVBs and FBs, the transition of the GNPA ratio from baseline to severe stress is from 5.82 per cent to 6.04 per cent to 6.46 per cent, and from 4.90 per cent to 5.35 per cent to 5.97 per cent, respectively.

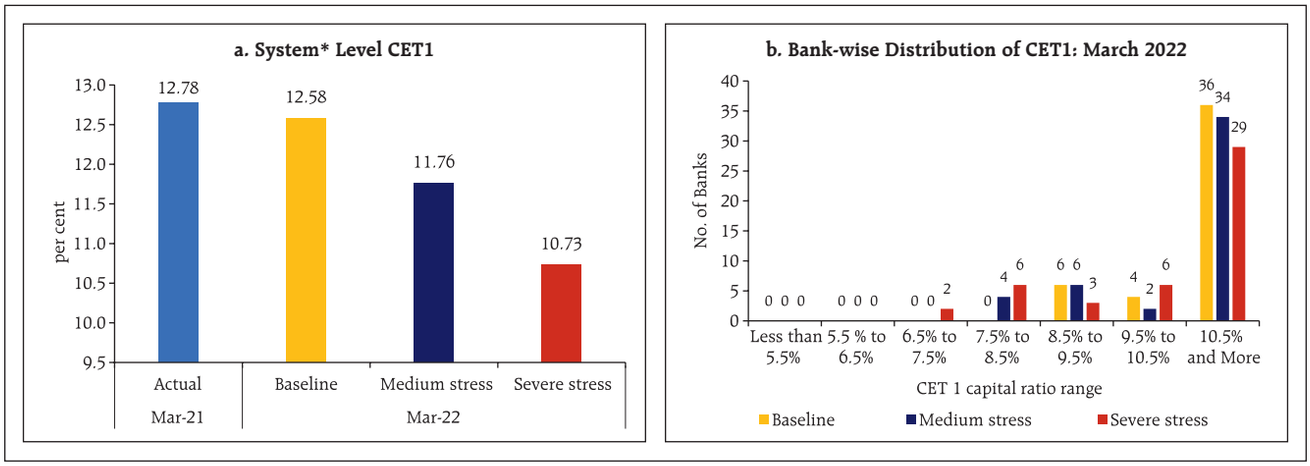
2.21 Under the baseline and the two stress scenarios, the system level CRAR holds up well, moderating by 30 basis points between March 2021 and March 2022 under the baseline scenario and by 130 bps and 256 bps, respectively, under the two stress scenarios (Chart 2.7 a). All 46 banks would be able to maintain CRAR well above the regulatory minimum of 9 per cent as of March 2022 even in the worst case scenario (Chart 2.7 b).

**Chart 2.7: CRAR Projections under Stressed Scenarios**




* For a system of 46 major SCBs.
**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 2.8: Projection of CET-1 Capital Ratio under Stressed Scenarios**




* 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:** Reserve Bank's supervisory returns and staff calculations.

2.22 The common equity Tier I (CET-1) capital ratio of SCBs may decline from 12.78 per cent in March 2021 to 12.58 per cent under the baseline scenario and further to 11.76 per cent and 10.73 per cent, respectively, under the medium and severe stress scenarios by March 2022 (Chart 2.8 a). Even under adverse scenarios, however, no bank is expected to face a decline of CET-1 capital ratio below the regulatory minimum of 5.5 per cent (excluding capital conservation buffer [CCB])(Chart 2.8 b).

### II.1.5 Sensitivity Analysis[10]

2.23 Top-down[11] sensitivity analysis involving several single-factor shocks[12] to simulate credit, interest rate, equity price and liquidity risks under various stress scenarios[13] are also carried out as a robustness check to assess the vulnerabilities of SCBs, based on March 2021 data.

#### a. Credit Risk

2.24 Credit risk sensitivity has been analysed under two scenarios – the system-level GNPA ratio is assumed to rise in a quarter by (i) 1-SD[14] and (ii) 2-SD from its current level. It is observed that under a severe shock of 2-SD, the GNPA ratio of 46 select SCBs moves up from 7.5 per cent to 13.3 per cent, while the system-level CRAR would decline from 15.8 per cent to 12.0 per cent and the Tier-1 capital ratio from 13.7 per cent to 9.9 per cent. The system-level capital impairment could be about 25.7 per cent (Chart 2.9 a).

2.25 A reverse stress test shows that it requires a shock of 4.3 SD to bring down the system-level CRAR to 9 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 GNPAs, 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] For details of the stress tests, please see Annex 2.

[13] 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.

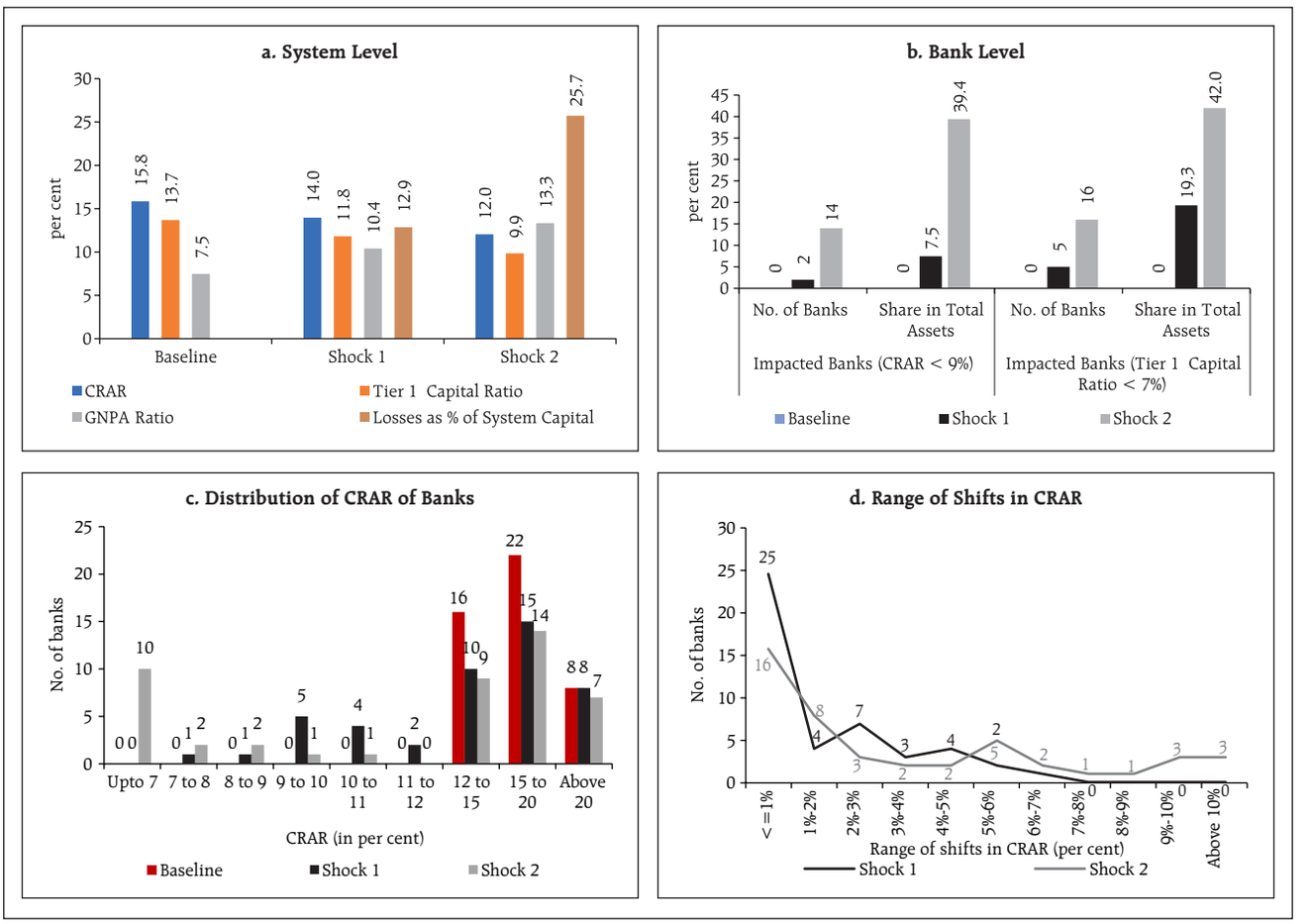
[14] The SD of the GNPA ratio is estimated by using quarterly data since March 2011. One SD shock approximates a 39 per cent increase in the level of GNPAs.

2.26 Bank-level stress test results show that under the 2-SD shock scenario, 14 banks with a share of 39 per cent in SCBs' total assets may fail to maintain the regulatory minimum level of CRAR (Chart 2.9 b). The CRAR would fall below 7 per cent in case of 10 banks (Chart 2.9 c) and 10 banks would record a decline of over six percentage points in the CRAR. In general, PVBs and FBs would face lower erosion in their CRARs than PSBs under both scenarios (Chart 2.9 d).

### b. Credit Concentration Risk

2.27 Stress tests on banks' credit concentration – considering top individual borrowers according to their standard exposures – shows that in the extreme scenario of the top three individual borrowers of the banks under consideration failing to repay[15], no bank will face a situation of fall in CRAR below the regulatory requirement of 9 per cent, although 37 banks would experience a decline

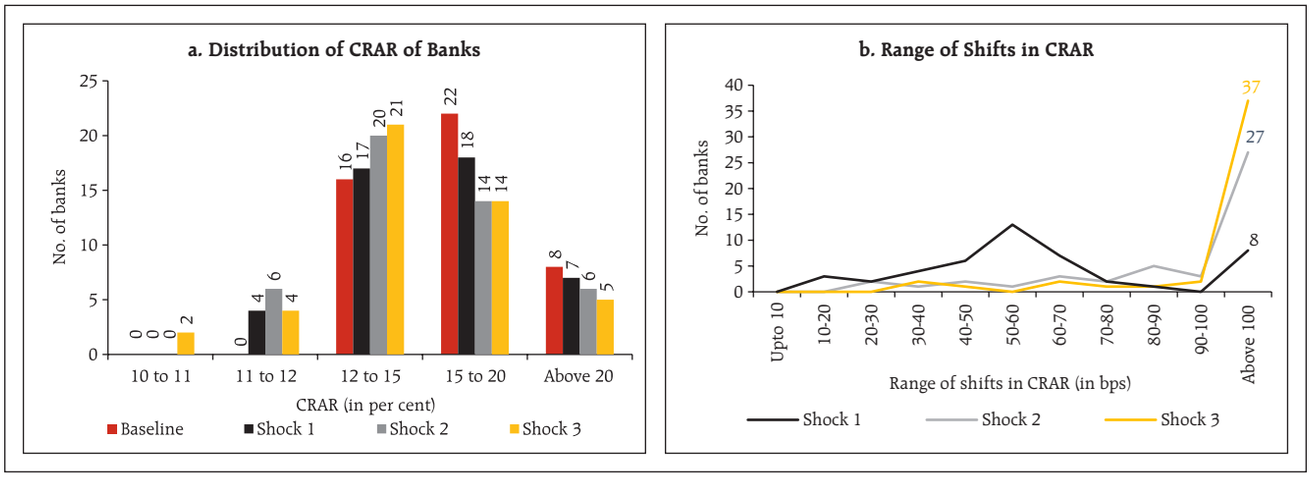
**Chart 2.9: Credit Risk - Shocks and Outcomes**




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

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

**Chart 2.10: Credit Concentration Risk: Individual Borrowers' Exposure**

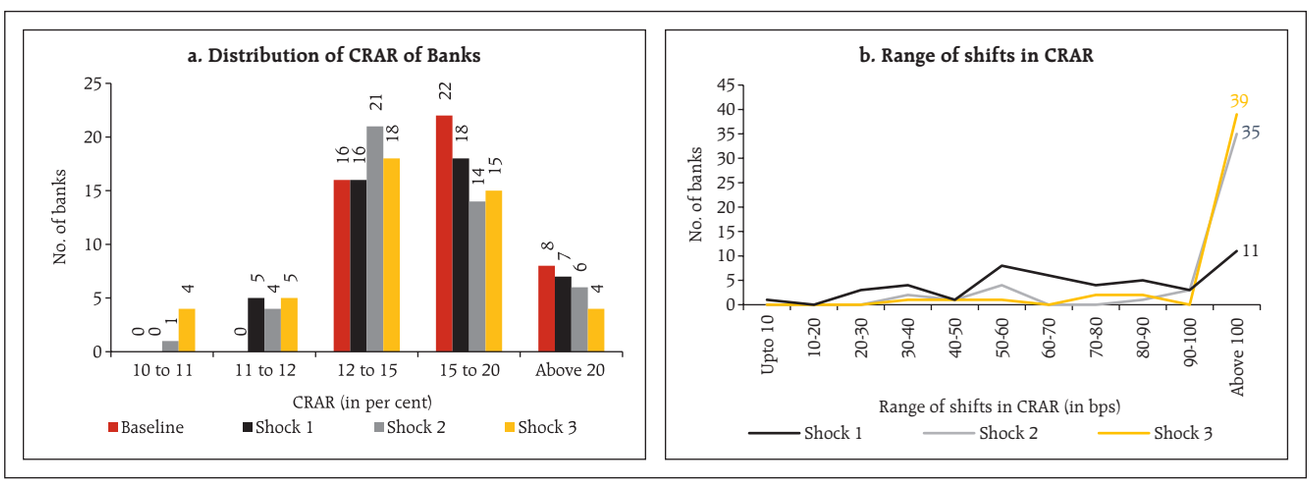



**Note:** For a system of select 46 SCBs
Shock 1: Topmost individual borrower fails to meet payment commitments
Shock 2: Top 2 individual borrowers fail to meet their payment commitments
Shock 3: Top 3 individual borrowers fail to meet their payment commitments
**Source:** RBI supervisory returns and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

of more than one percentage point in their CRARs (Chart 2.10 a and b).

2.28 Under the extreme scenario of the top three group borrowers in the standard category failing to repay[16], the worst impacted four banks would have CRARs in the range of 10 to 11 per cent (Chart 2.11 a) and 39 banks would experience a decline in CRAR of more than one percentage point (Chart 2.11 b).

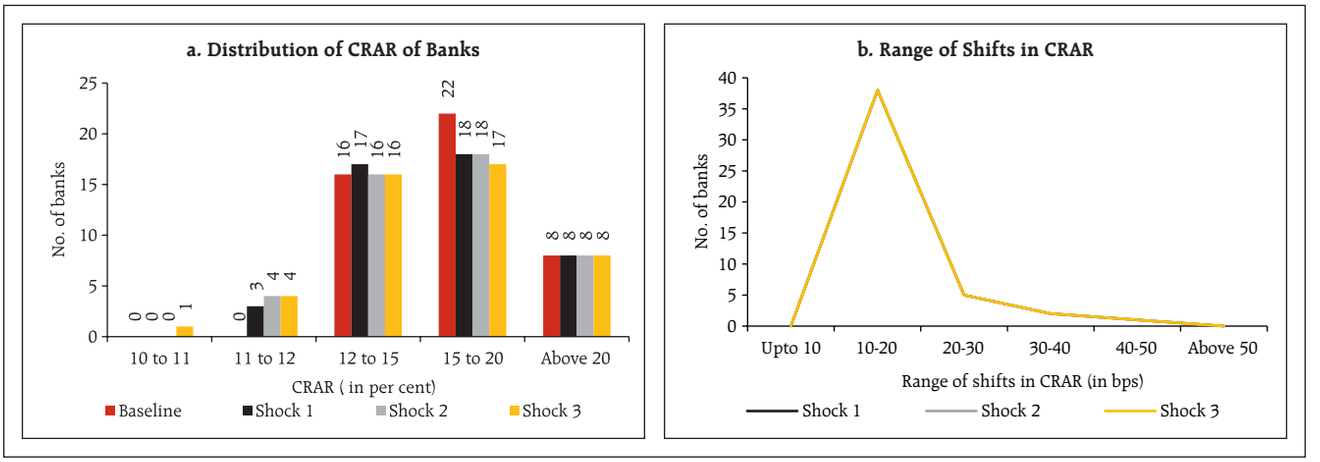
**Chart 2.11: Credit Concentration Risk: Group Borrowers' Exposure**




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

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

**Chart 2.12: 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.

2.29 In the extreme scenario of the top three individual stressed borrowers of these banks failing to repay[17], a majority of the banks would experience a reduction of 10 to 20 bps only in their CRARs on account of low level of stressed assets in March 2021 (Chart 2.12).

### c. Sectoral Credit Risk

2.30 Shocks applied on the basis of volatility of industry sub-sector wise GNPA ratio indicate varying magnitudes of increases in banks' GNPAs. A 2-SD shock to the segments of infrastructure-energy and basic metals and metal products would reduce the system-level CRAR by 17 bps and 16 bps, respectively (Table 2.3).

### d. Interest Rate Risk

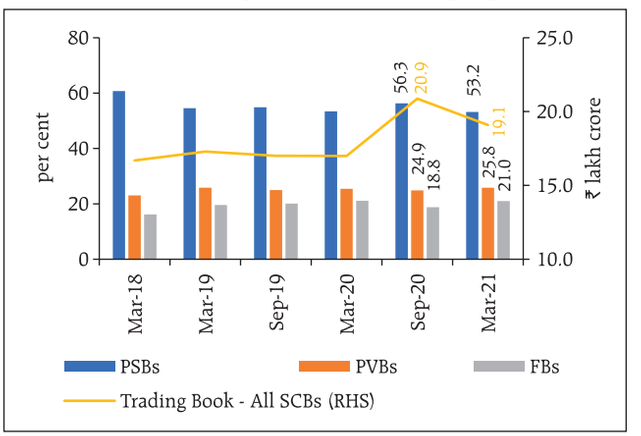
2.31 The market value of investments subject to fair value for the current sample of SCBs stood at ₹19.1 lakh crore in March 2021, down from the high reached in September 2020 (Chart 2.13). About 95 per cent of these investments were classified as available for sale (AFS) and remaining as held for trading (HFT).

**Table 2.3: Decline in System Level CRAR**
(basis points, in descending order for top 10 most sensitive sectors)

| Sector | 1-SD | 2-SD |
|---|---|---|
| Infrastructure - Energy (71%) | 9 | 17 |
| Basic Metal and Metal Products (115%) | 9 | 16 |
| Infrastructure - Transport (38%) | 3 | 7 |
| Engineering (40%) | 3 | 4 |
| Textiles (34%) | 2 | 4 |
| Construction (26%) | 2 | 3 |
| Food processing (26%) | 2 | 3 |
| Infrastructure - Communication (40%) | 1 | 2 |
| Vehicles, vehicle parts and transport equipments (95%) | 1 | 2 |
| Petroleum (non-infra), coal products (non-mining) and nuclear fuels (92%) | 1 | 2 |

**Note:** 1. For a system of select 46 banks.
2. Figures in parentheses represent the growth in GNPAs of that sub-sector due to 1-SD shock to the sub-sector's GNPA ratio.
**Source:** RBI supervisory returns and staff calculations

**Chart 2.13: Trading Book Portfolio: Bank-group wise**




**Source:** Individual bank submissions and staff calculations.

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

2.32 The sensitivity (PV01[18]) of the AFS portfolio increased marginally *vis-à-vis* the December 2020 position at an aggregate level, driven by FBs registering a 9.5 per cent increase whereas PSBs as well as PVBs saw a decline in their PV01 values. Some positioning in the greater than 10-year segment by FBs involved bonds held as cover for hedging derivatives, which may not be active contributors to PV01 risk. In terms of PV01 curve positioning, the tenor-wise distribution in PSBs indicated a flattening bias in the greater than 10-year maturity bucket relative to the 5-10 year tenor, whilst PVBs' sensitivity increased at both the tails. The FBs further built upon their view on the long end of the curve, with an enhanced share in the greater than 10-year bucket (Table 2.4).

2.33 Trading profits reduced in absolute as well as percentage terms across all bank groups during Q4:2020-21 (both q-o-q and y-o-y basis), driven by yield curve movements (Table 2.5 and Chart 2.14). An increase in PV01 sensitivity and adverse movement of the yield curve, if any, may affect banks' trading profit going forward. Nevertheless, the Government Securities Acquisition Program (G-SAP 1.0) conducted during April-June 2021 and G-SAP 2.0 announced on June 4, 2021 for Q2:2021-22 along with the enhanced HTM limit permitted by the Reserve Bank on February 5, 2021 should help cushion mark-to-market (MTM) losses for banks.

2.34 The interest rate exposure of PVBs and FBs continued to be higher than that of PSBs in their HFT portfolios relative to their AFS book. The tenor-wise PV01 distribution for PVBs and FBs showed a pronounced shift to shorter tenor exposures (Table 2.6). PV01 of PSBs was almost entirely concentrated in the 5-10 year segment, although their total PV01 sensitivity remained small.

**Table 2.4: Tenor-wise PV01 Distribution of AFS Portfolio**
(in per cent)

| | Total (in ₹ crore) | < 1 year | 1 year-5 year | 5 year-10 year | > 10 years |
|---|---|---|---|---|---|
| PSBs | 227.9 (232.4) | 7.0 (7.5) | 38.3 (38.5) | 38.4 (40.8) | 16.3 (13.2) |
| PVBs | 64.9 (65.1) | 17.0 (14.5) | 54.9 (55.0) | 22.0 (26.5) | 6.1 (4.0) |
| FBs | 110.6 (101.0) | 3.1 (3.4) | 32.6 (38.9) | 10.8 (11.3) | 53.4 (46.3) |

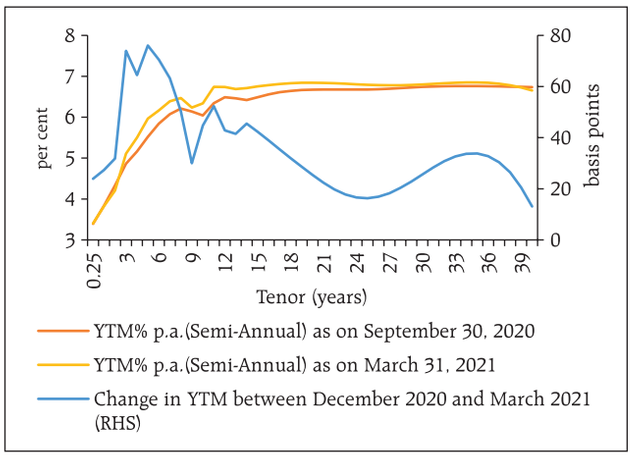
**Note:** Values in the brackets indicate December 2020 figures.
**Source:** Individual bank submissions and staff calculations.

**Table 2.5: OOI - Profit/(Loss) on Securities Trading**
(in ₹ crore)

| | Mar-20 | Jun-20 | Sep-20 | Dec-20 | Mar-21 |
|---|---|---|---|---|---|
| PSBs | 8,270 (21.5%) | 10,082 (22.9%) | 6,847 (14.9%) | 9,055 (18.4%) | 5,112 (10.5%) |
| PVBs | 4,185 (8.6%) | 9,883 (22.3%) | 4,523 (10.3%) | 4,825 (10.1%) | 2,495 (5.3%) |
| FBs | 229 (2.6%) | 1,731 (18.3%) | 622 (5.8%) | 12 (0.2%) | -203 (-1.8%) |

**Note:** Figures in parentheses represents OOI-Profit/(Loss) as a percentage of Net Operating Income.
**Source:** RBI supervisory returns.

**Chart 2.14: Yield Curves and Shift in Yields across tenors since September 2020**




**Source:** Fixed Income Money Markets and Derivatives Association of India (FIMMDA).

**Table 2.6: Tenor-wise PV01 Distribution of HFT portfolio**
(in per cent)

| | Total (in ₹ crore) | < 1 year | 1 year-5 year | 5 year-10 year | > 10 years |
|---|---|---|---|---|---|
| PSBs | 0.2 (0.8) | 4.8 (3.7) | 1.3 (14.9) | 93.9 (35.4) | 0.0 (46.0) |
| PVBs | 8.1 (12.3) | 16.3 (2.5) | 49.5 (58.2) | 24.2 (25.9) | 10.0 (13.4) |
| FBs | 11.1 (8.2) | 3.2 (4.4) | 47.9 (12.9) | 47.8 (62.7) | 1.2 (20.0) |

**Note:** Values in the brackets indicate December 2020 figures.
**Source:** Individual bank submissions and staff calculations.

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

2.35 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 2.5 percentage points in the yield curve would lower the system level CRAR by 84 bps and system level capital would decline by 6.3 per cent (Table 2.7).

2.36 In March 2021, PSBs and PVBs preferred to augment their allocation of HTM investments from G-Secs through SDLs, whereas FBs maintained their portfolio in G-Secs alone (Chart 2.15). The unrealised gains of PSBs were disproportionately concentrated in SDLs, while those of PVBs were mostly in G-Secs, in line with their holdings (Chart 2.16). The Reserve Bank's G-SAP 2.0 will allow an additional window for banks, particularly PSBs, to crystallise their SDL gains.

2.37 Since October 2020, banks have been permitted to hold SLR securities acquired between September 1, 2020 and March 31, 2021 under the HTM category up to an overall limit of 22 per cent of their net demand and time liabilities (NDTL) up to March 31, 2022. This has been extended further to March 31, 2023 in relation to securities to be acquired between April 1, 2021 and March 31, 2022. PSBs' holding of SLR securities in HTM amounted to 20 per cent of their NDTL in March 2021, while it stood at 18.8 per cent and 0.4 per cent for PVBs and FBs, respectively.

### e. Equity Price Risk

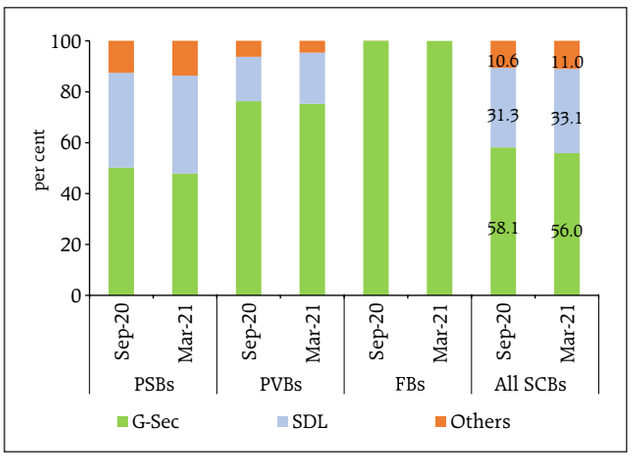
2.38 In this analysis, the impact of a significant fall in equity prices on banks' CRAR is analysed. For the overall system, equity price risk is limited in view of banks' low proportion of capital market exposures due to regulatory limits. Under the scenarios of 25 per cent, 35 per cent and 55 per cent drop in equity prices, the system level CRAR would

**Table 2.7: 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 | 2.5 | 1.5 | 1.5 | 3.2 | 2.2 | 2.2 | 1.9 |
| Reduction in CRAR (bps) | 87 | | 37 | | 264 | | 84 | |

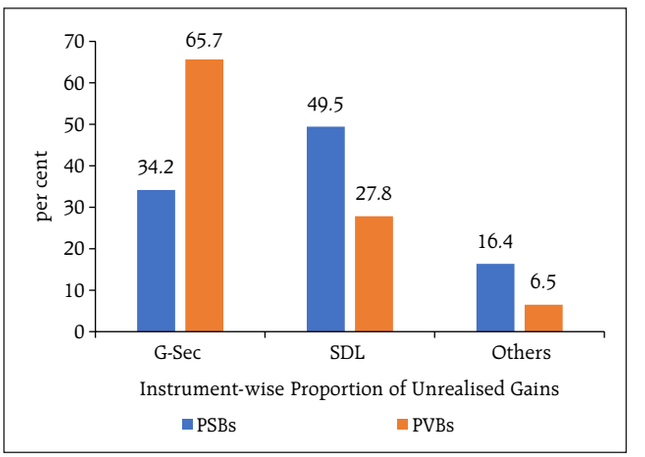
**Source:** Individual bank submissions and staff calculations

**Chart 2.15: HTM Portfolio – Composition**




**Source:** Individual bank submissions and staff calculations

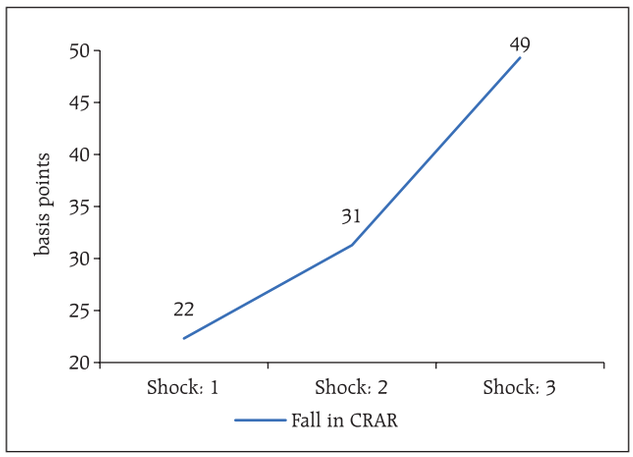
**Chart 2.16: HTM Portfolio – Unrealised Gains as on March 31, 2021**




**Source:** Individual bank submissions and staff calculations

decline by 22 bps, 31 bps and 49 bps, respectively (Chart 2.17).

**Chart 2.17: Equity Price Risk**

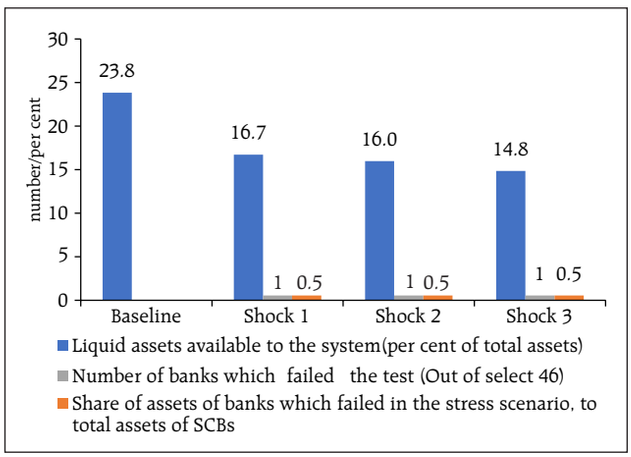



**Note:** For a system of select 46 SCBs
Shock 1: Equity prices drop by 25 per cent
Shock 2: Equity prices drop by 35 per cent
Shock 3: Equity prices drop by 55 per cent
**Source:** RBI supervisory returns and staff calculations.

### f. Liquidity Risk

2.39 Liquidity risk analysis aims to capture the impact of a possible run on deposits and increased demand for unutilised portions of sanctioned / committed / guaranteed credit lines. Accordingly, the assumed scenarios are that of increased withdrawals of un-insured deposits[19] and a simultaneous increase in usage of the unutilised portions of sanctioned working capital limits as well as utilisation of credit commitments and guarantees extended by banks to their customers. In a scenario of sudden and unexpected withdrawals of around 15 per cent of deposits along with the utilisation of 75 per cent of unutilised portion of committed credit lines, 45 out of the 46 banks in the sample will remain resilient, using their HQLAs[20] for meeting day-to-day liquidity requirements (Chart 2.18).

**Chart 2.18: Liquidity Risk – Shocks and Outcomes**




**Note:** 1. A bank was considered to have 'failed' in the test when it was unable to meet the requirements under stress scenarios with the help of its liquid assets – the stock of liquid assets turned negative under stress conditions.

2. 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 towards their customers) 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.1.6 Bottom-up Stress Tests: Credit, Market and Liquidity Risk

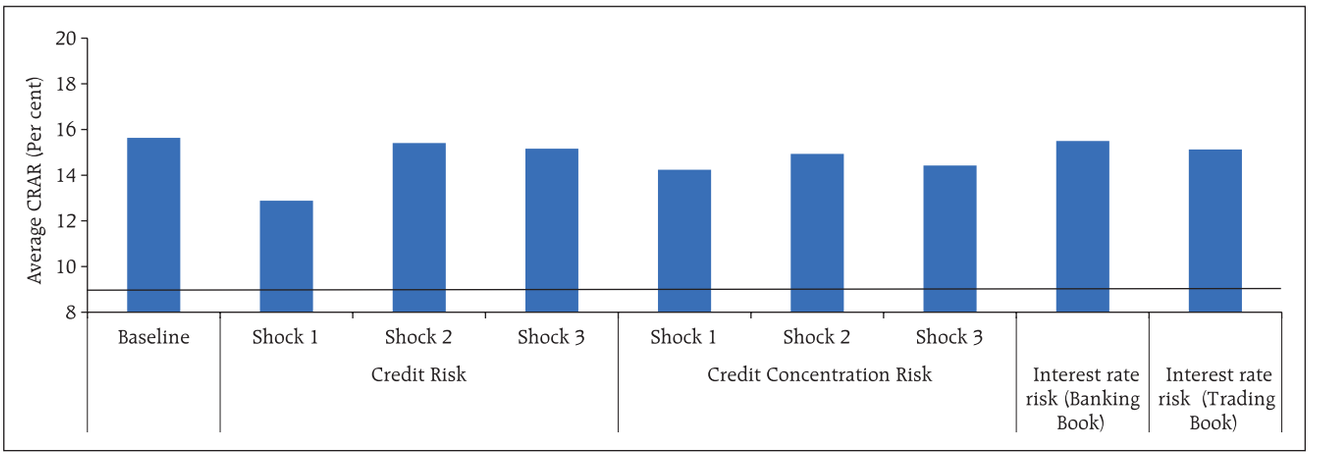
2.40 A series of bottom-up stress tests (sensitivity analyses) has been conducted for select banks[21] with the reference date of March 31, 2021. The results testify to banks' general resilience to different kinds of shocks and are in line with the findings from the top-down stress tests, in general. The average CRAR of banks would remain above the prescribed minimum of 9 per cent but stressed CRAR of three

[19] 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, 2019-20).

[20] HQLAs were computed as cash reserves in excess of required CRR, excess SLR investments, SLR investments at 3 per cent of NDTL (under MSF) (following the Circular DOR.No.Ret.BC.77/12.02.001/2019-20 dated June 26, 2020) and additional SLR investments at 15 per cent of NDTL (following the Circular DOR.No.Ret.BC.36/12.01.001/2020-21 dated Feb 5, 2021).

[21] Stress tests on various shocks were conducted on a sample of 18 select banks. A same set of shocks was used for conducting top-down and bottom-up stress tests. Details of these are given in Annex 2.

**Chart 2.19: Bottom-up Stress Tests - Credit and Market Risks – Impact on CRAR**



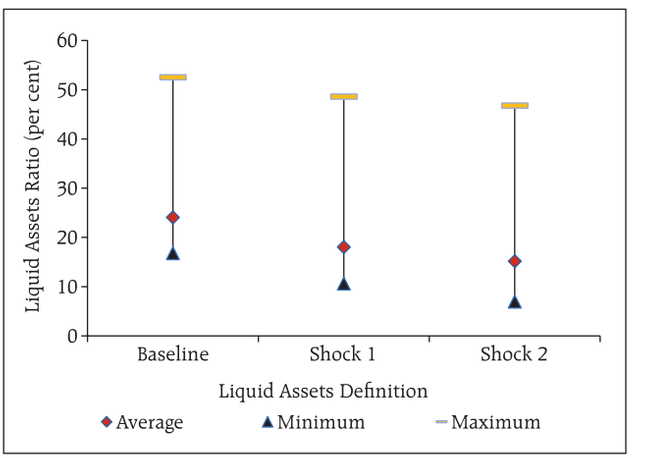

| | | |
|---|---|---|
| Credit Risk: Gross Credit | Shock1 | NPAs increase by 50 per cent |
| | Shock2 | 30 per cent of restructured assets become NPAs |
| | Shock3 | 5 percentage points increase in NPAs in each top 5 sector / industry |
| Credit Risk: Concentration | Shock1 | The top three individual 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).

banks would fall below 9 per cent in a scenario of NPAs increasing by 50 per cent (Chart 2.19).

2.41 The bottom-up stress tests for liquidity risk performed on select banks indicate that they would have positive liquid assets ratios[22] under the various alternative scenarios. High quality liquid assets (HQLAs) would enable banks in the sample to withstand liquidity pressures from sudden and unexpected withdrawal of deposits by depositors. Under all the scenarios, the average liquid asset ratios of the select banks are higher than under the exercise conducted in the FSR for July 2020 (Chart 2.20).

**Chart 2.20: 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).

[22] 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.

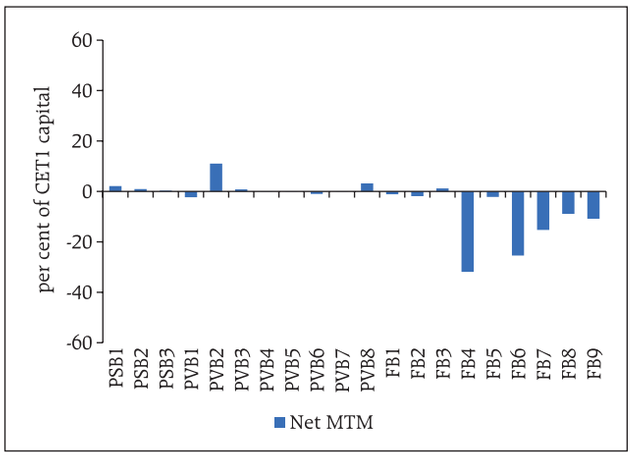
### II.1.7 Bottom-up Stress Tests: Derivatives Portfolio

2.42 A series of bottom-up stress tests (sensitivity analyses) on derivative portfolios of select banks[23] was conducted, with the reference date as March 31, 2021. The banks in the sample reported the results of four separate shocks on interest and foreign exchange rates. The shocks on interest rates ranged from (+/-) 100 to 250 basis points, while 20 per cent appreciation/depreciation shocks were assumed for foreign exchange rates. The stress tests were carried out for individual shocks on a standalone basis.

2.43 Most of the FBs had significantly negative net mark-to-market (MTM) positions as proportions to CET-1 capital in March 2021. The MTM impact was largely muted in the case of PSBs and PVBs, except for one PVB (Chart 2.21). Such risks in derivatives portfolio are possibly residing on corporate balance sheets and it is recognised that they can only be transferred and not eliminated. An assessment of the inherent risks therefrom can be made from their hedging profile as given in their disclosures.

2.44 The stress test results indicate that derivatives exposure remains short in the interest rate segment, *i.e.*, the selected banks gain on an average from an interest rate rise, which is similar to their positioning in recent times. As regards exposures to forex derivatives, they stand to benefit from INR depreciation and *vice versa* – a pay-off profile consistent with a short INR positioning (Chart 2.22). The pay-off profile both in respect of interest rate risk and foreign exchange risk remained asymmetric, with gains being significantly large relative to losses, possibly reflecting unrealised gains as on March 31, 2021.

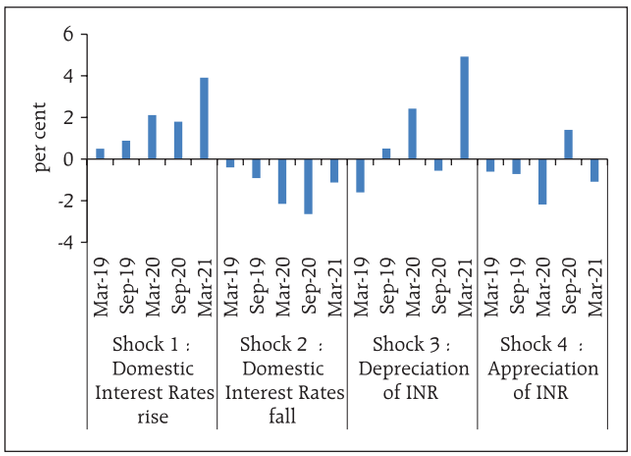
**Chart 2.21: MTM of Total Derivatives Portfolio – Select Banks – March 2021**




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

**Chart 2.22: 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 with respect to the baseline.
**Source:** Sample banks (Bottom-up stress tests on derivative portfolio).

[23] Stress tests on derivatives portfolios were conducted for a sample of 20 banks, constituting the major active authorised dealers and interest rate swap counterparties. Details of test scenarios are given in Annex 2.

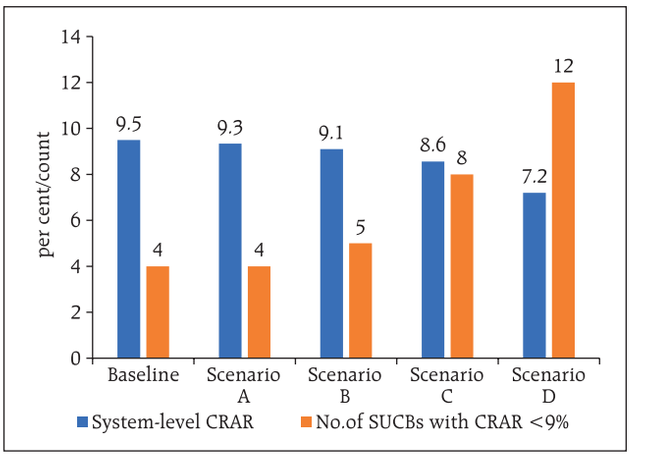
## II.2 Scheduled Primary (Urban) Cooperative Banks

2.45 At the system level[24], the GNPA ratio of scheduled primary (urban) cooperative banks (SUCBs) declined marginally from 10.4 per cent in September 2020 to 10.3 per cent in March 2021, while their provisioning coverage ratio[25] ebbed from 65.1 per cent to 63.6 per cent over this period. The system-level CRAR of the SUCBs improved from 9.2 per cent in September 2020 level to 9.5 per cent in March 2021. SUCBs' liquidity ratio[26] climbed from 34.3 per cent to 35.4 per cent[27].

### II.2.1 Stress Test – Credit Risk

2.46 The impact of credit risk shocks on the CRARs of SUCBs was simulated under four different scenarios[28]. Before application of any shock, four banks had CRARs below the regulatory minimum requirement of 9 per cent in March 2021. On application of a 2 SD shock to the GNPA ratio and classifying the incremental NPAs as sub-standard assets, the system-level CRAR declines to 9.1 per cent and one additional bank (five in all) fails to achieve the minimum CRAR requirement. A 2 SD shock to the GNPA ratio together with classifying additional NPAs as loss advances, results in the system-level CRAR dropping to 7.2 per cent and eight more SUCBs (twelve in all) recording CRARs below the regulatory minimum of 9 per cent (Chart 2.23).

**Chart 2.23: Credit Risk in SUCBs**




**Source:** RBI supervisory returns and staff calculations.

### II.2.2 Stress Test - Liquidity Risk

2.47 Stress tests on liquidity carried out under two scenarios, *viz.*, increase in cash outflows in the 1 to 28 days time bucket by i) 50 per cent; and by ii) 100 per cent, with cash inflows remaining unchanged, indicated that 17 and 30 SUCBs, respectively, (each including three SUCBs which were non-compliant even before application of the shock), may face liquidity stress[29].

[24] Comprising 53 SUCBs

[25] Provisioning coverage ratio=provisions held for NPA*100/GNPAs

[26] Liquidity ratio = 100*(cash + dues from banks + dues from other institutions + SLR investment) / Total Assets

[27] Data are provisional and based on OSS Returns

[28] The four scenarios are: (Scenario A) a 1 SD shock to GNPA (incremental NPAs classified as sub-standard advances), (Scenario B) a 2 SD shock to GNPA (incremental NPAs classified as sub-standard advances), (Scenario C) a 1 SD shock to GNPA (incremental NPAs classified as loss advances), and (Scenario D) a 2 SD shock to GNPA (incremental NPAs classified as loss advances). SD was estimated by using last 10 years' data. One SD shock approximates about 16 per cent increase in the level of GNPA (Annex 2).

[29] As per the RBI's guidelines, a mismatch [negative gap i.e., cash inflows less cash outflows] should not exceed 20 per cent of outflows in the time bucket of 1 to 28 days. SUCBs which are above a 20 per cent mismatch after the shock function under very thin liquidity margins.

## II.3 Non-banking Financial Companies (NBFCs)

2.48 Credit extended by NBFCs rose 8.8 per cent (y-o-y) during 2020-21 after a deceleration in the preceding year that was marred by credit events in the sector and muted demand. Despite the pandemic conditions during the year, the GNPA ratio for the sector declined with a more than commensurate fall in the NNPA ratio attesting to higher provisioning, and capital adequacy improved marginally (Table 2.8).

2.49 NBFC-MFIs, which are primarily dependent on bank borrowings for funding, have been undergoing asset quality stress during the pandemic. Their GNPA ratio ballooned from 2.0 per cent of total advances in March 2020 to 4.9 per cent in March 2021 as business dislocation dampened recoveries. Furthermore, their SMA-2 advances increased from 0.2 per cent to 1.3 per cent of total advances. Decline in collection efficiency could impact the liquidity position of NBFC-MFIs negatively and have implications for the quality of their borrowings.

### II.3.1 Stress Test – Credit Risk

2.50 The resilience of the NBFC sector to credit risk shocks was assessed through system level stress tests conducted for a sample of 177 NBFCs[33]. Two scenarios were used, *viz.*, medium and high risk involving increase in the GNPA ratio of the sector by 1 SD and 2 SD, respectively (Annex 2).

2.51 Under a high-risk shock of 2 SD, the GNPA ratio of the sector increases by more than one percentage point and the capital adequacy ratio declines marginally (Chart 2.24).

**Table 2.8: Asset Quality[30] and CRARs[31] of NBFCs**

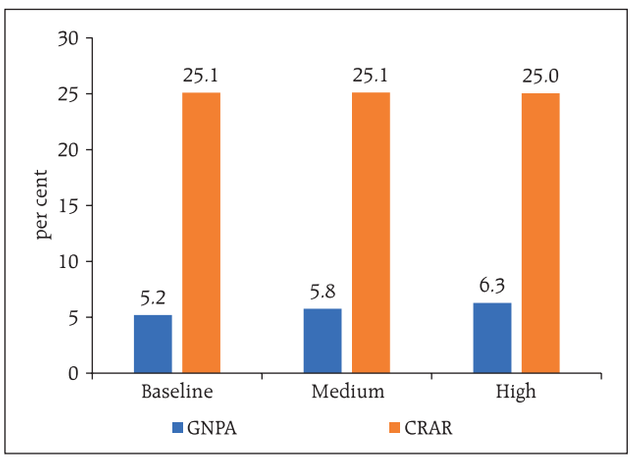
(per cent)

| | GNPA Ratio | NNPA Ratio | CRAR |
|---|---|---|---|
| Mar-2015 | 4.1 | 2.5 | 26.2 |
| Mar-2016 | 4.5 | 2.5 | 24.3 |
| Mar-2017 | 6.1 | 4.4 | 22.1 |
| Mar-2018 | 5.8 | 3.8 | 22.8 |
| Mar-2019 | 6.1 | 3.3 | 20.1 |
| Mar-2020 | 6.8 | 3.4 | 23.7 |
| Mar-2021[32] | 6.4 | 2.7 | 25.0 |

**Source:** RBI supervisory returns and staff calculations.

2.52 Capital adequacy ratios of seven NBFCs were below the minimum regulatory requirement of 15 per cent in March 2021. Under medium and high risk scenarios the system-level CRAR of 12.6 per cent and 14 per cent of NBFCs, respectively, would fall below the minimum regulatory requirements.

**Chart 2.24: Credit Risk in NBFCs - System Level**




**Source:** RBI supervisory returns and staff calculations

[30] Not based on a common set of companies, given the churn in the NBFC sectors; the GNPA ratio may not be based on common criteria, given that prudential norms have been progressively tightened since 2015.

[31] Based on Basel 1 capital framework which provides for capital on uniform credit risk.

[32] Mar 2021 data is provisional based on data of 276 NBFCs of total asset size ₹38.8 lakh crore.

[33] The sample comprised of 9 deposit taking NBFCs and 168 non-deposit taking systemically important NBFCs with a total asset size Rs 27.43 lakh crore as on March 31, 2021, constituting about 70 per cent of the total assets of the sector. They do not include any HFC.

## II.4 Interconnectedness

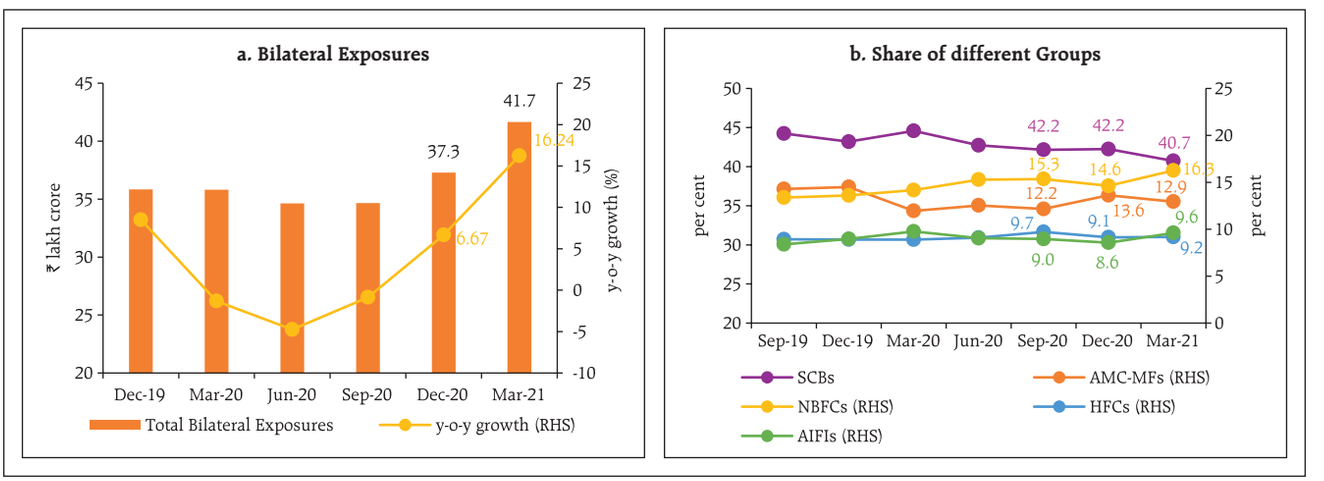
### II.4.1 Network of the Financial System [34 35]

2.53 A financial system network with financial institutions as nodes and bilateral exposures as links provides opportunities for investment, risk diversification, sourcing of funds and liquidity management. At the same time, however, the network exposes its constituents to negative externalities - spillovers and spillbacks - by creating channels through which shocks can spread, leading to contagion. The interconnectedness of financial institutions could amplify systemic shocks. For the analysis presented here, the coverage has been expanded relative to the previous issue of the FSR (January 2021) by including 31 additional entities. To this extent, data across the two periods may not be exactly comparable.

2.54 The total outstanding bilateral exposures[36] among the entities in the financial system stabilised after a sharp fall during Q1:2020-21 following the onset of the COVID-19 pandemic (Chart 2.25 a). This was primarily due to increased[37] exposures of SCBs to NBFCs and HFCs and of asset management companies - mutual funds (AMC-MFs) to the financial system.

2.55 SCBs had the largest bilateral exposures; however, their share declined by March 2021 on account of the shrinking inter-bank market while the share of NBFCs and HFCs rose sharply due to significant jump in their payables. Owing to the rallies in the equity markets, the share of AMC-MFs in bilateral exposures increased during 2020-21. On the other hand, the share of All-India Financial Institutions (AIFIs) and insurance companies went down marginally (Chart 2.25 b).

**Chart 2.25: Bilateral Exposures between Entities in the Financial System**




**Source:** RBI supervisory returns and staff calculations.

[34] 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.

[35] Analysis presented here and in the subsequent part is based on data of 221 entities from the following *eight sectors:* SCBs, scheduled UCBs (SUCBs), AMC-MFs, NBFCs, HFCs, insurance companies, pension funds and AIFIs. These 221 entities covered include 77 SCBs; 10 small finance banks (SFBs); 20 SUCBs; 22 AMC-MFs (which cover more than 90 per cent of the AUMs of the mutual fund sector); 41 NBFCs (both deposit taking and non-deposit taking systemically important companies, which represent about 70 per cent of total NBFC assets); 21 insurance companies (that cover more than 90 per cent of assets of the sector); 19 HFCs (which represent more than 95 per cent of total HFC asset); 7 PFs and 4 AIFIs (NABARD, EXIM, NHB and SIDBI).

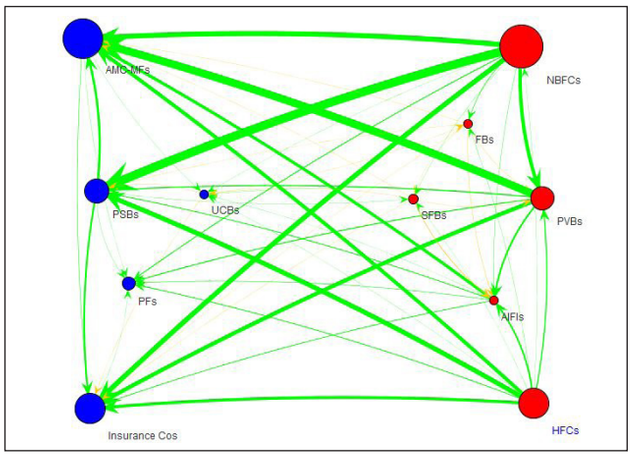
[36] Includes exposures between entities of the same sector. Exposures are outstanding position as on March 31, 2021 and are broadly divided into fund based and non-fund-based exposure. Fund based exposure includes money market instruments, deposits, loans and advances, long term debt instruments and equity investments. Non-fund based exposure includes letter of credit, bank guarantee and derivate instruments (excluding settlement guaranteed by CCIL).

[37] Incorporation of 31 new entities in the financial network analysis also contributed to this increase.

2.56 In terms of inter-sectoral[38] exposures, AMC-MFs, followed by insurance companies, were the biggest fund providers in the system, whereas NBFCs were the biggest receiver of funds, followed by HFCs. Among the major bank groups, PSBs had a net receivable position *vis-à-vis* the entire financial sector whereas PVBs had a net payable position (Chart 2.26).

2.57 In March 2021, AMC-MFs, insurance companies and pension funds recorded increase in their receivables from the financial system while those of PSBs fell marginally. Among the entities which received funds from the financial system, NBFCs and HFCs recorded increases[39], while payables of PVBs declined y-o-y (Chart 2.27).

**Chart 2.26: Network Plot of the Financial System – March 2021**



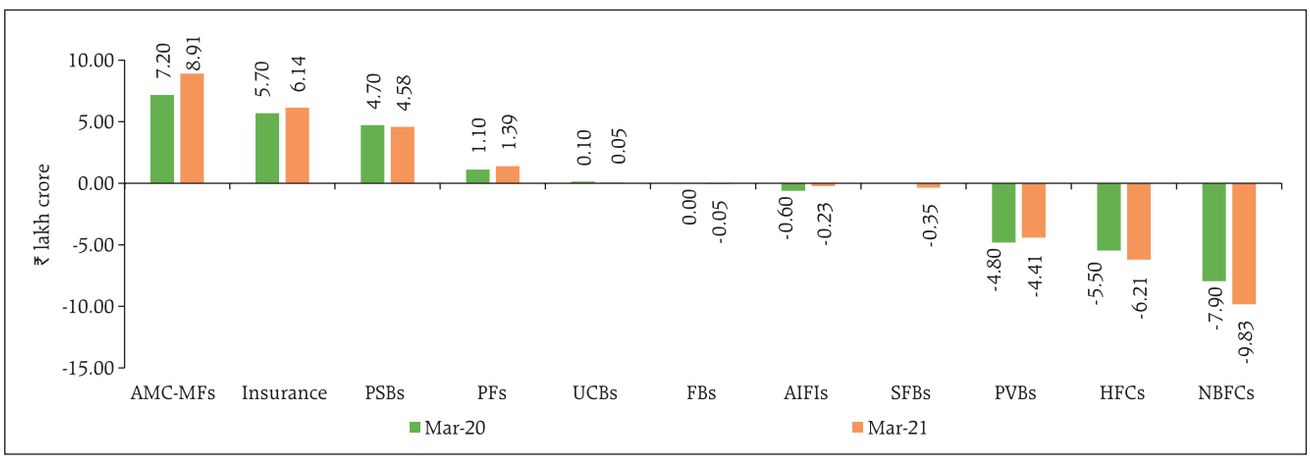

**Note:** Receivables and payables do not include transactions among entities of the same group. Red circles are net payable institutions and the blue ones are net receivable institutions.

**Source:** RBI supervisory returns and staff calculations.

### a. Inter-bank Market

2.58 The shares of both fund-based[40] and non-fund based[41] inter-bank exposures in the total assets of the banking system diminished during 2020-21 as

**Chart 2.27: Net Receivables (+ve) / Payables (-ve) by Institutions**




**Source:** RBI supervisory returns and staff calculations.

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

[39] This includes exposures of nine additional NBFCs and five additional HFCs as compared to the analysis in the previous FSR

[40] 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.

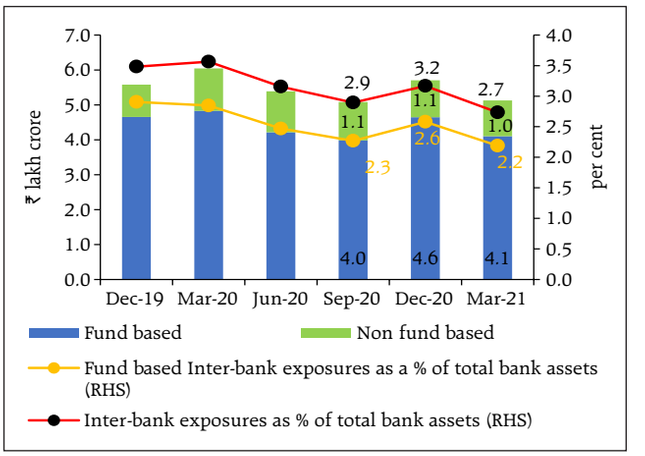
[41] Non-Fund based exposure includes - outstanding bank guarantees, outstanding Letters of Credit, and positive mark-to-market positions in the derivatives market (except those exposures for which settlement is guaranteed by the CCIL).

a fallout of bank mergers and abundant liquidity in the system (Chart 2.28).

2.59 PSBs maintained their dominant position in the inter-bank market though their share dwindled, whereas the share of FBs increased[42] (Chart 2.29).

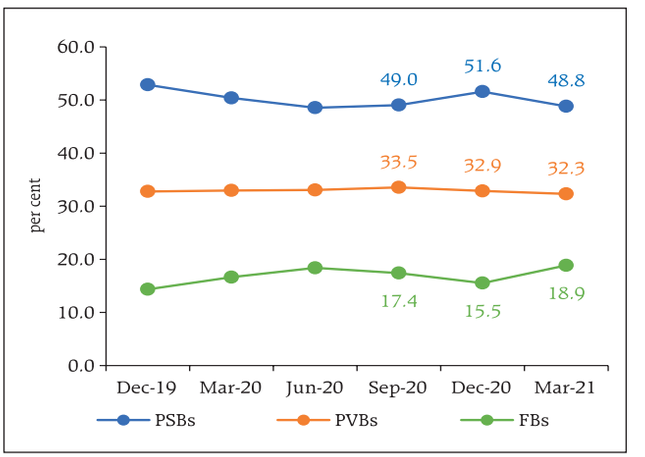
2.60 About 67 per cent of the fund-based inter-bank market was short-term (ST) in nature, in which ST deposits had the highest share, followed by call money market exposure. Long-term (LT) loans predominated in LT fund-based inter-bank exposures (Chart 2.30).

**Chart 2.28: Inter-bank Market**



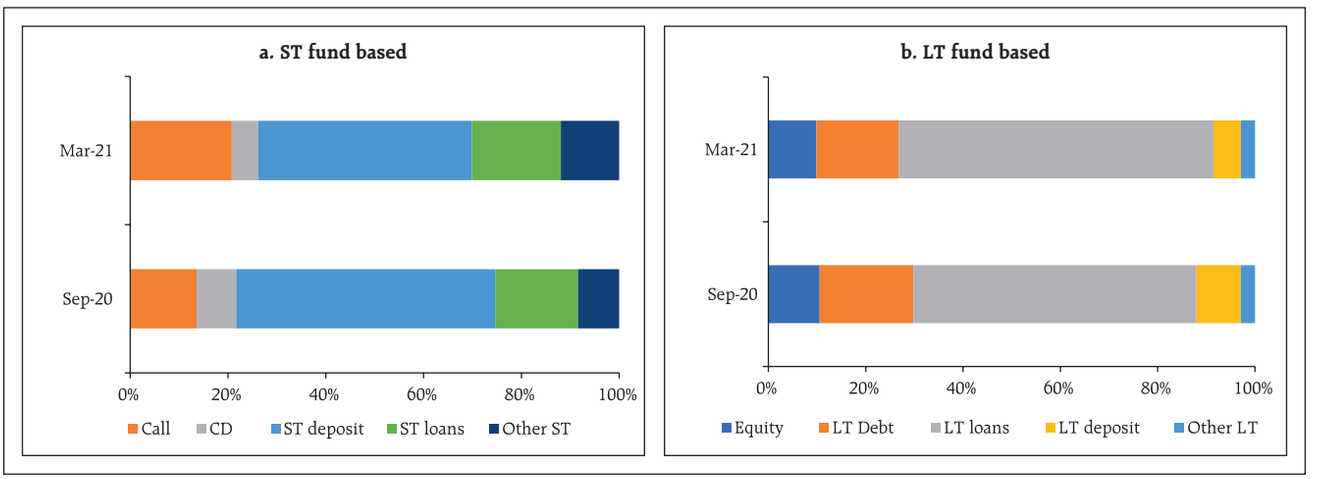

**Source:** RBI supervisory returns and staff calculations.

**Chart 2.29: Different Bank Groups in the Inter-Bank Market - March 2021**




**Source:** RBI supervisory returns and staff calculations.

**Chart 2.30: Composition of Fund based Inter-Bank Market**




**Source:** RBI supervisory returns and staff calculations

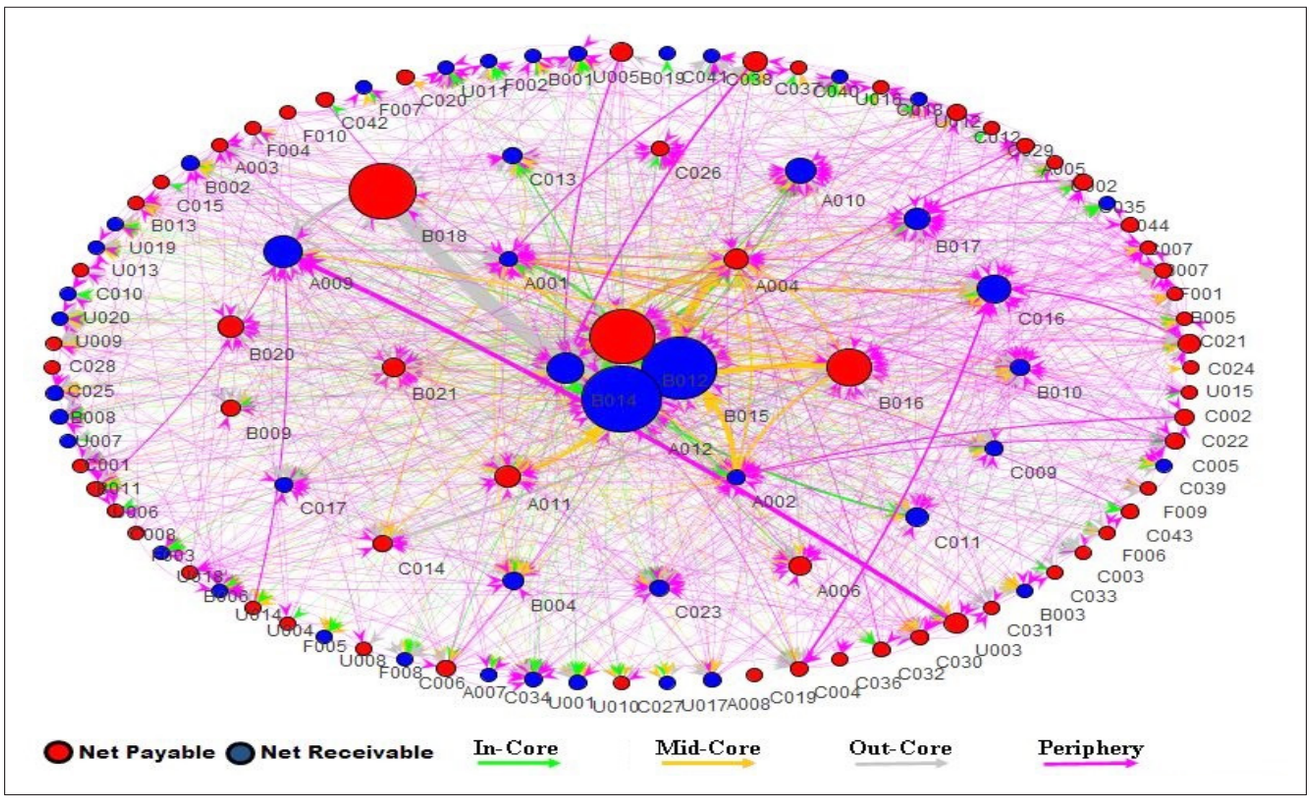
[42] Incorporation of additional foreign banks in financial network analysis also contributed to this change

**b. Inter-bank Market: Network Structure and Connectivity**

2.61 The inter-bank market typically has a core-periphery network structure[43] [44]. As on end-March 2021, there were four banks in the inner-most core and six banks in the mid-core circle. The four banks in the inner-most core included large public and private sector banks. The banks in the mid-core were large PSBs and PVBs while most of the old private sector banks, foreign banks, SFBs and SUCBs form the outer core (Chart 2.31).

2.62 The degree of interconnectedness in the banking system (SCBs), as measured by the connectivity ratio[45], which had increased post-merger of PSBs in March 2020 on account of smaller number of potential connections, reduced slightly in March 2021 on account of incorporation of additional FBs in the network. The cluster coefficient[46] which depicts

**Chart 2.31: Network Structure of the Indian Banking System (SCBs + SFBs+ SUCBs) – March 2021**




**Source:** RBI supervisory returns and staff calculations.

[43] 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.

[44] 77 SCBs,10 SFBs and 20 SUCBs were considered for this analysis.

[45] *The Connectivity ratio* measures the actual number of links between the nodes relative to all possible links in a complete network. For methodology, please see Annex 2.

[46] *Cluster Coefficient:* Clustering in networks measures how interconnected each node is. Specifically, there should be an increased probability that two of a node's neighbours (banks' counterparties in case of the financial network) are also neighbours themselves. A high cluster coefficient for the network corresponds with high local interconnectedness prevailing in the system. For methodology, please see Annex 2.

local interconnectedness (i.e., tendency to cluster) also fell marginally (Chart 2.32).

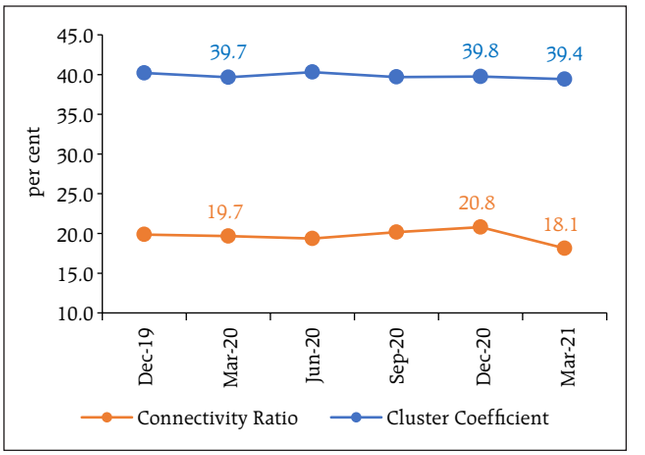
### c. Exposure of AMC-MFs

2.63 AMC-MFs maintained their position as the largest net providers of funds to the financial system in terms of inter-sectoral exposures in March 2021. Their gross receivables stood at ₹9.84 lakh crore (around 32 per cent of their average AUM) whereas their gross payables were ₹0.93 lakh crore as at end-March 2021.

2.64 The major recipients of their funding were SCBs, followed by NBFCs, HFCs and AIFIs. Their receivables from SCBs increased in Q4:2020-21 with the revival of banking sector stocks (Chart 2.33 a).

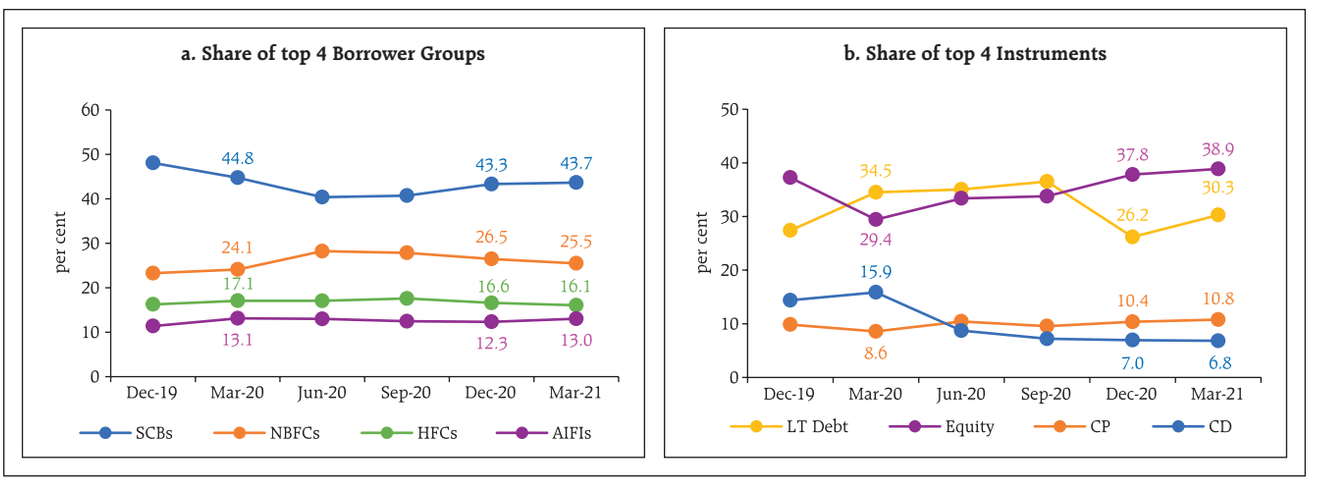
2.65 Instrument-wise, the share of equity holdings in AMC-MFs' receivables saw a sharp increase in H2:2020-21 as equity markets remained buoyant. The share of long-term debt funding by AMC-MFs fell sharply but recovered moderately during Q4:2020-21. AMC-MFs' holdings of CPs increased over those of CDs as corporates resorted to market borrowings in the low interest rate scenario and the banking system remained flush with liquidity (Chart 2.33 b).

**Chart 2.32: Connectivity Statistics of the Banking System (SCBs)**



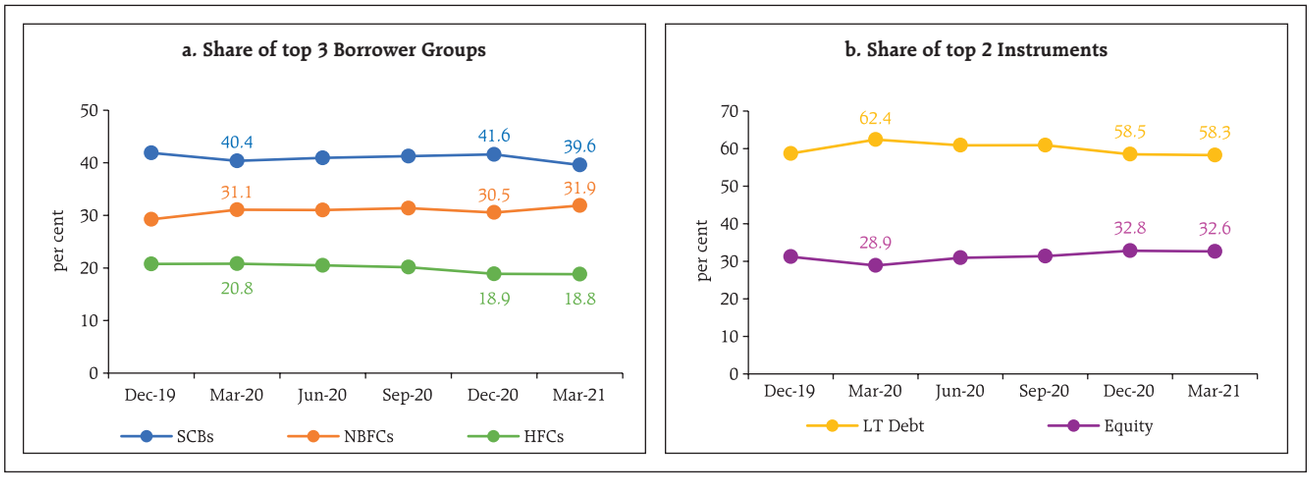

**Source:** RBI supervisory returns and staff calculations.

**Chart 2.33: Gross Receivables of AMC-MFs from the Financial System**




**Source:** RBI supervisory returns and staff calculations

**Chart 2.34: Gross Receivables of Insurance Companies from the Financial System**




**Source:** RBI supervisory returns and staff calculations

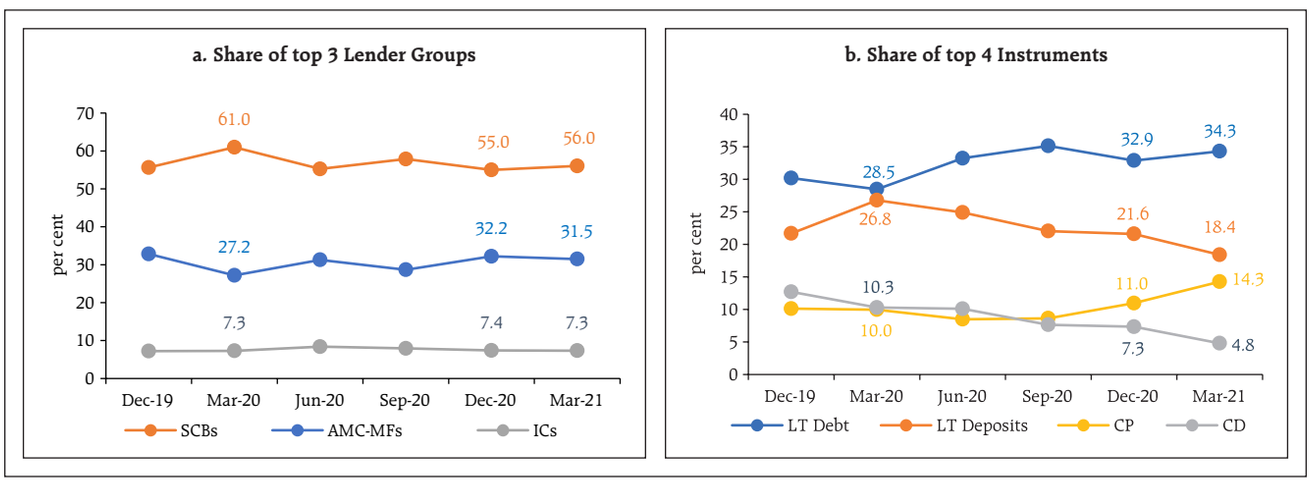
### d. Exposure of Insurance Companies

2.66 Insurance companies were the second largest net providers of funds to the financial system (gross receivables were at ₹6.68 lakh crore and gross payables at ₹0.54 lakh crore in March 2021). SCBs were the largest recipients of their funds, followed by NBFCs and HFCs, mainly in the form of LT debt and equity (Chart 2.34 a and b). LT debt mostly comprised of subscription to debt issued by NBFCs and HFCs.

### e. Exposure to AIFIs

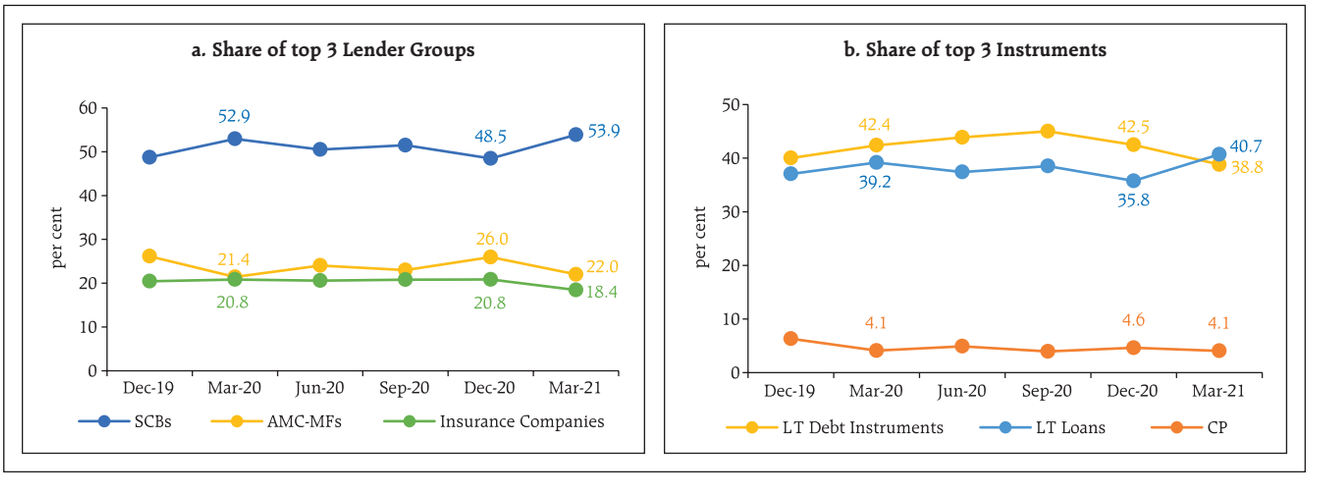
2.67 AIFIs were net borrowers of funds from the financial system, with their gross payables and gross receivables having increased to ₹4.11 lakh crore and ₹3.89 lakh crore, respectively, in March 2021. They raised funds mainly from SCBs (primarily PVBs), AMC-MFs and insurance companies (Chart 2.35 a) through LT debt and LT deposits, of which the latter witnessed a sharp reduction in Q4:2020-21. Issuance of CPs registered a sharp uptick in H2:2020:21 (Chart 2.35 b).

**Chart 2.35: Gross Payables of AIFIs to the Financial System**




**Source:** RBI supervisory returns and staff calculations

**Chart 2.36: Gross Payables of NBFCs to the Financial System**




**Source:** RBI supervisory returns and staff calculations

## f. Exposure to NBFCs

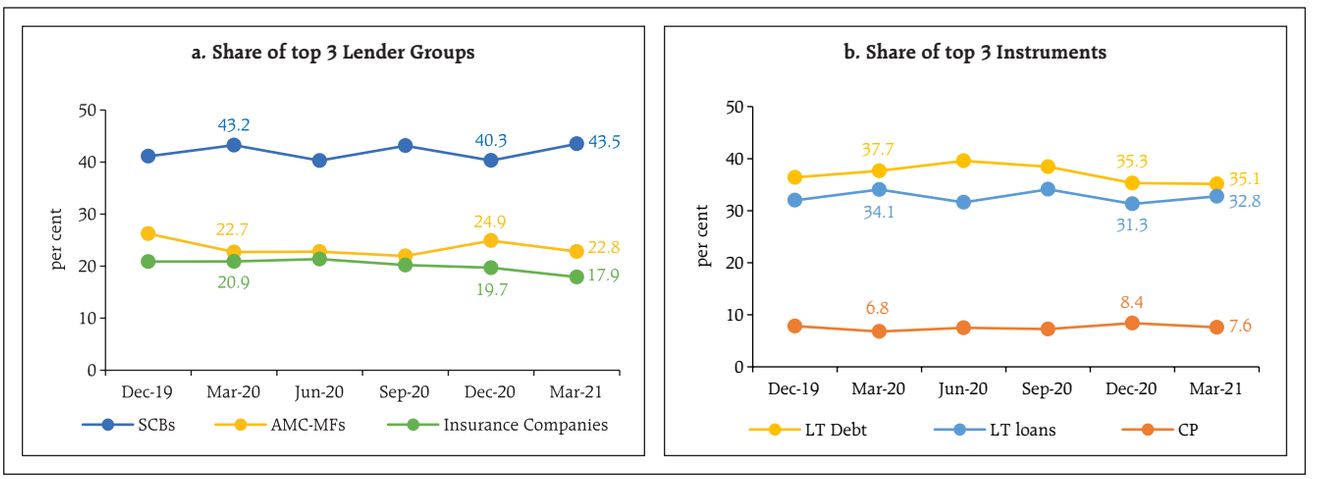
2.68 NBFCs were the largest net borrowers of funds from the financial system, with gross payables of ₹11.69 lakh crore and gross receivables of ₹1.86 lakh crore as at end-March 2021. The share of funding by SCBs grew substantially in Q4:2020-21 while that of AMC-MFs and insurance companies dipped (Chart 2.36 a).

2.69 During Q4:2020-21, the NBFC funding mix saw a decline in the share of LT debt while that of LT loans increased (Chart 2.36 b).

## g. Exposure to HFCs

2.70 HFCs were the second largest net borrowers of funds from the financial system, with gross payables of ₹6.93 lakh crore and gross receivables of ₹0.72 lakh crore as at end-March 2021. During Q4:2020-21, their borrowing profile was marked by a higher share of borrowings from SCBs, whereas the shares of AMC-MFs and insurance companies declined (Chart 2.37 a). The proportion of fund mobilisation through LT loans grew and that in the form of CPs contracted (Chart 2.37 b).

**Chart 2.37: Gross Payables of HFCs to the Financial System**




**Source:** RBI supervisory returns and staff calculations

### II.4.2 Contagion Analysis[47]

2.71 Contagion analysis uses network technology to estimate the systemic importance of individual banks. The failure of a systemically important bank leads to greater solvency and liquidity losses for the banking system, the scale of which would depend on the capital and liquidity position of banks as well as the number, nature (whether it is a lender or a borrower) and magnitude of the interconnections that the failing bank has with the rest of the banking system.

#### a. Joint Solvency[48]-Liquidity[49] Contagion Losses for SCBs due to Bank Failure

2.72 In this analysis, the impact of discrete shocks on the banking system is gauged in terms of the number of bank failures that take place and the amount of solvency and liquidity losses that are incurred.

2.73 A contagion analysis of the banking network based on the end-March 2021 position indicates that the bank with the maximum capacity to cause contagion losses (Bank 1 in Table 2.9) was positioned in the inner-most core of the core-periphery network structure and its failure would lead to a solvency loss of 2.39 per cent of the total Tier 1 capital of SCBs and liquidity loss of 0.01 per cent of total HQLA of the banking system. Contagion losses due to failure of the five largest banks with the maximum capacity to cause contagion losses reduced in March 2021 *vis-à-vis* September 2020, both in absolute and percentage terms. Further, the failure of the bank that would cause the fifth largest contagion loss could lead to the failure of one additional bank (Table 2.9).

**Table 2.9: Contagion Losses due to Bank Failure – March 2021**

| Trigger Code | % of Tier 1 capital of the Banking System | % of HQLA | Number of banks defaulting due to solvency | Number of banks defaulting due to liquidity |
|---|---|---|---|---|
| Bank 1 | 2.39 | 0.01 | 0 | 0 |
| Bank 2 | 2.22 | - | 0 | 0 |
| Bank 3 | 1.81 | 0.04 | 0 | 0 |
| Bank 4 | 1.80 | 0.22 | 0 | 0 |
| Bank 5 | 1.58 | 0.11 | 0 | 1 |

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

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

2.74 Banks provide a substantial part of the funding for NBFCs and HFCs which are the largest borrowers of funds from the financial system. Therefore, failure of any NBFC[50] or HFC would act as a solvency shock to their lenders. The solvency losses caused by these shocks can spread further by contagion.

[47] For methodology, please see Annex 2.

[48] 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.

[49] 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: 18 per cent of NDTL + excess SLR + excess CRR.

[50] Only Private NBFCs are considered.

2.75 By end-March 2021, idiosyncratic failure of any NBFC or HFC with the maximum capacity to cause solvency losses to the banking system could have impacted banks' total Tier-1 capital by 2.52 per cent and 4.86 per cent, respectively, but would not have led to failure of any bank (Tables 2.10 and 2.11).

### c. Solvency Contagion Impact[51] after Macroeconomic Shocks to SCBs

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

2.77 In the previous iteration, the shock was applied to the entity that could cause the maximum solvency contagion losses. In this iteration, however, the initial impact of such a shock on the individual bank's capital is taken from the macro-stress tests[52].

2.78 Initial capital loss due to macroeconomic shocks stood at 1.85 per cent, 7.96 per cent and 15.61 per cent of Tier-I capital for baseline, medium and severe stress scenarios, respectively. No bank failed to maintain Tier-I capital adequacy ratio of 7 per cent in any of the scenarios. As a result, there were 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 2.38).

**Table 2.10: Contagion Losses due to NBFC Failure – March 2021**

| Trigger Code | Solvency Losses as % of Tier -1 Capital of the Banking System | Number of Defaulting banks due to Solvency |
|---|---|---|
| NBFC 1 | 2.52 | 0 |
| NBFC 2 | 2.19 | 0 |
| NBFC 3 | 1.85 | 0 |
| NBFC 4 | 1.44 | 0 |
| NBFC 5 | 1.18 | 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 2.11: Contagion Losses due to HFC Failure – March 2021**

| Trigger Code | Solvency Losses as % of Tier -1 Capital of the Banking System | Number of Banks Defaulting due to solvency |
|---|---|---|
| HFC 1 | 4.86 | 0 |
| HFC 2 | 4.86 | 0 |
| HFC 3 | 1.62 | 0 |
| HFC 4 | 1.08 | 0 |
| HFC 5 | 0.96 | 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.

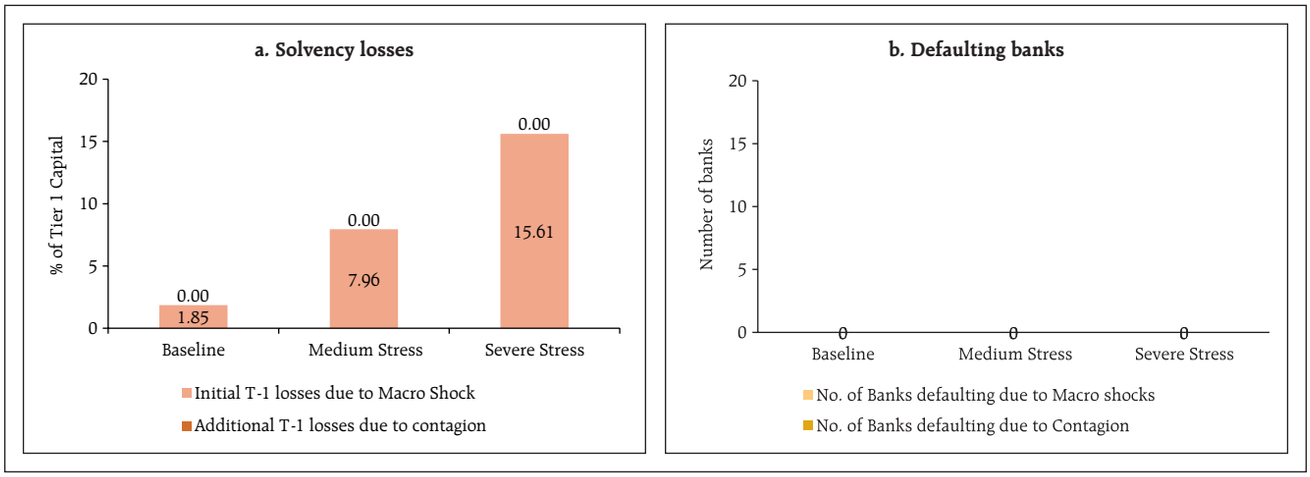
[51] Failure criterion for both PSBs and PVBs has been taken as Tier 1 CRAR falling below 7 per cent.

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

a) The projected losses under a macro scenario (calculated as reduction in projected Tier 1 CRAR, in percentage terms, in March 2022 with respect to the actual value in March 2021) were applied to the March 2021 capital position assuming proportionally similar balance sheet structures for both March 2021 and March 2022.

b) Bilateral exposures between financial entities are assumed to be similar for March 2021 and March 2022.

**Chart 2.38: Contagion Impact of Macroeconomic Shocks (Solvency Contagion)**




**Note:** The projected capital in March 2022 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

2.79 Unprecedented policy support has contained the impairment of balance sheets of banks in India despite the dent in economic activity brought on by waves of the pandemic. Banks' performance and balance sheet quality have turned out to be better than anticipated at the beginning of the pandemic in terms of deposit growth, decline in GNPAs, capital adequacy and improved profitability. Stress tests indicate a limited impact of macroeconomic and other shocks on the Indian banking sector. Banks were largely shielded from the MTM losses in their portfolios subject to fair valuation, also aided by the G-SAP of the Reserve Bank.

2.80 Downside risks nevertheless remain, with stress signals emanating from the build-up in SMA advances. Banks must prepare contingency strategies to deal with segment-specific asset quality pressures, especially when regulatory reliefs are eventually rolled back. Subdued credit growth in a low interest rate scenario could impact net interest income levels adversely.

2.81 Network analysis throws light on the dominant positions occupied by mutual funds and insurance companies as purveyors of funds and by NBFCs and HFCs as recipients in the financial system. As the inter-bank market continues to contract, amidst abundant liquidity conditions, contagion risks due to failure of banks have ebbed. On the other hand, contagion risks associated with the failure of NBFCs and HFCs remain significant, pointing to the need for continued vigilance to signs of incipient stress.

# Chapter III

# Regulatory Initiatives in the Financial Sector

*The response to the pandemic from central banks, other regulators and fiscal authorities has been unprecedented, mitigating the impact on macroeconomic conditions and financial market stability. Targeted regulatory and other support measures helped to ameliorate sector-specific strains. On the domestic front, regulatory support curtailed solvency risk of financial entities, stabilised markets and provided the necessary impetus for economic revival, while maintaining financial stability. The Financial Stability and Development Council (FSDC) and its Sub-Committee remained vigilant and proactive, ensuring that financial markets and institutions remained resilient in the face of the resurgence of the pandemic to a peak in early 2021-22.*

## Introduction

3.1 The COVID-19 pandemic is noteworthy for the unprecedented and sustained policy support by governments, central banks and other regulators. By and large, these policy actions have been able to dampen and mitigate pandemic-related losses and stresses, cushioning real activity and preserving the soundness of the financial system. Regulatory reforms implemented in the years after the global financial crisis (GFC) enabled banks in many jurisdictions to enter the COVID-19 crisis with sizable capital and liquidity buffers. Concurrently, the swift and aggressive responses of central banks eased financial conditions and liquidity risks were allayed, compressing term spreads. Regulatory easing across jurisdictions facilitated the flow of financial resources to the economy and effectively prevented the amplification of the shock.

3.2 As vaccination drives are being rolled out and the global economy re-charts an uneven upturn, this chapter undertakes an overview of the policy responses that enabled this renewed tryst with recovery.

## III.1 Global Regulatory Developments and Assessments

3.3 In its assessment of financial stability risks arising out of a potential large wave of insolvencies, the European Systemic Risk Board (ESRB) points out that public authorities have shielded the corporate sector so far from COVID-19 induced stress through a variety of measures, including loan guarantees and moratoria, thereby preventing the rise in insolvencies that typically follow in the wake of a contraction in economic activity[1]. As current support measures are withdrawn, these authorities should have strategies in place to evolve from addressing liquidity needs towards addressing solvency issues by differentiating between viable and non-viable firms and enabling fundamentally viable companies to thrive again in the post-pandemic period. To avoid moral hazard, it is important that the interests of public authorities and banks are aligned when debt is restructured. This would require banks to bear some of the restructuring costs and downside risks.

3.4 On credit ratings across four asset classes, *viz.*, sovereigns, financial institutions, non-financial

[1] ESRB (2021): "Preventing and managing a large number of corporate insolvencies", April.

corporates and structured finance, the International Organization of Securities Commissions (IOSCO) observed no material changes to credit rating methodologies while noting the significance of government support measures (GSMs) in alleviating the downward pressure on credit ratings[2]. GSMs are expected to remain in place until the economic environment is stable and resilient enough to allow for a gradual withdrawal, according to credit rating agencies (CRAs). Any premature withdrawal of GSMs, especially in EMEs, is a downside risk to the global economic recovery.

**III.1.1 Regulatory Restrictions on Dividend Distribution - Calibrated Normalisation**

3.5 As the recovery begins to emerge in several parts of the world, a calibrated return to dividend distribution by banks is also taking place after the suspension of dividend payouts and buy-back of ordinary shares was necessitated by the pandemic. The European Central Bank (ECB) has recommended that banks should exercise extreme prudence on dividends and share buy-backs, limiting distributions to below 15 per cent of accumulated 2019-20 profits and not higher than 20 basis points of the common equity tier-1 (CET-1) ratio until September 30, 2021. The US Federal Reserve (Fed) has announced that temporary and additional restrictions on bank holding company dividends and share repurchases currently in place has ended for most firms after June 30, 2021, based on results from stress tests. The Prudential Regulatory Authority of UK has withdrawn its restrictions on dividend distribution and share buy-backs and left it to banks' boards to decide when to recommence distributions within an appropriately prudent framework.

**III.1.2 Banking Sector Liquidity**

3.6 The ECB has prolonged its support *via* targeted lending operations for banks upto June 2022 in order to smooth out any temporary funding issues for solvent banks. Additionally, it has provided for a liquidity backstop to support money market functioning during the extended pandemic period, by offering four additional pandemic emergency longer-term refinancing operations in 2021, each with a tenor of one year, allotted on a quarterly basis.

3.7 The US Fed had temporarily modified the provisions relating to the supplementary leverage ratio (SLR) by excluding central bank reserves and US Treasuries from the calculation of SLR so as to ease the strain on the US treasury market and enable banks to continue lending to households during the pandemic. While the accomodation was allowed to expire as scheduled on March 31, 2021 the Fed highlighted the need for recalibration of the SLR in view of the recent growth in central bank reserves and US Treasury reissuance.

**III.1.3 Reform in Non-Bank Financial Intermediation**

3.8 The Financial Stability Board (FSB), G-20 and IOSCO have set out a comprehensive programme for strengthening the resilience of Non-Bank Financial Intermediation (NBFI), which *inter alia* covers funding and credit intermediaries and markets, including money market funds (MMFs), investment funds, bond funds and the like. The immediate policy emphasis is on money market funds, open-ended funds, margining practices, liquidity, structure and resilience of core bond markets, and cross-border USD funding. The FSB will also launch an evaluation of the effects of G20 financial reforms on bond

[2] IOSCO (2021): "Observed Impact of COVID-19 Government Support Measures on Credit Ratings", February.

market liquidity. In the US, the President's Working Group on Financial Markets (PWG) has focused on analysing the March 2020 market turmoil and potential policy recommendations, particularly for MMFs[3]. Based on the PWG's report, the US Securities and Exchange Commission (SEC) has solicited comments on potential reform measures to improve the resilience of MMFs.

### III.1.4 COVID-19-related Loan Loss Provisioning by Banks

3.9 In response to the pandemic, regulatory authorities granted banks greater leeway in implementing expected credit loss (ECL) provisioning. Provisioning practices by 70 internationally active banks show that relative to loans, the median of the annualised provisions rose from 35 basis points to 105 basis points between H2:2019 to H1:2020, with provisioning under the US Generally Accepted Auditing Principles (GAAP) being somewhat higher than under the International Financial Reporting Standards (IFRS)[4]. As macroeconomic conditions improved, banks reduced quarterly provisions in Q4:2020, with some banks even releasing provisions, although such releases were substantially smaller than the amount of loan loss reserves added during the previous three quarters.

### III.1.5 Operational Risk in Banks

3.10 Operational resilience focuses on the ability of firms and the financial system to deliver key services and continue to serve the needs of customers through disruptions. The Basel Committee on Banking Supervision (BCBS) issued principles[5] for operational resilience and revised the principles for sound management of operational risk, aiming to strengthen banks' ability to withstand risk-related events including pandemics, cyber incidents, technology failures and natural disasters that could cause significant operational failures or wide-scale disruptions in financial markets. The Global Financial Markets Association (GFMA) in association with the Institute of International Finance (IIF) has set out ways to continuously improve and strengthen operational resilience in the financial system for the benefit of customers, markets and the broader economy[6].

### III.1.6 Other International Regulatory Developments

3.11 In February 2021, the UK Treasury issued a consultation paper on its proposed central counter party (CCP) resolution framework, which would set out the powers that the Bank of England (BoE) would hold as a resolution authority in closing down a central counter party (CCP) after a fatal default or non-default event. The expanded CCP resolution regime would give the BoE additional powers to mitigate the risk and impact of a CCP failure and the subsequent risks to financial stability and public funds. These additional powers *inter alia* include the ability to write down CCP members' unsecured liabilities and to make cash calls on clearing members.

3.12 The European Banking Authority (EBA) has issued draft technical standards on implementing Pillar 3 disclosures on Environmental, Social and Governance (ESG) risks[7]. Acting on a mandate from the EU Capital Requirements Regulation, the EBA is proposing specific templates for quantitative and qualitative disclosures on climate-change-related

[3] US Treasury (2020): "Overview of Recent Events and Potential Reform Options for Money Market Funds", December.

[4] Bank for International Settlements (2021): "Bank loan loss provisioning during the Covid crisis", Araujo et. al, BIS quarterly Review, March.

[5] Bank for International Settlements (2021): "Principles for operational resilience", March.

[6] GFMA (2021):" GFMA and IIF Priorities for Strengthening Global Operational Resilience Maturity in Financial Services", January.

[7] European Banking Authority (2021): "Implementing technical standards (ITS) on Pillar 3 disclosures on Environmental, Social and Governance (ESG) risks", March.

transition and physical risks as well as financial institutions' mitigating actions and adaptation plans.

### III.1.7 Insurance Sector

3.13 The International Association of Insurance Supervisors (IAIS) has identified the key challenges posed by cyber risk underwriting as: (a) measurement of risk exposure due to the evolving nature of cyber risk; and (b) issues related to the clarity of cyber insurance policies, which *inter alia* include overlapping coverage, the treatment of ransoms, fines, terrorism and war risk[8].

### III.1.8 Central Bank Digital Currency

3.14 The third BIS Survey on Central Bank Digital Currency (CBDC)[9] notes that most central banks are exploring CBDCs, in both wholesale and retail form, progressing from conceptual research to practical experimentation. EMEs were driven by considerations of financial inclusion and payment system safety and efficiency in their approach to CBDCs. While most central banks have no plans to issue CBDCs in the foreseeable future, several are likely to launch retail CBDCs in the next three years.

## III.2 Domestic Regulatory Developments

3.15 The Sub-Committee of the Financial Stability and Development Council (FSDC-SC), chaired by the Governor, Reserve Bank of India (RBI) met twice since December 2020 to review developments in the financial sector impinging on financial stability and to discuss matters involving inter-regulatory co-ordination. Among the issues taken up in its 26th meeting held on January 13, 2021 the Sub-Committee discussed the scope for improvements in "the corporate insolvency resolution process under the Insolvency and Bankruptcy Code, 2016 (IBC), utilisation of data with the Central KYC Records Registry and changes in the regulatory framework relating to Alternative Investment Funds (AIFs) set up in the International Financial Services Centre (IFSC). At the 27th meeting held on April 29, 2021 the FSDC-SC discussed members' assessments of the scenario emerging from the second wave of the COVID-19 pandemic as well as inter-regulatory issues and reviewed the activities of various technical groups under its purview as well as the functioning of State Level Coordination Committees (SLCCs) in various states / UTs. The members resolved to remain vigilant and proactive to ensure that financial markets and financial institutions remain resilient in the face of fresh challenges brought on by the resurgence of the pandemic.

## III.3 Initiatives from Regulators/Authorities

3.16 In order to mitigate pandemic induced stress, financial sector regulators and the government rolled out a number of measures, including extending existing relaxations to provide relief. Additionally, several significant regulatory initiatives were taken towards fortifying the resilience of the financial system (Annex 3). Regulatory forbearances lapsed on the stipulated end dates.

### III.3.1 Credit Related Measures

3.17 With the objective of alleviating the potential stress to individual borrowers and small businesses due to the COVID-19 pandemic, a limited window upto September 30, 2021 was opened by the Reserve Bank under Resolution Framework 2.0 permitting lending institutions to implement resolution plans in respect of their exposures to individuals, MSMEs and other small businesses with aggregate

[8] International Association of Insurance Supervisors (2020): "Cyber Risk Underwriting: Identified Challenges and Supervisory Considerations for Sustainable Market Development", December.

[9] Bank for International Settlements (2021): "Ready, steady, go? - Results of the third BIS survey on central bank digital currency", January.

exposure upto ₹50 crore, while classifying the same as standard. Moreover, priority sector classification was extended to fresh credit advanced by SFBs to specified categories of NBFC-MFIs and other MFIs for the purpose of on-lending to individuals in order to address the emergent liquidity stress faced by smaller MFIs.

3.18 In recognition of the continuing adverse impact of COVID-19 pandemic on certain service sectors, the Government expanded the scope of Emergency Credit Line Guarantee Scheme (ECLGS) on March 31, 2021 through introduction of ECLGS 3.0 to cover the credit needs of business enterprises in hospitality, travel and tourism, leisure and sporting sectors. This was followed by ECLGS 4.0 announced on May 31, 2021 which covered the credit needs of hospitals for setting up oxygen generation plants while expanding the coverage of ECLGS 3.0 to include the civil aviation sector and extending the validity of the schemes to September 30, 2021.

3.19 Asset classification and provisioning norms are prudential guidelines that provide a baseline assessment of risks building up in financial intermediaries and a provision floor for expected losses. Any disturbance or pause in asset classification can have wider implications, particularly in respect of the assessment of the true financial position of banks and other lending institutions. Against the backdrop of the pandemic and the multiple petitions filed seeking more policy support measures from the Government and the Reserve Bank, the Supreme Court had directed that borrowers' accounts which had not been classified as non-performing as on August 31, 2020 should be retained in the same category till further orders. This stay on asset classification was vacated on March 23, 2021. Post the Supreme Court's judgement, the Reserve Bank issued instructions dated April 7, 2021 to ensure consistent application of prudent asset classification and income recognition norms by lending institutions.

### III.3.2 Development of the Credit Risk Market

3.20 In order to facilitate diversification of credit risk originating in the banking sector and to ensure market-based credit products for diversified set of investors having commensurate capacity and risk appetite, the Reserve Bank has been working on a revised securitisation framework, a comprehensive framework for transfer of loan exposures and on institutionalising a secondary market for corporate loans. As part of the latter, it has facilitated the establishment of a self-regulatory body *viz.*, Secondary Loan Market Association (SLMA), comprising of market participants.

### III.3.3 Pre-Packaged Insolvency for MSMEs

3.21 With the revocation of the suspension on fresh proceedings under the Insolvency and Bankruptcy Code, 2016 (IBC) on March 24, 2021, creditors can again leverage on the instrumentality of IBC for resolution of stressed assets. As regards MSMEs, the Central Government has promulgated the Insolvency and Bankruptcy Code (Amendment) Ordinance 2021 to allow the corporate debtor to initiate pre-packaged insolvency resolution processes in case of a default of ₹10 lakh and above. This hybrid mechanism (a blend of formal and informal mechanisms) is intended to facilitate resolution for MSMEs in an expeditious and cost-effective manner with minimum disruption in business continuity. In this scheme the resolution of a company's business is explored first with the debtor-in-possession even before the formal initiation of the process. After the process gets underway, in case there is no impairment of operational creditors' dues in the base resolution plan, the Committee of Creditors (CoC) has the option to call for resolution plans from third parties, while it is mandated to do so if impairment arises.

### III.3.4 Bad Bank

3.22 In the Union Budget for 2021-22, the Government announced a proposal for setting up the National Asset Reconstruction Company Limited (NARCL), popularly termed as a "bad bank", to consolidate and take over stressed debt from banks, based on decided characteristics. The aggregation of assets is expected to assist in turning around the assets and eventually offloading them to AIFs and other potential investors for further value unlocking. Drawing from established market principles and global experience, the success of a bad bank initiative would eventually depend upon design aspects, *viz.*, fair pricing; complete segregation of risk from selling banks; investment of external capital; independent and professional management of the new entity; minimising moral hazard; and adequate capitalisation of the banks post-sale of assets to invigorate fresh lending.

### III.3.5 Customer Protection

3.23 Over the years, the Reserve Bank has taken several measures for improving customer service and grievance redress in banks. With increasing number of complaints received in the offices of the Banking Ombudsman, the need was felt to strengthen the existing mechanism. Accordingly, with effect from January 27, 2021[10] a comprehensive framework for dealing with customer grievances was implemented which comprises: (a) enhanced disclosures on customer complaints; (b) monetary disincentive in the form of recovery of cost of redress of complaints from banks when maintainable complaints are comparatively high; and (c) intensive review of the grievance redress mechanism and supervisory action against banks that fail to improve their redress mechanism in a time bound manner.

### III.3.6 Centralised Payment Systems – Permitting Membership to Non-bank Entities

3.24 Currently, the centralised payment systems (CPS), *viz.*, Real Time Gross Settlement (RTGS) and National Electronic Funds Transfer (NEFT) primarily function on a bank-led model. As non-bank entities have emerged as key players in the digital payments space offering innovative products and solutions, granting them direct access in CPS can minimise the cost and time involved in routing payments through banks. Therefore, in line with progress envisaged in the Payment and Settlement Systems in India: Vision 2019-2021, the Reserve Bank announced in April 2021 that entities in the payment space fully regulated by it, *viz.*, non-bank prepaid payment instrument (PPI) issuers, card networks (like Visa and MasterCard), Trade Receivables Discounting System (TReDS) platform operators and white-label ATM operators can obtain direct membership in CPSs after fulfilling the eligibility criteria. Non-bank access to CPS is expected to minimise settlement risk in the financial system and widen the reach of digital financial services to all segments of users.

### III.3.7 Innovation through Regulatory Sandbox

3.25 The Reserve Bank has adopted a thematic approach to its regulatory sandbox (RS) in the fintech sector, which allows it to pursue specific sector-wise objectives and visualise risks at sub-levels. After the first cohort was launched in November 2019 with "Retail Payments" as its theme, the second cohort was launched in December 2020 with the theme "Cross Border Payments". The Reserve Bank also selected "MSME lending" as the theme for the third cohort.

[10] RBI(2021): "Strengthening of Grievance Redress Mechanism in Banks", Circular No. RBI/2020-21/87 CEPD.CO.PRD.Cir.No.01/13.01.013/2020-21, January.

### III.3.8 Strengthening of Cyber Security Preparedness in Supervised Entities

3.26 The cyber threat landscape for the financial system in India is continuously evolving, with new vulnerability exploits, attack vectors and threat groups emerging regularly. The year 2021 has so far seen attempts to target the payment ecosystem of the country by adopting multiple *modus operandi*, including the theft of payment card credentials and compromise of ATM infrastructure. In response, the Reserve Bank has issued advisories/alerts to mitigate their impact and is also working more intensively with supervised entities to strengthen their cyber security resilience.

3.27 Recognising the growing usage of digital channels in banking and payment services and the need for an enabling environment for customers to use digital payment products in a more safe and secure manner, comprehensive guidelines[11] on Digital Payments Security Controls were issued in February 2021 for supervised entities. They stipulate setting up a robust governance structure for digital payment systems and implementing common minimum standards of security controls for channels such as internet/mobile banking and card payments, among others.

3.28 The Computer Security Incident Response Team for the Financial Sector (CSIRT-Fin) under The Indian Computer Emergency Response Team (CERT-In) issued various early warning threat intelligence alerts in near real time to enable mitigation of attacks by the financial sector organisations. CERT-In has on-boarded 158 financial sector organisations in the Cyber Swachhta Kendra to track vulnerable services and malware infections in their respective networks and has been conducting regular cyber security drills / exercises for capacity building.

### III.3.9 Amalgamation of Urban Co-operative Banks

3.29 The enactment of Banking Regulation (Amendment) Act, 2020 empowers the Reserve Bank to sanction voluntary amalgamations of the urban co-operative banks (UCBs) in specified conditions. In this context, the Reserve Bank issued comprehensive directions[12] on various aspects of such amalgamations to help in facilitating amalgamation of weaker UCBs with stronger entities. These include incentives for an amalgamating UCB, such as relaxed conditions for closure/merger of branches as well as minimum entry point capital if the entity becomes a multi-state UCB on account of the amalgamation.

## III.4 Other Developments

### III.4.1 Deposit Insurance

3.30 Insured deposits[13] of banks amounted to ₹76,21,258 crore as on end-March 2021 constituting 50.9 per cent of total assessable deposits at ₹1,49,67,776 crore. The number of fully protected accounts constituted 98.1 per cent of the total number of deposit accounts, and the amount coverage available to depositors of SCBs and UCBs stood at 49.6 per cent and 69.4 per cent, respectively.

3.31 The Deposit Insurance and Credit Guarantee Corporation (DICGC) processed claims amounting to ₹993 crore during 2020-21, with a view to ensuring payment to insured depositors of liquidated banks under the prevailing pandemic situation. Of this, ₹564 crore pertained to nine co-operative banks.

[11] RBI(2021): "Master Direction on Digital Payment Security Controls", Direction No. RBI/2020-21/74 DoS.CO.CSITE.SEC.No.1852/31.01.015/2020-21, February.

[12] RBI(2021): "Master Direction - Amalgamation of Urban Cooperative Banks, Directions, 2020", Direction No. RBI/DOR/2020-21/75 Master Direction DOR.MAM.No.49/09.16.901/2020-21, March.

[13] The limit of deposit insurance cover has been enhanced to ₹5 lakh per depositor with effect from February 4, 2020.

**Table 3.1: Corporate Insolvency Resolution Process**

(Number)

| Year / Quarter | CIRPs at 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 | 1,156 | 149 | 97 | 79 | 305 | 1,063 |
| Apr-Jun, 2019 | 1,063 | 301 | 53 | 32 | 26 | 96 | 1,157 |
| Jul-Sep, 2019 | 1,157 | 596 | 57 | 51 | 34 | 156 | 1,455 |
| Oct-Dec, 2019 | 1,455 | 637 | 114 | 60 | 42 | 153 | 1,723 |
| Jan-Mar, 2020 | 1,723 | 444 | 95 | 58 | 39 | 137 | 1,838 |
| Apr-Jun, 2020 | 1,838 | 84 | 13 | 27 | 20 | 26 | 1,836 |
| Jul-Sep, 2020 | 1,836 | 96 | 25 | 35 | 35 | 81 | 1,756 |
| Oct-Dec, 2020 | 1,756 | 107 | 8 | 30 | 24 | 83 | 1,718 |
| Jan-Mar, 2021 | 1,718 | 212 | 8 | 21 | 29 | 149 | 1,723 |
| **Total** | **NA** | **4376** | **617** | **411** | **348** | **1,277** | **1,723** |

**Note:** 1) These CIRPs are in respect of 4289 CDs.
2) This excludes 1 CD which has moved directly from BIFR to resolution.
**Source:** Compilation from website of the NCLT and filing by Insolvency Professionals.

The net outgo of funds towards settlement of claims was lower, aided by a recovery of ₹567 crore during the year. During April 2021, an amount of ₹330 crore was settled in case of one co-operative bank.

3.32 The size of the deposit insurance fund stood at ₹1,29,904 crore as at end-March 2021 leading to a reserve ratio (deposit insurance fund to insured deposits) of 1.7 per cent. The DICGC deployed the funds in central government securities, primarily in the liquid 10-year paper, maintaining a modified duration of 7.41 years to enable availability of funds for settlement of claims in case of failure of banks.

3.33 The Government had announced in the Union Budget a move towards streamlining the provisions of the Deposit Insurance and Credit Guarantee Corporation Act, 1961 so that if a bank is temporarily unable to fulfil its obligations, the depositors can get easy and time-bound access to their deposits to the extent of the deposit insurance cover.

**Table 3.2: Sectoral Distribution of CIRPs as on March 31, 2021**

| Sector | No. of CIRPs | | | | | | |
|---|---|---|---|---|---|---|---|
| | Admitted | Closed | | | | | Ongoing |
| | | Appeal/ Review/ Settled | Withdrawal under Section 12A | Approval of Resolution Plan | Commencement of Liquidation | Total | |
| Manufacturing | 1784 | 214 | 166 | 178 | 566 | 1124 | 660 |
| Real Estate, Renting & Business Activities | 862 | 159 | 100 | 46 | 214 | 519 | 343 |
| Construction | 458 | 90 | 46 | 32 | 94 | 262 | 196 |
| Wholesale & Retail Trade | 442 | 56 | 35 | 20 | 156 | 267 | 175 |
| Hotels & Restaurants | 99 | 17 | 12 | 12 | 24 | 65 | 34 |
| Electricity & Others | 134 | 15 | 4 | 13 | 32 | 64 | 70 |
| Transport, Storage & Communications | 132 | 17 | 9 | 9 | 48 | 83 | 49 |
| Others | 465 | 49 | 39 | 38 | 143 | 269 | 196 |
| **Total** | **4376** | **617** | **411** | **348** | **1277** | **2653** | **1723** |

**Source:** Compilation from website of the NCLT and filing by Insolvency Professionals.

### III.4.2 Corporate Insolvency Resolution Process (CIRP)

3.34 At the end of Q4:2020-21, the number of CIRPs commenced under the Insolvency and Bankruptcy Code (IBC) stood at 4376, with the manufacturing sector accounting for the largest share (Tables 3.1 and 3.2). About 61 per cent of these had been closed, with 13 per cent culminating in resolution plans and 48 per cent yielding orders for liquidation. Of the latter, 74.3 per cent had earlier been with the Board for Industrial and Financial Reconstruction (BIFR) or defunct and the assets involved, on average, were valued at less than 5 per cent of the outstanding debt amount (Table 3.3).

3.35 Out of the 348 CIRPs that ended in resolution, 120 were BIFR or defunct cases. Overall, realisation by financial creditors (FCs) in the resolved cases was 39.3 per cent of their claims and 179.9 per cent of liquidation value (Table 3.4). The CIRPs which yielded resolution plans by the end of March 2021 took 406 days on an average (after excluding the time excluded by the Adjudicating Authority) for conclusion of the process.

**Table 3.3: CIRPs Ending with Orders for Liquidation till March 31, 2021**

| 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 | 384 | 444 | 118 | 946 |
| Resolution Value > Liquidation Value | 75 | 44 | 27 | 146 |
| Resolution Value ≤ Liquidation Value | 471 | 528 | 127 | 1126 |

**Note:** 1. There were 67 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 5 CIRPs are awaited.

**Source:** Compilation from National Company Law Tribunal (NCLT) website and filing by Insolvency Professionals.

### III.4.3 Mutual Funds

3.36 The volume of fund mobilisation and redemption in mutual funds (MF) during H2:2020-21 was subdued as compared to the corresponding period in the previous year. The net inflow of ₹0.7 lakh crore into MF schemes, however, outstripped the level of ₹0.3 lakh crore recorded during H2:2019-20. Income/debt-oriented schemes accounted for inflows of ₹80,937 crore while growth/equity-oriented schemes witnessed outflows of ₹41,823 crore. Total inflows under all other schemes stood at ₹28,382 crore during H2:2020-21.

**Table 3.4: Outcome of CIRPs, initiated Stakeholder-wise, as on March 31, 2021**

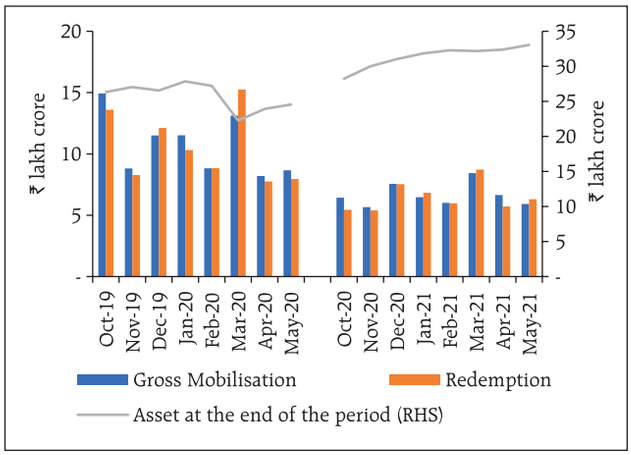
| Outcome | Description | CIRPs initiated by | | | |
|---|---|---|---|---|---|
| | | Financial Creditor | Operational Creditor | Corporate Debtor | Total |
| **Status of CIRPs** | Closure by Appeal/Review/Settled | 164 | 447 | 6 | 617 |
| | Closure by Withdrawal u/s 12A | 120 | 284 | 7 | 411 |
| | Closure by Approval of Resolution Plan | 191 | 116 | 41 | 348 |
| | Closure by Commencement of Liquidation | 548 | 573 | 156 | 1277 |
| | Ongoing | 852 | 805 | 66 | 1723 |
| | **Total** | **1875** | **2225** | **276** | **4376** |
| **CIRPs yielding Resolution Plans** | Realisation by FCs as % of Liquidation Value | 190.4 | 114 | 141 | 179.9 |
| | Realisation by FCs as % of their Claims | 44.7 | 16.6 | 26 | 39.3 |
| | Average time taken for Closure of CIRP | 463 | 458 | 439 | 459 |
| **CIRPs yielding Liquidations** | Liquidation Value as % of Claims | 6.3 | 8.9 | 9.9 | 7 |
| | Average time taken for Closure of CIRP | 366 | 344 | 324 | 351 |

**Source:** Compilation from website of the NCLT and filing by Insolvency Professionals.

3.37 The assets under management (AUM) of the mutual fund industry increased by 44.5 per cent during 2020-21 (Chart 3.1). At the end of May 2021, the AUM increased by 34.7 per cent year-on-year.

3.38 The AUM of investment through systematic investment plans (SIPs), which continued to be a favoured choice for investors, recorded 78.1 per cent growth during 2020-21 (Table 3.5).

**Chart 3.1: Resource Mobilisation by Mutual Funds and AUM**




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

### III.4.4 Capital Mobilisation - Equity and Corporate Bonds

3.39 Capital mobilisation through public and rights issues during 2020-21 increased to ₹1,10,088 crore, registering a 42.9 per cent increase over the previous year (Table 3.6). There was a significant fall in fund raising though preferential allotment during 2020-21. Also, on the back of the lower bond yields and low return on bank deposits, corporates raised ₹7.8 lakh crore during 2020-21 as compared with ₹6.9 lakh crore in the previous year. During April-May 2021, debt issues accounted for nearly 69 per cent of the capital raised.

**Table 3.5 : SIPs in 2020-21**

| Existing at the beginning of 2020-21 (Excluding STP) | Registered during 2020-21 | Matured during 2020-21 | Terminated prematurely during 2020-21 | Closing no. of SIPs at the end of 2020-21 | AUM at the beginning 2020-21 | AUM at the end of 2020-21 |
|---|---|---|---|---|---|---|
| (Number in lakhs) | | | | | Amount in ₹ crore | |
| 315 | 131 | 25 | 54 | 368 | 2,38,821 | 4,25,338 |

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

**Table 3.6: Capital/Debt Mobilisation modes**

(Amount in ₹ crore)

| Particulars | 2021-22$ | | 2020-21 | | 2019-20 | |
|---|---|---|---|---|---|---|
| | Number | Amount | Number | Amount | Number | Amount |
| Public issue (Equity)# | 8 | 3010 | 56 | 46,030 | 62 | 21,382 |
| Rights Issues (Equity) | 4 | 305 | 21 | 64,059 | 17 | 55,670 |
| QIP & Institutional placement programme (IPP)* | 6 | 7,857 | 31 | 78,738 | 14 | 54,389 |
| Preferential Allotments* | 68 | 14,706 | 230 | 40,876 | 280 | 174,875 |
| **Total Equity** | **86** | **25,878** | **338** | **2,29,703** | **373** | **306,317** |
| Public Issue (Debt) | 6 | 3,581 | 18 | 10,587 | 34 | 14,984 |
| Private Placement of Corporate Bonds | 192 | 53,632 | 1995 | 7,71,840 | 1,786 | 674,671 |
| **Total Debt** | **198** | **57,213** | **2,013** | **7,82,427** | **1,820** | **6,89,655** |
| **Total Fund Raised** | **284** | **83,091** | **2,351** | **10,12,130** | **2,193** | **9,95,971** |

**Notes:** 1) Equity public issues also includes issues listed on SME platform
2) $ Data upto May 2021.
3) #Data has been prepared based on date of listing of the Issues
4) *Based on trading date.
5) The data of debt is being prepared based on closing date.

**Source:** SEBI

### III.4.5 Credit Ratings

3.40 On an aggregate basis, the share of downgraded listed debt issues in total outstanding ratings declined significantly during Q4:2020-21 *vis-à-vis* earlier quarters, while the share of upgraded listed debt issues was at a three-year high for both ICRA and CRISIL (Chart 3.2).

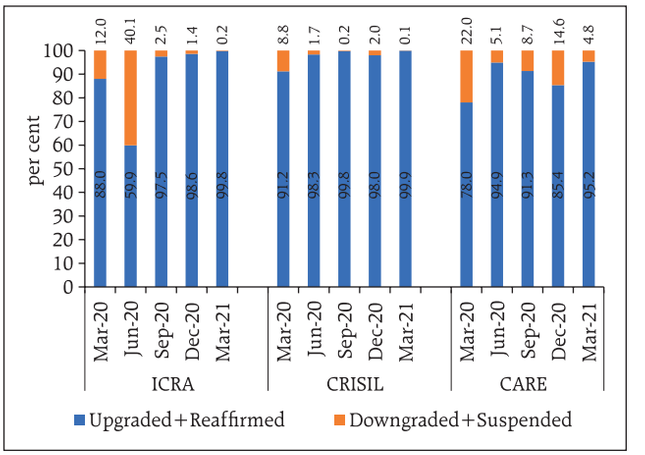
3.41 Out of the rating downgrades during Q4:2020-21, the share of the NBFC and HFC sectors as well as banks and financial services went down significantly as compared to the preceding quarter (Chart 3.3).

### III.4.6 Commodity Derivatives Market

3.42 Reflecting the strong demand for commodities globally and in India, the benchmark domestic commodity derivative indices, MCX iCOMDEX composite and the NKrishi[14] index, gained 6.2 per cent and 28.3 per cent, respectively, during the period January – June 2021 (upto June 21, 2021) (Chart 3.4). Apart from external factors such as a surge in China's industrial demand, adverse weather patterns impacting agri-produce in various countries and rising energy prices due to OPEC production cuts, domestic factors, including increase in export demand, pent-up domestic demand and commodity specific demand–supply imbalances drove up prices.

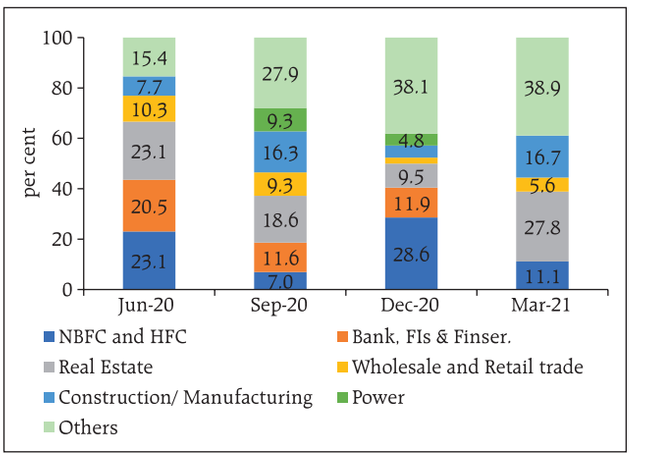
3.43 During January-June 2021 (upto June 21,2021), the iCOMDEX crude oil index registered a rise of

**Chart 3.2: Listed Debt Issues by Rating Actions**



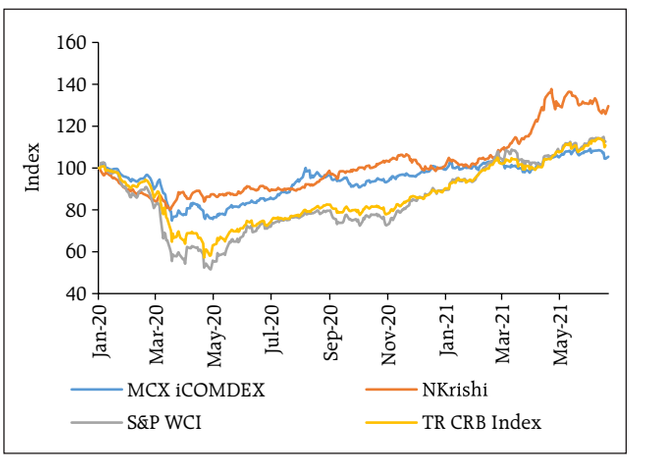

**Source:** Individual Credit Rating Agencies (CRAs).

**Chart 3.3: Distribution of Rating Downgrades - Sector wise**




**Source:** Individual Credit Rating Agencies (CRAs).

**Chart 3.4: Domestic and International Commodity Futures Indices**

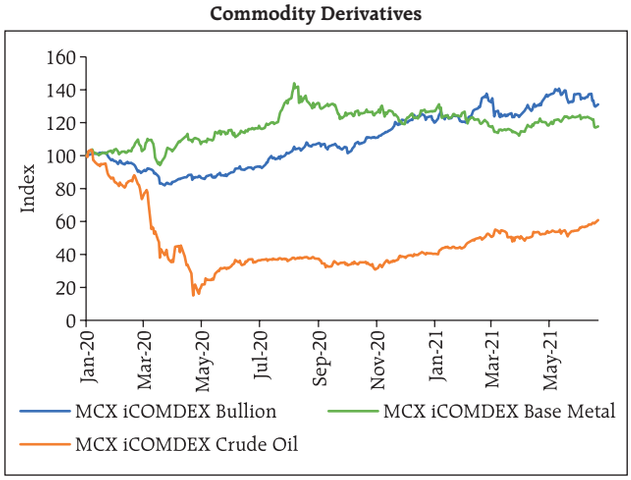



**Source:** MCX, NCDEX and Reuters

[14] NKrishi is a value weighted index, computed in real time using the prices of the 10 most liquid commodity futures traded on the NCDEX platform.

50.7 per cent, reflecting increasing energy prices (Chart 3.5). The iCOMDEX base metal index surged by 9.3 per cent during the same period, clocking an overall rise of 47.9 per cent for 2020-21 as a whole. On the other hand, the iCOMDEX bullion index, which had risen by 10.4 per cent during 2020-21, declined by 7.3 per cent during January – June 2021 due to reduction in the safe haven appeal of precious metals on account of strengthening of the dollar, rise in US bond yields and optimism on economic recovery following rollout of vaccines.

**Chart 3.5: Movement in Select Sectoral indices in Commodity Derivatives**

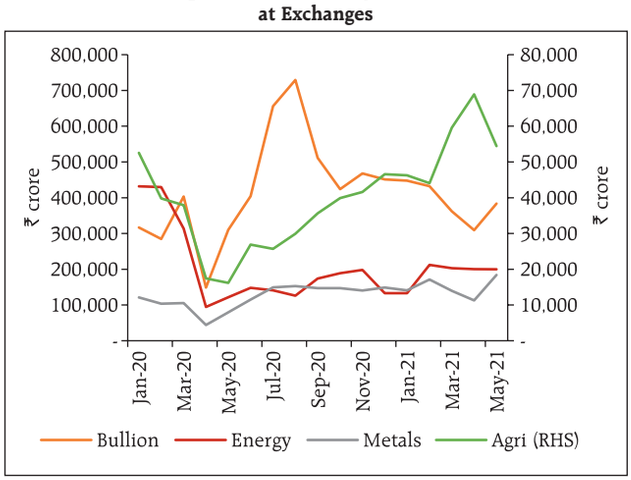



**Source:** MCX

## Trading Activity in the Commodity Derivatives Market

3.44 Commodity derivatives recorded lower turnover during January – May 2021 relative to August – December 2020 period, driven by fall in bullion segment, which constitutes half of the aggregate turnover (Table 3.7). While turnover of futures contracts declined by 12.4 per cent, that of the options segment increased by 13.9 per cent. Traded volumes in tonnes increased for agriculture and energy and declined for bullion and metals (Chart 3.6).

**Chart 3.6: Snapshot of Commodity Derivatives Turnover at Exchanges**




**Source:** MCX, NCDEX, BSE, NSE, ICEX

**Table 3.7: Segment-wise aggregate turnover (Futures + Options) in Commodity Derivatives**

(Amount in ₹ crore)

| Period | Agri. | Bullion | Energy | Metals | Gems & Stones | Total Turnover |
|---|---|---|---|---|---|---|
| January – May 2021 | 2,73,292 | 19,34,976 | 9,48,218 | 7,48,235 | 0.1 | 39,04,716 |
| August – December 2020 | 1,93,585 | 25,83,180 | 8,19,620 | 7,35,792 | 0.3 | 43,32,176 |
| Change (per cent) | 41.2 | -25.1 | 15.7 | 1.7 | - | -9.9 |
| Share in Jan – May 2021 (in per cent) | 7.0 | 49.5 | 24.3 | 19.2 | 0.0 | 100.0 |

**Source:** MCX, NCDEX

### III.4.7 Insurance

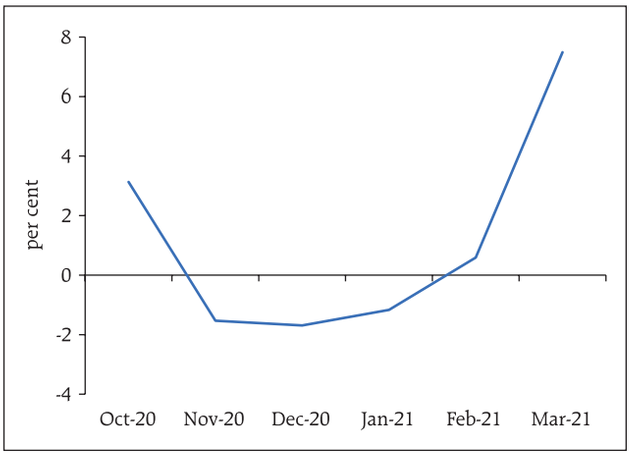
3.45 New business premiums pertaining to life insurance picked up sharply after plunging in Q3:2020-21 (Chart 3.7). Non-linked insurance products with guaranteed benefits increased by nearly 8 per cent in 2020-21.

3.46 The total premium, which includes renewal premium, also continued the uptrend seen since November 2020 (Chart 3.8).

3.47 Insurance premiums collected under various COVID-19 specific policies stood at ₹1,307 crore for an insured sum of ₹13.6 lakh crore up to May 15, 2021 (Table 3.8).

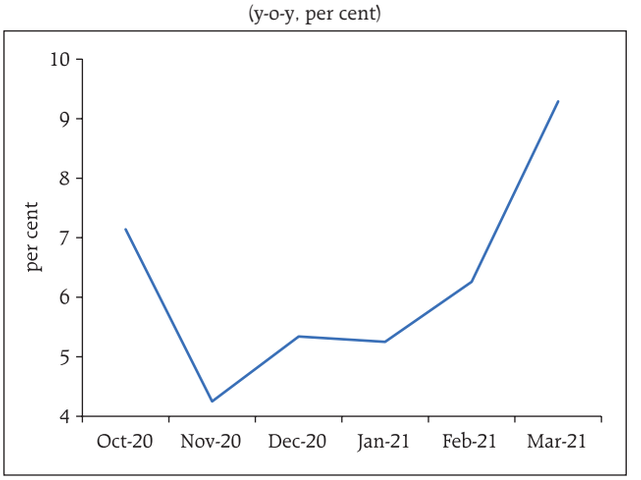
3.48 During 2020-21, the life insurance industry received 22,205 claims worth ₹1,644.56 crore where death was due to COVID-19 and related complications, which amounted to 0.3 per cent of total premium income of the year. Of these, 21,854 death claims amounting to ₹1,492.02 crore were settled and there was no significant impact on the financials of the life insurers. As per the number of claims, the claims paid ratio (provisional) stood at 98.1 per cent for individual claims and 98.6 per cent in the group category in comparison with 96.8 per cent and 97.3 per cent, respectively, for the previous financial year. Thus, the pandemic did not have a significant impact on death claim settlement rates.

**Chart 3.7: New Business Premium Growth – Life Insurance**




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

**Chart 3.8 Growth in Total Premia – Life Insurance**
(y-o-y, per cent)




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

**Table 3.8: Business in COVID-19-specific Insurance Products**
**(April 1, 2020 to May 15, 2021)**

| Type of business / Units | No. of Policies | Lives covered | Total Sum Insured | Gross Premium |
|---|---|---|---|---|
| | Number | | ₹ Crore | |
| Corona Kavach | 27,62,126 | 48,14,096 | 1,60,615 | 679 |
| Corona Rakshak | 4,74,807 | 5,48,242 | 9,193 | 71 |
| Other COVID-19 specific products | 62,021 | 95,35,366 | 11,92,436 | 557 |
| **Total** | **32,98,954** | **1,48,97,704** | **13,62,244** | **1,307** |

**Note:** The data is as submitted by the insurers through a special format
**Source:** IRDAI

### III.4.8 Pension Funds

3.49 The enrolment and assets under management (AUM) of the National Pension System (NPS) and Atal Pension Yojana (APY) continued to grow (Table 3.9). The coverage of citizens under the pension net expanded and the number of banks registered under APY increased to 414.

**Table 3.9: Subscriber and AUM Growth: NPS and APY**

| Sector | Numbers in lakh | | Amount in ₹ crore | |
|---|---|---|---|---|
| | Mar-20 | Mar-21 | Mar-20 | Mar-21 |
| Central Government | 21.02 | 21.76 | 1,38,046 | 1,81,788 |
| State Government | 47.54 | 51.41 | 2,11,023 | 2,91,381 |
| Corporate | 9.73 | 11.25 | 41,243 | 62,609 |
| All Citizen Model | 12.52 | 16.47 | 12,913 | 22,206 |
| NPS Lite | 43.32 | 43.02 | 3,728 | 4,354 |
| APY | 211.42 | 280.49 | 10,526 | 15,687 |
| **Total** | **345.55** | **424.4** | **4,17,479** | **5,78,025** |

**Source:** Pension Fund Regulatory and Development Authority

### III.4.9 International Financial Services Centres Authority (IFSCA)

3.50 The IFSCA issued various enabling regulations relating to market infrastructure institutions, banking, bullion exchange, finance companies, global in-house centres, fintech regulatory sandbox, alternate investment funds (AIFs), aircraft leasing and ancillary services. This attracted significant interest and permission was granted for setting up business in IFSC to funds and fund managers, portfolio managers, global inhouse centres, aircraft leasing units and professional and other ancillary services providers.

### Summary and Outlook

3.51 Central banks and regulatory authorities are at the forefront of the war effort mounted to cushion the damage wrought by the COVID-19 pandemic. As recovery remains hesitant and divergent, they have extended existing regulatory relaxations further and are also addressing emerging sectoral concerns on an ongoing basis. Various initiatives to strengthen the operational resilience of the financial sector entities have been taken up. Learning from the effectiveness of measures, global standard setting agencies have initiated processes to build new capabilities and refine the existing systems. As banks and other financial intermediaries strengthen capital positions and provisions to withstand aftershocks from waves of the pandemic, these buffers will help in managing the rollback of regulatory measures without leaving scars in their wake.

3.52 Domestically too, several measures were taken across the regulatory space to strengthen financial sector entities, ease access to financial products, strengthen the grievance redressal mechanism and protect the interests of depositors/investors. As the economy recovers from the pandemic, the financial system will be called upon to support the revival of growth. Therefore, safeguarding and boosting financial sector resilience will remain a policy priority.

## Annex 1

## Systemic Risk Survey

The twentieth round of the systemic risk survey (SRS) was conducted during April-May 2021[1] to capture the perceptions of experts, including market participants, on the major risks faced by the Indian financial system. In this round, in addition to the usual coverage, views of the panellists were also solicited on the short-term and long-term impacts of the second wave of the COVID-19 pandemic. The survey results, based on feedback from 36 respondents, are encapsulated below.

### Outlook on Major Risk categories

2. The participants perceived all broad categories of risks to the financial system - global, macroeconomic, financial market, institutional and general - as 'medium' in magnitude (Figure 1). Their opinion about institutional risk which had been categorised as 'high' in the previous two survey rounds, moderated in the latest round. Within the major categories, however, certain components were rated as 'high' risk viz., commodity price risk, domestic growth and inflation, fiscal deficit, corporate vulnerabilities, equity price volatility, banks' assets quality and capital requirement, credit growth and cyber risk (Figure 2). Commodity price risk was assessed to have been amplified as compared to the previous round, while risks relating to global growth and pace of infrastructure development were seen as having waned.

**Figure 1: Major risk groups identified in the Systemic Risk Survey**

| Major Risk Groups | Apr-21 | Oct-20[2] | Change in Risk Perception* |
|---|---|---|---|
| *A. Global Risks* | | | Decline |
| *B. Macroeconomic Risks* | | | **Increase** |
| *C. Financial Market Risks* | | | **Increase** |
| *D. Institutional Risks* | | | Decline |
| *E. General Risks* | | | Decline |

**Source**: RBI's Systemic Risk Survey (October 2020 & April 2021).

**Note:**
**Risk Category**

| | | | | |
|---|---|---|---|---|
| **Very high** | **High** | **Medium** | **Low** | **Very low** |

* The risk perception, as it emanates from the systemic risk survey conducted at different time points (on a half-yearly basis in April and October), may shift (increase/decrease) 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.

[1] Responses for the survey launched in April 2021 round were received during April-May 2021.
[2] Responses for the October 2020 round of SRS were received during October-November 2020.

**Figure 2: Various risks identified in Systemic Risk Survey**

| Risk items | | Apr - 21 | Oct - 20 | Change in Risk Perception* |
|---|---|---|---|---|
| *A. Global Risks* | Global growth | | | Decline |
| | Sovereign risk / contagion | | | Decline |
| | Funding risk (External borrowings) | | | **Increase** |
| | Commodity price risk | | | **Increase** |
| | Other global risks | | | **Increase** |
| *B. Macro-economic Risks* | Domestic growth | | | Decline |
| | Domestic inflation | | | **Increase** |
| | Current account deficit | | | **Increase** |
| | Capital inflows/ outflows (Reversal of FIIs, Slowdown in FDI) | | | **Increase** |
| | Sovereign rating downgrade | | | **Increase** |
| | Fiscal deficit | | | Decline |
| | Corporate sector risk | | | Decline |
| | Pace of infrastructure development | | | Decline |
| | Real estate prices | | | Decline |
| | Household savings | | | **Increase** |
| | Political uncertainty/ governance /policy implementation | | | **Increase** |
| | Other macroeconomic risks | | | **Increase** |
| *C. Financial Market Risks* | Foreign exchange rate risk | | | **Increase** |
| | Equity price volatility | | | **Increase** |
| | Interest rate risk | | | **Increase** |
| | Liquidity risk | | | Decline |
| | Other financial market risks | | | **Increase** |
| *D. Institutional Risks* | Regulatory risk | | | Decline |
| | Asset quality deterioration | | | Decline |
| | Additional capital requirements of banks | | | Decline |
| | Access to funding by banks | | | Decline |
| | Level of credit growth | | | Decline |
| | Cyber risk | | | Decline |
| | Operational risk | | | Decline |
| | Other institutional risks | | | **Increase** |
| *E. General Risks* | Terrorism | | | Decline |
| | Climate related risks | | | Decline |
| | Social unrest (Increasing inequality) | | | **Increase** |
| | Other general risks | | | **Increase** |

**Note:**
**Risk Category**

| Very high | High | Medium | Low | Very low |
|---|---|---|---|---|

* The risk perception, as it emanates from the systemic risk survey conducted at different time points (on a half-yearly basis in April and October), may shift (increase/decrease) 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.

## Outlook on the Financial System

3. Majority of the respondents envisaged marginal deterioration in the prospects of the Indian banking sector over the next one year: this was a significant worsening of sentiments from the previous survey round (Chart 1).

4. Most of the respondents expected a 'medium' probability of occurrence of a high impact event in the financial system, in India as well as globally, in the short-term (up to one year) and medium term (one to three years) (Chart 2). The uncertainty regarding the short-term assessment of the domestic financial system reduced *vis-à-vis* the previous survey round (Chart 2c).

**Chart 1: Prospects of Indian banking sector in the next one year**

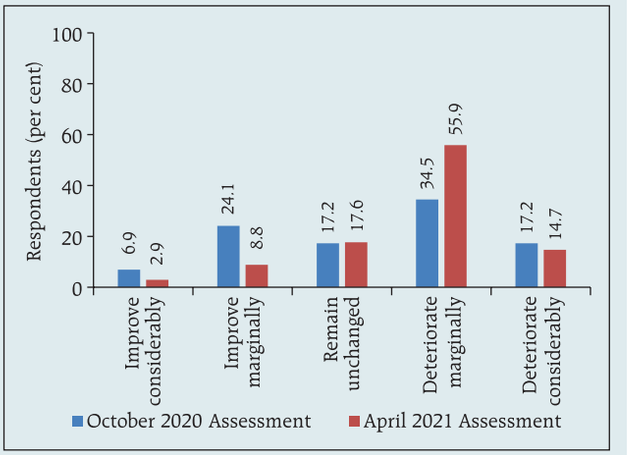
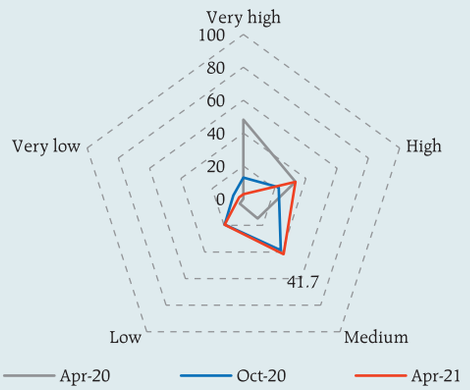



**Chart 2: Perception on occurrence of high impact events and confidence in the financial systems** *(Contd.)*

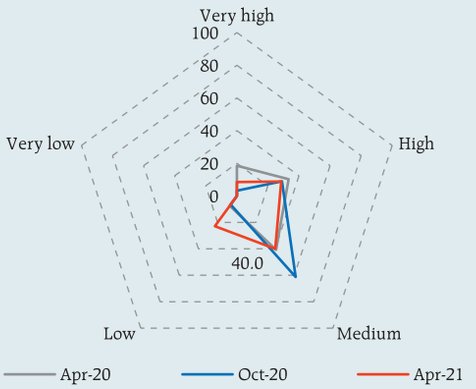
share of respondents (per cent)

**A. Probability of high impact event in the global financial system**

**a. In the short term**

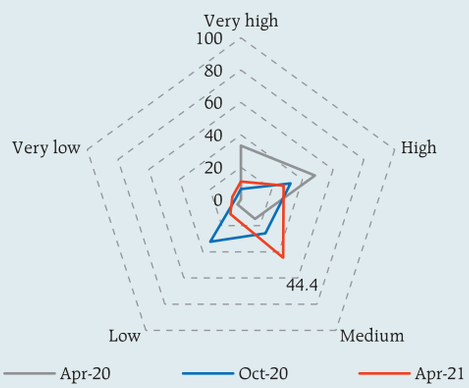



**b. In the medium term**




**B. Probability of high impact event in the domestic financial system**

**c. In the short term**




**d. In the medium term**

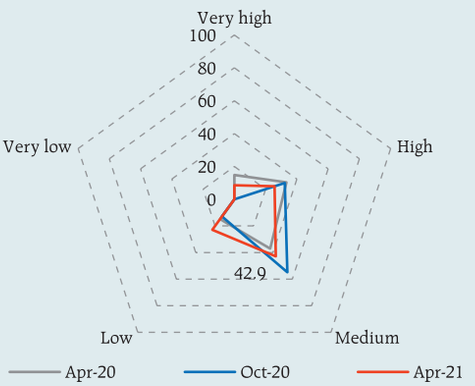
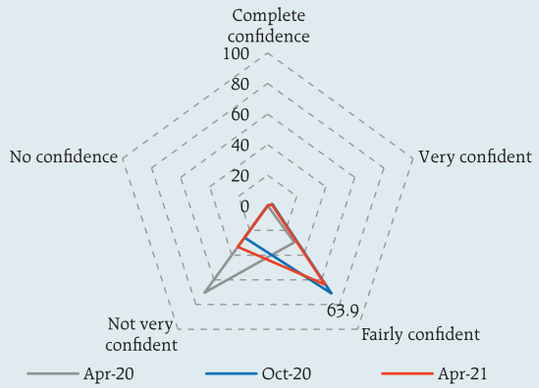


**Chart 2: Perception on occurrence of high impact events and confidence in the financial systems** *(Concld.)*

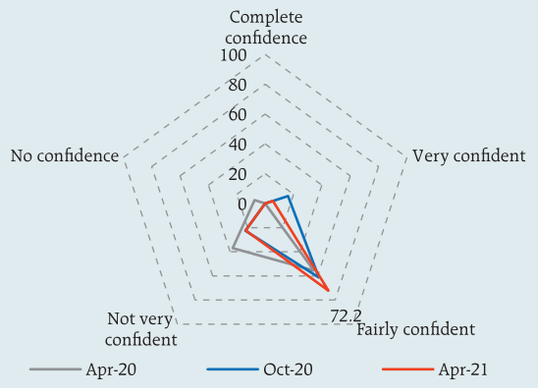
share of respondents (per cent)

**C. Confidence in the financial systems**

**e. Stability of Global financial system**




**f. Stability of Indian financial system**




5. The survey panellists had lower confidence about stability of both global and Indian financial system, as compared to the previous round. The share of respondents who were 'fairly confident' about the stability of the global and the Indian financial system stood at 63.9 per cent and 72.2 per cent, respectively (Charts 2 e and f).

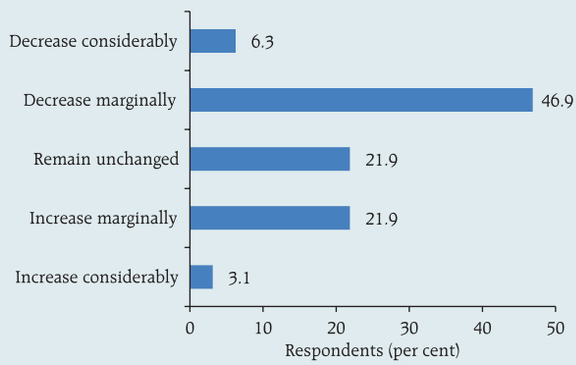
6. Majority of the respondents anticipated marginal fall in credit demand and deterioration in average credit quality over the next three months due to uncertainty caused by second wave of COVID-19 pandemic involving localised lockdowns in different parts of the country and postponement of discretionary spending (Chart 3). Stress in MSME and contact intensive sectors was expected to exacerbate further.

## Post-pandemic Recovery

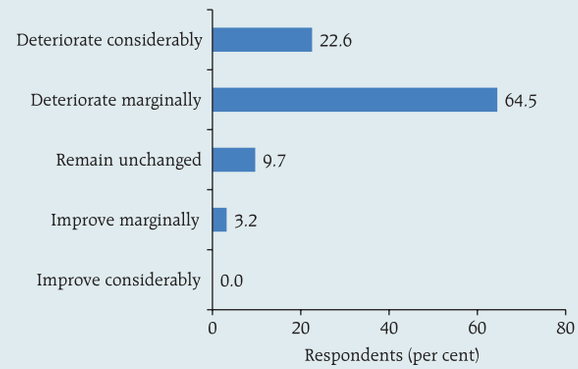
7. As regards short-term effects of the second wave of the pandemic, respondents were unequivocal that employment, productivity and wages will decline; while prices, debt-to-GDP ratio and size

**Chart 3: Indian Banking Sector – Outlook**

**a. Demand for credit: Likely change in the next three months**




**b. Average credit quality: Likely change in the next three months**



of the Reserve Bank of India's balance sheet will increase. More than half of the respondents expected capital stock to fall. The share of NBFCs in financial intermediation may remain close to its present level over the next one year and is expected to improve in the subsequent period (Chart 4).

**Chart 4: Impact of the second wave (April 2021)** *(Contd.)*

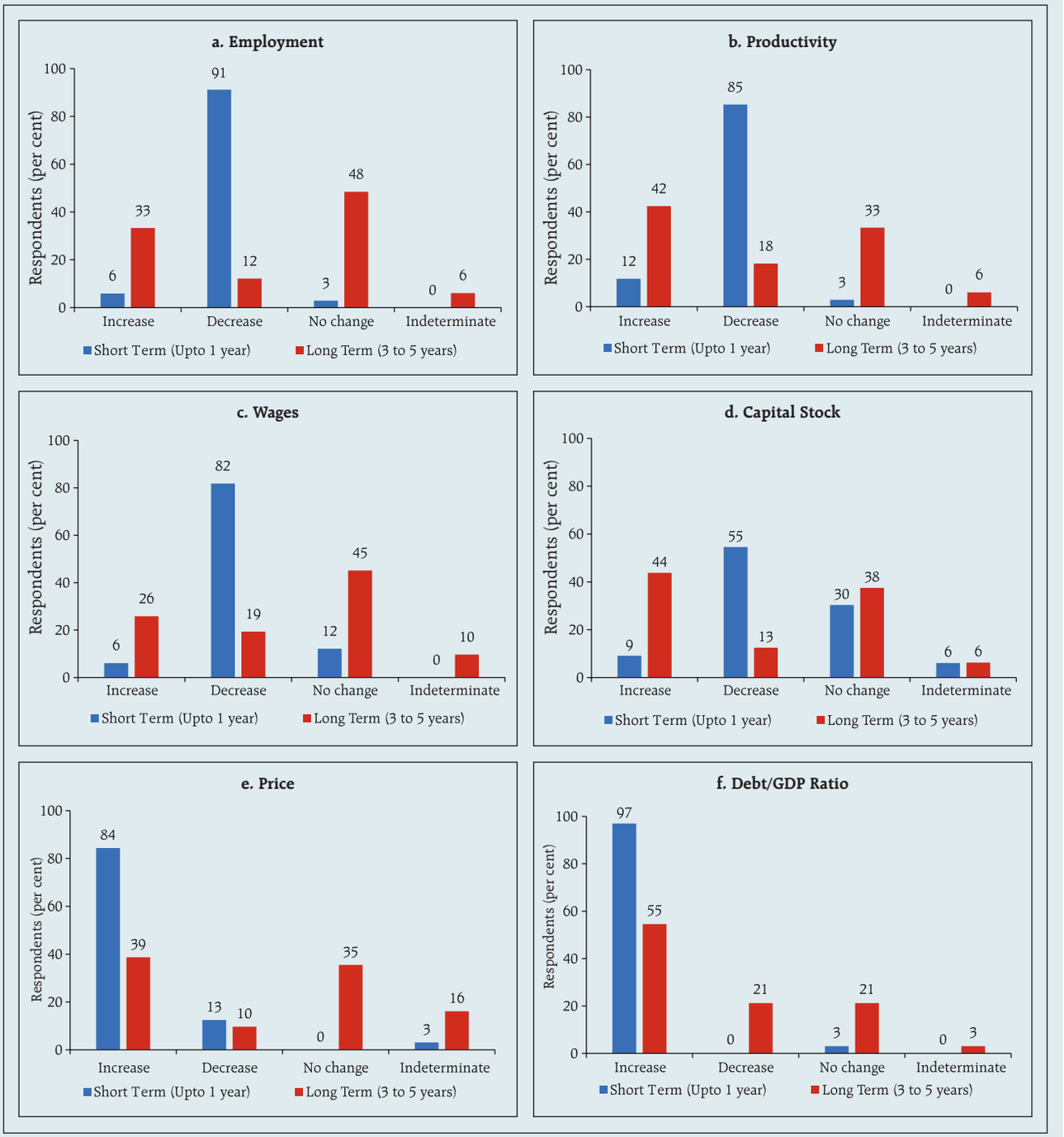
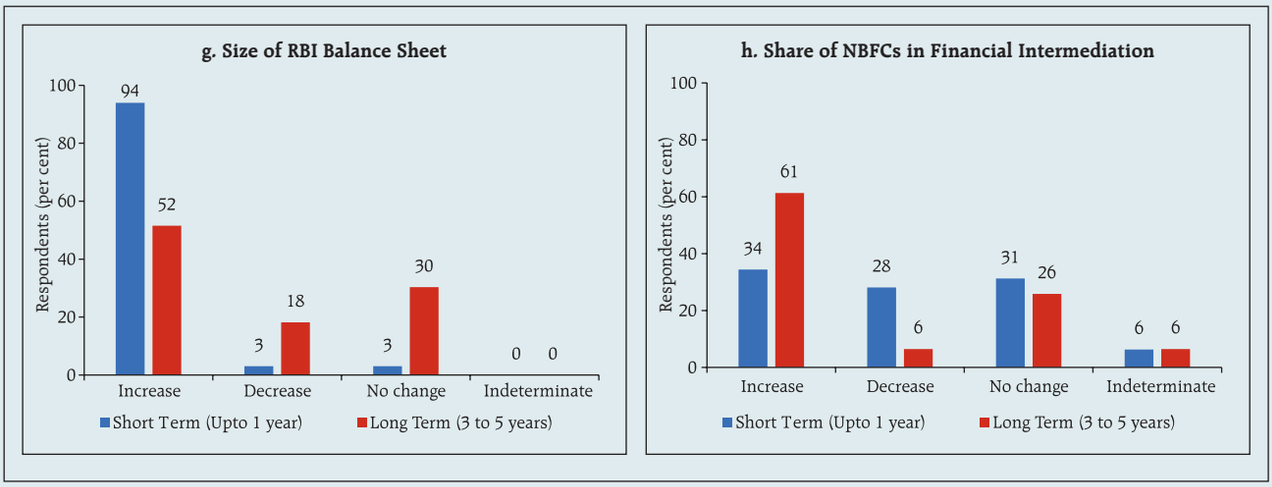


**Chart 4: Impact of the second wave (April 2021)** *(Concld.)*

Respondents (per cent)




8. On the long-run (3 to 5 years) impact, a majority of the respondents was of the view that debt-to-GDP ratio, size of the Reserve Bank of India's balance sheet and involvement of NBFCs would grow (Chart 4).

9. The survey respondents identified tourism and hospitality, construction and real estate, aviation, retail and entertainment as the major sectors adversely affected by the second wave of the COVID-19 pandemic (Table 1). Pandemic related lockdowns, requirement of social distancing, risk aversion and curb in discretionary spending have worsened the already bleak economic prospects assessed in the previous round. Many respondents hinged their expectations of economic recovery on the pace and extent of the vaccination drive.

10. Over 60 per cent of the respondents anticipated K-shaped recovery post the second wave, *i.e.*, different parts of the economy recover at different rates (Chart 5). About 17 per cent of the responses indicated a quick recovery followed by a second decline (W-shaped) and another 14 per

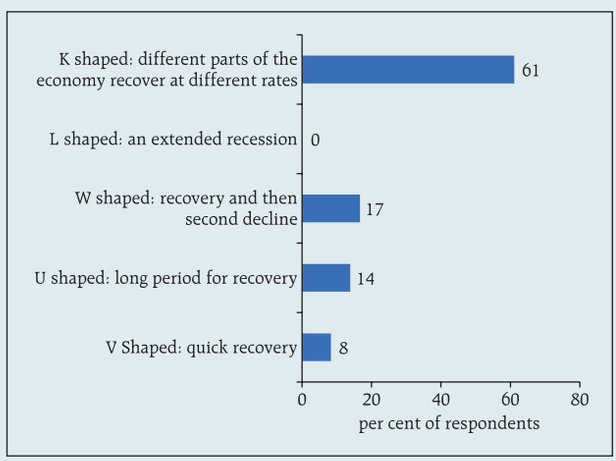
**Table 1: Sectors adversely affected by COVID-19 and their future prospects**

(per cent of respondents)

| Sector | Prospects of recovery in the next six months | | | |
|---|---|---|---|---|
| | Good | Moderate | No change | Bleak |
| Tourism and Hospitality | | 27.6 (29.0) | 17.2 (16.1) | 55.2 (54.8) |
| Construction and Real Estate | 0.0 (5.0) | 27.8 (30.0) | 27.8 (35.0) | 44.4 (30.0) |
| Aviation | 0.0 (5.3) | 33.3 (36.8) | 11.1 (10.5) | 55.6 (47.4) |
| Retail | | 62.5 (66.7) | 0.0 (16.7) | 37.5 (16.7) |
| Entertainment* | | 28.6 | 28.6 | 42.9 |

**Note**: Figures in brackets represent per cent of respondents in the previous survey round.
* Not adjudged as one of the most affected sectors in the previous survey round.

**Chart 5: Possible shape of Economic Recovery**



cent of the respondents projected a long period for recovery (U-shaped).

### Risks to Financial Stability

11. The survey panellists cited the following major factors as posing risks to financial stability (global and domestic), going forward:

- highly accommodative monetary policies and large fiscal stimuli adding to concerns around market-based indicators of inflation expectations, unsettling bond markets globally;
- disparity in recovery between countries resulting in increasing inequality in emerging markets and developing economies;
- increase in global commodity prices leading to higher volatility in the markets; supply chain disruptions leading to inflationary pressures;
- muted consumer demand due to the pandemic related uncertainty;
- overleveraged balance sheets;
- pandemic related restrictions imposed in major states which contribute significantly to India's GDP, GST collection and thereby, Central Government's finances; and
- prolonged restrictions on movement and supply chain disruptions on business and credit-offtake as well as asset quality of financial institutions, particularly retail exposure.

## Annex 2

## Methodologies

### 2.1 Scheduled Commercial Banks

#### 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. The five composite indices used in the banking stability map and indicator represent the five dimensions of soundness, asset-quality, profitability, liquidity and efficiency. The ratios used for constructing each composite index are given in Table 1.

**Table 1: Ratios used for constructing the banking stability map and indicator**

| Dimension | Ratios | | | |
|---|---|---|---|---|
| **Soundness** | CRAR # | Tier-I Capital to Tier-II Capital # | Leverage Ratio as Total Assets to Capital and Reserves | |
| **Asset-Quality** | Net NPAs to Total Advances | Gross NPAs to Total Advances | Sub-Standard Advances to Gross NPAs # | Restructured Standard Advances to Standard Advances |
| **Profitability** | Return on Assets # | Net Interest Margin # | Growth in Profit # | |
| **Liquidity** | Liquid Assets to Total Assets # | Customer Deposits to Total Assets # | Non-Bank Advances to Customer-Deposits | Deposits maturing within 1-year to Total Deposits |
| **Efficiency** | Cost to Income | Business (Credit + Deposits) to Staff Expenses # | | Staff Expenses to Total Expenses |

**Note**: # Negatively related to risk.

Each composite index, representing a dimension of bank functioning, takes values between zero and one. Each index is a relative measure during the sample period used for its construction, where a higher value means the risk in that dimension is high. Therefore, an increase in the value of the index in any particular dimension indicates an increase in risk in that dimension for that period as compared to other periods. Each index is normalised for the sample period using the following formula:

$$\frac{(X_t - \min(X_t))}{(\max(X_t) - \min(X_t))}$$

Where, $X_t$ is the value of the ratio at time t. A composite index of each dimension is calculated as a weighted average of normalised ratios used for that dimension where the weights are based on the marks assigned for assessment for the CAMELS rating. The banking stability indicator is constructed as a simple average of these five composite indices.

#### Macro stress testing

Macro stress test for credit risk ascertains the resilience of banks against macroeconomic shocks. It assesses the impact of macroeconomic shocks on GNPA ratio of banks (at system level and at major bank-group level) and finally on their capital adequacy (bank-by-bank and system level for a sample of 46 banks).

**Impact of GNPA ratio**

Here, the slippage ratio (SR)[1] is modelled as a function of macroeconomic variables, using various econometric models that relate the select banking system aggregates to macroeconomic variables. The system-level and bank group-level slippage ratios are modelled using (i) multivariate regression; (ii) VAR and (iii) quantile regression. The banking system aggregates include current and lagged values of slippage ratio, while macroeconomic variables include gross domestic product (GDP), weighted average lending rate (WALR), CPI (combined) inflation, exports-to-GDP ratio, annualized current account balance-to-GDP ratio and annualized combined gross fiscal deficit-to-GDP ratio.

While multivariate regression allows evaluating the impact of select macroeconomic variables on the banking system's GNPA, the VAR model takes into account the feedback effect also. In these methods, the conditional mean of slippage ratio is estimated wherein it is assumed that the impact of macro-variables on credit quality will remain the same, irrespective of the level of the credit quality, which may not always be true. In order to relax this assumption, quantile regression was adopted, wherein conditional quantile is estimated instead of the conditional mean to deal with tail risks and to account for the non-linear impact of macroeconomic shocks.

The following econometric models are used to estimate the impact of macroeconomic shocks on the slippage ratio:

***System level models***

The system level GNPAs are projected using three different but complementary econometric models: multivariate regression, VAR and quantile regression. The final projection is derived by averaging the projections based on these three models.

- *Multivariate regression*

  The following multivariate regression model is used for projecting the slippage ratio of SCBs as a whole:

  $SR_t = \alpha_1 + \beta_1 SR_{t-1} - \beta_2 \Delta NGDP_{t-2} + \beta_3 RWALR_{t-2} - \beta_4 \left(\frac{CAB}{GDP}\right)_{t-3} + \beta_5 \left(\frac{GFD}{GDP}\right)_{t-1} + \beta_6 Dummy$

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

- *VAR model*

  In notational form, mean-adjusted VAR of order p can be written as:

  $$y_t = A_1 y_{t-1} + \ldots\ldots + A_p y_{t-p} + u_t;\ t=0,1,2,3,\ldots.$$

  where, $y_t = (y_{1t}, \ldots\ldots, y_{Kt})'$ is a (K×1) vector of variables at time t, the $A_i$ (i=1,2,…p) are fixed (K×K) coefficient matrices and $u_t = (u_{1t}, \ldots\ldots, u_{Kt})'$ is a K-dimensional white noise or innovation process.

The VAR model is estimated using slippage ratio, real WALR, nominal GDP growth, annualized current account balance-to-GDP ratio and annualized combined gross fiscal deficit-to-GDP ratio. The appropriate

[1] Slippages are fresh accretion to NPAs during a period. Slippage Ratio = Fresh NPAs/Standard Advances at the beginning of the period.

order of VAR selected based on minimum information criteria as well as other diagnostics is two. The impact of various macroeconomic shocks is determined using the impulse response function of the selected VAR.

- *Quantile regression*

  The following quantile regression model is used to estimate the conditional quantile of slippage ratio at 0.8:

  $$SR_t = \alpha_1 + \beta_1 SR_{t-1} - \beta_2 \Delta NGDP_{t-2} + \beta_3 RWALR_{t-2} - \beta_4 \left(\frac{CAB}{GDP}\right)_{t-3} + \beta_5 \left(\frac{GFD}{GDP}\right)_{t-1} + \beta_6 Dummy$$

***Bank group level models***

The bank group-wise slippage ratios are projected using three different but complementary econometric models: multivariate regression and VAR and quantile regression. The final projection is derived by averaging the projections based on these three models.

- *Multivariate regression*

  The following multivariate regressions are used to model the slippage ratio of various bank groups:

  Public Sector Banks (PSBs):

  $$SR_t = \alpha_1 + \beta_1 SR_{t-1} + \beta_2 RWALR_{t-2} - \beta_3 \Delta NGDP_{t-2} + \beta_4 \left(\frac{GFD}{GDP}\right)_{t-3} - \beta_5 \left(\frac{CAB}{GDP}\right)_{t-3} + \beta_6 Dummy$$

  Private Sector Banks (PVBs):

  $$SR_t = \alpha_1 + \beta_1 SR_{t-1} + \beta_2 RWALR_{t-3} - \beta_3 \Delta NGDP_{t-1} - \beta_4 \left(\frac{EXP}{GDP}\right)_{t-1} + \beta_5 Dummy$$

  Foreign Banks (FBs):

  $$SR_t = \alpha_1 + \beta_1 SR_{t-1} + \beta_2 \Delta^2 CPI_{t-4} + \beta_3 \Delta\left(\frac{GFD}{GDP}\right)_{t-3} - \beta_4 \Delta\left(\frac{EXP}{GDP}\right)_{t-1} + \beta_5 Dummy$$

- *VAR model*

  In order to model the slippage ratio of various bank groups, different VAR models are estimated based on the following macro variables:

  PSBs: NGDP, RWALR, CAB- to -GDP ratio and GFD- to- GDP ratio of order 1.

  PVBs: NGDP, RWALR and exports- to- GDP ratio of order 1.

  FBs: GDP, CPI, exports- to- GDP ratio and GFD-to-GDP ratio of order 1.

- *Quantile regression*

  The following quantile regression models are used to model the conditional quantile of slippage ratios at 0.8 for various bank groups:

  Public Sector Banks (PSBs):

  $$SR_t = \alpha_1 + \beta_1 SR_{t-1} + \beta_2 RWALR_{t-2} - \beta_3 \Delta NGDP_{t-1} + \beta_4 \left(\frac{GFD}{GDP}\right)_{t-3} - \beta_5 \left(\frac{CAB}{GDP}\right)_{t-3} + \beta_6 Dummy$$

  Private Sector Banks (PVBs):

  $$SR_t = \alpha_1 + \beta_1 SR_{t-1} + \beta_2 RWALR_{t-4} - \beta_3 \Delta NGDP_{t-1} - \beta_4 \left(\frac{EXP}{GDP}\right)_{t-1} + \beta_5 \left(\frac{CAB}{GDP}\right)_{t-3} + \beta_6 Dummy$$

Foreign Banks (FBs):

$$SR_t = \alpha_1 + \beta_1 SR_{t-1} + \beta_2 \Delta^2 CPI_{t-1} + \beta_3 \Delta\left(\frac{GFD}{GDP}\right)_{t-3} - \beta_4 \Delta\left(\frac{EX}{GDP}\right)_{t-1} + \beta_5 \text{ Dummy}$$

***Estimation of GNPAs from slippages***

Once, slippage ratio is projected using the above-mentioned models, GNPA is projected using the identity given below:

$$GNPA_{t+1} = GNPA_t + Slippage_{(t,t+1)} - Recovery_{(t,t+1)} - Write\text{-}off_{(t,t+1)} - Upgradation_{(t,t+1)}$$

Derivation of GNPAs from slippage ratios, which are projected using the above mentioned credit risk econometric models, are based on the following assumptions: credit growth of 5.7 per cent, 6.4 per cent, 7.2 per cent and 7.9 per cent respectively; recovery rates of 2.5 per cent, 2.5 per cent, 3.6 per cent and 3.4 per cent, respectively; write-off rates of 5.2 per cent, 4.3 per cent, 5.7 per cent and 8.2 per cent respectively; upgradation rates of 1.4 per cent, 1.1 per cent, 1.0 per cent and 1.3 per cent respectively during quarters ending June 2021, September 2021, December 2021 and March 2022.

**Impact on capital adequacy**

The impact of macro shocks on capital adequacy of banks is captured through the following steps;

i. The impact on future capital accumulation is captured through projection of profit under the assumed macro scenarios, assuming that only 25 per cent of profit after tax (PAT) (which is minimum regulatory requirements) goes into capital of banks.

ii. The requirement of additional capital in future are projected by estimating risk-weighted assets (RWAs) using internal rating based (IRB) formula.

Formulae used are:

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

$$Common\ Equity\ Tier\ 1\ Capital\ Ratio_{t+1} = \frac{CET1_t + 0.25 * PAT_{t+1}}{RWAs(credit\ risk)_{t+1} + RWAs(others)_{t+1}}$$

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

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

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

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

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

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

where, $LGD_i$ is loss given default of the sector i, $PD_i$ is probability of default of the sector i, N(..) is cumulative distribution function of standard normal distribution, G(..) is inverse of cumulative distribution function of standard normal distribution, $M_i$ is average maturity of loans of the sector (which is taken 2.5 for all the sector in this case), $b(PD_i)$ is smoothed maturity adjustment and $R_i$ is correlation of the sector i with the general state of the economy. Calculation of both, b(PD) and R depend upon PD.

This IRB formula requires three major inputs, namely, sectoral PD, EAD and LGD. Here, sectoral PDs are proxied by annual slippage of the respective sectors using banking data. PD for a particular sector is taken as same (*i.e.* systemic shocks) for each of the 46 selected banks, whereas, EAD for a bank for a particular sector is total outstanding loan (net of NPAs) of the bank in that particular sector. Further, assumption on LGD was taken as follows; under the baseline scenario, LGD = 60 per cent (broadly as per the RBI guidelines on 'Capital Adequacy - The IRB Approach to Calculate Capital Requirement for Credit Risk'), which increases to 65 per cent under medium macroeconomic risk scenario and 70 per cent under severe macroeconomic risk.

*Selected sectors:* The following 17 sectors/sub-sectors (and others) are selected for the stress test.

**Table 2: List of selected sectors/sub-sectors**

| Sr. No. | Sector/Sub-sector | Sr. No. | Sector/Sub-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 stochastic relationship of sectoral annual slippage ratio (*i.e.* sectoral PDs) with macro variables is estimated using multivariate regression for each sector. Using these estimated regressions, sectoral PDs of each sector are projected for four quarters ahead under assumed baseline as well as two adverse scenarios, namely, medium stress and severe stress. The sectoral regression models are presented in the next section.

The bank-wise profit after tax (PAT) is projected using the following steps:

- Components of PAT (*i.e.* Net Interest Income(NII), Other Operating Income(OOI), Operating Expenses(OE) and Provisions & Write off) of each bank-group is projected under baseline and adverse scenarios, using the method explained in the subsequent section.
- Share of components of PAT of each bank (except income tax) in their respective bank-group is calculated.
- Each component of PAT (except income tax) of each bank is projected from the projected value of the component of PAT of respective bank-group and applying that bank's share in the particular component of PAT.

- Finally, bank-wise PAT was projected by appropriately adding or subtracting their components estimated in the previous step and using income tax rate at 35 per cent.

Using these formulae, assumptions and inputs, impact of assumed macro scenarios on the capital adequacy of each bank is estimated and future change in capital adequacy under baseline from the latest observed data and change in the capital adequacy of banks from baseline to adverse macro shocks are calculated. Finally, these changes are appropriately applied on the latest observed capital adequacy (under Standardised Approach) of the bank.

***Projection of Sectoral PDs***

1. *Engineering*

$$\Delta PD_t = \alpha + \beta_1 \Delta PD_{t-1} + \beta_2 \Delta WALR_{t-2} - \beta_3 \left(\frac{EXP}{GDP}\right)_{t-2} - \beta_4 \Delta GVA(Industry)_{t-3} + \beta_5 Dummy$$

2. *Auto*

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

3. *Cement*

$$PD_t = \alpha + \beta_1 PD_{t-1} - \beta_2 \Delta GDP_{t-2} + \beta_3 \Delta WALR_{t-1} - \beta_4 \left(\frac{EXP}{GDP}\right)_{t-2} + \beta_5 Dummy$$

4. *Chemicals and Chemical Products*

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

5. *Construction*

$$PD_t = \alpha + \beta_1 PD_{t-1} + \beta_2 \Delta WALR_{t-1} - \beta_3 \left(\frac{EXP}{GDP}\right)_{t-1} - \beta_4 \Delta GDP_{t-1} + \beta_5 Dummy_t$$

6. *Textiles*

$$PD_t = \alpha + \beta_1 PD_{t-1} - \beta_2 \Delta GDP_{t-1} + \beta_3 \Delta WALR_{t-1} - \beta_4 \left(\frac{EXP}{GDP}\right)_{t-2} + \beta_5 \Delta CPI_{t-3} + \beta_6 Dummy$$

7. Food Processing

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

8. Gems and Jewellery

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

9. Infrastructure

$$PD_t = \alpha + \beta_1 PD_{t-1} - \beta_2 \Delta GDP_{t-2} + \beta_3 WALR_{t-1} + \beta_4 \Delta CPI_{t-1} + \beta_5 Dummy_t$$

10. Basic Metal and Metal Products

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

11. Mining and Quarrying

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

12. Paper and Paper Products

$$PD_t = \alpha + \beta_1 PD_{t-1} + \beta_2 \Delta WALR_{t-4} - \beta_3 \left(\frac{EXP}{GDP}\right)_{t-2} - \beta_4 \Delta GDP_{t-1} + \beta_5 Dummy_t$$

13. *Petroleum and Petroleum Products*

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

14. *Agriculture*

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

15. *Services*

$$\Delta PD_t = \alpha + \beta_1 \Delta PD_{t-1} + \beta_2 \Delta WALR_{t-1} - \beta_3 \left(\frac{EXP}{GDP}\right)_{t-2} - \beta_4 \Delta GDP_{t-2} + \beta_5 \Delta CPI_{t-1}$$

16. *Retail Housing*

$$\Delta PD_t = \alpha + \beta_1 \Delta PD_{t-1} + \beta_2 \Delta WALR_{t-2} - \beta_3 \Delta GDP_{t-1}$$

17. *Other Retail*

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

18. *Others*

$$PD_t = \alpha + \beta_1 PD_{t-1} + \beta_2 \Delta WALR_{t-2} - \beta_3 \Delta GDP_{t-1} + \beta_4 Dummy_t$$

***Projection of bank-group wise PAT***

The various components of PAT of major bank-groups (namely, PSBs, PVBs and FBs), such as, NII, OOI, OE and Provisions & Writeoff are projected using different time series econometric models (as given below). Finally, PAT is estimated using the following identity:

$$PAT = NII + OOI - OE - Provisions\ \&\ writeoff - Income\ Tax$$

where, $NII$ is net interest income, $OOI$ is other operating income and $OE$ is operating expenses.

*Net Interest Income (NII):* NII is the difference between interest income and interest expense and is projected using the following regression model:

$$LNII_t = -\alpha_1 + \beta_1 LNII_{t-1} + \beta_2 LNGDP\_SA_{t-1} + \beta_3 Adv\_Gr_{t-1} + \beta_4 Spread_t$$

$LNII$ is log of NII. $LNGDP\_SA$ is seasonally adjusted log of nominal GDP. $Adv\_Gr$ is the y-o-y growth rate of loans and advances. Spread is the difference between average interest rate earned by interest earning assets and average interest paid on interest bearing liabilities.

*Other Operating Income (OOI):* Log of OOI (LOOI) of SCBs is projected using the following regression model:

$$LOOI_t = -\alpha_1 + \beta_1 LOOI_{t-1} + \beta_2 LNGDP\_SA_t$$

*Operating Expense (OE):* OE of SCBs is projected using an Autoregressive Moving Average (ARMA) model.

*Provisions (including write-off):* The required provisioning is projected using the following regression:

$$P\_Adv_t = \alpha_1 + \beta_1 P\_Adv_{t-1} - \beta_2 \Delta GDP_{t-2} + \beta_3 GNPA_{t-1} - \beta_4 Dummy$$

$P\_Adv$ is provisions to total advances ratio. $\Delta GDP$ is the y-o-y growth rate of real GDP. $GNPA$ is gross non-performing assets to total advances ratio.

*Income Tax:* The applicable income tax is taken as 35 per cent of profit before tax, which is based on the past trend of ratio of income tax to profit before tax.

### 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.

**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.

**Sectoral 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.

**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.

**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.

**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.

**Bottom-up Stress testing: Select banks**

Bottom-up sensitivity analysis was performed by 18 select scheduled commercial banks. A set of common scenarios and shock sizes were provided to the select banks. The tests were conducted using March 2021 data. Banks used their own methodologies for calculating losses in each case.

**Bottom-up stress testing: Derivatives portfolios of select banks**

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 was 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 stress testing of derivatives portfolio**

| | 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 Scheduled Primary (urban) Co-operative Banks

### Single factor sensitivity analysis – Stress testing

**Credit risk**

Stress tests on credit risk were conducted on SUCBs. The tests were based on a single factor sensitivity analysis. The impact on CRAR was studied under following four different scenarios, using the historical standard deviations (SD).

- Scenario A: 1 SD shock to GNPA (incremental NPAs classified as sub-standard advances),
- Scenario B: 2 SD shock to GNPA (incremental NPAs classified as sub-standard advances),
- Scenario C: 1 SD shock to GNPA (incremental NPAs classified as loss advances),
- Scenario D: 2 SD shock to GNPA (incremental NPAs classified as loss advances).

**Liquidity risk**

A liquidity stress test based on a cash flow basis in the 1-28 days time bucket was also conducted, where mismatch [negative gap (cash inflow less cash outflow)] exceeding 20 per cent of outflow was considered stressful.

- Scenario A: Cash outflows in the 1-28 days time-bucket goes up by 50 per cent (no change in cash inflows).
- Scenario B: Cash outflows in the 1-28 days time-bucket goes up by 100 per cent (no change in cash inflows).

## 2.3 Non-banking Financial Companies

### Single factor sensitivity analysis – Stress testing

**Credit risk**

Credit portfolio of NBFCs at individual level and system level was applied a shock by increasing the GNPA ratio by 1-SD and 2-SD under medium and high-risk scenarios. Baseline scenario was presented based on

capital adequacy position of NBFCs reported as on March 2021. Credit exposure and RWA were assumed to grow at 75 per cent of compound annual growth rate (CAGR) over past three years. Additional NPAs were added to sub-standard advances and existing GNPA was distributed based on ageing impact as per the extant regulations. Provisioning requirements were applied at 10% for substandard advances, at the existing proportion as on March 2021 for doubtful advances and at 100% for loss advances as per the regulatory requirements. Additional provision requirements and income loss due to increase in GNPA were deducted from the earnings before provisions and taxes (EBPT) for FY2020-21 to calculate new profit before tax (PBT). Tax rate of 22 per cent was applied to calculate profit after tax (PAT) and complete PAT was accrued to existing capital with no dividend payment assumption. Based on the new capital and RWA, new capital to risk weighted assets ratio (CRAR) for individual NBFCs and entire sector were calculated for the assumed scenarios.

### 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:

*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 $\frac{K}{N(N-1)}$.

*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:

$$\text{Ci} = \frac{E_i}{k_i(k_i - 1)}$$

The clustering coefficient (C) of the network as a whole is the average of all Ci's:

$$\text{C} = \frac{\sum_{i=1}^{N} C_i}{N}$$

*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.

*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).

**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.

**Liquidity contagion analysis**

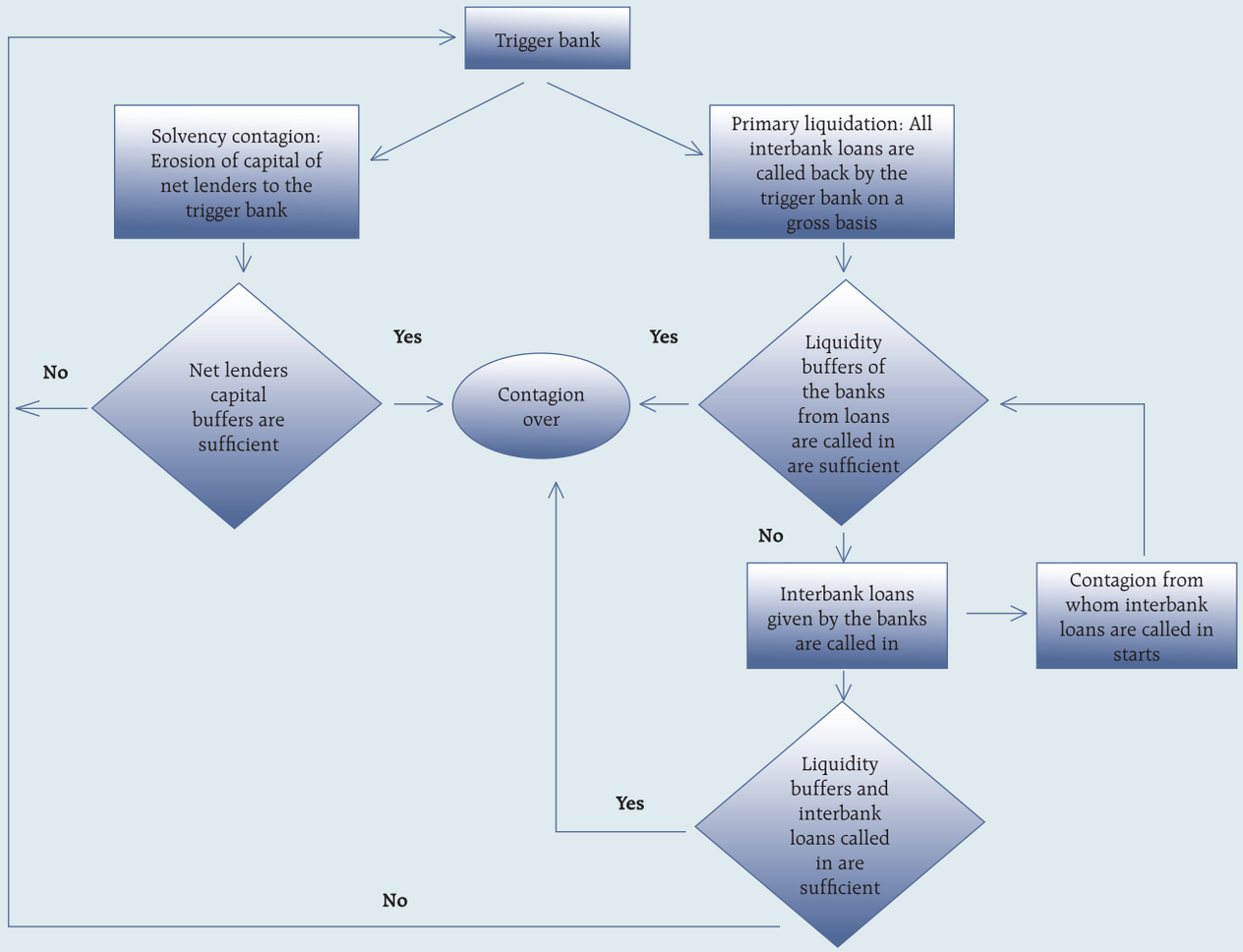
While the solvency contagion analysis assesses potential loss to the system owing to failure of a net borrower, liquidity contagion estimates potential loss to the system due to the failure of a net lender. The analysis is conducted on gross exposures between banks. The exposures include fund based and 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) 18 per cent of NDTL. If a bank is able to meet the stress with liquidity buffers alone, then there is no further contagion.

However, if the liquidity buffers alone are not sufficient, then a bank will call in all loans that are 'callable', resulting in a contagion. For the analysis only short-term assets like money lent in the call market and other very short-term loans are taken as callable. Following this, a bank may survive or may be liquidated. In this case there might be instances where a bank may survive by calling in loans, but in turn might propagate a further contagion causing other banks to come under duress. The second assumption used is that when a bank is liquidated, the funds lent by the bank are called in on a gross basis, 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).

**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.

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 5, 2021 | **PIDF scheme:** The payment infrastructure development fund (PIDF) scheme for subsidising deployment of payment acceptance infrastructure in Tier-3 to Tier-6 centres with special focus on North-Eastern states of the country, was operationalised. | To enhance payment acceptance infrastructure and extend the reach of digital payments in the country. |
| January 5, 2021 | **LEI for large value transactions in centralised payment systems:** Legal Entity Identifier (LEI) , a 20-digit number used to uniquely identify parties to financial transactions worldwide, was mandated for all payment transactions of ₹50 crore and above, undertaken by entities (non-individuals) using the RBI-run Centralised Payment Systems from April 1, 2021. | To improve the quality and accuracy of financial data systems for better risk management. |
| January 27, 2021 | **Grievance Redress Mechanism in Banks:** A comprehensive framework for strengthening grievance redress mechanism in banks was instituted providing for: (a) enhanced disclosures on complaints, (b) recovery of cost of redress of complaints from banks based on specified criteria, and (c) intensive review of grievance redress mechanism and time bound remedial action plan for banks. | To ensure delivery of better customer service and improve the efficacy of the grievance redress mechanism in banks. |
| February 5, 2021 | **Maintenance of Cash Reserve Ratio (CRR)** : Banks were advised that the cash reserve ratio (CRR) which had been reduced to 3 per cent of their Net Demand and Time liabilities (NDTL) effective from the reporting fortnight beginning March 28, 2020, is to be restored to 4 per cent in two phases, *viz.*, 3.50 per cent of NDTL effective from the reporting fortnight beginning March 27, 2021 and 4.00 per cent effective from the reporting fortnight beginning May 22, 2021. | To restore the CRR to its long-standing value based on a review of monetary and liquidity conditions. |
| February 12, 2021 | **Investment in NBFCs from FATF non-compliant jurisdictions:** Norms for accepting investments in NBFCs from Financial Action Task Force (FATF) non-compliant jurisdictions were tightened by stipulating that fresh investors (directly or indirectly) from such jurisdictions, in aggregate, shall hold less than the threshold of 20 per cent of the voting power (including potential voting power) of the NBFC. | To combat money laundering and terrorist financing. |

| Date | Regulation | Rationale |
|---|---|---|
| February 16, 2021 | **Remittances to IFSCs under LRS:** Resident individuals were permitted to make remittances under the Liberalised Remittance Scheme (LRS) to International Financial Services Centres (IFSCs) established in India for making investments in securities other than those issued by entities/companies resident (outside IFSC) in India and to open non-interest-bearing Foreign Currency Account (FCA) in IFSCs, for the purpose. | To deepen the financial markets in IFSCs and to provide an opportunity to resident individuals to diversify their portfolio. |
| April 7, 2021 | **Priority Sector Lending (PSL) by banks to NBFCs for on-lending:** The benefit of PSL classification to bank credit to registered NBFCs (other than MFIs) for on-lending, was extended up to September 30, 2021. | To improve the liquidity position of the NBFCs and to ensure continued availability of credit to important sectors of economy. |
| April 7,2021 | **Parking of unutilised ECB proceeds in term deposits:** ECB Borrowers were permitted to park unutilised ECB proceeds drawn down on or before March 01, 2020, in term deposits with AD Category-I banks in India prospectively, for an additional period up to March 01, 2022, as against the earlier time limit of 12 months. | To provide relief to the ECB borrowers affected by the COVID-19 pandemic. |
| April 8,2021 | **Maximum balance per customer at end of the day for Payments Banks (PBs):** The stipulation that PBs may hold a maximum balance of ₹1 lakh per individual customer at the end of the day was relaxed and the limit was enhanced to ₹2 lakh per individual customer. | To provide greater flexibility to PBs and to enhance their capability for financial inclusion. |
| May 5,2021 | **Credit to MSME Entrepreneurs:** Banks were allowed to deduct the amount equivalent to credit disbursed to new MSME borrowers up to ₹25 lakh per borrower from their Net Demand and Time Liabilities (NDTL) for calculation of the Cash Reserve Ratio (CRR) for the credit disbursed up to the fortnight ending October 1, 2021. This exemption was extended for such credits disbursed up to the fortnight ending December 31, 2021. | To incentivise new credit flow to the micro, small, and medium enterprise (MSME) borrower. |
| May 5, 2021 and June 4, 2021 | **Resolution of Covid-19 related stress of MSMEs:** The facility for restructuring existing MSME loans (where the aggregate exposure of all lending institutions to the borrower does not exceed ₹50 crore as on March 31, 2021) without a downgrade in the asset classification was extended up to September 30, 2021. | To provide relief to MSME sector in view of the uncertainties created by the resurgence of the Covid-19 pandemic in India in the recent weeks. |

| Date | Regulation | Rationale |
|---|---|---|
| May 5,2021 and June 4, 2021 | **Resolution of Covid-19 related stress of Individuals and Small Businesses:** The facility for implementing a resolution plan in respect of existing loans of individuals and small businesses other than MSME, without a downgrade in the asset classification, was permitted to be invoked up to September 30, 2021. While the facility could be invoked in the case of all eligible personal loans the invocation for eligible loan exposures to small businesses and individuals for businesses purposes could be done where the aggregate exposure, including non-fund based facilities, of all lending institutions to the borrower does not exceed ₹50 crore as on March 31, 2021. | To alleviate the potential stress to individual borrowers and small businesses, in view of the resurgence of Covid-19 pandemic in India in the recent weeks and the consequent containment measures to check the spread of the pandemic. |
| May 19, 2021 | **Mandating interoperability of full-KYC prepaid payment instruments (PPIs):** Interoperability of fully KYC compliant PPIs, amongst the issuing and acquiring entities alike, banks or non-banks, which was voluntary earlier was made mandatory, to be enabled by March 2022. | To promote optimal utilisation of payment instruments and to allow participants in different payment systems to undertake, clear and settle payment transactions across systems without participating in multiple systems. |
| June 14, 2021 | **Investment in Entities from FATF non-compliant Jurisdictions:** New investors, in payment system operators (PSOs) or entities seeking authorisation as PSOs, from or through non-compliant FATF jurisdictions were restricted from acquiring, directly or indirectly, 'significant influence' as defined in the applicable accounting standards in the concerned PSO. | To strengthen the ownership structure and governance arrangements in place at PSOs. |

**2) Securities and Exchange Board of India**

| Date | Regulation | Rationale |
|---|---|---|
| December 21, 2020 | Core Settlement Guarantee Fund, Default Waterfall and Stress Test for Limited Purpose Clearing Corporation (LPCC) | To extend the existing robustness of the risk management systems in the clearing corporations, to LPCC as well. |
| January 11, 2021 | Review of Volatility Scan Range (VSR) for Option Contracts in Commodity Derivatives Segment | To ensure that a minimum floor value of VSR is specified for underlying commodities based on their volatility (high, medium, low). |
| February 02, 2021 | Setting up of Limited Purpose Clearing Corporation (LPCC) by Asset Management Companies (AMCs) of Mutual Funds | Development of the corporate bond market from the perspective of mutual funds. |

| Date | Regulation | Rationale |
|---|---|---|
| March 10, 2021 | Review of norms regarding investment in debt instruments with special features, and the valuation of perpetual bonds. | To lay down the prudential investment limits for such instruments. Further, to consider a glide path for the implementation of the policy, deemed residual maturity for the purpose of valuation was also prescribed. |
| March 22, 2021 | Guidelines for Business Continuity Plan (BCP) and Disaster Recovery (DR) of Market Infrastructure Institutions (MIIs) | With advancement in technology and improved automation of processes, the existing framework has been revised. |
| April 27, 2021 | Guidelines for CRAs on rating symbol, conditions of rating being considered provisional, validity period of such ratings and other related issues | In order to further strengthen and standardise the policies on provisional rating by CRAs for debt instruments. |
| April 28, 2021 | Alignment of interest of key employees of AMCs with the Unit holders of the Mutual Fund schemes | To protect interests of investors. |
| April 29, 2021 | Disclosure of risk-o-meter of scheme and benchmark and portfolio details by mutual funds | To enhance the quality of disclosure w.r.t. risk, performance and portfolio of the schemes, without creating information overload on the investor. |
| May 10, 2021 | Business responsibility and sustainability reporting by listed entities | To enable companies to engage more meaningfully with their stakeholders, by encouraging them to look beyond financials and to help investors make better investment decisions. |

**3) Insurance Regulatory and Development Authority of India**

| Date | Regulation | Rationale |
|---|---|---|
| January 25, 2021 | **Centralised KYC Registry (CKYCR) – Roll out of Legal Entity Template**: Regulated entities shall upload the know your customer (KYC) data pertaining to accounts of Legal Entities opened on or after April 1, 2021, on to CKYCR. | To bring the format for legal entity being followed for KYC in line with the format prescribed by CERSAI. |

| Date | Regulation | Rationale |
|---|---|---|
| April 8, 2021 | Investment in Alternate Investment Funds (AIFs): The Investment Master Circular, 2017 which specifies the conditions applicable for insurers' investment in Alternative Investment Fund (AIF) was modified by replacing the provisions applicable to Fund of Funds (FoF) | To accelerate institutional rupee funding to startups |
| May 19, 2021 | **The Insurance (Amendment) Act, 2021 -** The aggregate holdings limit of equity shares by foreign investors including portfolio investors has been increased from 49 per cent to 74 per cent. | To accelerate growth and spur competition in the sector. |

**4) Pension Fund Regulatory and Development Authority**

| Date | Regulation | Rationale |
|---|---|---|
| January 14, 2021 | **Ease of Partial withdrawal of NPS Subscribers through self-declaration**: Subscribers were allowed partial withdrawal with 'self-declaration' without submitting supporting documents to substantiate the reasons for partial withdrawal | To meet subscribers' needs. |
| February 3, 2021 | **D-Remit for NRI Subscribers -** D-Remit mode of deposit was extended to NRI subscribers of NPS who can contribute to their NPS accounts from funds in their NRO/NRE accounts. Further, at the time of withdrawal/exit, the proceeds of NPS shall be credited into NRO/NRE account of NRI subscribers. | To simplify the process of deposit of contributions by the subscribers. |
| February 15,2021 | **Transfer of Legacy Funds of NPS Subscribers of Government Sectors (SGs/CABs/SABs) pursuant to opening of choice of Investment schemes and Pension Funds** - In case subscribers of the SGs/SABs/CABs decide to open up the choices of pension funds or allocations of funds, then by exercising the option of choice of investment schemes and pension funds, their entire accumulated corpus under PRAN account shall be transferred to the opted Pension Funds /asset allocation. Further, legacy funds of subscribers who have already exercised this option, shall be transferred to the Pension Fund and assets allocation opted by them. | To streamline the process. |
| March 10, 2021 | **Enablement of IMPS mode of contribution under D-Remit** - The IMPS mode of contribution under D-Remit was enabled. | To facilitate the process of deposit of contributions by the subscribers. |

| Date | Regulation | Rationale |
|---|---|---|
| March 11, 2021 | **Inter Sector Shifting of NPS Subscribers under Corporate Sector** - NPS subscribers of the corporate sector were advised to exercise Inter Sector Shifting (ISS) before leaving their employers and transfer their NPS account to Point of Presence (POP) of their choice. | To enable employees to transfer their NPS account to Point of Presence (POP) of their choice. |

**5) Insolvency and Bankruptcy Board of India**

| Date | Regulation | Rationale |
|---|---|---|
| December 22, 2020 | **Extension of suspension of filing of applications for CIRP**<br>The Government extended suspension of filing of applications for CIRP for a further period of three months starting from 25th December 2020. | To prevent companies, which were experiencing COVID-19 related distress from being pushed into insolvency proceedings. |
| January 14, 2021 | **Amendment to Insolvency Professional Agencies Regulations**<br>The Insolvency and Bankruptcy Board of India (Model Bye-Laws and Governing Board of Insolvency Professional Agencies) (Amendment) Regulations, 2021 were notified to provide for the following:<br>i. Include accountancy, economics and valuation to the fields of expertise for eligibility of an independent director, in addition to the existing fields of finance, law, management or insolvency.<br>ii. The Governing Board of the Insolvency Professional Agency (IPA) shall specify the eligibility norms for shareholder directors.<br>iii. An IPA shall undertake a self-evaluation of its Governing Board and publish the result of the self-evaluation on its website.<br>iv. Directors are required to disclose any order of any authority which affects the character or reputation of the individuals to the IPA within one week of such order and such order shall be placed on the website of the IPA.<br>v. An IPA shall designate or appoint a compliance officer who shall be responsible for ensuring compliance with the provisions of the Code and regulations, circulars, guidelines, and directions issued thereunder. | To improve governance framework of IPAs. |

| Date | Regulation | Rationale |
|---|---|---|
| March 4, 2021 | **Amendment to Liquidation Process Regulations -** The Liquidation Process Regulations were amended to provide that a liquidator shall file the list of stakeholders with the Adjudicating Authority (AA) within forty-five days from the last date for receipt of claims and the same shall also be filed on the electronic platform of the Board for dissemination on its website. | To improve transparency and enable stakeholders to ascertain the details of their claims at a central place. |
| March 15, 2021 | **Amendment to CIRP Regulations -** The CIRP Regulations were amended to provide for Update of claims by creditors as and when the claim is satisfied, partly or fully, from any source in any manner, after the insolvency commencement date and reporting on specified incomplete activities till completion | To promote transparency and enable timely updating of database regarding progress of CIRP by IBBI. |

**6) International Financial Service Centres Authority**

| Date | Regulation | Rationale |
|---|---|---|
| February 10, 2021 | **Ancillary Services at IFSCs**: The framework for enabling ancillary services such as legal, compliance and secretarial, auditing, accounting, professional & management consulting services *etc.* was notified. | To enable ancillary services for the development of financial products, financial services and financial institutions in GIFT IFSC. |
| February 19, 2021 | **Framework for Aircraft Operating Lease**: A comprehensive framework was issued for aircraft operating lease business in IFSCs in India | To promote development of such businesses. |
| March 31, 2021 | **International Financial Services Centres Authority (Finance Company) Regulations, 2021**: These regulations provide opportunities to non-bank entities, both Indian as well as foreign, to set up units in the IFSC to undertake a wide range of financial services classified into core, non-core and specialised services. | To provide a regulatory framework for companies in IFSC. |
| March 31, 2021 | **International Financial Services Centres Authority (Banking) (Amendment) Regulations, 2021:** The amendment provided for Portfolio Management Services and Investment Advisory Services to be included under permissible activities for banking units | To improve the regulatory framework. |
| April 19, 2021 | **International Financial Services Centres Authority (Market Infrastructure Institutions) Regulations, 2021**: The Regulations provided for more flexibility in terms of shareholding of Market Infrastructure Institutions (MIIs) in IFSC. | To enhance governance norms for MIIs. |

| Date | Regulation | Rationale |
|---|---|---|
| May 3,2021 | **Guidelines on distribution of mutual funds and insurance products by Finance Company /Finance Unit** | To allow finance units in IFSC to carry out distribution of mutual funds and insurance on a fee basis, without any risk participation. |
| June 25, 2021 | **Framework for undertaking Global/Regional Corporate Treasury Centres Activities in IFSC** | To enable units registered as "Finance Company" or "Finance Unit" under Finance Company Regulations, 2021 to perform the functions of Global/ Regional Corporate Treasury Centre allowing them to undertake Treasury Activities and Treasury Services for its Group Entities from IFSC. |