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Foreword

The COVID-19 pandemic has changed the world, with a devastating impact on human and economic conditions. Governments, central banks and other public agencies across countries have responded unprecedentedly to mitigate its impact. A multi-speed recovery is struggling to gain traction, infusing hope, reinforced by positive news on vaccine development. Nonetheless, a second wave of infections and new mutations of the virus have spread heightened uncertainty, threatening to stall the fragile recovery.

India's banking system faced the pandemic with relatively sound capital and liquidity buffers built assiduously in the aftermath of the global financial crisis and buttressed by regulatory and prudential measures. Notwithstanding these efforts, the pandemic threatens to result in balance sheet impairments and capital shortfalls, especially as regulatory reliefs are rolled back. In addition, banks will be called to meet the funding requirements of the economy as it traces a revival from the pandemic. Consequently, maintaining the health of the banking sector remains a policy priority and preservation of the stability of the financial system is an overarching goal.

Congenial liquidity and financing conditions have shored up the financial parameters of banks, but it is recognised that the available accounting numbers obscure a true recognition of stress. It is in this context that banks must exploit the congenial financial conditions and the conducive policy environment to plan for capital augmentation and alterations in business models that address emerging challenges for future expansion, while strengthening the capacity to absorb shocks and supporting the revival of the economy.

In spite of rising public commitments for mitigating the impact of the pandemic, fiscal authorities are also witnessing revenue shortfalls. The resultant expansion in the market borrowing programme of the Government has imposed additional pressures on banks. The borrowing programme has been managed smoothly so far, with the lowest borrowing costs in 16 years and elongation of maturity. The corporate sector has also raised substantial funds from financial markets amidst easy financing conditions, which have been mainly used for deleveraging and building up precautionary buffers. As growth impulses take root, the private sector capex cycle should revive as existing capacities get utilised and new capacities are added. This will require the financial system to intermediate expanded growth requirements of Indian business. Meanwhile, the disconnect between certain segments of financial markets and the real economy has been accentuating in recent times, both globally and in India. Stretched valuations of financial assets pose risks to financial stability. Banks and financial intermediaries need to be cognisant of these risks and spillovers in an interconnected financial system.

Information technology platforms and digital payment systems have provided considerable support for business continuity and smooth functioning during the pandemic. More investment is required by all stakeholders for building robust IT platforms and technologies for operational purposes as well as for fortifying public confidence in digital banking, especially when the financial landscape is rapidly embracing new technologies. In fact, digital technologies have been identified as a bright spot in India's economic prospects.

We have been scarred by the COVID-19 pandemic and the task ahead is to restore economic growth and livelihood. Financial stability is a precondition for supporting this mission. This issue of Financial Stability Report should act as a springboard for further policy action. As we take up these challenges, we have to remain unwaveringly focussed on taking India to a new destiny.

Shaktikanta Das
Governor

January 11, 2021

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List of Select Abbreviations

AEs	Advanced Economies
AFS	Available For Sale
APY	Atal Pension Yojana
ARRs	Alternative Reference Rates
AUM	Assets Under Management
BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlement
BoE	Bank of England
BOJ	Bank of Japan
BSI	Banking Stability Indicator
CC	Cash Credit
CCIL	Clearing Corporation of India Ltd
CD	Corporate Debtor
CDD	Customer Due Diligence
CDS	Credit Default Swaps
CET	Common Equity Tier
CIRP	Corporate Insolvency Resolution Process
CLM	Co-Lending Model
CM	Clearing Member
CoCo	Contingent Convertible
COVID-19	Corona Virus Disease 2019
CP	Commercial Paper
CPSEs	Central Public Sector Enterprises
CRAR	Capital to Risk-weighted Assets Ratio
CSF	Consolidated Sinking Fund
CVA	Credit Valuation Adjustment
DCCBs	District Cooperative Central Banks
DIIs	Domestic Institutional Investors
DPD	Days Past Due
D-SIIs	Domestic Systemically Important Insurers
EBA	European Banking Authority
EBPT	Earnings before provisions and taxes
ECB	European Central Bank
ECBs	External Commercial Borrowings
ECL	Expected Credit Loss
ECLGS	Emergency Credit Line Guarantee Scheme
EMDEs	Emerging Markets and Developing Economies
EMs	Emerging Markets
EPS	Earnings Per Share
EU	European Union
EURIBOR	Euro Interbank Offer Rate
EWS	Early Warning Signal
FAIS	Forensic Accounting and Investigation Standards
FATF	Financial Action Task Force
FBs	Foreign Banks
FFPI	FAO Food Price Index
FI	Financial Institutions
FMI	Financial Market Infrastructures
FPC	Financial Policy Committee
FPI	Foreign Portfolio Investment
FSB	Financial Stability Board
FSDC	Financial Stability and Development Council
FSDC-SC	Financial Stability and Development Council - Sub Committee
FSR	Financial Stability Report
GDP	Gross Domestic Product

GFC	Global Financial Crisis
GNPA	Gross Non Performing Assets
G-Secs	Government Securities
GVA	Gross Value Added
HFCs	Housing Finance Companies
HFT	Held for Trading
HQLA	High Quality Liquid Assets
HTM	Held to Maturity
IAIS	International Association of Insurance Supervisors
IASB	International Accounting Standards Board
IBA	Indian Banks Association
IBC	Insolvency and Bankruptcy Code
ICAI	Institute of Chartered Accountants of India
ICR	Interest Coverage Ratio
IEA	International Energy Agency
IFSCA	International Financial Services Centres Authority
IMF	International Monetary Fund
InvITs	Infrastructure Investment Trusts
IOSCO	International Organization of Securities Commissions
IPDIs	Innovative Perpetual Debt Instruments
IPEs	Insolvency Professional Entities
IRDAI	Insurance Regulatory and Development Authority of India
LAF	Liquidity Adjustment Facility
LCR	Liquidity Coverage Ratio
LIBOR	London Interbank Offer Rate
LT	Long Term
LTV	Loan to Value
MCLR	Marginal Cost of fund based Lending Rate
MFs	Mutual Funds
MIFOR	Mumbai Interbank Forward Offer Rate
ML	Money Laundering
MMMFs	Money Market Mutual Funds
MPR	Monetary Policy Report
MSF	Marginal Standing Facility
MSME	Micro, Small and Medium Enterprises
MTM	Mark To Market
NAV	Net Asset Values
NBFCs	Non Banking Financial Companies
NBFI	Non Banking Financial Intermediation
NCCDs	Non Centrally Cleared OTC Derivatives
NCD	Non Convertible Debenture
NCFE	National Centre for Financial Education
NEFT	National Electronic Fund Transfer
NII	Net Interest Income
NIM	Net Interest Margin
NNPA	Net Non Performing Assets
NPCI	National Payments Corporation of India
NPS	National Pension System
OD	Overdraft
OFR-FSI	Office of Financial Research's Financial Stress Index
OMO	Open Market Operations
OOI	Other Operating Income
OTR	Order to Trade Ratio
PCG	Partial Credit Guarantee

PCR	Provision Coverage Ratio
PDIs	Perpetual Debt Instruments
PEPP	Pandemic Emergency Purchase Programme
PFMIs	Principles for Financial Market Infrastructures
PM	Performance Metrics
PNCPS	Perpetual Non-Cumulative Preference Shares
PoA	Point of Arrival
PSB	Public Sector Bank
PSMOR	Principles for the Sound Management of Operational Risk
PSU	Public Sector Undertaking
PVB	Private Sector Bank
QR	Quick Response
RBNZ	Reserve Bank of New Zealand
REIT	Real Estate Investment Trusts
RoA	Return on Assets
RoE	Return on Equity
RPS	Retail Payment Systems
RRBs	Regional Rural Banks
RTGS	Real Time Gross Settlement
SA	Standardised Approaches
SCB	Scheduled Commercial Bank
SD	Standard Deviation
SDLs	State Development Loans
SEBI	Securities and Exchange Board of India
SFTs	Securities Financing Transactions
SICR	Significant Increase in Credit Risk
SIP	Systematic Investment Plans
SLCC	State Level Coordination Committee
SMS	Short Message Service
SOP	Standard Operating Procedure
SPV	Special Purpose Vehicle
SRS	Systemic Risk Survey
ST	Short Term
StCB	State Cooperative Bank
SUCBs	Scheduled Urban Cooperative Banks
T-Bill	Treasury Bill
TF	Terrorist Financing
TLTRO	Targeted Long-term Repo Operations
TM	Trading Member
UCBs	Urban Cooperative Banks
UNCTAD	United Nations Conference on Trade and Development
UPI	Unified Payments Interface
US-Fed	US Federal Reserve Board
VCIP	Video Based Customer Identification Process
VRR	Voluntary Retention Route
WTO	World Trade Organisation

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

This FSR, the second of the biannual publications for the year 2020-21[1], is being released at a time when the global economy is still suffering from the pain inflicted by the COVID-19 pandemic, though a fragile and hesitant journey to normalcy is struggling to gain traction across countries, buffeted by second waves of the virus including fear of more virulent strains. Policy actions, which in the initial phase of the pandemic, were geared towards restoring normal functioning and mitigating stress, are now getting increasingly oriented towards supporting the recovery and preserving the solvency of businesses and households. Capital flows to emerging economies have seen a sharp rebound with India emerging as a preferred habitat. Even as the positive news on vaccine development has underpinned optimism on the outlook, hopes have been marred by the adverse developments referred to earlier, which are particularly threatening macroeconomic and financial prospects across Europe, the US and some other countries.

Domestic Economy and Markets

On the domestic front, while policy measures have ensured the smooth functioning of markets and financial institutions, managing market volatility amidst rising spillovers has become challenging. Movements in certain segments of the financial markets are not in sync with the developments in the real sector. Aggregate banking sector credit remained subdued, pointing to vestiges of risk aversion even as aggregate demand in the economy is mending and reviving. In particular, credit flows to the manufacturing sector have been lukewarm at a time when output of the sector is emerging out of a prolonged contraction. The focus of the policy efforts is shifting from provision of liquidity and guarantees to supporting growth – including consumption and investment. Although a recovery in economic activity from the lows of March and April 2020 is underway, it is far from being entrenched and output remains below pre-pandemic levels. Congenial financial conditions have been put in place to support the recovery. The overarching objective is to mitigate the impact of COVID-19 and strengthen the return to sustainable and inclusive growth with macroeconomic and financial stability.

Financial Institutions: Soundness and Resilience

Bank credit growth (Y-o-Y), which had declined to 5.7 per cent in 2019-20, remains sluggish; on the other hand, deposit growth has remained robust in the double digits, reflecting precautionary saving in the face of high uncertainty.

Return on assets (RoA) and return on equity (RoE) for SCBs have improved across all bank groups and capital to risk-weighted assets ratios (CRARs) improved by 110 bps over March 2020 levels to 15.8 per cent in September 2020. Gross non-performing assets (GNPA) and net NPA (NNPA) ratios, which were edging down from September 2019 levels, fell further to 7.5 per cent and 2.1 per cent, respectively, by September 2020. The overall provision coverage ratio (PCR) improved substantially to 72.4 per cent from 66.2 per cent over this period. These

[1] The previous issue of FSR was released on July 24, 2020.

improvements were aided significantly by regulatory dispensations extended in response to the COVID-19 pandemic.

Macro-stress tests[2] for credit risk show that SCBs' GNPA ratio may increase from 7.5 per cent in September 2020 to 13.5 per cent by September 2021 under the baseline scenario. If the macroeconomic environment deteriorates, the ratio may escalate to 14.8 per cent under the severe stress scenario. These projections are indicative of the possible economic impairment latent in banks' portfolios. Stress tests also indicate that SCBs have sufficient capital at the aggregate level even in the severe stress scenario but, at the individual bank level, several banks may fall below the regulatory minimum if stress aggravates to the severe scenario. The need of the hour is for banks to assess their respective stress situations and follow it up with measures to raise capital proactively.

At the aggregate level, the CRAR of scheduled urban co-operative banks (SUCBs) deteriorated from 9.70 per cent to 9.24 per cent between March 2020 and September 2020. NBFCs' credit grew at a tepid pace of 4.4 per cent on an annual (Y-o-Y) basis as compared with the growth of 22 per cent a year ago.

Network analysis indicates that the total outstanding bilateral exposures among constituents of the financial system grew marginally after witnessing a sharp fall as at end-June 2020. SCBs continued to have the largest bilateral exposure in the Indian financial system in September 2020. As regards 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 receiver of funds, followed by housing finance companies (HFCs).

The continuing shrinking of the inter-bank market as well as better capital position of banks led to decline in risk levels due to contagion effects.

Regulatory Initiatives and Other Developments in the Financial Sector

The Reserve Bank, other financial sector regulators and the government have undertaken extraordinary measures to mitigate the impact of the pandemic. Several innovative measures were rolled out to ease balance sheet stress for borrowers and lending institutions. Alongside these pandemic induced actions, the pace of ongoing efforts to address systemic gaps and to develop and strengthen various parts of the financial system, did not slow down.

Assessment of Systemic Risk

In the latest systemic risk survey (SRS), respondents rated institutional risks, which comprise asset quality deterioration, additional capital requirements, level of credit growth and cyber risk, among others, as 'high'. All other major risk groups, *viz.*, global risks, macroeconomic risks and financial market risks were perceived as being 'medium' in magnitude. This represents a clear shift from the April/May 2020 survey results in which all the above groups were rated as 'high' risk.

[2] FSR for mid-year presents stress test projections for next March and end-year FSR gives the projections for next September.

Chapter I
Macrofinancial Risks

Economic activity has begun making a hesitant and uneven recovery from the unprecedented steep decline in the wake of the COVID-19 pandemic. Active intervention by central banks and fiscal authorities has been able to stabilise financial markets but there are risks of spillovers, with macrofinancial implications from the disconnect between certain segments of financial markets and real sector activity. In a period of continued uncertainty, this has implications for the banking sector as its balance sheet is linked with corporate and household sector vulnerabilities.

Introduction

1.1 As global economic activity makes a hesitant and uneven recovery from the unprecedented COVID-19 pandemic on the back of extraordinary policy responses by monetary, fiscal and regulatory authorities, the focus is shifting to developing policies and strategies to nurse deleteriously affected sectors back to health and normalcy. The trade-off that will inevitably confront authorities and get sharper going forward is between cliff effects of terminating exceptional measures and risk a deterioration of the repair and healing that has been achieved so far, and ramp effects that involve more graduated withdrawal of policy support but also the moral hazard of making various economic agents more reliant on policy stimuli and for longer, eventually locking in authorities into forbearance and liquidity traps.

1.2 By all counts, policy authorities have been able to restrain the immediate risks from the destructive macrofinancial feedback loops of the pandemic, but incipiently pre-pandemic vulnerabilities have intensified and pose headwinds to a fuller recovery. Also, as stated earlier, support measures may have unintended consequences as reflected, for instance, in the soaring equity valuations disconnected from economic performance. These deviations from fundamentals, if they persist, pose risks to financial stability, especially if recovery is delayed.

1.3 Against this backdrop, this chapter begins with an overview of global and domestic macroeconomic and financial market developments. Section I.1 adresses global macrofinancial developments and the outlook. Section I.2 deals with domestic macrofinancial developments, emerging fiscal and corporate sector risks, and the evolving dynamics of bank and non-bank financial intermediation. The chapter concludes by drawing on the responses to the Reserve Bank's half-yearly systemic risk survey.

I.1 Global Backdrop

I.1.1 Macrofinancial Developments and Outlook

1.4 Global economic activity remained besieged by the COVID-19 pandemic, more recently by the second wave that has forced re-clamping of lockdowns across Europe and a resurgence of infections in the US. This is casting a shadow on the strong rebound of economic activity in Q3:2020. The International Monetary Fund (IMF) placed global growth in 2020 at (-)4.4 per cent, followed by a recovery in 2021 to 5.2 per cent which is, nonetheless, insufficient to lift output above the 2019 level in most advanced and emerging market and developing economies (EMDEs), excluding China

Table 1.1: Growth Projections for 2020 and 2021

(in per cent)

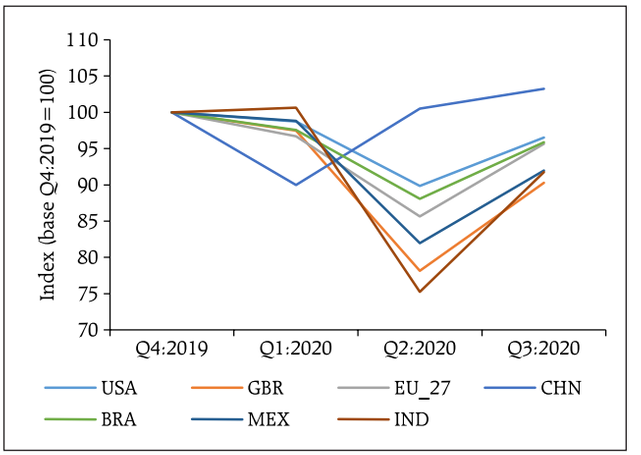
Release period	Advanced Economies		EMDEs		World	
	2020	2021	2020	2021	2020	2021
January 2020	1.6	1.6	4.4	4.6	3.3	3.4
April 2020	-6.1	4.5	-1.0	6.6	-3.0	5.8
June 2020	-8.0	4.8	-3.0	5.9	-4.9	5.4
October 2020	-5.8	3.9	-3.3	6.0	-4.4	5.2

Source: World Economic Outlook, IMF.

(Table 1.1 and Chart 1.1). Optimism about global growth in 2021 (Chart 1.2), on the back of vaccine roll-out, is now tempered by the realisation that production and distribution constraints will allow only a gradual move towards mass vaccination.

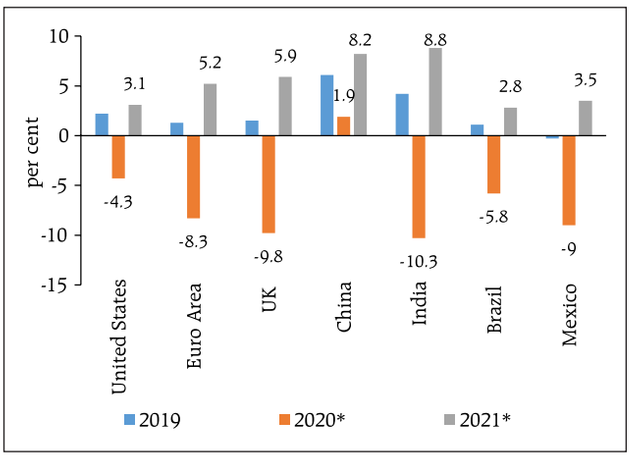
1.5 The response of public authorities to the pandemic has varied across advanced economies (AEs) and emerging market and developing economies (EMDEs) (Chart 1.3). Since July 2020, policy measures have shifted to fine-tuning and extending strategies to nurse severely affected sectors back to health. Given the substantial risk of a looming solvency crisis eroding the strength of the business sector, authorities have turned to providing fiscal support to rebuild businesses. The European Union (EU), through its long-term budget and other initiatives, has designed a fiscal package of Euro 1.8 trillion, the largest stimulus package ever to be funded through the budget. In Japan, fiscal authorities have introduced a fresh stimulus package of about Yen 73.6 trillion, of which about Yen 40 trillion is dedicated to fiscal spending on loans, investments and other measures. The US has approved a US$ 2.3 trillion coronavirus relief and government spending package in the wake of a second resurgence of the pandemic and slowing employment numbers in November 2020.

Chart 1.1: GDP Growth in Major Economies



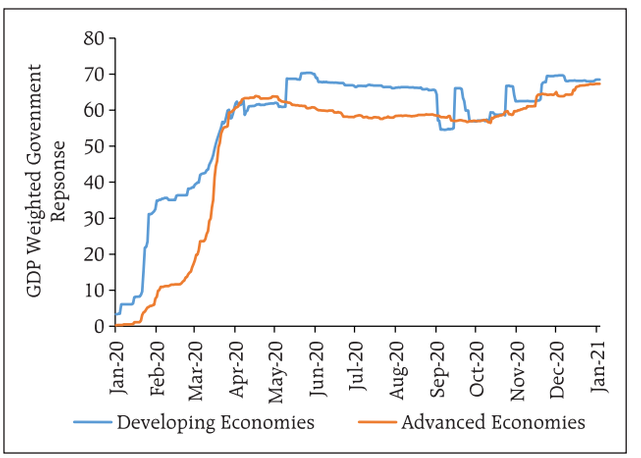
Source: Bloomberg.

Chart 1.2 : Growth Projections for Key Economies



Note: * - Projected.
Source: World Economic Outlook (WEO)-October 2020 update, IMF.

Chart 1.3 : Policy Response to COVID-19

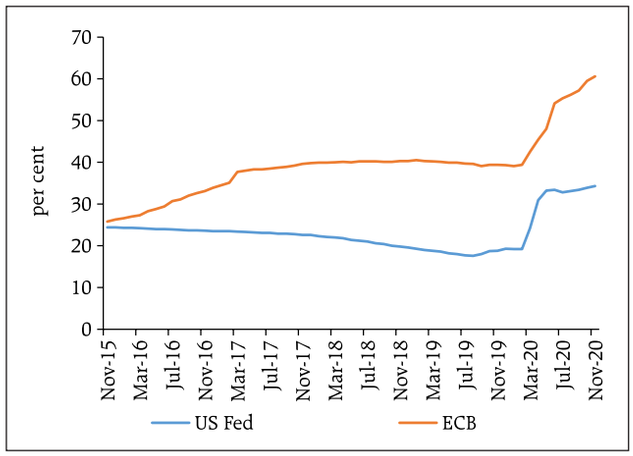


Note: 1. Updated till January 3, 2021.
2. Higher scores implying government response being more restrictive.
Source: University of Oxford's Coronavirus Government Response Tracker.

1.6 Given the unprecedented nature of the crisis, central bank interventions spanned interest rate reductions, funding liquidity and market liquidity expansion, asset purchases, credit easing, macroprudential policies and swap lines. They have persisted with and in some jurisdictions intensified these measures since July 2020. Illustratively, in a series of measures, the European Central Bank (ECB) has ramped up its corpus for purchase of sovereign bonds (including principal repaid), extended the horizon of such purchases and recalibrated the conditions of targeted longer-term refinancing operations. As a result, policy rates have touched historic lows and have even descended to negative territory and balance sheets have expanded to levels hitherto unobserved (Chart 1.4).

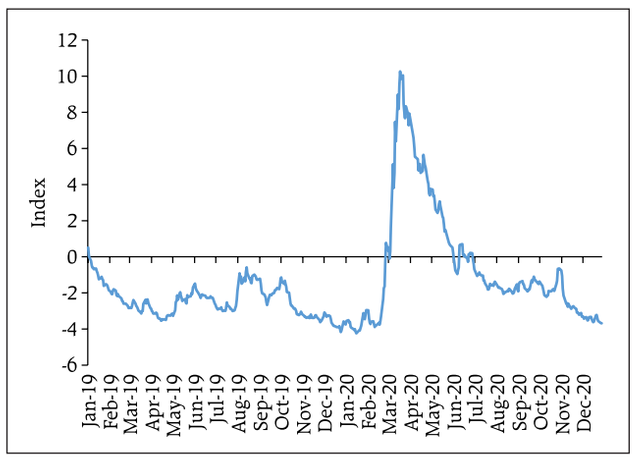
1.7 These actions have eased financial conditions across the globe back to pre-COVID levels. The Office of Financial Research's Financial Stress Index[1] (OFR FSI) moved further into negative territory since July 2020, indicating below average stress levels (Chart 1.5). Easing financial conditions have also directly impacted insurance on corporate credit, with high-grade and high-yield credit default swaps (CDS) in the US back at their pre-COVID levels and the 3-year over 5-year CDS spread changing course after the COVID-19 induced inversion (Charts 1.6 & 1.7). European CDSs were similar, approaching

Chart 1.4 : Balance sheets of the US Federal Reserve (Fed) and European Central Bank (proportion to their respective GDPs)



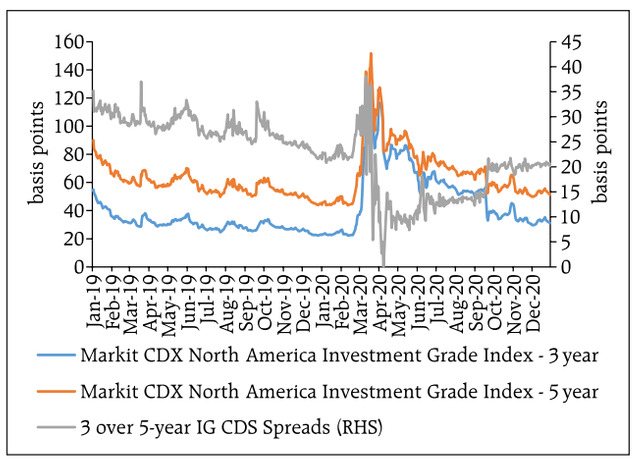
Source: Bloomberg.

Chart 1.5 : Financial Stress Index[1]



Source: Bloomberg.

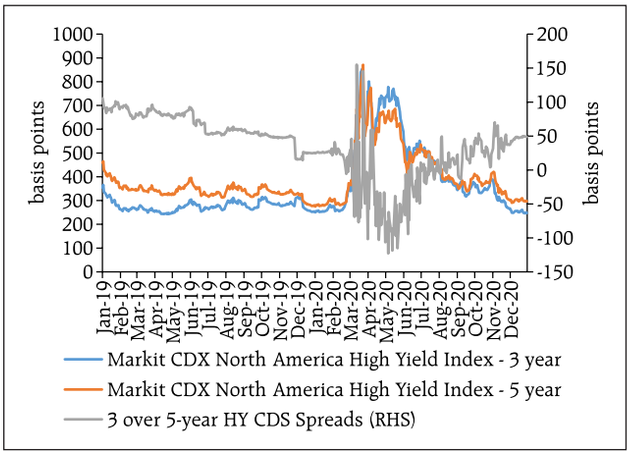
Chart 1.6 : North American Investment Grade (IG) CDS



Source: Bloomberg.

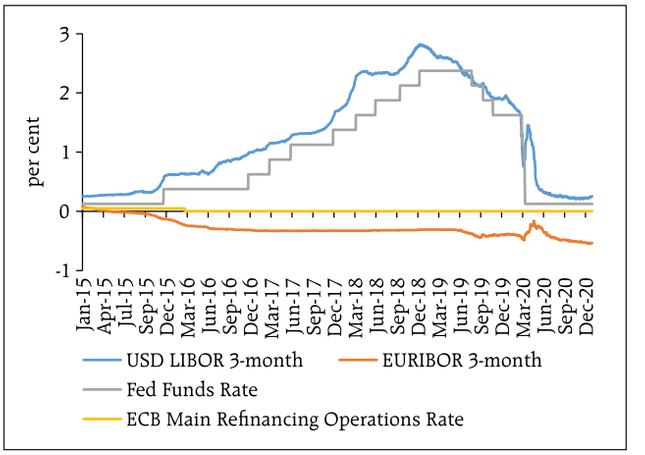
[1] The OFR FSI published by Office of Financial Research, an independent bureau within the United States Department of the Treasury, incorporates five categories of indicators: credit, equity valuation, funding, safe assets and volatility. The FSI shows stress contributions by three regions: United States, other advanced economies, and emerging markets.

Chart 1.7 : North American High Yield (HY) CDS



Source: Bloomberg.

Chart 1.8 : Movement in Key Interest Rates in the US and Eurozone

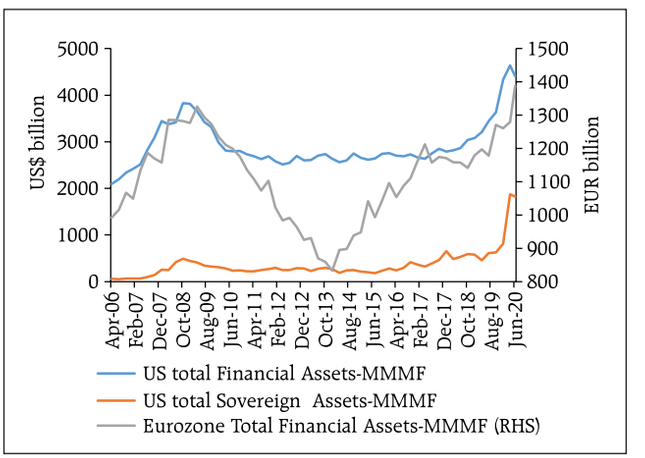


Source: Bloomberg.

pre-COVID levels. While easier financial conditions do support growth prospects in the short run, the longer-term impact in terms of encouraging leverage and inflating asset prices may give rise to financial stability concerns.

1.8 The massive infusion of central bank liquidity in the wake of the pandemic has led to a sharp decline in term rates (Chart 1.8), which has brought down borrowing costs substantially, but has also compressed net interest rate margins of banks, driving down their profitability[2]. Even as deposit yields have fallen, assets under Money Market Mutual Funds (MMMFs) have grown, indicative of a search for yield (Chart 1.9). Such risk taking among institutional investors, specifically in illiquid investments to earn targeted returns, may lead to build-up of financial vulnerabilities, with adverse implications for financial stability.

Chart 1.9 : Growth in Money Market Mutual Fund Assets in the US and Eurozone



Source: Federal Reserve Bank of St. Louis Economic Research & European Central Bank Statistical Data Warehouse.

[2] Bank for International Settlements (2020): "Box A: Banks through Covid-19", BIS Quarterly Review, September 2020.

Table 1.2: Fiscal Deficit as per cent of GDP – Key Regions

	2019	2020*
Advanced economies	-3.01	-14.39
Emerging and Middle-Income Asia	-6.00	-11.40
Emerging and Middle-Income Europe	-0.65	-7.18
Emerging and Middle-Income Latin America	-4.00	-11.09
Emerging Market and Middle-Income Economies	-4.83	-10.72

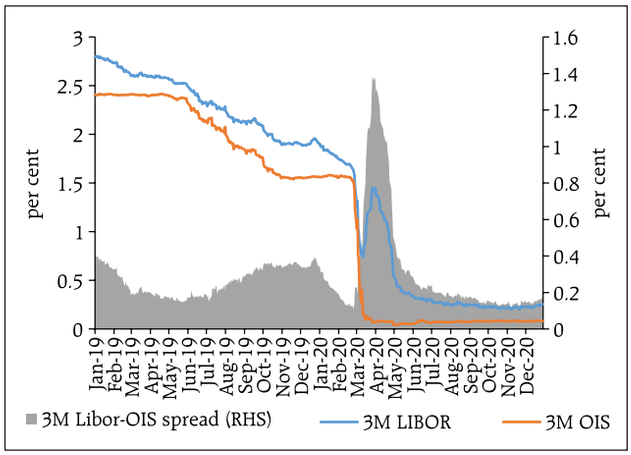
Note: * - Projected.
Source: IMF Fiscal Monitor;

1.9 Other fault lines have also emerged in the wake of the COVID-19 pandemic-induced economic disruptions. For one, the pandemic has severely affected government revenue receipts which, in turn, has inflated sovereign borrowing to fund sharp increases in fiscal deficits across all geographies, especially in the advanced economies (Table 1.2). This has aggravated global debt vulnerabilities.

1.10 Second, it has exposed vulnerabilities in treasury markets. Following the onset of the pandemic, the 3-month overnight indexed swap (OIS)-US Treasury Bill (T-Bill) spread turned negative persistently, pointing to unprecedented illiquidity in US money markets which, in turn, had a cascading influence on global risk appetite, affecting borrowing rates and flows (Charts 1.10 & 1.11). The unsecured rate's spread over the OIS rate, also widened sharply. While these spreads have reverted to positive territory more recently, the developments brought into sharp relief the implications for emerging markets (EMs), should the frailties of the US treasury market give rise to US dollar shortages in non-US markets.

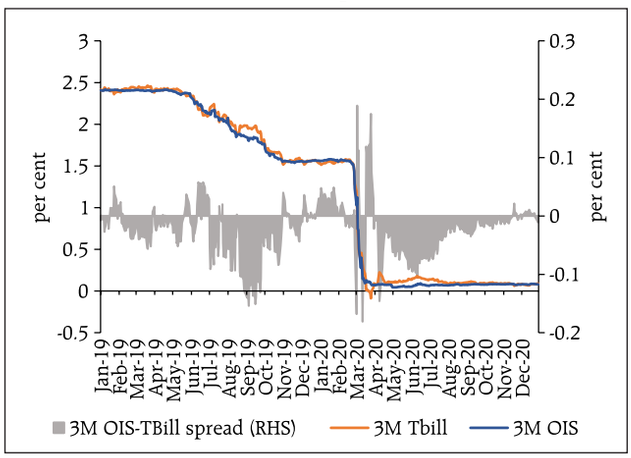
1.11 Third, COVID-19 has accentuated the credit risk of firms and households, which is impacting short term corporate earnings. Yet, strong growth expectations remain firmly embedded in equity prices (Charts 1.12 & 1.13). Developments that lead to re-evaluation of corporate earnings prospects will have significant implications for global flows, going forward.

Chart 1.10 : US: LIBOR-OIS Spread (3-month tenor)



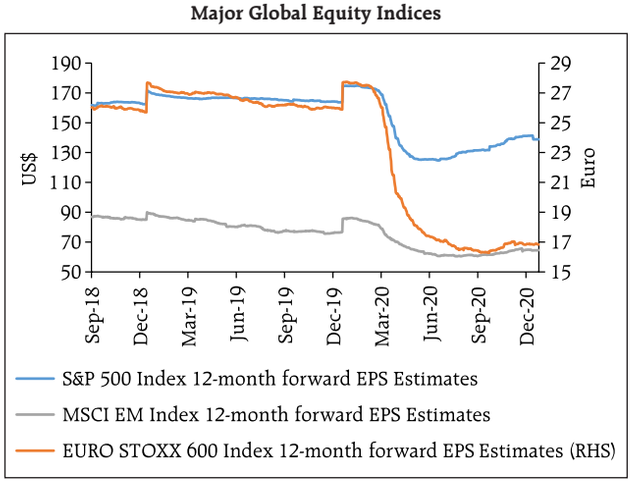
Source: Bloomberg.

Chart 1.11 : US: OIS-T-Bill Spread (3-month tenor)



Source: Bloomberg.

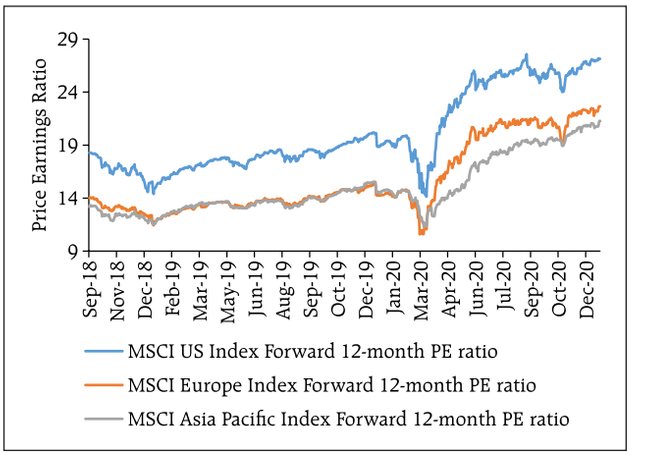
Chart 1.12 : 12-month Forward Earnings Per Share (EPS) Estimates – Major Global Equity Indices



Source: Bloomberg.

1.12 The policy endeavour is moving from mitigating stress to repair and recovery. Accordingly, a policy shift is underway from broad-based liquidity support to more targeted measures to support households and firms and to maintain the health of the financial system (Box 1.1).

Chart 1.13 : Price Earnings Multiples of Major Global Indices



Source: Bloomberg.

Box 1.1: Reviving and Restructuring the Corporate Sector

Policymakers around the world took quick and bold measures through injection of liquidity, reduction in cost of funds, regulatory forbearance, consumption supporting stimulus packages and other measures to contain the immediate adverse effects of the COVID-19 pandemic.

The pandemic has ushered in several structural changes in consumption patterns and business operations, the impact of which is still unfolding. For some businesses, solvency concerns have become acute. Accordingly, authorities need to be in readiness to alter their responses with new tools and processes to further support the corporate sector.

In this context, the Group of Thirty (G30)[3], has set out key universal principles on reviving and restructuring the corporate sector post-COVID in its mid-December 2020 report. They include (a) the productive use of scarce resources; (b) encouraging necessary or desirable business transformations; (c) harnessing private sector expertise; and (d) appropriately timing the interventions. It primarily focusses on using targeted credit programs, encouraging infusion of equity/equity-like investments into viable companies and enabling restructuring of balance sheets rapidly and inexpensively through suitable bankruptcy and workout procedures.

Insurance for corporates generally revolves around protection against business interruption, but virtually always excludes coverage of losses from a pandemic as quantification and pricing of unpredictable risks is difficult. The report examines government-backed business interruption insurance, either directly or *via* reinsurance, where fiscal capacity acts as a limiting factor.

In jurisdictions with strong private financial institutions and deep capital markets, prioritising financial restructuring through mobilising various mechanisms may be feasible. In some emerging economies with relatively weaker institutional frameworks, however, the focus is likely to be on extending sovereign borrowing capacity for government-backed support. Emerging economies also face constraints in the form of large employment-intensive unorganised sectors affected by the pandemic and the embedded risks of adverse selection in designing the support schemes. Also, any restructuring of corporate credit obligations would possibly require conversion of some credit claims to equity, where selection of projects eligible for such conversion is critical. Hence, while the "optimal response" may vary by jurisdiction, the report stresses the urgency to act before the underlying strength of the business sector is completely eroded.

References

Group of Thirty (2020): Reviving and Restructuring the Corporate Sector Post-Covid: Designing Public Policy Interventions. Working Group on Corporate Sector Revitalisation. Special Report (December 15).

International Monetary Fund (2020). Global Financial Stability Report. October.

[3] The G30 is an independent global body of economic and financial leaders from the public and private sectors and the academia.

I.1.2 Capital Flows and Exchange Rate Volatility

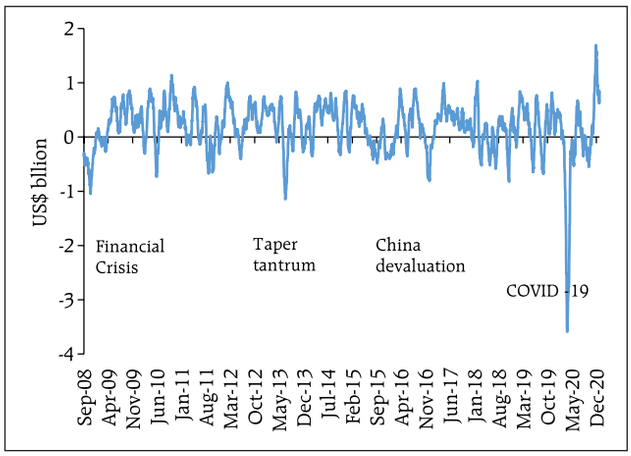
1.13 After the unprecedented outflows in the earlier part of the year following the outbreak of the pandemic, a hesitant recovery in capital flows to emerging markets (EMs) began in June 2020 and picked up strongly following positive news on COVID-19 vaccines (Chart 1.14). The response of foreign investors to primary issuances from EMs has been ebullient (Chart 1.15). Anticipating the COVID-19 vaccine induced economic boost, US yields of intermediate tenors (2– and 5-year) have started edging higher[4]. This could have implications for future portfolio flows to EMs.

1.14 EM local currency bond portfolio returns in US$ terms have been lower than local currency as well as hedged returns since early 2020 as emerging market currencies have softened against the US$ (Chart 1.16). This has led to sluggishness in EM local currency bond flows even as global bond markets have been pricing in a prolonged economic slowdown and benign inflationary conditions in Europe and US. In this scenario, any significant reassessment of either growth or inflation prospects, particularly for the US, can be potentially destabilising for EM local currency bond flows and exchange rates.

I.1.3 COVID-19 and Bank Capital

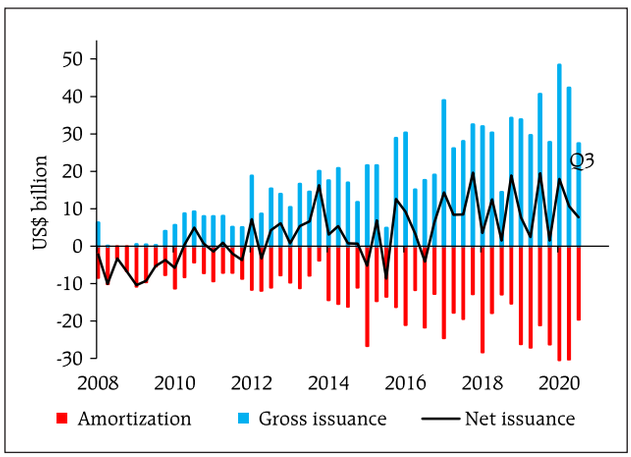
1.15 The world faced the COVID-19 crisis with much better capitalised banks than was the case during the global financial crisis of 2008; the latter actually provided an impetus for stronger capital buffers. The COVID-19 crisis has significantly altered capital costs of banks and has posed challenges for both banks and prudential authorities. Bank stock

Chart 1.14 : EMs' Daily Flows (28-day moving average)



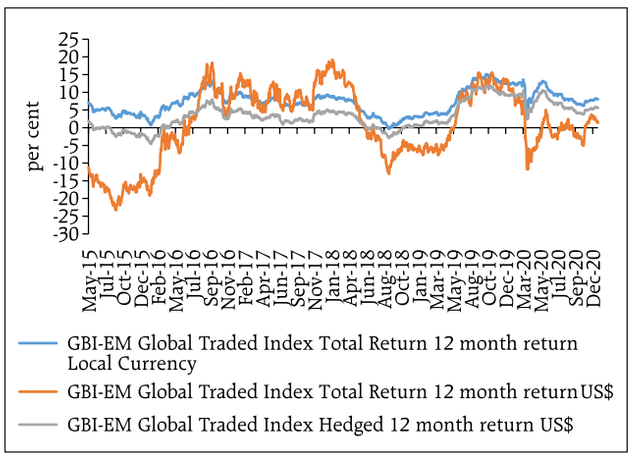
Note : Till December 28,2020.
Source : International Institute of Finance (IIF).

Chart 1.15 : Net Issuance of EM Bonds Abroad



Source: IIF, Bloomberg.

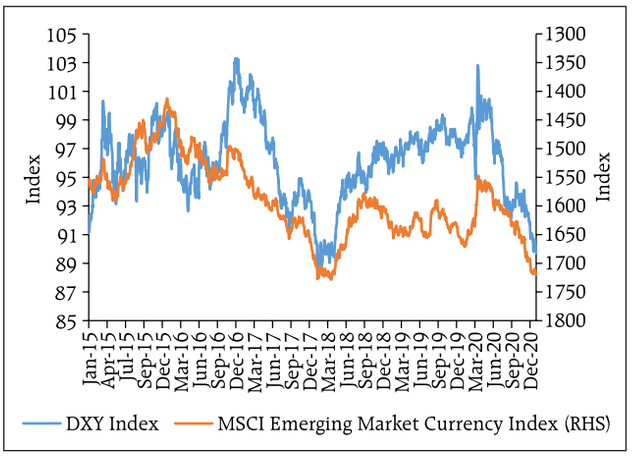
Chart 1.16 : Emerging Market Bond Returns (Annualised)



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. Courtesy J.P. Morgan Chase & Co., Copyright 2020.
Source: JP Morgan.

[4] Observations based on US yield curve as on December 3, 2020.

Chart 1.17 : Exchange Rates in AEs and EMs

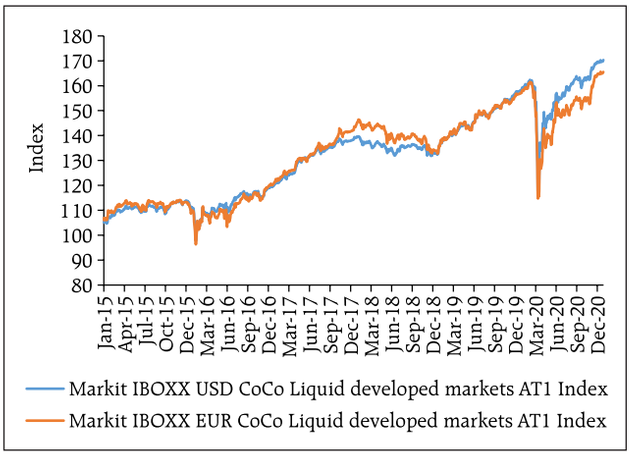


Source: Bloomberg.

prices plummeted as the crisis unfolded (BIS, 2020[5]) and their subsequent recovery was subdued as they generally remained well below other global stock prices and also below their own pre-crisis levels. Similarly, price-to-book ratios fell, plateauing at around unity, on average, for banks outside Europe. Less profitable banks in Europe and Japan had ratios below unity pre-crisis and they deteriorated even further thereafter. Although US and European banks' Contingent Convertible (CoCo) bonds have recovered sharply from COVID-19 induced lows (Chart 1.18), funding costs for such instruments are still recovering and are high relative to their pre-COVID levels (BIS, op.cit).

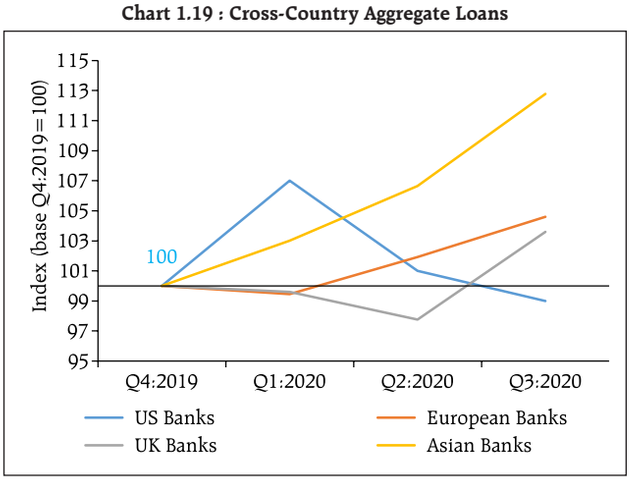
1.16 While globally regulators have encouraged banks in their jurisdictions to dip into their buffers to support the local economy, this has not yielded desired results uniformly. An analysis of key balance sheet parameters of banks across regulatory jurisdictions through the pandemic throws up interesting contrasts. While the growth in bank loans in Asia remained robust (largely driven by a sharp recovery in China), US banks have been aggressive in loan loss provisioning and UK and European banks lead in common equity tier-1 (CET-1) capital augmentation (Charts 1.19 to 1.21).

Chart 1.18 : US and European Contingent Convertible Additional Tier-1 (AT-1) Index



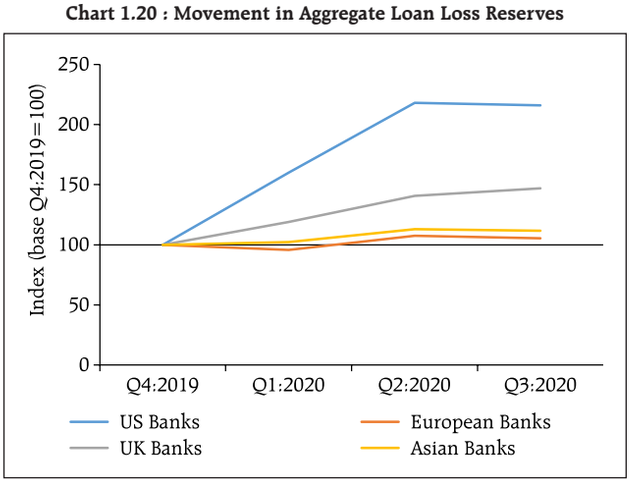
Source: Bloomberg.

Chart 1.19 : Cross-Country Aggregate Loans



Source: Bloomberg.

Chart 1.20 : Movement in Aggregate Loan Loss Reserves



Source: Bloomberg..

[5] BIS (2020): "Markets rise despite subdued economic recovery", BIS Quarterly Review, September.

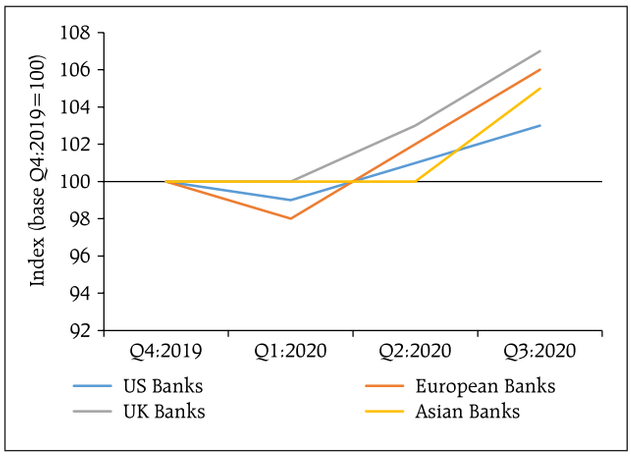
I.1.4 Commodity Market Spillovers

1.17 There was considerable excitement in the energy markets at the news of an effective vaccine candidate against COVID-19. Oil prices initially surged and the Brent front month futures price bounced back to over US$ 45/barrel (bbl) (Chart 1.22), a level not seen since the beginning of September. However, the International Energy Agency (IEA), in its November monthly report, did not anticipate a significant impact of the vaccine in the first half of 2021. The surging caseloads, particularly in Europe and the US and the consequent recent announcements of lockdowns and other containment measures in many countries, have led to lower estimates for global oil demand. The IEA estimates global oil demand to average 91.3 million barrels /day (mb/d) in 2020, which is 8.8 per cent lower than in 2019. In 2021, demand is expected to recover to 97.1 mb/d which would still be about 3 per cent below the pre-COVID level in 2019.

1.18 The recent news on vaccine development has kindled hopes of a recovery of demand outside of China in 2021 which will support metal prices, although the likely pull back in demand both in Europe and the US due to the second pandemic induced lockdown constitutes a near term risk to that outlook. The expectation that, going forward, a moderation in China's demand will be offset by improvements in the rest of the world, is supporting base metal prices, which have registered a sharp recovery in Q3:2020 from pandemic induced lows (Chart 1.23).

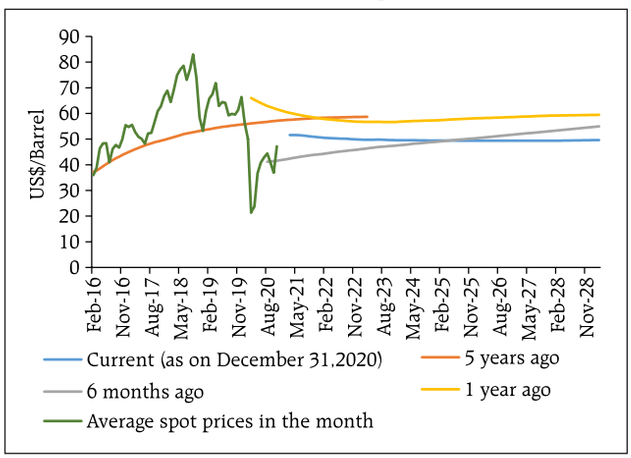
1.19 Volatility in commodity prices has a large impact on commodity exporting countries 91 per cent of which are categorised as low income. A significant commodity price downswing spanning mineral, energy and agricultural products over 2013-17 has severely stretched the fiscal balance

Chart 1.21 : Aggregate CET-1 Ratios



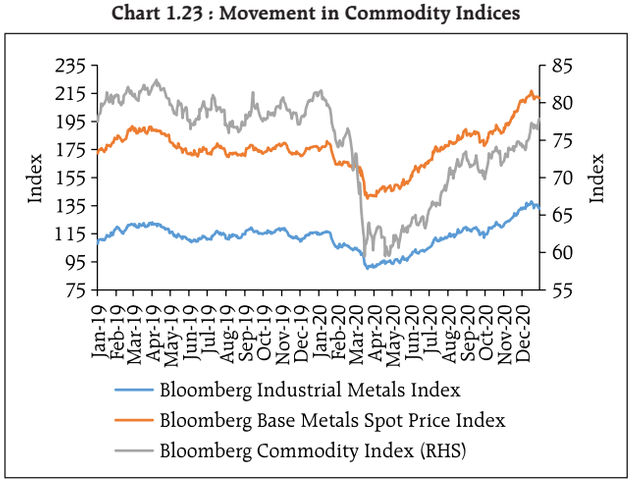
Source: Bloomberg.

Chart 1.22 : Brent Crude Oil Spot and Futures



Source: Bloomberg.

Chart 1.23 : Movement in Commodity Indices



Source: Bloomberg.

Table 1.3: Fiscal Deficit as per cent of GDP of Low Income Regions

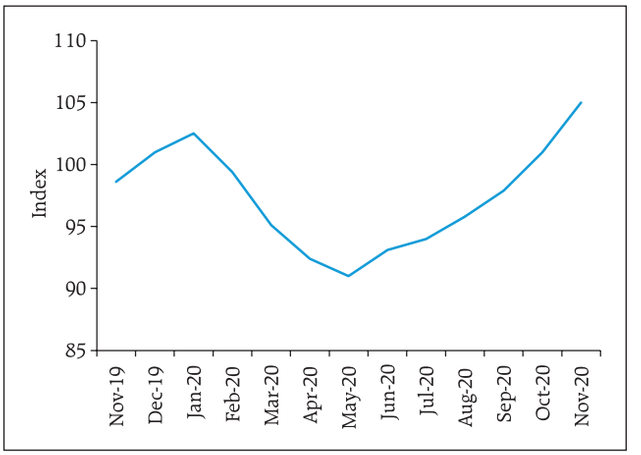
	2015	2016	2017	2018	2019	2020*	2021*
Low-Income Developing Asia	-4.22	-3.26	-2.72	-3.89	-4.11	-6.32	-5.67
Low-Income Developing Latin America	-1.33	-0.72	-0.64	-1.15	-0.51	-3.93	-3.10
Low-Income Developing Sub-Saharan Africa	-3.76	-4.28	-4.51	-3.98	-4.09	-6.26	-4.86

Source: IMF Fiscal Monitor; * = Projected

of such countries (UNCTAD 2019) (Table 1.3). As a result, their fiscal support in response to the pandemic has been minimal. A continued slump in commodity prices is likely to have severe implications for fiscal sustainability of the low-income countries, which are also among the most indebted.

1.20 Global food commodity prices, as tracked by the FAO Food Price Index[6] (FFPI), rose sharply in November 2020, continuing the reversal since May 2020 (Chart 1.24). All sub-indices of the FFPI registered gains in November, with the vegetable oil sub-index rising the most, followed by those of sugar, cereals, dairy and meat.

Chart 1.24 : Food Price Index



Source: Food and Agricultural Organisation.

I.2 Domestic Macrofinancial Developments

1.21 The large disruption in economic activity in the wake of the pandemic has resulted in fiscal strains, corporate sector stresses and weakening of demand conditions. Rapid and bold responses of the Reserve Bank, other financial sector regulators and the Government have contained risks to financial stability for now. Inward capital flows have been supported by surplus global liquidity in search of yields. The full impact of the pandemic on the domestic economy is still unfolding and the outlook would depend on the pace of the recovery, especially for more vulnerable cohorts of small and medium enterprises.

1.22 In the wake of a sequential 8-quarter slowdown in domestic activity, the outbreak of COVID-19 turned out to be a once-in-a-century black swan event that took the Indian economy down into one of the deepest contractions among peer economies in April-June 2020. As per the advance estimates, GDP is expected to shrink by 7.7 per cent in 2020-21. Since then, however, an uneven, multi-speed recovery is gradually taking hold. As a result, contractions in several sectors are easing, and green shoots are visible in some others. Surges of capital flows are being experienced, with the return of risk appetite and a renewed search for yield. Financial markets and asset prices have been lifted by this resurgence of foreign portfolio investment to India. Alongside a growing optimism on the brightening of

[6] 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.

India's prospects, consumer and business confidence is turning upbeat with the progressive unlocking and normalisation of supply disruptions. Nevertheless, global developments, elevated domestic inflation pressures and the incipient festering of financial stress under the camouflage of moratorium, asset recognition standstill and the one-time restructuring, slant the balance of risks to the downside.

I.2.1 Recent Macroeconomic Developments

1.23 Government finances are likely to deteriorate in 2020-21, with revenues badly hit by COVID-19 related disruptions even as expenditure pressure remains high on account of the fiscal stimulus.

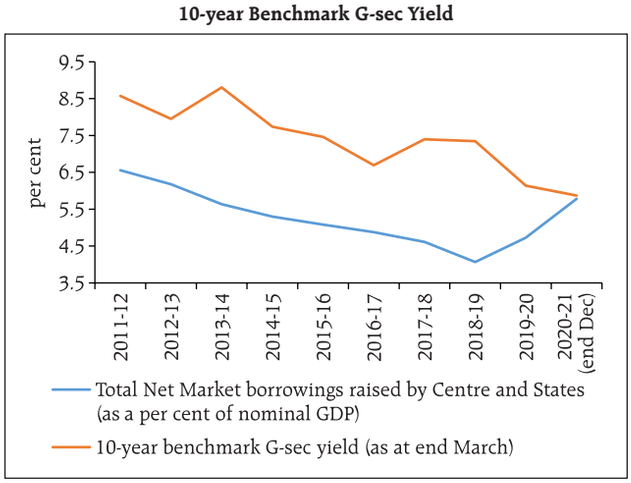
1.24 The pandemic-led economic contraction has resulted in revenue shortfall for the Government. During April-November, total receipts of the union government contracted by 17.9 per cent in relation to the previous year. However, revenue collections seem to have turned the corner, as indicated by monthly GST revenues (centre + states) which recorded positive y-o-y growth of 10.2 per cent, 1.4 per cent and 11.6 per cent in the months of October,November and December, respectively. Despite the sizeable fiscal stimulus, total expenditure recorded a modest growth of 4.7 per cent during April-November 2020-21, with revenue expenditure growing at 3.7 per cent and capital expenditure by 12.8 per cent, as part of the additional expenditure requirement has been met by re-allocation of funds from other heads of expenditure.

1.25 For states, lower own revenue receipts, coupled with the additional burden of lower federal transfers, may accentuate downside risks to the outlook in 2020-21. During April-October, total receipts of state governments contracted by 13.7 per cent, which induced a contraction in total expenditure by 4.1 per cent over previous year. The revenue expenditure of states has also not witnessed any sharp upturn during April-October 2020-21 as compared with previous years, despite the fact that states have been at the forefront in the fight against the pandemic. This is primarily attributable to re-prioritisation of expenditure through means such as Dearness Allowance (DA) freeze, deferment of part or full salary, and rationalisation of travel and vehicle expenses (RBI, 2020). Growth in capital expenditure of state governments in October 2020, however, witnessed a positive growth after eight months of consecutive contraction.

1.26 The large gap between receipts and expenditure has been met primarily through additional market borrowings, as reflected in the revised borrowing calendar announced by the Centre and higher market borrowing limits given to states (Chart 1.25). Pressures from the spillover of increased government borrowings to the bond markets have so far been contained by the liquidity support measures of the Reserve Bank, besides increase in the limits of ways and means advances, as also relaxation of rules governing withdrawals from the Consolidated Sinking Fund (CSF) to ease the redemption pressure on states.

1.27 With the weakening of domestic demand in H1:2020-21, the current account surplus increased to 3.1 per cent of GDP (0.1 per cent in Q4:2019-20). India's merchandise exports contracted by 21.2

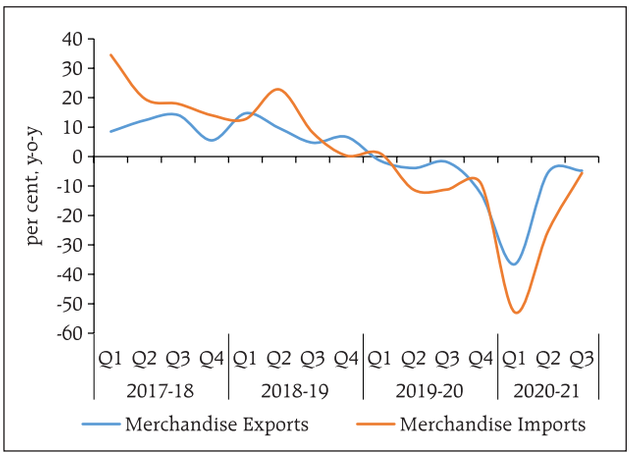
Chart 1.25 : Net Borrowings (Centre and State Governments) and 10-year Benchmark G-sec Yield



per cent in H1:2020-21 due to demand and supply disruptions caused by the COVID-19 pandemic. Imports shrank even more sharply – by 39.7 per cent. Subsequently, exports have shown some signs of revival as the rate of contraction moderated to 4.8 per cent in Q3:2020-21, with non-oil exports expanding by 2.6 per cent during the quarter. With the gradual unlocking of the economy, the decline in imports has also moderated to 5.6 per cent during Q3: 2020-21 (Chart 1.26). Based on provisional data, there was a sharp rebound in imports by 7.6 per cent in December 2020. The turnaround in imports was broad-based as 20 out of 30 major commodities registered an expansion led by gold, electronic goods, chemicals, pearls and precious stones, machinery and vegetable oils. There has been a narrowing of the trade deficit to US$ 24.1 billion in H1 from US$ 88.9 billion a year ago; during Q3:2020-21, the trade deficit at US$ 34.3 billion was lower than US$ 37.1 billion in the same quarter last year. India's trade outlook may improve in line with the gradual pick up in global trade activity as projected by the World Trade Organisation (WTO), though downside risks remain.

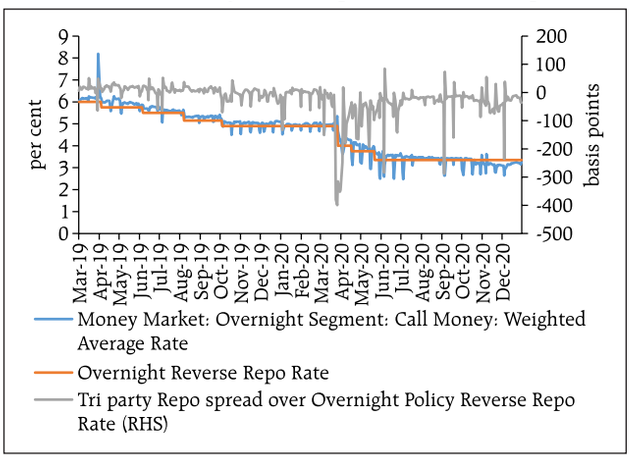
1.28 The Reserve Bank's balance sheet expanded considerably in its efforts to deal with the economic consequences of the pandemic. The unprecedented infusion of liquidity has affected the near-end term curve. Since March 2019, the overnight secured funding rate for market transactions, which was 10-15 bps lower than the LAF reverse repo rate, has fallen sharply from late October 2020 (Chart 1.27). The unsecured overnight call rate, which was generally in the reverse repo-MSF corridor has also fallen below the reverse repo rate from around the same time. Consequently, the risk-free money market term structure, specifically at the short end of the curve, has consistently touched negative spreads over the reverse repo rate (Chart 1.28). The state of the term curve largely reflects the surplus liquidity conditions.

Chart 1.26 : India's Merchandise Trade Growth



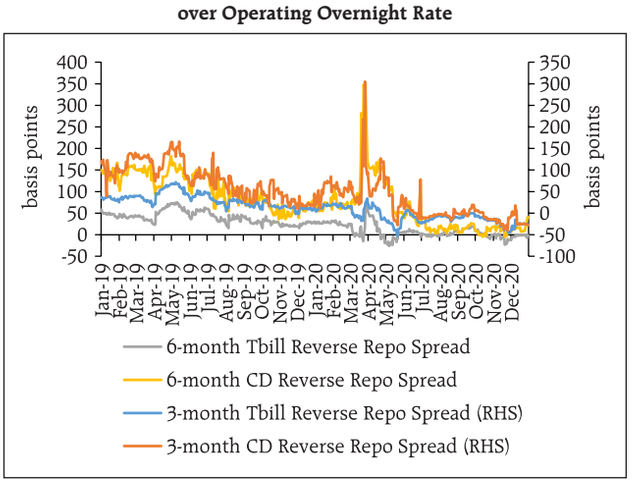
Source: Directorate General of Commercial Intelligence & Statistics (DGCI&S).

Chart 1.27 : Policy Rate and Spread over Market Repo



Source: CEIC.

Chart 1.28 : Spreads of Term – Risk-free Rate and Unsecured Rate over Operating Overnight Rate



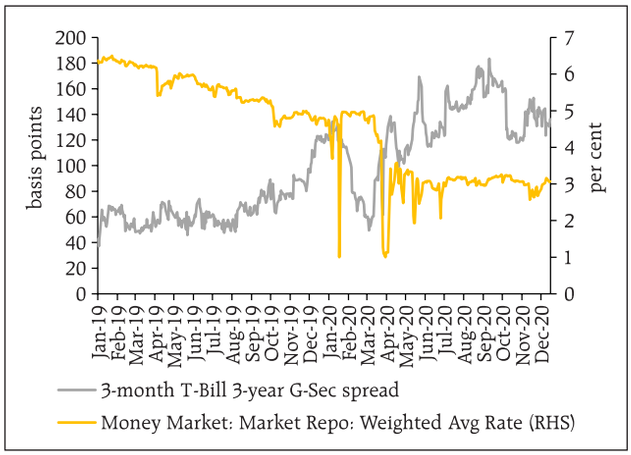
Source: Bloomberg.

1.29 Since January 2019, the overnight market repo rate (weighted average) has softened from 6.37 per cent to 3.03 per cent while the 3-month T-bill-3-year G-Sec spread has widened from 43 bps to 133 bps, implying that the softening of 3-month T-bill rates has been the main driver of the steeper yield curve up to the 3-year tenor (Chart 1.29).

1.30 A comparison of the slopes of the overnight indexed swap (OIS) curve relative to the G-Sec curve over the 3-year and 7-year tenors reveals considerable churn in the underlying G-Sec curve, although it has generally been steeper relative to the OIS curve in the wake of the pandemic (Chart 1.30). Most of the advanced economies also witnessed significant rise in spreads in the wake of the pandemic.

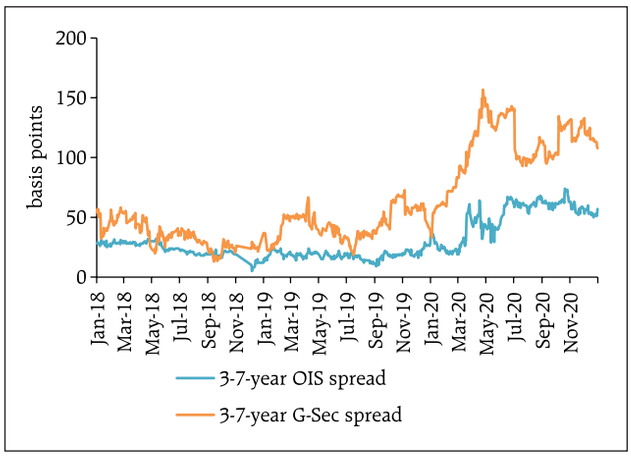
1.31 With the onset of the COVID-19 pandemic, global financial conditions had tightened sharply in March 2020, precipitating a selloff by portfolio investors which was unprecedented both in scale and pace. Foreign portfolio investment (FPI) flows have, however, rebounded since June 2020 propelled by risk-on sentiments, weakening of the US dollar and increased global monetary and fiscal stimulus (Chart 1.31). Net FPI inflows were at an all-time

Chart 1.29 : Slope (short-term) of the Sovereign Yield Curve: 3-month to 3-year



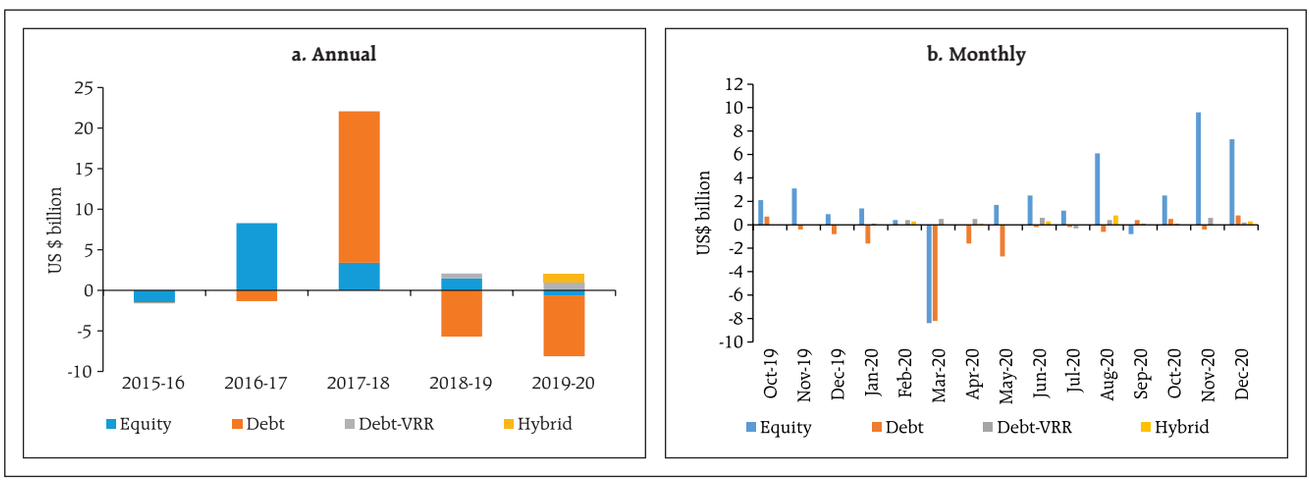
Source: Bloomberg.

Chart 1.30 : Slope (3y-7y) of OIS and G-Sec Curves



Source: Bloomberg.

Chart 1.31: Foreign Portfolio Investment Flows



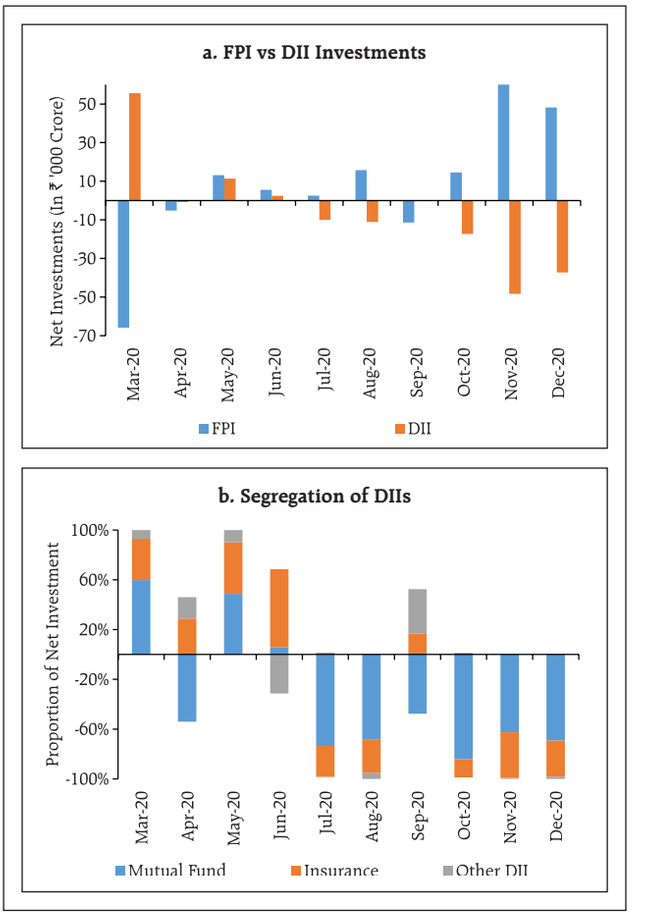
Source: National Securities Depository Limited (NSDL)

monthly high of US$ 9.8 billion in November 2020. During April-December 2020, net FPI inflow in equities was US$ 30.0 billion as compared with inflow of US$ 6.0 billion a year ago – in the debt segment (general route), there were outflows of US$ 2.7 billion as compared with inflows of US$ 2.9 billion a year ago while under the voluntary retention route (VRR), there were net inflows of US$ 2.3 billion during the same period.

1.32 During March to December 2020, domestic institutional investors (DIIs), particularly the mutual funds and the insurance sector, counter-balanced the actions of FPIs in the equity cash segment (Chart 1.32a and b).

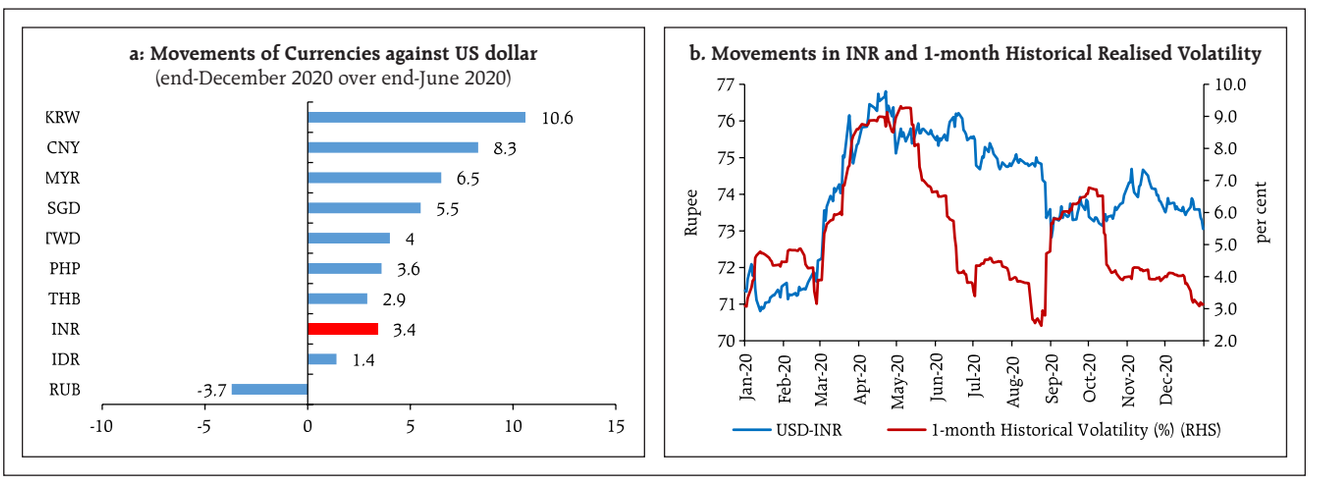
1.33 The Indian rupee has appreciated since end-June 2020 due to weakening of the US dollar and robust capital inflows. The appreciation of the rupee, however, was modest as compared with emerging market (EM) peers (Chart 1.33 a). It has traded with an appreciating bias against the US dollar and underlying realised volatility has moderated since mid-October 2020 (Chart 1.33 b).

Chart 1.32: Trend in Foreign and Domestic Investments in Equity Cash Segment



Source: SEBI.

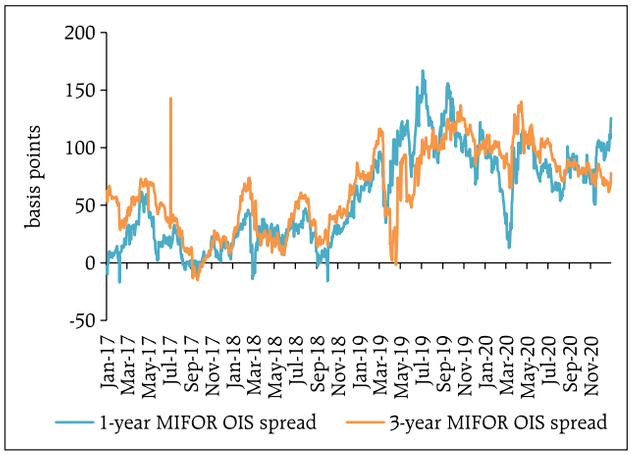
Chart 1.33 : Exchange Rate Movements and Realised Volatility



Source: FBIL, IMF, Central Banks of Taiwan and Indonesia.

1.34 The MIFOR-OIS spread of 1 and 3-year tenors has, however, widened comparable to pre-COVID levels, in the positive territory (Chart 1.34). While comparing an interbank funding curve derived out of foreign exchange premia and USD LIBOR (MIFOR) with the evolution of the risk-free policy rate (OIS) may appear incongruous, it conveys implications for funding (basis swaps), especially as OIS linked rates are more susceptible to domestic inflation linked volatility. In addition, a higher MIFOR level renders hedging of short USD exposures expensive.

Chart 1.34 : 1-year and 3-year MIFOR-OIS Spread



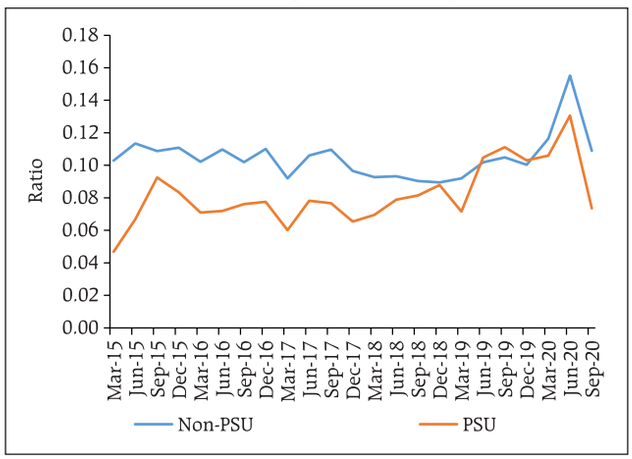
Source: Bloomberg.

I.2.2 Corporate Sector

1.35 The private corporate business sector had been experiencing a deterioration in performance even before the pandemic. This became accentuated with the outbreak of COVID-19. The brunt of the pandemic's impact was concentrated in Q1:2020-21. Signs of recovery became visible in Q2:2020-21. The contraction in sales at (-) 4.3 per cent was a significant improvement from the precipitous decline of 41.1 per cent in the preceding quarter for listed private manufacturing companies. Enabled by cost cutting as reflected in a larger reduction in expenses relative to sales, the manufacturing sector posted improvements in operating profits and in debt servicing, the latter being reflected in the improvement in their interest coverage ratio (ICR). Sales growth of the IT sector, on the other hand, remained resilient through H1:2020-21. Although profit margins improved across sectors, manufacturing companies reduced leverage[7] during H1:2020-21 vis-à-vis the previous half-year and built up precautionary cash positions, as reflected in the unaudited balance sheets of 1,249 listed private manufacturing companies. Further, their investment in fixed assets remained subdued.

1.36 An analysis of a sample of 2,788 listed non-financial entities {54 public sector undertakings (PSUs) and 2,734 non-PSU companies} from March 2015 to September 2020 shows significant worsening of the ratio of interest to PBIDTA & OA[8] in the wake of the pandemic followed by noticeable improvement in Q2:2020:21 (Chart 1.35). A disaggregated analysis of listed non-PSU non-financial companies, based

Chart 1.35 : Ratio of Interest to PBIDTA and OA for Non-financial Companies (Ownership-wise)



Source: Capitaline and RBI Staff Calculations.

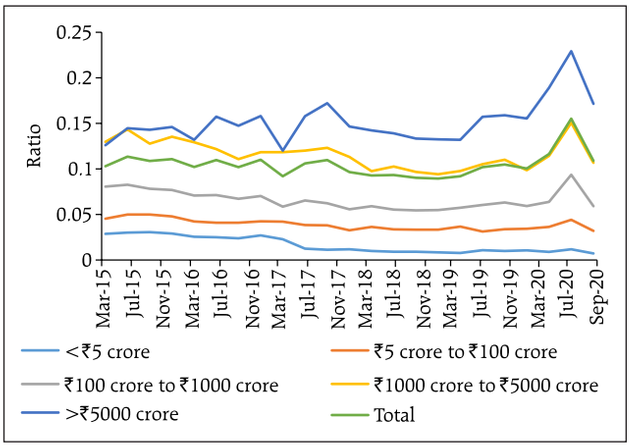
[7] Measured by debt to equity ratio and the debt to asset ratio.

[8] Profit before Interest, depreciation, tax, amortization and other adjustments

on the size of total debt (as per latest balance sheet data), however, indicates interest to PBIDTA & OA ratios still above pre-COVID levels for the large borrowers (Chart 1.36). Rating wise analysis of a constant sample of 1,195 listed non-PSU non-financial companies shows a more severe impact as also sharper recovery for lower rating grades (Chart 1.37).

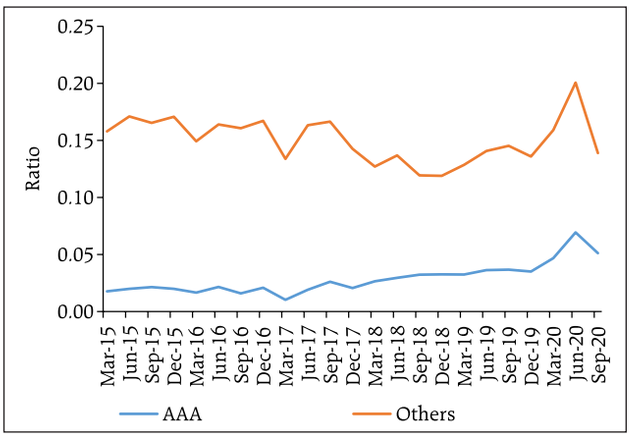
1.37 An analysis of a smaller common set of 1,700 listed non-PSU non-financial companies reflects the increasing role of non-banks in funding their balance sheet expansion during the period 2017-2020. The on-balance sheet debt as also total assets of the companies have grown, even as banking sector exposure to this cohort has declined significantly (Chart 1.38). As demand for bank credit by the non-financial corporate sector has moderated, scheduled commercial banks' (SCBs) asset portfolio has grown on the back of demand for retail loans. Going forward, resurgence in economic activity may lead to higher loan demand from the non-financial corporations for their operational and investment needs.

Chart 1.36 : Ratio of Interest to PBIDTA and OA for Non-PSU Non-financial Companies (Size-wise)



Source: Capitaline and RBI Staff Calculations.

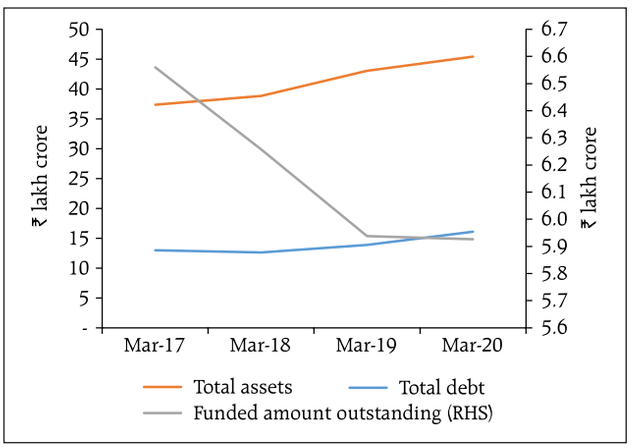
Chart 1.37 : Ratio of Interest to PBIDTA and OA for Non-PSU Non-financial Companies (Rating-wise)



Note: Companies shown as AAA were rated AAA throughout March 2017 to March 2020.

Source: Capitaline, Prime Database and RBI Staff Calculations.

Chart 1.38 : Balance sheet Growth and Banking Sector Exposure - Listed Non-PSU Non-financial Companies



Source: Capitaline, CRILC and RBI Staff Calculations.

1.38 The long-term rating momentum (quarterly upgrades versus downgrades), which has been consistently declining since Q3:2018-19, showed a reversal in Q2:2020-21 even though the rating downgrades continue to outnumber upgrades (Chart 1.39). The ratings migration, however, also reflects the temporary discretion given by the SEBI to credit rating agencies in recognition of default / treatment of rescheduling, in the wake of the pandemic[9].

I.2.3 Banking System – Liquidity Profile

1.39 In view of the comfortable liquidity situation in the system, it is useful to evaluate the adequacy of unencumbered high-quality liquid assets (HQLA) for meeting short term liquidity under a significantly severe liquidity stress scenario. This is reflected in the movement of the liquidity coverage ratio (LCR) across bank groups, while recognising that the negative carry engendered by deployment of available deposits in HQLA can potentially strain the future profitability of banks (Table 1.4).

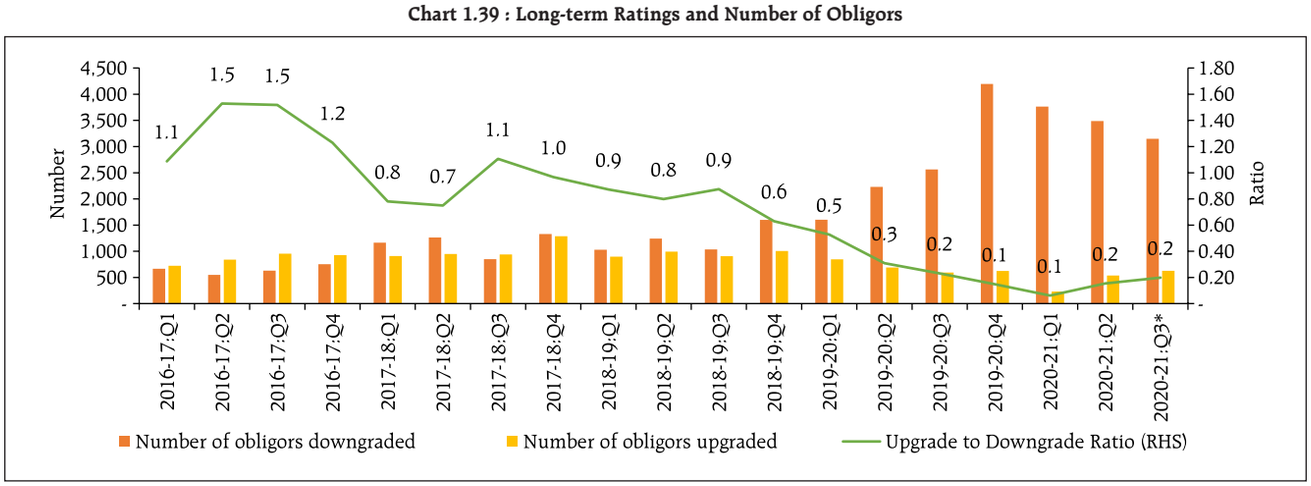
Table 1.4: LCR Profiles across Bank Groups

(Per cent)

Bank Group Name		Liquidity Coverage Ratio (LCR)		
		31-Mar-20	30-Jun-20	30-Sep-20
Public Sector Banks		148.64	162.34	181.83
Private Sector Banks	Aggregate	130.65	144.42	148.35
	Old Private Sector Banks	218.1	231.89	261.05
	New Private Sector Banks	123.18	136.64	139.15
Foreign Bank Group		175.17	179.32	201.32

Source: RBI Supervisory Returns.

Chart 1.39 : Long-term Ratings and Number of Obligors



Note: *: Till December 29, 2020.
Source: Prime Database.

[9] SEBI (2020): Circular no. SEBI/HO/MIRSD/CRADT/CIR/P/2020/53 dated March 30 2020 on "Relaxation from compliance with certain provisions of the circulars issued under SEBI (Credit Rating Agencies) Regulations, 1999 due to the COVID-19 pandemic and moratorium permitted by RBI"

I.2.4 Banking System – Wholesale Credit

1.40 The profile of wholesale credit in H1:2020-21 and in Q3:2020-21 (upto November) reflects a subdued credit situation across bank groups, pointing to risk aversion and muted demand weighing on the outlook (Table 1.5). With the onset of COVID-19, retail credit growth (y-o-y) has suffered, while wholesale credit growth has held up though at low levels (Chart 1.40). With stress tests pointing to a deterioration in asset quality of banks, early identification of impairment and aggressive capitalisation is imperative for supporting credit growth across various sectors alongside pre-emptive strategies for dealing with potential NPAs.

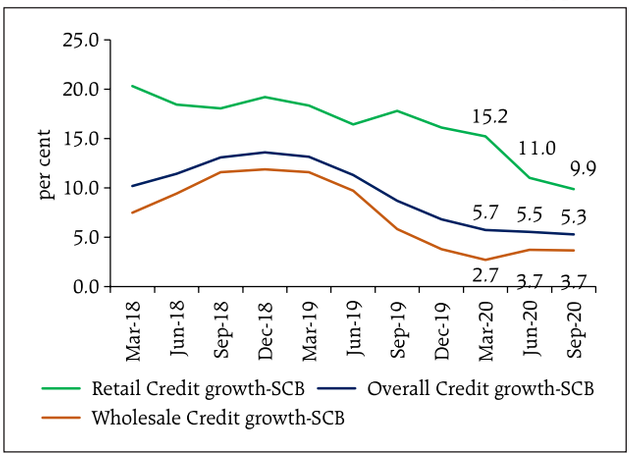
1.41 For the purpose of wholesale credit analysis in paras 1.41-1.44, funded amount outstanding of companies (which account for about 88 per cent of the total funded amount outstanding to wholesale obligors) has been considered as opposed to other organisational forms such as cooperatives, partnerships, trusts and societies. Credit growth in respect of public sector undertakings (PSUs) was comparatively resilient during the pandemic, although the aggregate PSU credit exposure declined between March-September, 2020. The market capitalisation of central public sector enterprises (CPSEs) has, however, fallen in an otherwise bullish equity market, implying muted market expectations about value creation through the PSU channel (Table 1.6 and Chart 1.41).

Table 1.5: Growth in Wholesale Credit
(q-o-q unless specified otherwise, per cent)

	Sep-19	Dec-19	Mar-20	Jun-20	Sep-20	Nov-20*
PSBs	-0.53	-1.08	7.26	-1.51	-2.54	-2.40
PVBs	3.38	0.92	1.27	-0.68	0.94	-1.28
All SCBs	0.67	-0.53	5.85	-0.97	-1.67	-1.36

Note: *Growth over September 2020.
Source: CRILC and RBI staff calculations.

Chart 1.40 : Credit by SCBs – Annual Growth (y-o-y) by Type



Source: Supervisory returns of RBI.

Table 1.6: Disaggregated Wholesale Credit Growth based on Ownership (q-o-q, unless mentioned otherwise)

(per cent)

	Non-PSU					PSU				
	Dec-19	Mar-20	Jun-20	Sep-20	Nov-20 *	Dec-19	Mar-20	Jun-20	Sep-20	Nov-20 *
PSBs	-2.5	1.0	-1.7	-2.4	-1.5	1.6	21.5	-2.4	-3.7	-1.7
PVBs	-0.7	-0.9	-3.0	-1.5	-3.7	14.0	29.4	16.2	13.5	2.6
PSBs+PVBs	-1.8	0.2	-2.2	-2.0	-2.4	2.9	22.3	-0.3	-1.4	-1.0

Note: *Growth over September 2020.
Source: CRILC and RBI staff calculations.

Table 1.7: Disaggregated Wholesale Credit Growth in Non-PSU obligors (q-o-q)

(per cent)

	PVBs					PSBs				
	Dec-19	**Mar-20**	**Jun-20**	**Sep-20**	**Nov-20 ***	**Dec-19**	**Mar-20**	**Jun-20**	**Sep-20**	**Nov-20 ***
AA and above	-0.43	5.21	-2.55	-5.86	-7.48	0.19	7.68	-5.22	-6.70	0.05
Other Investment Grade	0.16	-5.00	-4.26	-1.66	-4.03	1.42	-0.03	3.07	-1.15	-6.47
Below Investment Grade	-2.13	2.34	-1.49	3.83	-0.30	-7.42	-5.00	-0.74	2.90	0.02
Unrated/NA	-1.22	-4.80	-2.88	0.88	-1.18	-3.51	-0.11	-2.45	-3.40	-0.10

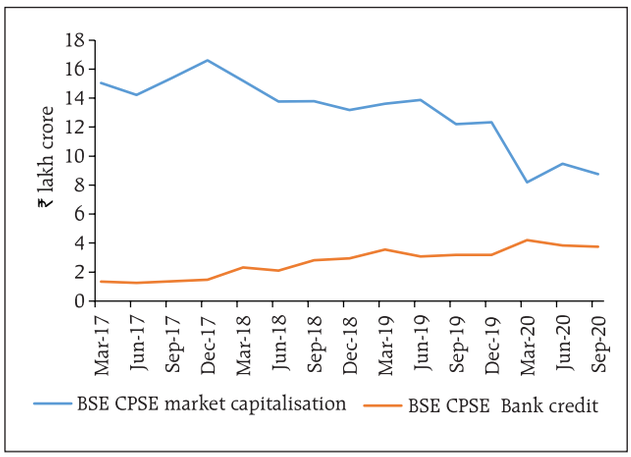
Note: *Growth over September 2020.
Source: CRILC, Prime Database and RBI staff calculations.

1.42 An analysis of wholesale credit flows, based on rating grades of non-PSU obligors, reveals sharp deleveraging (q-o-q) at rating grades 'AA and above' during 2020-21, across both PSBs and PVBs. This reflects a reversal from the position in March 2020 when a rush to access credit was observed in the early phase of the pandemic breakout (Table 1.7).

1.43 A size-wise disaggregation of wholesale credit growth points to deleveraging by large wholesale borrowers even as relatively smaller borrowers (loans size: ₹5 - ₹100 crore) continued to record sustained credit appetite (Chart 1.42).

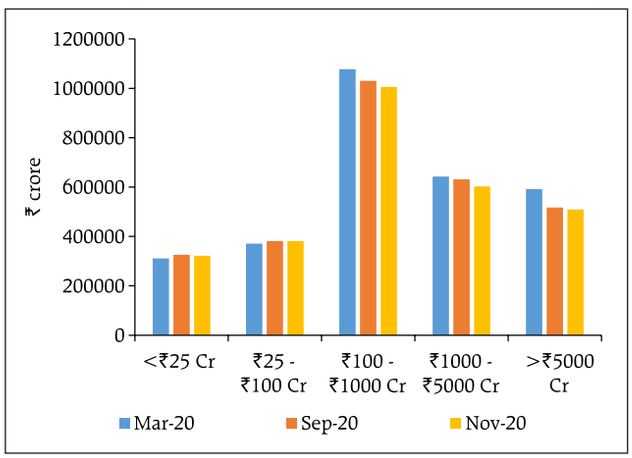
1.44 An examination of the transition of a constant sample of non-PSU non-financial wholesale performing exposures to SMA status[10] between

Chart 1.41 : Market Capitalisation of CPSEs and Credit Offtake



Source: Capitaline.

Chart 1.42 : Exposure Distribution of Non-PSU Non-financial Obligors



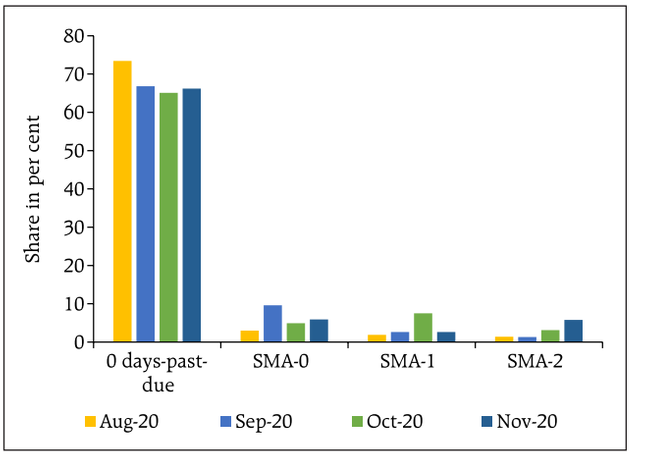
Note: Data as on November 2020 is provisional and not audited.
Source: CRILC and RBI Staff calculation.

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

August and November 2020 reveals accumulation of outstanding in SMA-0/1/2 categories, although the aggregate outstanding has remained flat (Table-1.8-1.9). A similar accumulation of exposure is seen when gross outstanding at every SMA cohort is compared between August and November 2020 (Chart 1.43). Admittedly, the asset classification standstill inhibits the true underlying economic categorisation of assets, although the incipient tilt is towards worsening as indicated by the growth in balances in the next worse categories for each cohort.

1.45 An analysis of sectoral credit growth[11], specifically to those that are critical in terms of gross value added (GVA), shows resilient flows to sectors

Chart 1.43 : SMA Distribution of Wholesale Non-PSU Non-financial Obligors Portfolio between August and November, 2020



Note: Data as on August 2020, October 2020 and November 2020 is provisional and not audited.
Source: CRILC and RBI Staff calculation.

Table 1.8: SMA Transition Matrix for Wholesale Portfolio of a Constant Sample of Non-PSU Non-financial Obligors between August and September 2020 (in per cent)

	Outstanding as on August 31, 2020 (₹ crore)	Growth in exposure over August 2020	September 30, 2020				
			Proportion of assets in various cohorts				
			0 dpd	SMA-0	SMA-1	SMA-2	NPA
Standard (0 dpd)	20,58,349.02	1.02	87.3	10.1	2.3	0.2	0.1
SMA-0	85,385.41	-0.34	45.4	38.9	14.7	1.0	0.0
SMA-1	54,707.60	-0.36	24.5	34.3	23.1	18.1	0.0
SMA-2	40,862.33	0.60	21.9	14.7	3.6	57.7	2.1
Total	22,39,304.36	0.93	83.1	11.8	3.3	1.7	0.1

Note: Data as on November 2020 is provisional and not audited.
Source: CRILC and RBI staff calculations.

Table 1.9: SMA Transition Matrix for Wholesale Portfolio of a Constant Sample of Non-PSU Non-financial Obligors between August and November 2020 (in per cent)

Status as on August 31, 2020	Growth in exposure over September 2020	November 30, 2020				
		Proportion of assets in various cohorts				
		0 dpd	SMA-0	SMA-1	SMA-2	NPA
Standard (0 dpd)	-2.55	85.7	6.5	2.9	4.8	0.1
SMA-0	0.76	59.2	22.9	6.3	11.5	0.2
SMA-1	-1.37	24.9	21.1	10.0	43.9	0.1
SMA-2	0.46	17.0	6.0	5.9	65.0	6.2
Total	-2.34	81.9	7.5	3.3	7.2	0.2

Note: Data as on August 2020 and November 2020 is provisional and not audited.
Source: CRILC and RBI staff calculations.

[11] Based on summary monthly data from select 33 scheduled commercial banks, accounting for about 90 per cent of the total non-food credit deployed by all scheduled commercial banks

Table 1.10: Sectoral Credit Growth

Economic Sector *	Share in Gross Value Added (GVA) (per cent)	Credit growth (y-o-y) (per cent)				
		Mar-20	Jun-20	Aug-20	Sep-20	Oct-20
Agriculture, forestry and fishing	15.8	4.2	2.4	4.9	5.9	7.4
Mining and quarrying	3.2	5.2	4.3	1.2	0	4.3
Manufacturing	19.1	0.9	0.8	-0.8	-1.0	-2.0
Electricity, gas, water supply & other utility services	2.3	-1.6	0.9	-1.8	-0.9	-1.3
Construction	8.5	4.8	5.6	8.1	4.5	5.1
Trade, repair, hotels and restaurants	13.4	5.5	6.9	12.9	12.1	13.9
Transport, storage, communication & services related to broadcasting	6.9	1.9	6.8	5.8	3.5	-0.8
Financial Services #	6.4	25.9	25.7	17.1	12.5	9.2
Real estate, ownership of dwelling & professional services	16.8	13.8	11.4	9.7	7.4	7.3
Other Services	7.7	-8.1	1.6	-2.0	7.0	10.5

Note: 1. * Covering the sectors in national accounts other than 'public administration and defence'.
2. # Represents bank credit to the non-bank financial sector.
Source: National Accounts Statistics, MoSPI and RBI Supervisory Returns.

such as construction, trade and hospitality, while bank credit remained muted to the manufacturing sector (Table 1.10).

I.2.5 Consumer Credit[12]

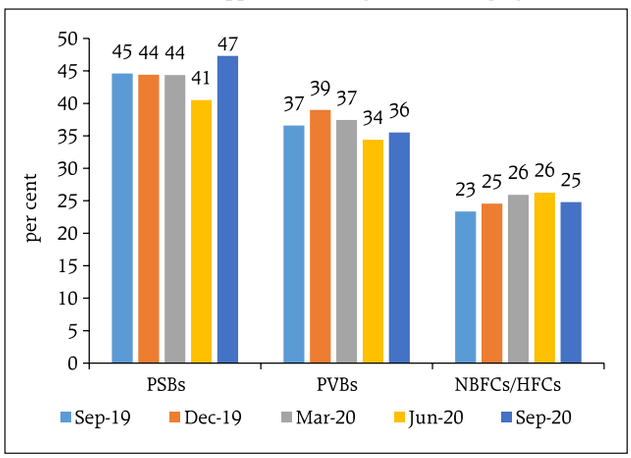
1.46 Consumer credit has shown significant growth in recent years, especially for PVBs. In these banks, a surge in the consumer credit portfolio has contributed to increasing their share in the credit market. The overall demand for consumer credit as reflected in inquiry volumes[13], however, remains depressed since the onset of the pandemic. PSBs' activity in the sector has increased considerably (Table 1.11). The approval rates were low during Q1:2020-21 but they have improved subsequently, especially for PSBs (Chart 1.44). Inquiry volumes by risk tier also show a distinct improvement in favour

Table 1.11: Growth in Inquiry volume
(y-o-y, per cent)

	Dec-19	Mar-20	Jun-20	Sep-20	Dec-20
Overall	36	-4	-34	-21	-14
PSBs	20	-8	37	20	5
PVBs	26	-21	-45	-13	-10
NBFCs/HFCs	47	6	-42	-37	-25

Source: TransUnion CIBIL

Chart 1.44 : Approval Rates by Lender Category

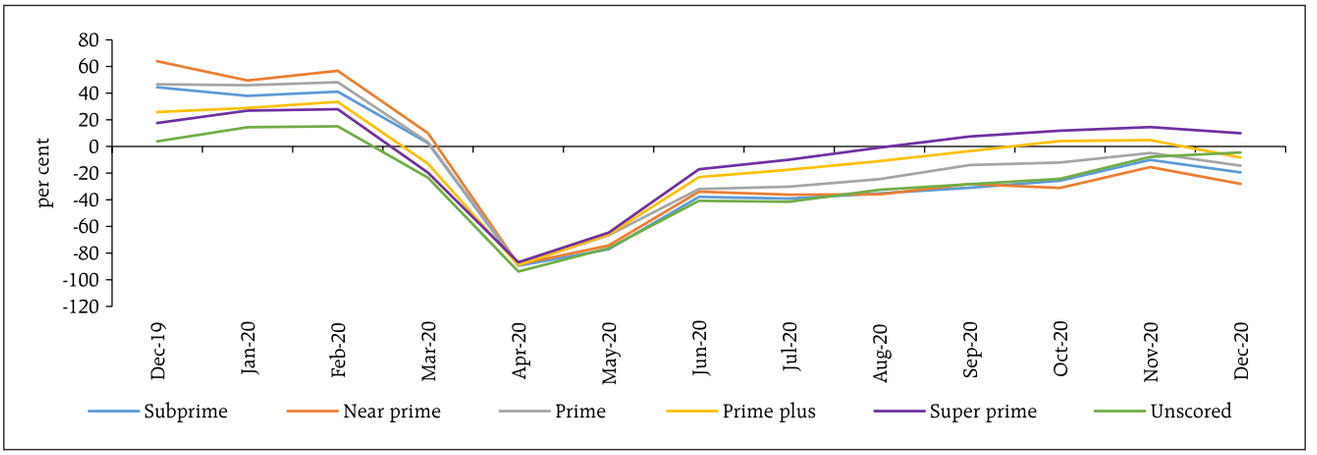


Source: TransUnion CIBIL.

[12] 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.

[13] 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 1.45 : Inquiry Volumes by Risk Tier



Note: 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.
Source: TransUnion CIBIL.

of better rated consumers (Chart 1.45). Nevertheless, the growth in overall loan balances has moderated considerably after March 2020 (Table-1.12). The 90 days past due (90+ DPD) position has remained stable but may not reflect the real vulnerability of the portfolio, in view of the regulatory reliefs granted following the pandemic.

I.2.6 Bank Credit to MSME Sector

1.47 In sharp contrast to consumer credit, the MSME[14] sector reflected robust growth in inquiry volumes except during Q1:2020-21 but the growth (y-o-y) in balances remained sluggish (Tables 1.13 and 1.14), with pullback in terms of balances outstanding seen in cases of PSBs and NBFCs. Further, over 90 days past due balances indicate much higher overdue levels than in the retail sector, even with the camouflages of regulatory reliefs.

Table 1.12: Growth in Consumer Credit
(y-o-y, per cent)

	Sep-19	Dec-19	Mar-20	Jun-20	Sep-20
Growth in Balances	16.5	17.3	13.5	7.1	5.1
Growth in Origination Volumes	46.9	48.5	-5.4	-28.0	-9.9
Balance level 90+ DPD %	3.2	3.3	3.2	3.4	3.5

Note: It is a composite consumer credit number aggregated across PSBs. PVBs,NBFCs/HFCs and Fin-Tech.
Source: TransUnion CIBIL.

Table 1.13: Volume of Inquiries for MSME Credit
(y-o-y, per cent)

	Nov-19	Feb-20	May-20	Aug-20	Nov-20
Overall	26.4	21.6	-43.1	12.3	2.8
PSB	49.8	26.3	-1.6	24.7	-2.0
PVB	36.3	18.2	-55.8	0.5	14.0
NBFC & FinTech	47.8	31.0	-85.4	18.0	-20.2

Note: MSME exposure aggregated across PSBs, PVBs, NBFCs/HFCs and FinTech.
Source: TransUnion CIBIL.

Table 1.14: Activity in MSME sector
(y-o-y, per cent)

	Sep-19	Dec-19	Mar-20	Jun-20	Sep-20
Growth in Balances	5.6	4.3	0.7	0.4	-2.3
Balance level 90+ DPD %	11.8	11.8	11.7	12.5	12.0

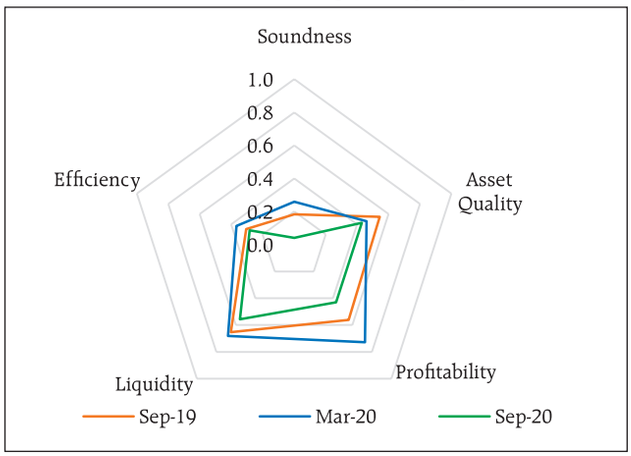
Source: TransUnion CIBIL.

[14] Commercial loans classified into various segments basis credit exposure aggregated at entity level. Micro less than ₹1 Crore, SME ₹1-₹25 Crores,

I.2.7 Banking Stability Indicator

1.48 By September 2020, the banking stability indicator (BSI)[15] showed improvement in all its five dimensions (*viz.*, asset quality; profitability; liquidity; efficiency; and soundness) that are considered for assessing the changes in underlying financial conditions and risks relative to their position in March 2020 (Chart 1.46). This improvement reflects the regulatory reliefs and standstills in asset classification mentioned earlier and hence may not reflect the true underlying configuration of risks in various dimensions.

Chart 1.46 : Banking Stability Map



Note: Away from the centre signifies increase in risk.
Source: RBI Supervisory Returns and Staff Calculations.

I.2.8 Developments in Non-banking Financial Intermediation

1.49 During the period April – November 2020, mutual fund schemes witnessed net inflows of ₹2.73 lakh crore and assets under management (AUM) grew at 17.73 per cent in the same period. As alluded to in the July 2020 Financial Stability Report (FSR), due to lack of liquidity in debt markets, mutual funds (MFs) as key financial intermediaries in the non-banking space have faced heightened redemption pressures during Q1:2020-21 (Table 1.15). The Reserve Bank's special liquidity window for MFs provided a large measure of relief and eased liquidity stress for the sector. Thereafter, strong rallies in equity markets coupled with favourable liquidity conditions have renewed optimism in the investor outlook for MFs. The normalised debt fund net asset values (NAVs) of various categories, which showed a sharp dip in March-April, 2020 in the wake of redemption pressure from debt funds have also normalised reflecting restoration of orderly market conditions (Chart 1.47).

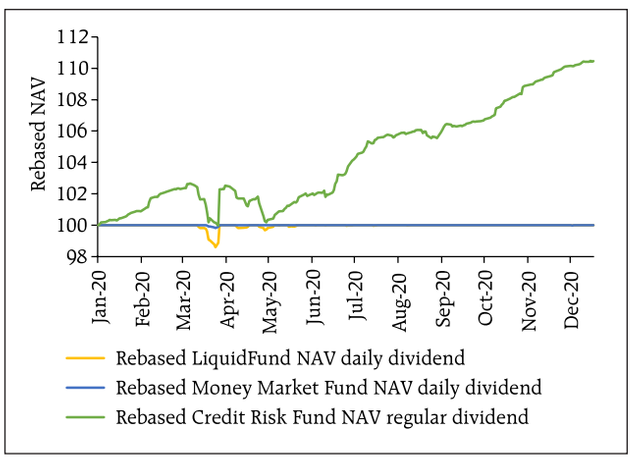
Table 1.15: Trends in Resource Mobilisation by Mutual Funds

(₹ crore)

	Q1:2020-21	Q2:2020-21	Oct-20	Nov-20
Gross Mobilisation	26,47,640	19,33,575	6,43,237	5,66,379
Redemption	25,23,561	19,10,407	5,44,661	5,39,185
Net Inflow/ Outflow	1,24,079	23,168	98,576	27,194
Assets at the end of Period	25,48,848	26,85,982	28,22,941	30,00,904

Source: SEBI.

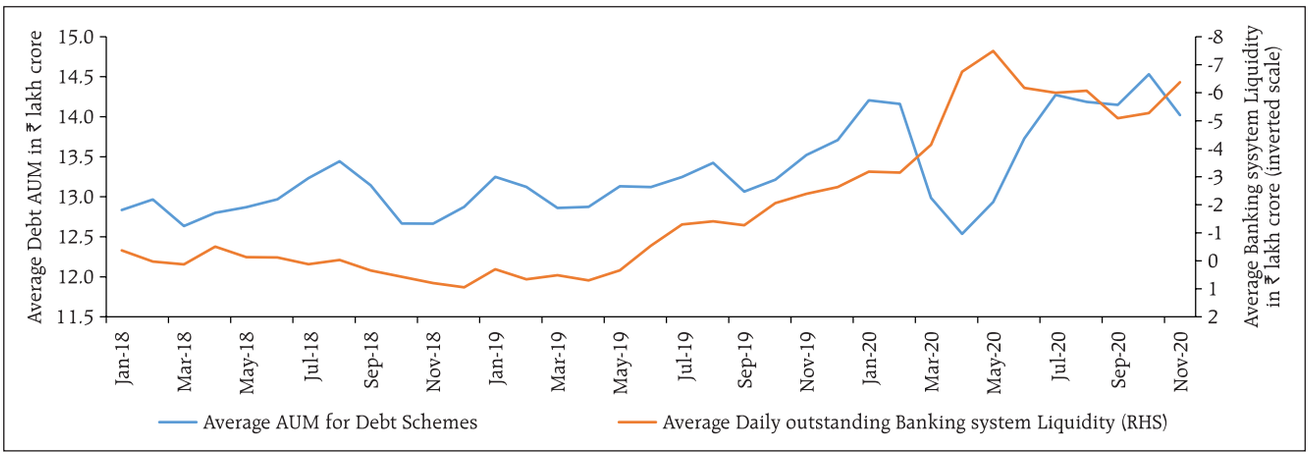
Chart 1.47 : Movements in Rebased Net Asset Values of three Schemes



Source: AMFI.

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

Chart 1.48 : Average Assets under Management of Debt Schemes and Average Daily Outstanding System Liquidity[16]

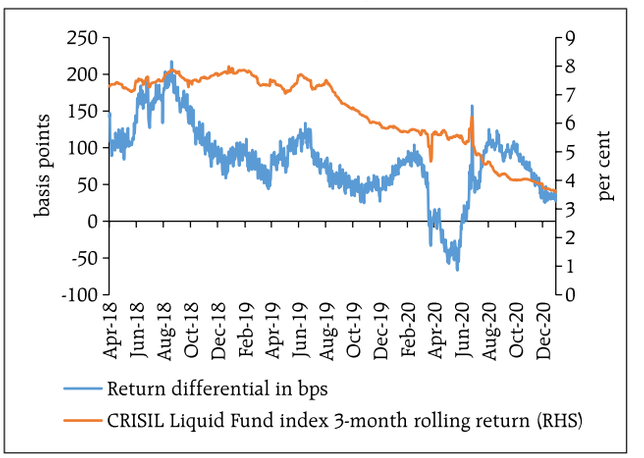


Source: Bloomberg; Association of Mutual Funds of India (AMFI) and Reserve Bank of India.

1.50 The average assets under management (AUM) of Money Market Mutual Funds (MMMFs) have expanded in line with system-level liquidity (Chart 1.48). Excess returns of MMMFs have started to normalise after turning negative in the previous quarter (Chart 1.49) reflecting increased proportion of liquid assets in their investment corpus. The share of liquid assets in debt mutual funds' portfolios has surged since March 2020 and constitutes 39 per cent of the aggregate AUM by end-November 2020, reflecting precautionary allocations (Chart 1.50).

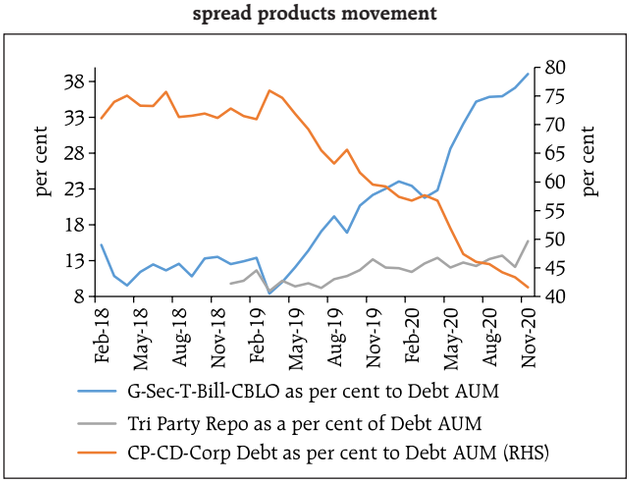
1.51 Liquidity support from Reserve Bank has ensured orderly functioning of both the commercial paper (CP) and non-convertible debenture (NCD) markets, with large issuances relative to a year ago and a substantial narrowing of spreads across rating

Chart 1.49 : Returns on Liquid fund Index



Note: Return differential between the CRISIL liquid fund index and the 3-month constant maturity T-Bill portfolio.
Source: Bloomberg.

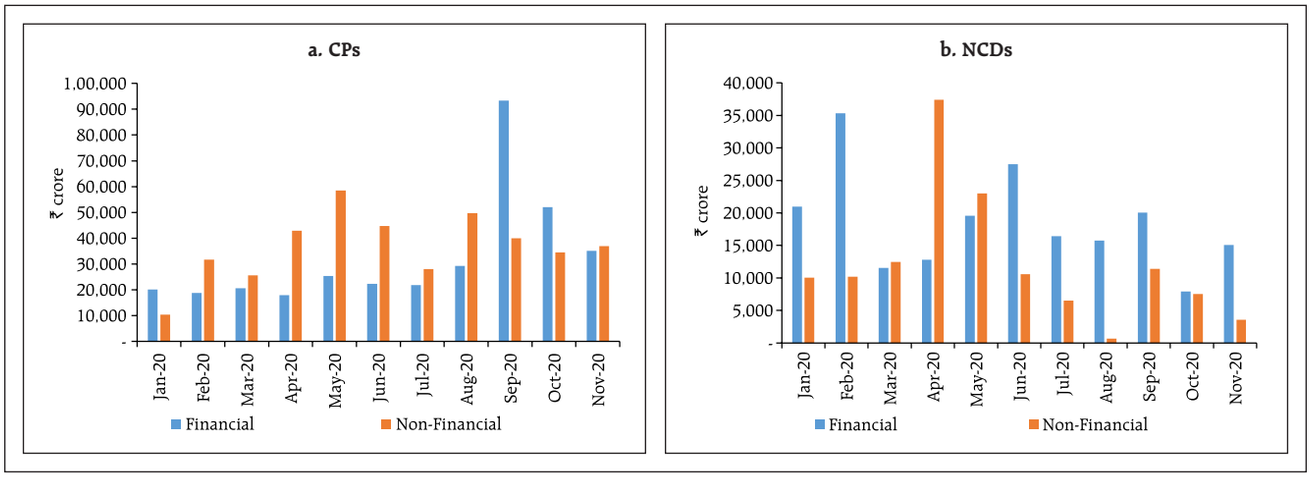
Chart 1.50 : Investment in G-Sec/T-Bills/ CBLO and spread products movement



Source: Securities and Exchange Board of India (SEBI) and Clearing Corporation of India Ltd (CCIL).

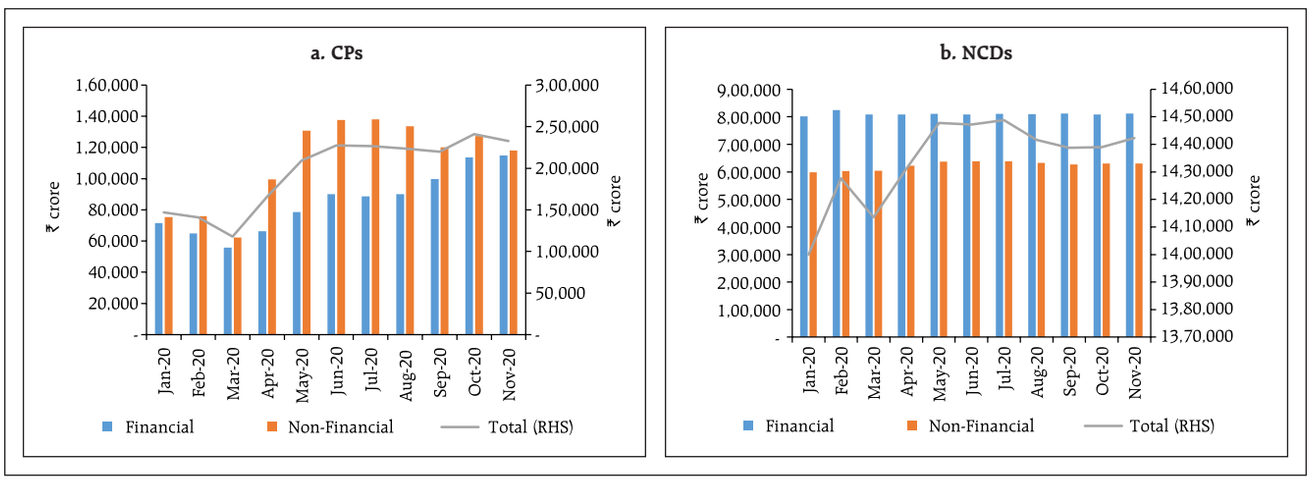
[16] This includes absorption / injection of daily liquidity, standing liquidity facility availed from RBI and Cash balance held in Central bank in excess / deficit of CRR requirements

Chart 1.51 : Issuances of Commercial Paper and Non-Convertible Debentures - Non-PSU Obligors



Note: Includes NCD issuances with tenor and put/call option of above 365 days only.
Source: Prime Database.

Chart 1.52 : Outstanding Commercial Papers and Non-Convertible Debentures - Non-PSU Obligors

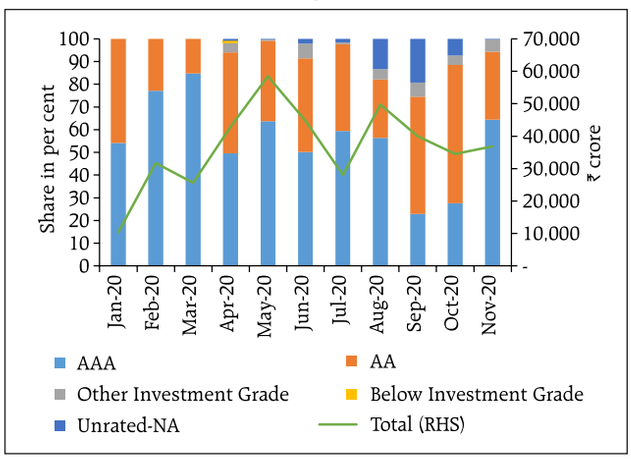


Note: Data on NCDs Includes private debt placements from April 2013 onwards with tenor and put/call option of above 365 days.
Source: Prime Database.

categories. As a result, CP outstanding for non-PSU obligors has increased sizably (Charts 1.51 and 1.52).

1.52 Ratings dispersion of CPs versus NCDs shows a more varied rating profiles. The relative share of NCD issuances by the 'AAA' rated cohort has sharply declined in H2:2020-21 (till November) (Charts 1.53 and 1.54). Near-term maturities in respect of CPs and NCDs show a wide dispersion across rating grades,

Chart 1.53 : CP Issuances – Non-PSU Non-financial Obligors – Rating-wise

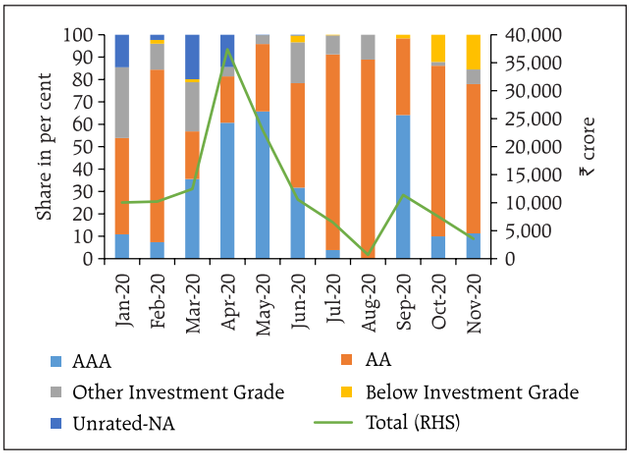


Source: Prime Database.

although maturities in respect of higher ratings dominate (Table 1.16).

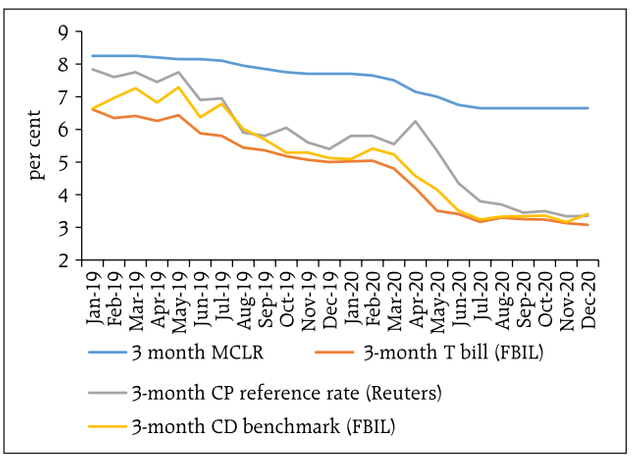
1.53 A sharp decline in money market rates specifically since April 2020, has opened up a significant wedge between the marginal cost of fund-based lending rate (MCLR) benchmark of banks[17] and money market rates of corresponding tenor (Chart 1.55). Expensive bank finance may lead to more credit worthy borrowers with access to money markets shifting away from bank based working capital finance. Such disintermediation of better-quality borrowers from banking channels have implications for banking sector interest income and credit risk.

Chart 1.54 : NCD Issuances – Non-PSU Non-financial Obligors – Rating-wise



Note: Includes NCD issuances with tenor and put/call option of above 365 days only.
Source: Prime Database.

Chart 1.55 : Short-term Money Market Rates



Source: Reuters, Financial Benchmarks India Ltd (FBIL).

Table 1.16: Issuances and Near-term Maturities of CPs and NCDs of Non-PSU Non-financial Obligors

(₹ crore)

	Issuances			Maturing						
	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21
AAA	16,450.0	10,300.0	24,155.0	23,769.1	12,858.0	10,008.0	10,081.6	1,004.4	1,000.0	6,531.7
AA	24,545.1	26,756.0	13,385.0	20,059.7	8,214.4	8,018.0	8,642.3	10,350.0	1,739.1	7,260.0
Others	2,689.0	2,493.3	2,767.3	8,111.6	1,486.5	5,477.0	3,403.4	7,460.7	3,900.0	4,711.2
Unrated/NA	7,678.0	2,525.0	111.0	4,589.8	1,288.6	1,032.3	7,557.6	1,926.4	681.0	1,741.0
Total	51,362.1	42,074.3	40,418.3	56,530.2	23,847.5	24,535.3	29,684.9	20,741.5	7,320.1	20,243.9

Note: 1) Data on NCDs Includes private debt placements from April 2013 onwards with tenor and put/call option of above 365 days.
2) Rating for maturity profile reflects outstanding ratings as on November 2020.
Source: Prime Database.

[17] MCLR of a large PSB.

I.2.9 Housing Market

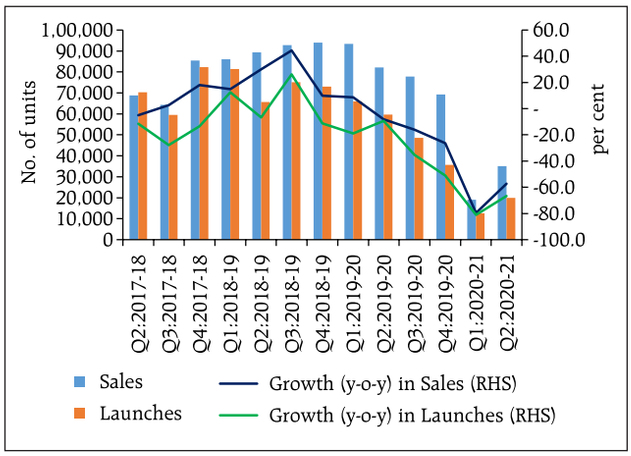
1.54 With the phased unlocking of the economy and various measures to aid revival, the Indian real estate market appears to be emerging from COVID-19-induced disruptions. The housing market is gradually rebalancing and recovering from the trough into which it had plunged in Q1: 2020-21. New units launched and residential units sold across the top eight cities reflected clear recoveries in Q2:2020-21 and in Q3 so far, relative to the previous quarter (Chart 1.56).

1.55 The uptick in sales in Q2:2020-21 resulted in a decline in unsold inventory, though the inventory overhang (*i.e.*, average number of months required to sell unsold houses) increased sharply in the wake of the pandemic (Chart 1.57). Under-construction units constituted about 70 per cent of the sales in Q2:20-21 and 81 per cent of the unsold inventory. Sluggish sales have restrained developers from increasing prices in major cities (Chart 1.58).

I.2.10 Systemic Risk Survey[18]

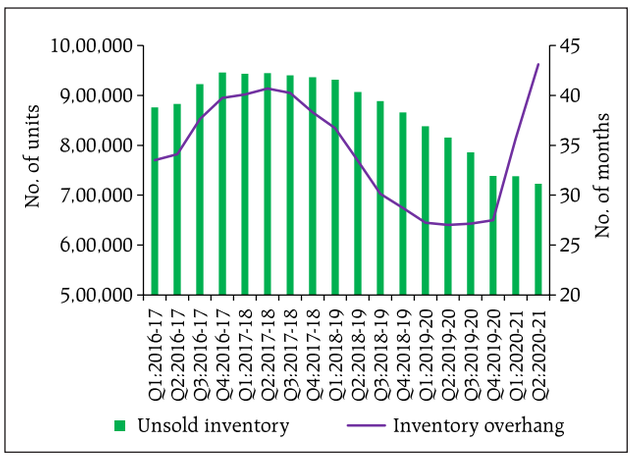
1.56 In the latest systemic risk survey (SRS) of October/November 2020, respondents rated select institutional risks as 'high' whereas global risks,

Chart 1.56 : House Launches and Sales



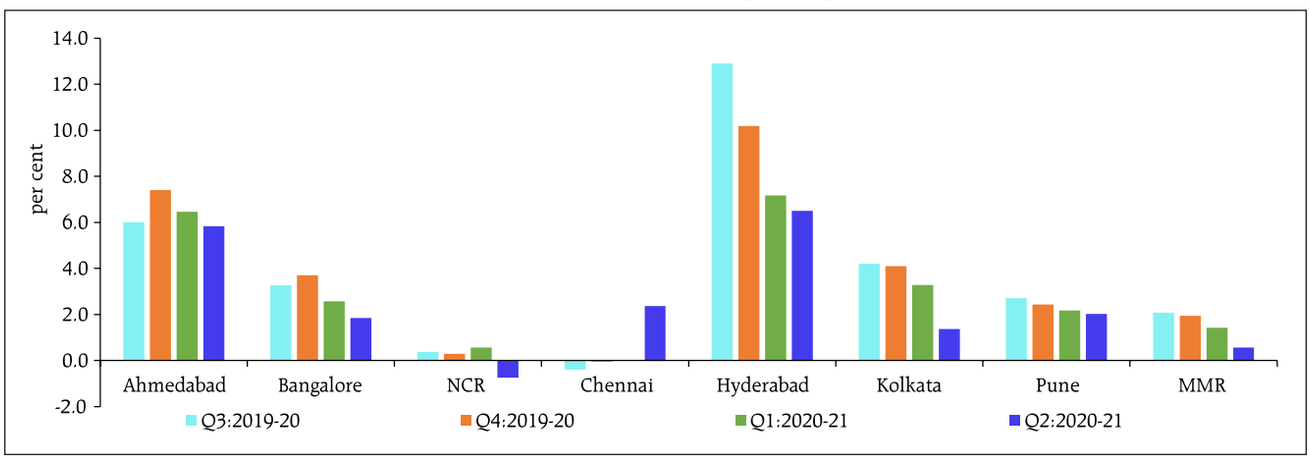
Source: Prop Tiger Datalabs.

Chart 1.57 : Unsold Inventory and Inventory Overhang



Source: Prop Tiger Datalabs.

Chart 1.58 : Price Growth Trends in Key Housing Markets



Source: Prop Tiger Datalabs.

[18] Details are given in Annex 1.

macroeconomic risks and financial market risks were perceived as 'medium'. This represented a clear shift from the previous round of the survey held during April/May 2020 in which all these groups were rated as 'high' risk. Also, unlike in the previous round of the survey, in which risks to economic growth (global and domestic) and to the fiscal deficit were assessed as 'very high', none of the risks were categorised 'very high' by the participants in the current round. The 'high' risk components among the risk groups other than the institutional risks include global growth, domestic growth, domestic inflation, fiscal deficit, corporate sector vulnerabilities, pace of infrastructure development and equity price volatility.

1.57 Nearly one third of the respondents opined that the prospects of the Indian banking sector are going to 'deteriorate marginally' in the next one year as earnings of the banking industry may be negatively impacted due to slow recovery post lockdown, lower net interest margins, elevated asset quality concerns and a possible increase in provisioning requirements. On the other hand, about one fourth of the respondents felt that the prospects are going to improve marginally.

1.58 The overall responses indicate a positive turn to the outlook relative to the last round of the survey.

Summary and Outlook

1.59 Since the publication of the Financial Stability Report (FSR) of July 2020, there is a much better assessment of the spread and depth of COVID-19 risks and their broader impact on global and domestic economic conditions. Although there has been rapid recovery in economic activity from the lows of March and April, major non-financial indicators remain below pre-pandemic levels.

1.60 The adverse impact on government revenue and the resultant increase in sovereign borrowing in a period when fiscal authorities are also required to provide stimulus to economic growth, is increasing sovereign debt to levels that have intensified concerns relating to sustainability with crowding out fears in respect of the private sector in terms of both volume of financing and costs thereof.

1.61 The growing disconnect between certain segments of financial markets and real sector activity, pointed out in the last FSR, has got further accentuated during the interregnum, with abundant liquidity spurring a reach for returns. Within the financial market spectrum too, the divergence in expectations in the equity market and in the debt market has grown, both globally and in India.

1.62 Domestically, corporate funding has been cushioned by policy measures and the loan moratorium announced in the face of the pandemic, but stresses would be visible with a lag. This has implications for the banking sector as corporate and banking sector vulnerabilities are interlinked. While the post-global financial crisis (GFC) prudential measures have ensured stronger capital buffers in the banking sector, which have stood banks in good stead in the face of the pandemic, the imminent crystallisation of financial stress may test their resilience, especially for individual banks which, in turn, can have systemic implications. Banks need to prepare for these adversities by augmenting their capital bases to support their own business plans and the broader economic recovery process in the post-COVID period. Moreover, while easy financial conditions are intended to support growth prospects they can have unintended consequences in terms of encouraging leverage, inflating asset prices and fuelling threats to financial stability. The pandemic has altered behaviour and business models fundamentally. Policy authorities are striving to stay ahead by designing suitable responses.

Chapter II

Financial Institutions: Soundness and Resilience

Policy induced easy liquidity and financing conditions in response to the COVID-19 pandemic enabled improvement in lending rates, profitability and capital adequacy of banks with some moderation in balance sheet stress; however, bank credit has remained subdued. Macro stress tests indicate a deterioration in SCBs' asset quality and capital buffers as regulatory forbearances get wound down. Contagion risks have receded with the shrinking of the inter-bank market. In the non-bank space, dominant positions occupied by mutual funds and insurance companies as fund providers continued, with Non-banking Financial Companies (NBFCs) and Housing Finance Companies (HFCs) turning out to be the largest borrowers.

Introduction

2.1 The functioning of financial markets in the recent months has been characterised by the economic impact of the COVID-19 pandemic, with financial institutions largely cushioned by abundant liquidity in the banking system, lowering of the cost of funds, and regulatory forbearance in asset classification of specified loans. Resultantly, despite subdued credit offtake, banks reported better than anticipated results. The fuller impact of the deterioration in the macroeconomic environment on banks' asset quality, capital adequacy and profitability may unfold gradually.

2.2 Nevertheless, a shock of such large dimensions is likely to place pressure on the balance sheets of banks going forward. The pre-pandemic vulnerabilities of some relatively weaker institutions may get accentuated. The pandemic is a common risk for a significant share of credit exposures in an interconnected financial market. An assessment of financial stability aspects through performance parameters and level of interconnectedness of Indian financial institutions, supplemented by macro stress tests, including bottom-up stress tests is useful to disband this complex aggregation.

2.3 Against this backdrop, this chapter sets out to evaluate the soundness and resilience of banks, NBFCs and scheduled primary (urban) cooperative banks (SUCBs) by examining their recent performance as reflected in audited balance sheets and offsite returns. The results of stress tests carried out on each category of financial intermediaries are presented in Sections II.1, II.2 and II.3. The chapter concludes with Section II.4 in which a detailed analysis of the network structure and connectivity of the Indian financial system is presented along with the results of contagion analysis under adverse scenarios.

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

2.4 Credit growth (y-o-y) of SCBs, which had declined to 5.7 per cent by March 2020, slid further to 5.0 per cent by September 2020. For public sector banks (PSBs), credit growth picked up from 3.0 per cent in March 2020 to 4.6 per cent in September 2020, while for private sector banks (PVBs) it eased to 7.1 per cent from 10.4 per cent in March 2020.

[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 December 04, 2020, which are provisional. SCBs include public sector banks, private sector banks and foreign banks. IDBI has been considered as a PVB for the analyses in this section consistent with the declaration of IDBI as private sector bank for regulatory purpose from January 21, 2019 and accordingly all data from March 2019 onwards have been recast to reflect this revision.

Foreign banks reported a decline of (-)5.4 per cent as against 7.2 per cent growth in March 2020 (Chart 2.1a). Loans disbursed through new accounts declined by almost one-fourth in Q1:2020-21 on an annual basis but subsequently, there has been some recovery. In Q2:2020-21 growth in new loans was witnessed primarily in the agriculture sector and in the personal loans segment (Table 2.1).

2.5 By contrast, deposit growth of SCBs remained robust at 10.3 per cent (y-o-y), driven by precautionary savings. PSBs recorded a growth of 9.6 per cent, among the highest in the last five years (Chart 2.1 a).

2.6 On the earnings front, SCBs' net interest income (NII) grew at a much higher clip of 16.2 per cent in September 2020 (13.0 per cent in March 2020). Net interest margin (NIM) edged up across all banking groups in September 2020 (Chart 2.1 c). However, growth in other operating income (OOI) plummeted to 1.2 per cent from 29.2 per cent in March 2020.

Table 2.1:Sector-wise New Loans by SCBs*
(y-o-y, per cent)

Sector	Share in March 2020 (%)	Q4:2019-20 Growth	Q1:2020-21 Growth	Q2:2020-21 Growth
Agriculture	9.1	-2.0	-22.3	18.0
Industry	35.4	19.3	-20.2	-15.4
Services	38.2	14.3	-12.3	-9.8
Personal Loans	14.1	11.3	-59.1	4.2
Others	3.2	-32.0	-41.8	-22.1
All Loans	100.0	11.4	-24.6	-7.4

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

Earnings before provisions and taxes (EBPT) grew by 17.6 per cent (Chart 2.1 b). Return on assets (RoA) and return on equity (RoE) improved substantially across all bank groups, with the recovery in RoE of PSBs being particularly noteworthy after languishing at sub-zero and near zero levels for the past four years (Chart 2.1 d and Chart 2.1 e). Falling interest rates led to cost of funds declining across bank groups,

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

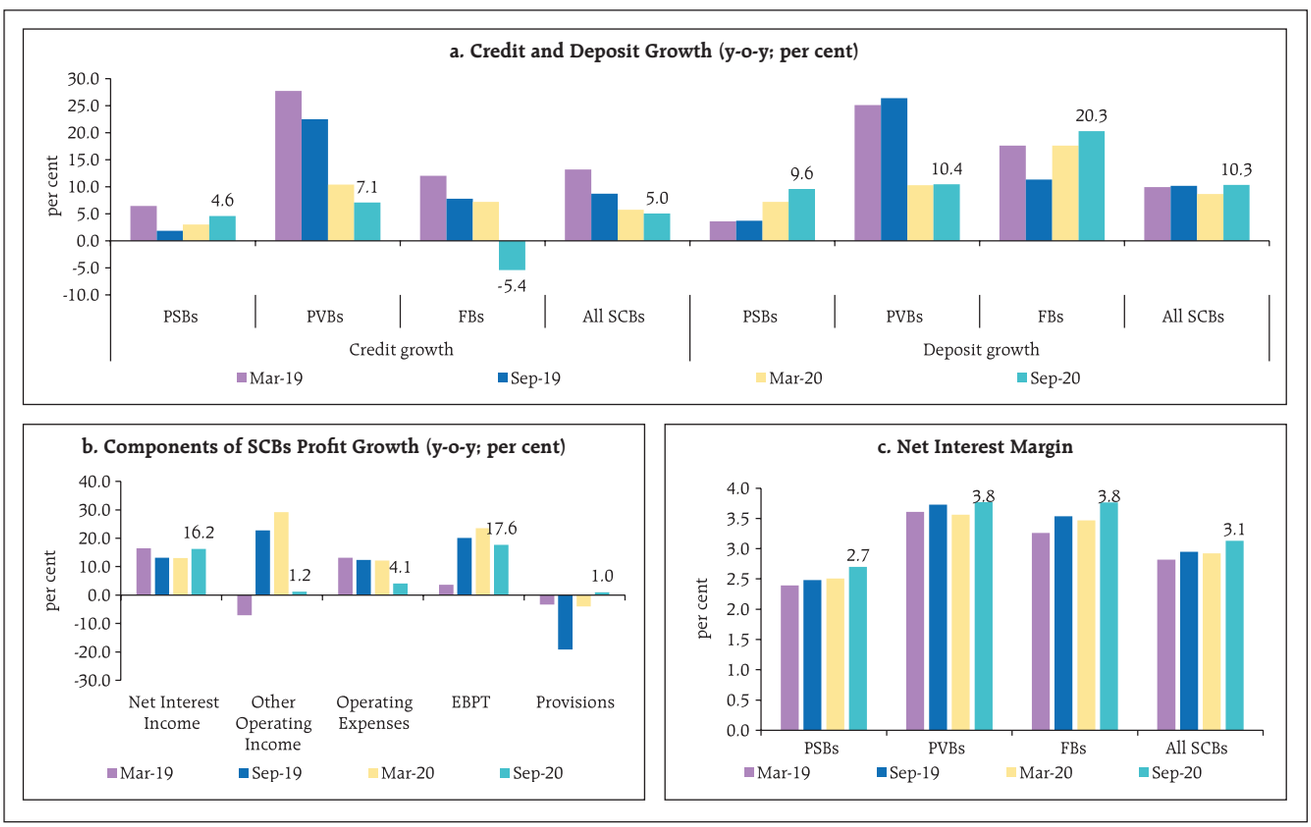


Chart 2.1: Select Performance Indicators *(Concld.)*

Source: RBI Supervisory Returns and Staff Calculations.

with FBs recording a pronounced 130 bps decline since March 2020 (Chart 2.1 f). Concomitantly, yields on assets for SCBs edged downwards by 60 bps in September 2020, after remaining almost constant before the onset of the COVID-19 pandemic (Chart 2.1 g).

II.1.1 Asset Quality and Capital Adequacy

2.7 SCBs' gross non-performing assets (GNPA) and net NPA (NNPA) ratios continued to decline and stood at 7.5 per cent and 2.1 per cent, respectively, in September 2020 (Charts 2.2 a, b and c). The slippage ratio, defined as new accretion to NPAs in the quarter as a ratio to the standard advances at the beginning of the quarter, contracted sharply for consecutive half-years to 0.15 per cent in September 2020 (Chart 2.2 e), with the decline spread across all bank groups. The improvement was aided significantly by the regulatory dispensations extended in response to the COVID-19 pandemic.[3] SCBs' NPA provisions recorded marginal decline of 0.2 per cent (y-o-y), with PSBs and FBs decreasing their provisioning and PVBs increasing them (Chart 2.2 d). The provision coverage ratio (PCR) of SCBs taken together improved across all bank groups and rose from 66.2 per cent in March 2020 to 72.4 per cent in September 2020 (Chart 2.2 f).

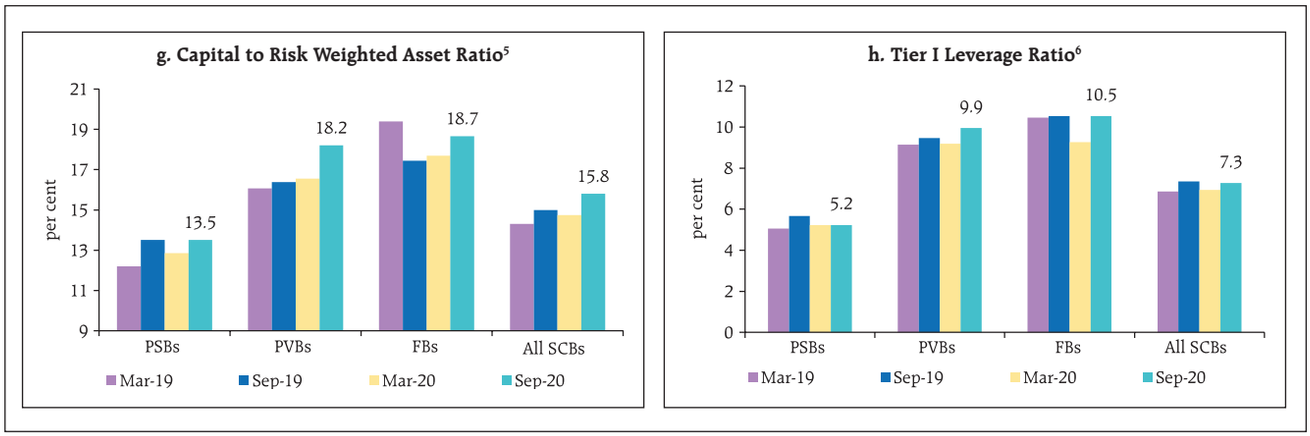
[3] In the wake of COVID-19 pandemic related disruptions, RBI permitted lending institutions to (i) extend moratorium on term loan instalments and interest on working capital facilities for six months from March 1, 2020 to August 31, 2020 in case of qualifying borrowers, without any impact on their 'standard' status; and (ii) restructure credit facilities meeting the prescribed criteria, without any consequent downgrade in asset classification.

2.8 The capital to risk-weighted assets ratio (CRAR) of SCBs improved considerably by 110 bps to 15.8 per cent in September 2020 over March 2020 (14.7 per cent). While PSBs recorded an increase of 60 bps, the improvement was more substantial for PVBs and FBs by 170 bps and 100 bps, respectively (Chart 2.2 g). In case of SCBs, Tier I leverage ratio also increased by 30 bps between March 2020 and September 2020, PVBs and FBs being the main contributors, having improved their ratio by 80 bps and 120 bps respectively, while the PSBs' ratio remained flat (Chart 2.2 h). However,the actual capital cushion available with banks could be overstated in view of the regulatory forbearance.

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

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

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

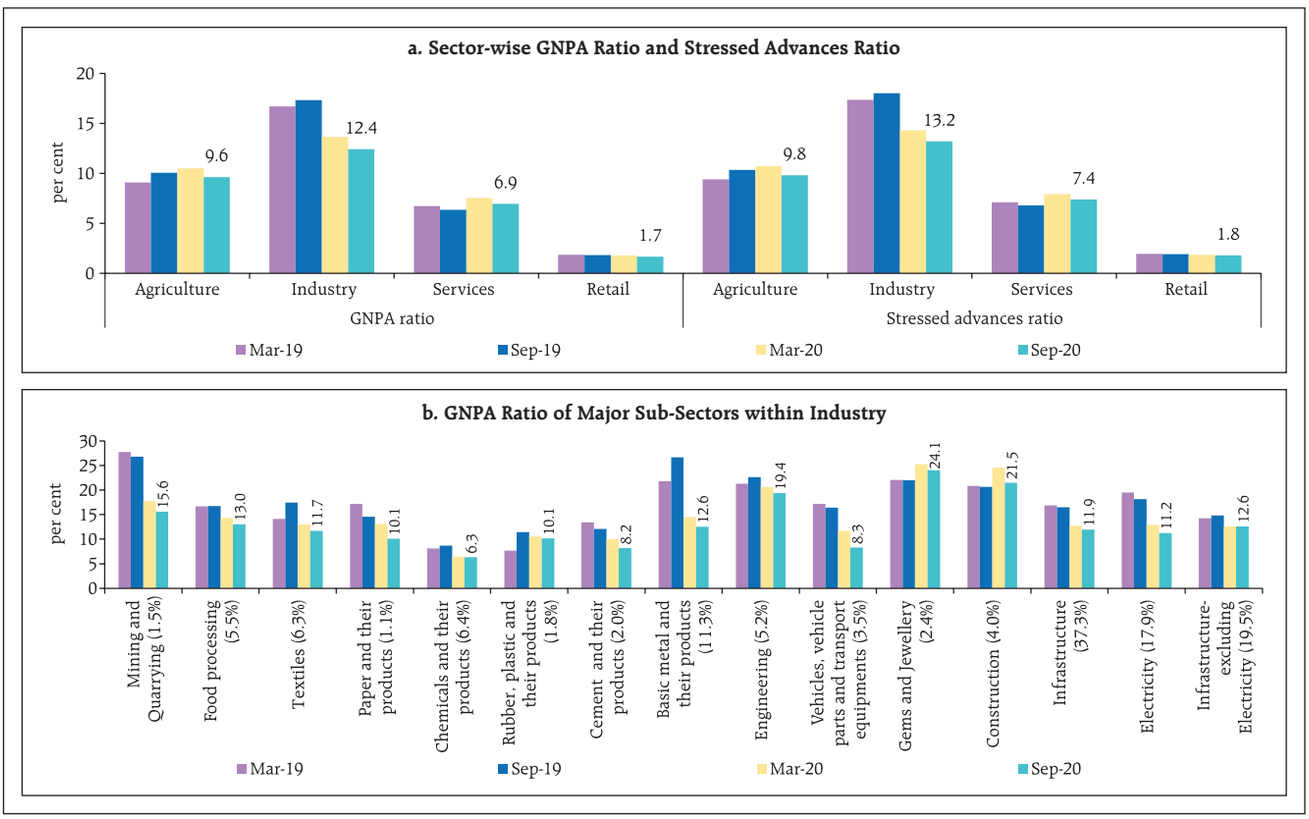


Source: RBI Supervisory Returns and Staff Calculations.

II.1.2 Sectoral Asset Quality

2.9 Among the broad sectors, asset quality improved noticeably in the case of industry, agriculture and services in September 2020 over March 2020, with a decline in GNPA and stressed advances ratios. In the case of retail advances, however, the GNPA ratio declined only marginally and stressed advances remained flat (Chart 2.3 a). A broad-based decline in GNPA ratio was visible across all major sub-sectors within industry (Chart 2.3 b).

Chart 2.3: Sectoral Asset Quality Indicators



Note: Numbers given in parentheses with the legend are the sub-sectors' share in total credit to industry.
Source: RBI Supervisory Returns and Staff Calculations.

[5] The CRAR pertains to all SCBs.

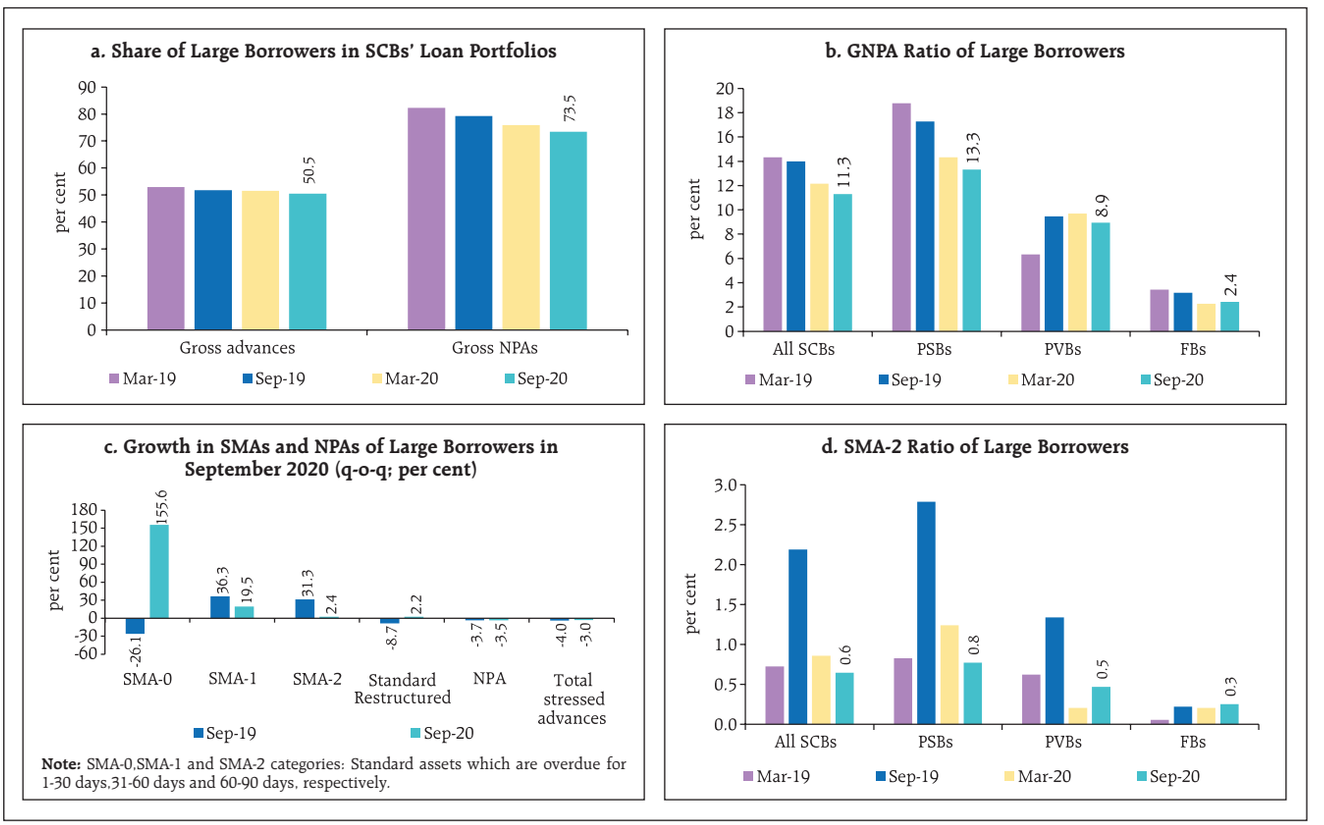
[6] Tier I leverage ratio is the ratio of Tier I capital to total assets.

In view of the regulatory forbearance, however, there are implications for asset quality for the ensuing reporting periods.

II.1.3 Credit Quality of Large Borrowers

2.10 The share of large borrowers[7] in the aggregate loan portfolios and GNPAs of SCBs sustained its downward trajectory, declining to 50.5 per cent and 73.5 per cent respectively in the quarter ending September 2020 (Chart 2.4 a). However, foreign banks recorded a marginal increase in the GNPA ratio of large borrowers (Chart 2.4 b). The share of restructured standard advances increased, indicating that large borrowers have commenced availing restructuring benefits extended for COVID-19 stressed borrowers. The proportion of substandard and doubtful advances contracted while that of loss assets increased, reflecting ageing of the NPA portfolio (Chart 2.4 e). The top 100 large borrowers accounted for 17 per cent and 33.7 per cent of SCBs' gross advances and large borrower loans, respectively. Although this represented a decline *vis-à-vis* March 2020, the share continued to remain above pre-COVID levels, indicating persisting credit concentration. However, the share of the top 100 borrowers' in SCBs' GNPA pool declined to 8.8 per cent (Chart 2.4 f). Large advances in the SMA-0 category registered a quantum jump (155.6 per cent) over the previous quarter and 245.6 per cent over March 2020 levels, portending slippages in

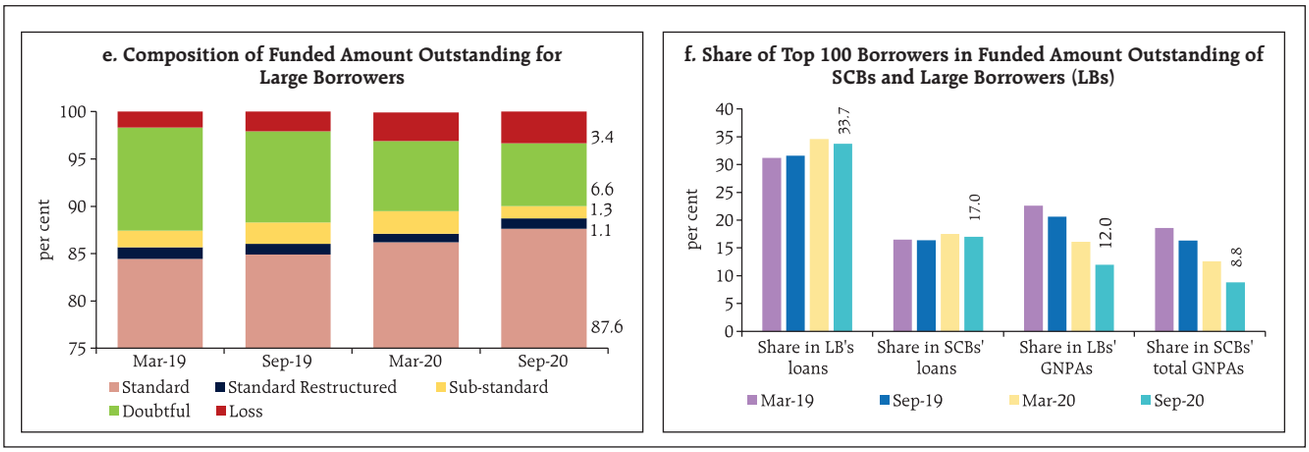
Chart 2.4: Select Asset Quality Indicators of Large Borrowers *(Contd.)*



Note: SMA-0,SMA-1 and SMA-2 categories: Standard assets which are overdue for 1-30 days,31-60 days and 60-90 days, respectively.

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

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



Source: RBI Supervisory Returns and Staff Calculations

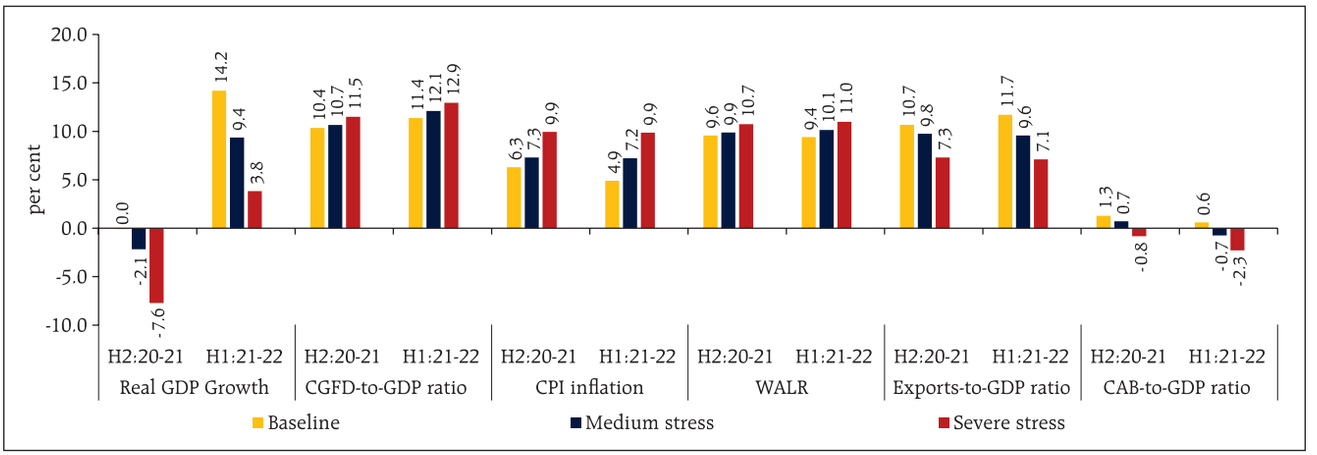
the ensuing quarters (Chart 2.4 c). SMA-2 ratios of large borrowers increased for PVBs and FBs, while declining for PSBs (Chart 2.4 d).

II.1.4 Resilience – Macro Stress Tests

2.11 Macro-stress tests were performed to assess the resilience of SCBs' balance sheets to unforeseen shocks emanating from the macroeconomic environment. Drawing on the results of the exercise, capital and impairment ratios are projected over a one-year horizon under a baseline and two adverse – medium and severe – scenarios. In the last Financial Stability Report, a one-time additional scenario of 'very severe stress' was introduced in view of the high uncertainty around the evolution of the COVID-19 pandemic, its economic costs and delay in the data gathering process. With better appraisal of the pandemic's impact on economic conditions, it is assessed that the worst is behind us, though the recovery path remains uncertain. Accordingly, stress tests have reverted to the regular 3-scenario analysis in this issue. The baseline is derived from the steady state forecasted values of key macroeconomic variables[8] and indicates the central path. **By design, the adverse scenarios used in the macro stress tests are stringent conservative assessments under hypothetical adverse economic conditions. It is emphasised that model outcomes do not amount to forecasts.** The medium and severe adverse scenarios have been obtained by applying 0.25 to one standard deviation (SD) shocks; and 1.25 to two SD shocks, respectively, to each

[8] 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 2.5: Macroeconomic Scenario Assumptions for H2:FY20-21 and H1:FY21-22



of the macroeconomic variables, increasing the shocks by 25 basis points in each projection quarter (Chart 2.5).

2.12 Generally, stress tests are carried out on the basis of SCBs' balance sheet positions, including slippage of loans into NPA, profitability, capital and other relevant data reported by banks. In view of the regulatory forbearances such as the moratorium, the standstill on asset classification and restructuring allowed in the context of the COVID-19 pandemic, the data on fresh loan impairments reported by banks may not be reflective of the true underlying state of banks' portfolios. This, in turn, can underestimate the impact of stress tests, given that the slippage ratios of the latest quarter for which data is available are the basic building blocks of the macro-stress testing framework. To tide over this limitation, it is necessary to arrive at reliable estimates of slippage ratios for the last three quarters, while controlling for the impact of regulatory forbearances.

2.13 A two-stage estimation procedure is adopted. First, for SCBs, data for December 2019 can be considered as the latest available data unaffected by the regulatory reliefs and are hence used as the starting point for the stress testing simulations to which realised values of the key macroeconomic variables are applied to obtain estimates of slippage ratios and GNPA ratios for the quarters ending March 2020, June 2020 and September 2020. In the second stage, the ratios estimated for September 2020 are taken as the base for projecting GNPA and capital ratios for September 2021. Contemporaneous cross-country experience in stress testing is captured in Box 2.1.

Box 2.1: Stress testing in Pandemic Times: Some Country Experiences

Stress tests gauge the adequacy of capital and liquidity buffers with financial institutions to withstand severe but plausible macroeconomic and financial conditions. In the face of a black swan event such as the COVID-19 pandemic, it is necessary to tweak regular stress testing frameworks to accommodate the features of the pandemic.

In this regard the experience of other central banks is instructive. In its stress test in March 2020, the Reserve Bank of New Zealand (RBNZ) adopted two severe but plausible scenarios for the profitability and capital of the nine largest banks in the country. A pessimistic

(Contd...)

baseline scenario was characterised by a one-in-50 to one-in-75-year event, with the unemployment rate rising to 13.4 per cent (4.1 per cent in December 2019) and property prices falling by 37 per cent (4.6 per cent y-o-y growth in December 2019). In the very severe scenario, a one-in-200-year event was simulated in which a fall in house prices by 50 per cent akin to Ireland's experience during the global financial crisis (GFC), and unemployment rate of 17.7 per cent were assumed.

The US Federal Reserve Board (US-Fed) performed an additional round of stress tests in December 2020, apart from the stress tests conducted in June 2020. The first round assumed three scenarios: (i) a rapid V-shaped recovery; (ii) a slower U-shaped recovery; and (iii) a W-shaped, double-dip recession and recovery. A large fiscal stimulus was absent in the three scenarios. The unemployment rate was assumed to peak between 15.6 per cent and 19.5 per cent, which was much more stringent than any of the US-Fed's pre-pandemic stress test scenarios and also higher than during the Great Recession. The December 2020 round of stress tests also featured severe global downturns with substantial stress in financial markets. They also included a global market shock component to be applied to banks with large trading operations, incorporating a default of the largest counterparty. These scenarios were significantly more severe than the current baseline projections for the path of the U.S. economy.

The European Central Bank (ECB) performed a stress test during April-July 2020 to assess the impact of COVID-19 on 86 Euro area banks, featuring three scenarios: (i) a baseline scenario defined before the pandemic outbreak; (ii) a COVID-19 central scenario, reflecting the ECB's projections which are the most likely to materialise; and (iii) a COVID-19 severe scenario, which assumed a deep recession and a slower economic recovery. The stress test methodology of the European Banking Authority (EBA) was used as a starting point after tailoring it to the needs of the vulnerability analysis. The methodology as well as the central and severe scenarios incorporated the impact of the unprecedented monetary, supervisory and fiscal COVID-19 relief measures.

Bank of England (BoE) cancelled the 2020 annual stress test to help lenders focus on meeting the credit provisions of UK households and businesses. Instead, the Financial Policy Committee (FPC) of the BoE carried out a desktop stress test of the major UK banks and building societies in May 2020 using the scenarios outlined in BoE's May 2020 Monetary Policy Report (MPR). In order to further examine the sufficiency of usable buffers to absorb losses, the bank also conducted a 'reverse stress test' in August 2020 to assess how severe an economic shock would need to be in order to deplete regulatory capital buffers by as much as in the 2019 stress test.

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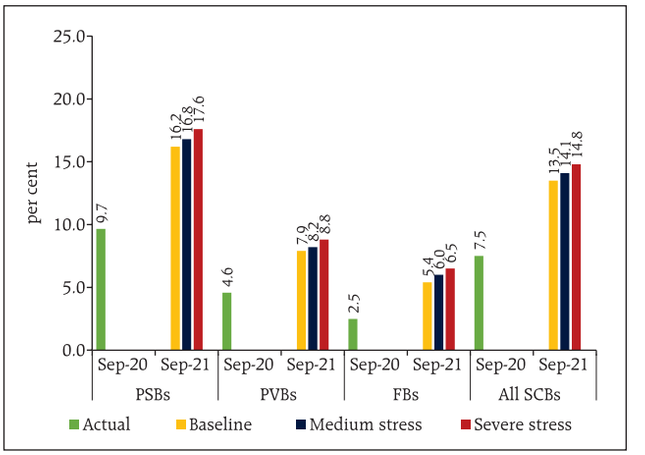
2.14 The stress tests indicate that the GNPA ratio of all SCBs may increase from 7.5 per cent in September 2020 to 13.5 per cent by September 2021 under the baseline scenario (Chart 2.6). If the macroeconomic environment worsens into a severe stress scenario, the ratio may escalate to 14.8 per cent. Among the bank groups, PSBs' GNPA ratio of 9.7 per cent in September 2020 may increase to 16.2 per cent by September 2021 under the baseline scenario; the GNPA ratio of PVBs and FBs may increase from 4.6 per cent and 2.5 per cent to 7.9 per cent and 5.4 per cent, respectively, over the same period. In the severe stress scenario, the GNPA ratios of PSBs, PVBs and FBs may rise to 17.6 per cent, 8.8 per cent and 6.5 per cent, respectively, by September 2021.

Chart 2.6: Projection of SCBs' GNPA Ratios



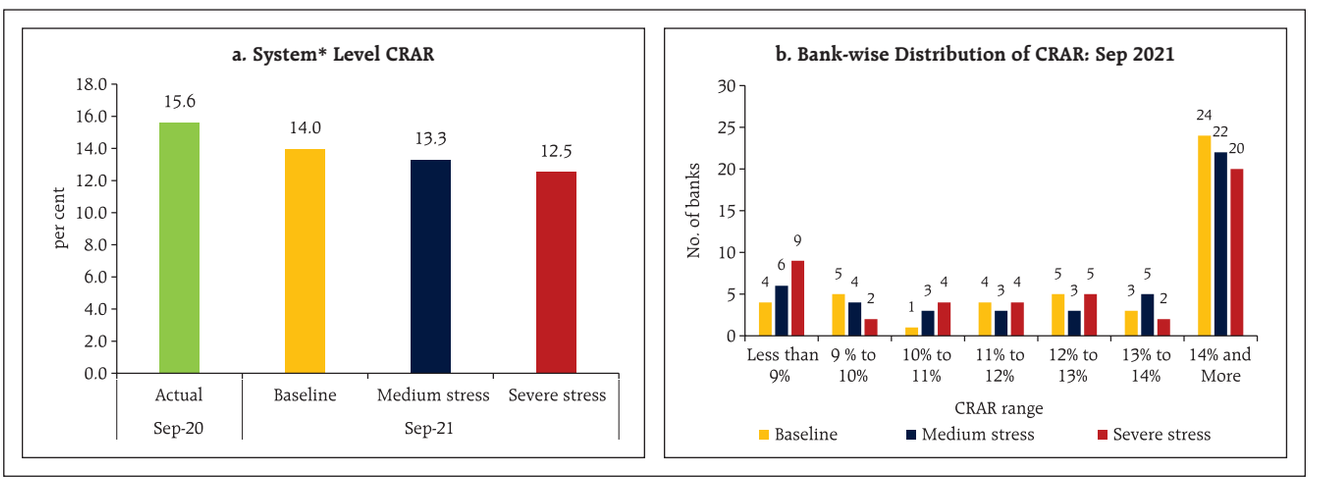
Note: The system level GNPAs are projected using three complementary econometric models- multivariate regression, vector autoregression (VAR) and quantile regression; and averaging the resulting GNPA ratios. For bank-group level projections, average of multivariate regression and VAR results are used.

Source: RBI Supervisory Returns and Staff Calculations.

2.15 These GNPA projections are indicative of the possible economic impairment latent in banks' portfolios, with implications for capital planning. A caveat is in order, though: considering the uncertainty regarding the unfolding economic outlook, and the extent to which regulatory dispensation under restructuring is utilised, the projected ratios are susceptible to change in a non-linear fashion.

2.16 The system level CRAR is projected to drop from 15.6 per cent in September 2020 to 14.0 per cent in September 2021 under the baseline scenario and to 12.5 per cent under the severe stress scenario (Chart 2.7 a). The stress test results indicate that four banks may fail to meet the minimum capital level by September 2021 under the baseline scenario, without factoring in any capital infusion by stakeholders. In the severe stress scenario, the number of banks

Chart 2.7: CRAR Projections



* For a system of 46 select scheduled commercial 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 the stakeholders.

Source: RBI Supervisory Returns and Staff Calculations.

failing to meet the minimum capital level may rise to nine (Chart 2.7 b).

2.17 The common equity Tier I (CET 1) capital ratio of SCBs may decline from 12.4 per cent in September 2020 to 10.8 per cent under the baseline scenario and to 9.7 per cent under the severe stress scenario in September 2021 (Chart 2.8 a). Furthermore, under these conditions, two banks may fail to meet the minimum regulatory CET 1 capital ratio of 5.5 per cent by September 2021 under the baseline scenario; this number may rise to five in the severe stress scenario (Chart 2.8 b).

2.18 At the aggregate level, SCBs have sufficient capital cushions, even in the severe stress scenario facilitated by capital raising from the market and, in case of PSBs, infusion by the Government. At the individual level, however, the capital buffers of several banks may deplete below the regulatory minimum. Hence going forward, mitigating actions such as phase-wise capital infusions or other strategic actions would become relevant for these banks from a micro-prudential perspective.

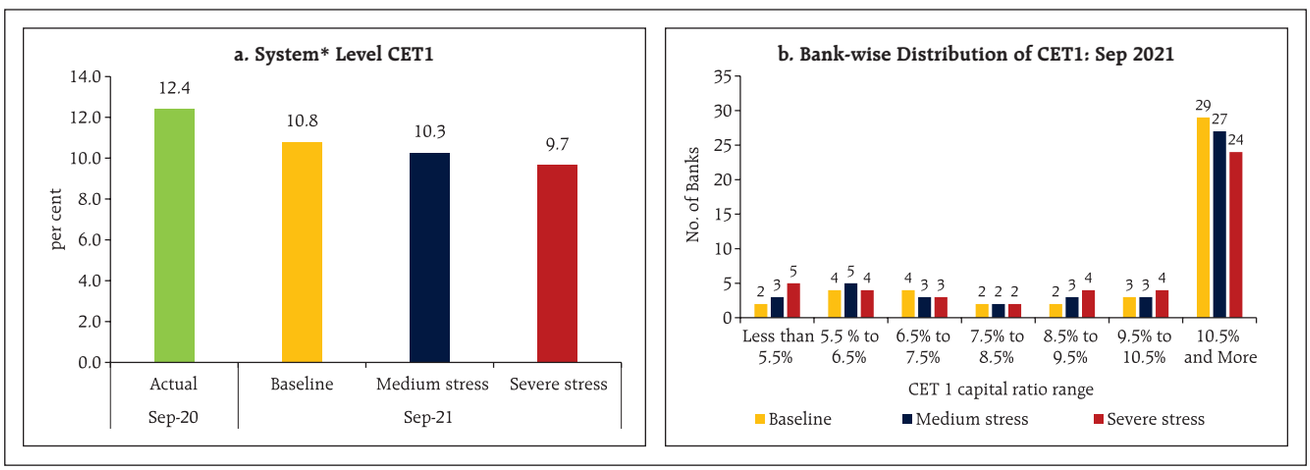
II.1.5 Sensitivity Analysis[9]

2.19 As part of a top-down[10] sensitivity analysis, the vulnerabilities of SCBs were assessed under various scenarios[11] by administering a number of single-factor shocks[12] to data for September 2020 to simulate credit, interest rate, equity price and liquidity risks.

a. Credit Risk

2.20 A severe shock of 2 SD[13] to the system level GNPA (*i.e.*, the GNPA ratio of 46 select SCBs moves up from 7.6 per cent to 13.6 per cent under the impact of the shock) would result in the system-level CRAR declining from 15.6 per cent to 11.6 per cent. The Tier-1 capital ratio declines from 13.3 per cent to 9.3 per cent. The system level capital impairment could

Chart 2.8: Projection of CET 1 Capital Ratio



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

[9] 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.

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

[11] 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.

[12] For details of the stress tests, please see Annex 2.

[13] 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.

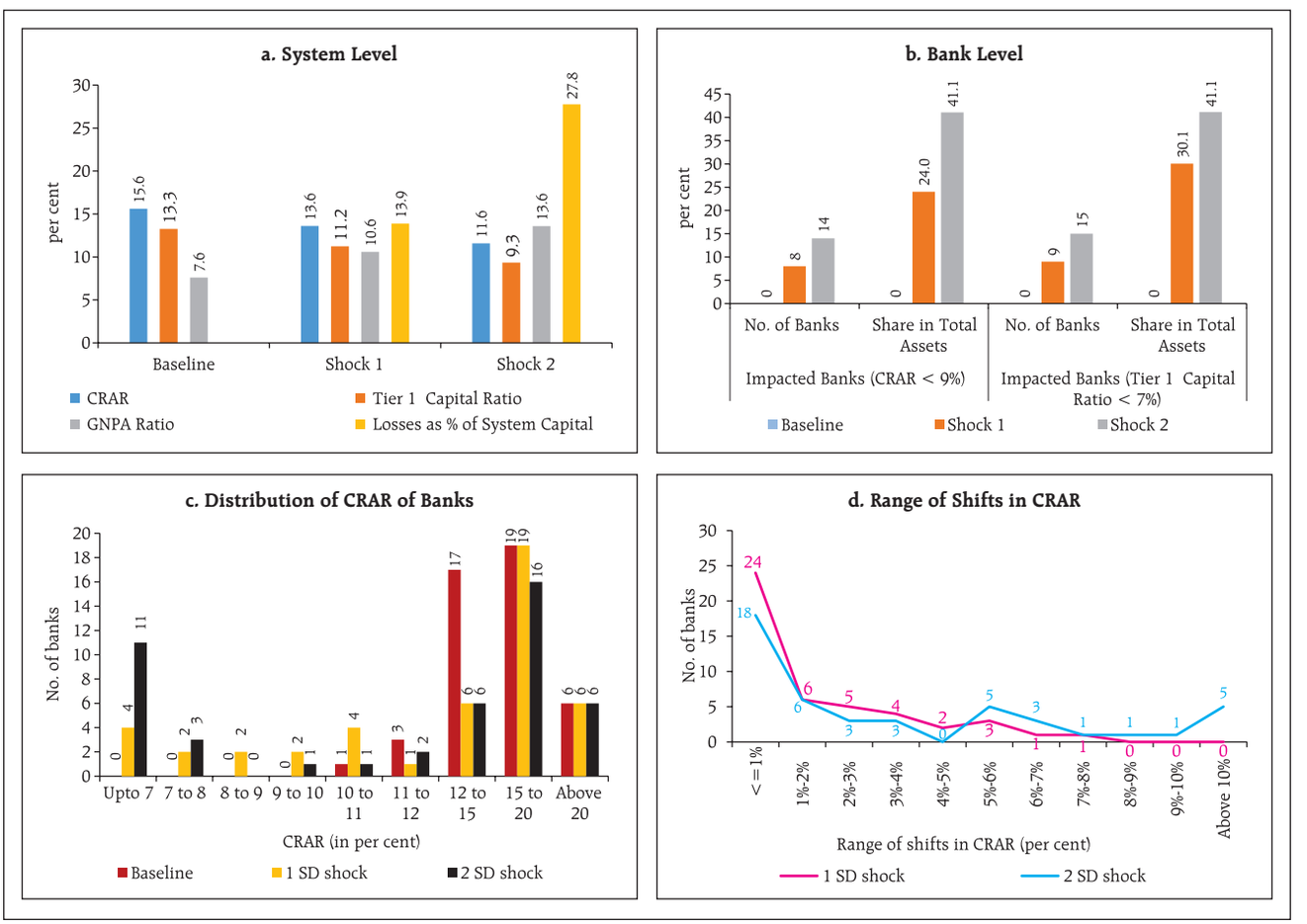
thus be about 27.8 per cent (Chart 2.9 a). The results of reverse stress tests show that it requires a shock of 4.1 SD to bring down the system-level CRAR to 9 per cent.

2.21 Bank-level stress test results show that if a 2 SD shock is applied to the GNPA ratio, 14 banks with a share of 41.1 per cent in SCBs' total assets may fail to maintain the required CRAR (Chart 2.9 b). The CRAR would fall below 7 per cent for as many as 11 banks (Chart 2.9 c). When 1 SD and 2 SD shocks are applied, 2 and 11 banks, respectively, would record a decline of over six percentage points in the CRAR. Comparatively, PVBs and FBs would experience lower erosion in CRAR than PSBs under a 2 SD shock scenario (Chart 2.9 d).

b. Credit Concentration Risk

2.22 Stress tests on banks' credit concentration - considering top individual borrowers according to their standard exposures - showed that in the extreme scenario of the top three individual borrowers of respective banks failing to repay[14], the CRAR of one bank will fall below 9 per cent (Chart 2.10 a) and 34 banks would experience a decline of more than one percentage point in their CRAR (Chart 2.10 b).

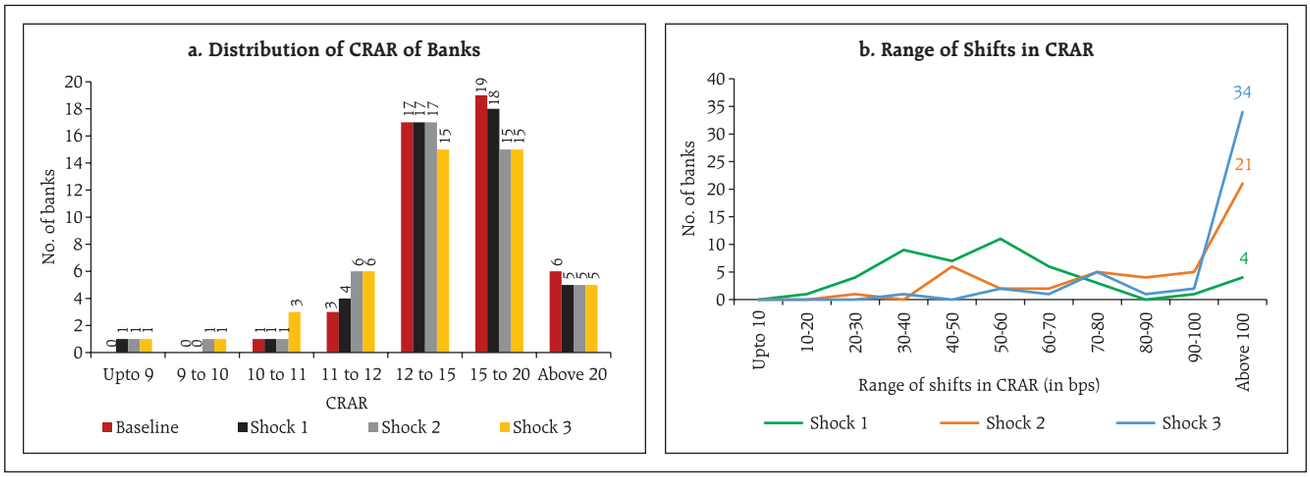
Chart 2.9: Credit Risk - Shocks and Outcomes



Shock 1: 1 SD shock on GNPA ratio
Shock 2: 2 SD shock on GNPA ratio
Note: System of 46 select SCBs.
Source: RBI Supervisory Returns and staff calculations.

[14] 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

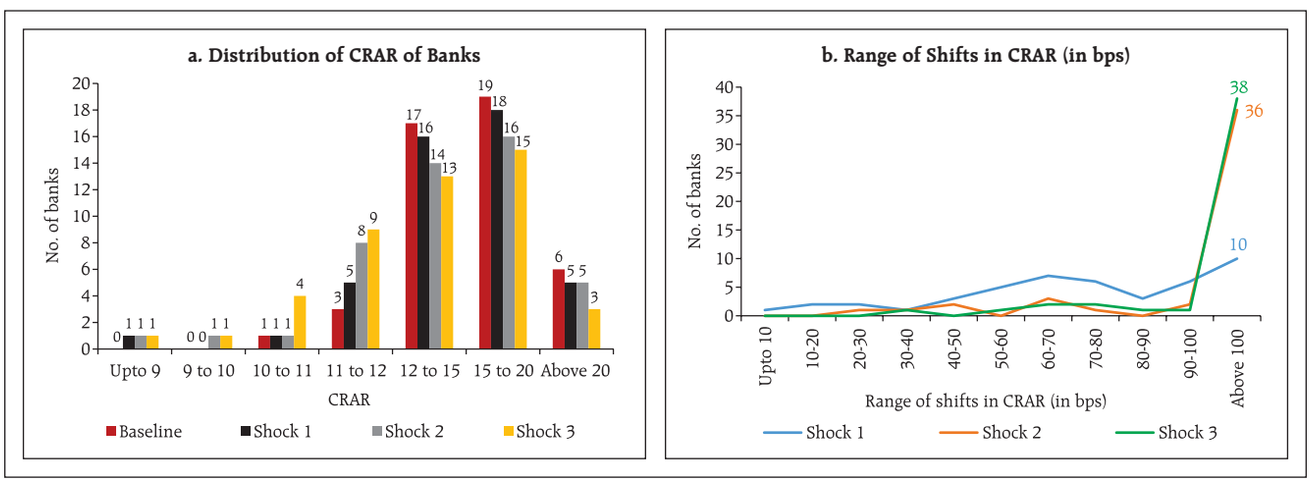


Note: For a system of select 46 SCBs
Shock 1: Topmost individual borrower fails to meet its payment commitments
Shock 2: Top 2 individual borrowers fail to meet their payment commitments
Shock 3: Top 3 individual borrowers fail to meet their payment commitments
Source: RBI Supervisory Returns and staff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

2.23 Under the scenarios of top three group borrowers of banks under consideration failing to repay[15], the CRAR of one bank would fall below 9 per cent (Chart 2.11 a) and 38 banks would experience a decline of more than one percentage point in their CRAR (Chart 2.11 b).

2.24 Stress tests on banks' credit concentration with respect to their top individual stressed borrowers showed that in the extreme scenario of the top three individual borrowers of respective banks failing to repay[16], the CRARs of two banks would fall below nine per cent and the majority of the banks would experience a reduction of only 10 to 20 bps in their

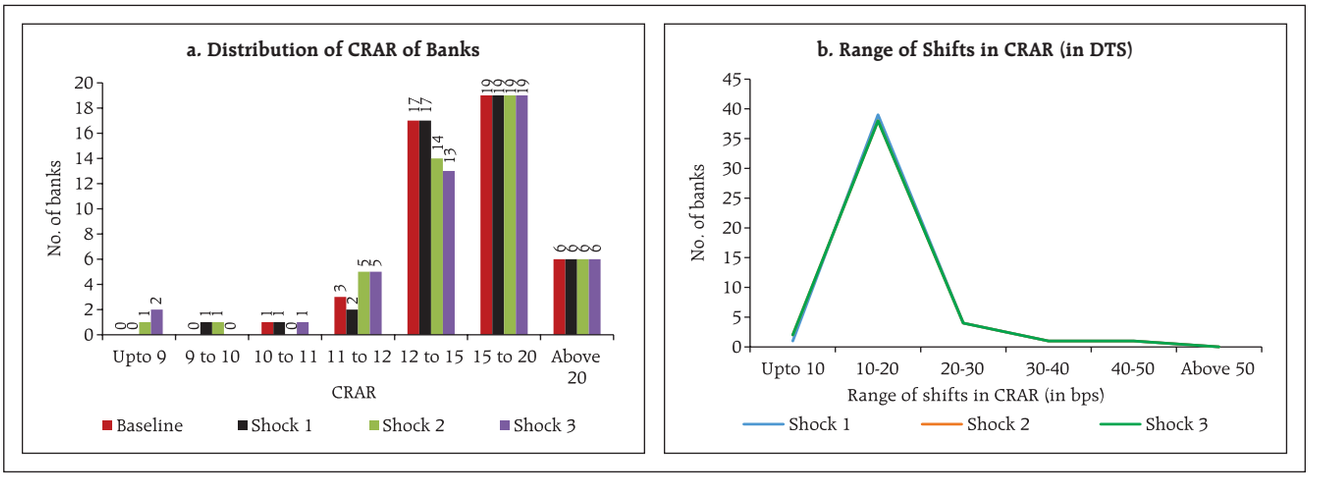
Chart 2.11: Credit Concentration Risk: Group Borrowers – Exposure



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

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

Chart 2.12: Credit Concentration Risk: Individual Borrowers – Stressed Advances



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

CRAR on account of low level of stressed assets as of September 2020 (Chart 2.12).

c. Sectoral Credit Risk

2.25 Sensitivity analysis of bank-wise vulnerabilities due to exposure to sub-sectors within industry (shocks based on sub-sector wise historical SDs of the GNPA ratio) reveals varying magnitudes of increases in the GNPAs of banks in different sub-sectors. A 2 SD shock to the basic metals and metal products and infrastructure-energy segment, would reduce the system level CRAR by 19 bps and 18 bps, respectively (Table 2.2).

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

Sector	1 SD	2 SD
Basic Metal and Metal Products (98%)	10	19
Infrastructure - Energy (62%)	9	18
Infrastructure - Transport (29%)	3	6
All Engineering (38%)	3	5
Textiles (33%)	2	4
Construction (29%)	2	3
Food Processing (26%)	1	3
Vehicles, Vehicle Parts and Transport Equipments (79%)	2	3
Infrastructure - Communication (56%)	1	2
Cement and Cement Products (61%)	1	1

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

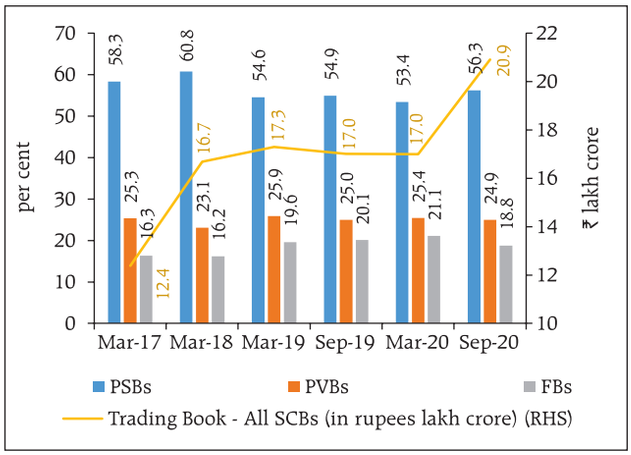
d. Interest Rate Risk

2.26 The market value of the investment portfolio subject to fair value for these sample SCBs stood at ₹20.9 lakh crore as on end-September 2020, the highest quarterly balance since March 2017 (Chart 2.13). About 95 per cent of the investments subjected to fair valuation were classified as available for sale (AFS).

2.27 The sensitivity (PV01[17]) of the AFS portfolio increased *vis-a-vis* the June 2020 position at an aggregate level, with FBs registering a 61.7 per cent increase in PV01 in the quarter. Some positioning in the greater than 10-year segment in FBs were, however, bonds held as cover for hedging derivatives and as such they may not be active contributors to PV01 risk. In terms of PV01 curve positioning, the tenor-wise distribution in PSBs indicates a steepening bias, with a slight increase in PV01 of 1-5 year maturity bucket and paring in the greater than 10-year segment, while the PVBs' view appeared unchanged. FBs were seen to be having significant exposure in the long end of the curve (Table 2.3).

2.28 Robust profit booking across all bank groups was observed in the quarter ended September 2020, although on a lower scale compared to the June 2020 quarter, possibly due to the rising yield curve movements across tenors (Table 2.4 and Chart 2.14). With a significant concentration of interest rate positions in the sub five-year tenor across bank groups, and volatility being highest in the shorter tenor buckets, there is a need to be cautious about the prospects of contribution of the trading book to profits, going forward.

Chart 2.13: Trading Book Portfolio: Bank Group-wise



Source: Individual bank submissions and staff calculations

Table 2.3: Tenor-wise PV01 Distribution of AFS Portfolio
(in per cent)

Sector	Total (in ₹ crore)	< 1 year	1 year-5 year	5 year-10 year	> 10 years
PSBs	254.7 (270.7)	7.0 (7.3)	37.8 (32.4)	41.3 (42.3)	13.9 (18.0)
PVBs	72.1 (72.3)	18.7 (15.3)	52.7 (51.3)	26.2 (28.8)	2.3 (4.6)
FBs	90.9 (56.2)	4.7 (5.6)	41.4 (45.3)	12.2 (15.7)	41.7 (33.4)

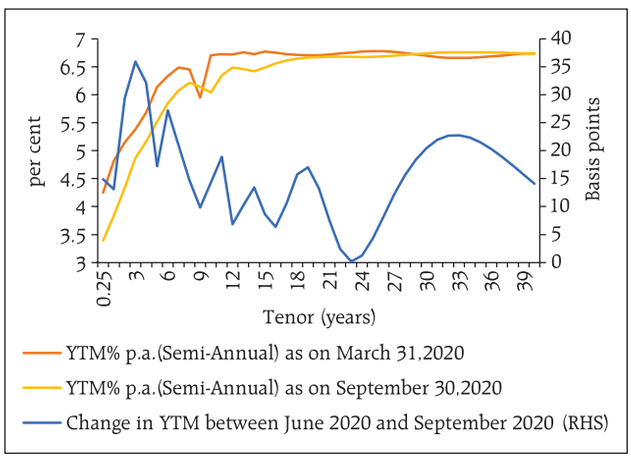
Note: Values in the brackets indicate June 2020 figures.
Source: Individual bank submissions and staff calculations.

Table 2.4: OOI - Profit/(loss) on Securities Trading
(in ₹ crore)

	Mar-20	Jun-20	Sep-20
Public Sector Banks	8,271.07	10,081.93	6,843.91
Private Sector Banks	4,185.46	9,882.76	4,520.88
Foreign Bank Group	228.34	1,730.87	620.66

Source: RBI Supervisory Returns.

Chart 2.14: Yield Curves and Shift in Yields Across Tenors



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

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

Table 2.5: 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	1.7 (2.0)	1.5 (0.5)	9.2 (3.2)	73.8 (31.6)	15.7 (64.8)
PVBs	11.7 (55.6)	10.2 (74.5)	59.9 (16.3)	17.3 (7.1)	12.6 (2.0)
FBs	15.7 (11.5)	5.4 (0.5)	30.4 (40.3)	51.3 (48.0)	12.9 (11.3)

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

2.29 PVBs and FBs had significant interest rate exposure in their held for trading (HFT) portfolios relative to their AFS books, although PVBs had reduced their PV01 exposure significantly. The tenor-wise PV01 distribution for PVBs shows a pronounced shift to exposures in the 1-5 year tenor from the less than 1-year tenor, while FBs have increased PV01 sensitivity at both ends of the curve (Table 2.5).

2.30 Any hardening of interest rates would depress investment gains under the AFS and HFT categories (direct impact). A parallel upward shift of 2.5 percentage points in the yield curve will lower the system level capital and CRAR by 7.0 per cent and 93 basis points, respectively (Table 2.6).

2.31 An analysis of held-to-maturity (HTM) positions as of September 2020 across bank groups reveals that unrealised gains of PSBs are almost evenly spread across SDLs and G-Secs while those of PVBs are concentrated in G-Secs (Chart 2.15). The recent decision to conduct Open Market Operations (OMOs) in SDLs will provide an additional window for PSBs to crystallise their SDL gains.

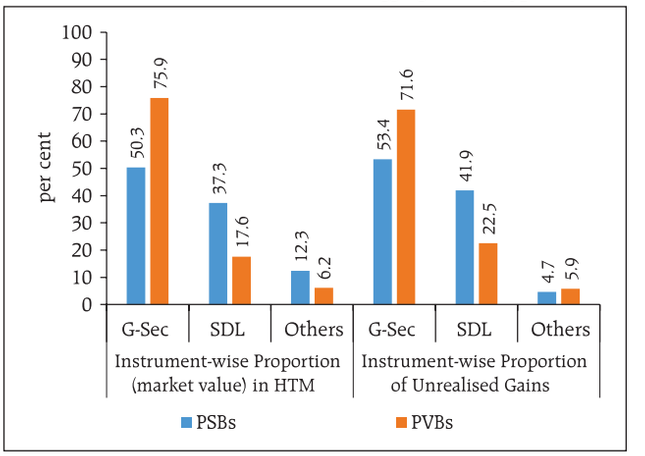
2.32 The Reserve Bank *vide* its notification dated October 12, 2020 has allowed banks to hold SLR securities acquired between September 1, 2020 and March 31, 2021 under the HTM category up to an overall limit of 22 per cent of NDTL, untill March 31, 2022. As of September 30, 2020, PSBs' holding of SLR-eligible securities in the HTM category amounted to 19.2 per cent of their NDTL, while for PVBs and FBs it stood at 19 per cent and 0.5 per cent, respectively.

Table 2.6: Interest Rate Risk – Bank-groups - Shocks and Impacts
(under shock of 250 basis points parallel upward shift of the INR yield curve)

	Public Sector Banks		Private Sector Banks		Foreign Banks		All SCBs	
	AFS	HFT	AFS	HFT	AFS	HFT	AFS	HFT
Modified Duration	2.2	2.5	1.5	2.3	2.7	2.9	2.1	2.6
Reduction in CRAR (bps)	103		46		239		93	

Source: Individual bank submissions and staff calculations.

Chart 2.15: HTM Portfolio – Disaggregated by Type

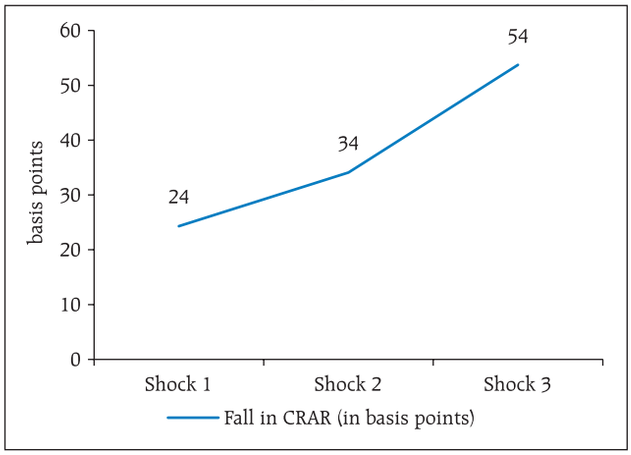


Source: Individual bank submissions and staff calculations

e. Equity Price Risk

2.33 An analysis of the impact of a fall in equity prices on bank capital and profits indicates that the system-level CRAR would decline by 54 basis points in an extreme scenario of a 55 per cent drop in equity prices (Chart 2.16). The impact for the overall system is limited due to banks' low capital market exposures arising from regulatory limits.

Chart 2.16: Equity Price Risk



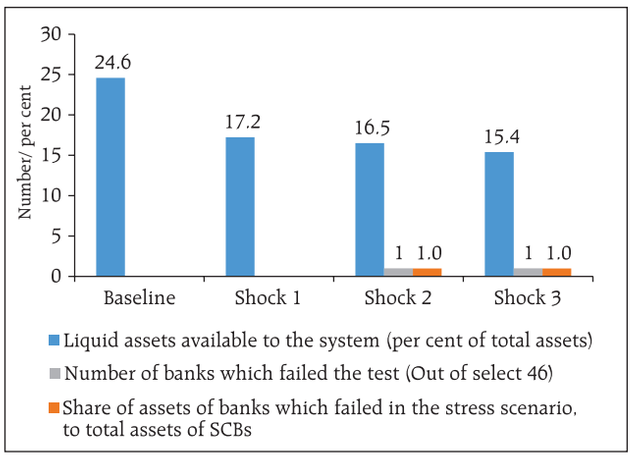
Note: For a system of select 46 SCBs
Shock 1: Equity prices drop by 25 per cent
Shock 2: Equity prices drop by 35 per cent
Shock 3: Equity prices drop by 55 per cent
Source: RBI Supervisory Returns and staff calculations.

f. Liquidity Risk

2.34 The liquidity risk analysis aims to capture the impact of a run on deposits and an increase in demand for unutilised portions of sanctioned / committed / guaranteed credit lines. Banks, in general, may be in a position to withstand liquidity shocks with their high-quality liquid assets (HQLAs)[18].

2.35 Under the assumed scenarios, there would be 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. Using their HQLAs required for meeting day-to-day liquidity requirements, 45 out of the 46 banks in the sample will remain resilient in a scenario of sudden and unexpected withdrawals of around 15 per cent of deposits, along with the utilisation of 75 per cent of their committed credit lines (Chart 2.17).

Chart 2.17: 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: Derivatives Portfolio

2.36 A series of bottom-up stress tests (sensitivity analyses) on derivative portfolios were conducted for select banks[20] with the reference date as September 30, 2020. The banks in the sample reported the results of four separate shocks on interest and foreign exchange rates. The shocks on interest rates

[18] 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.BP.BC.No.65/21.04.098/2019-20 dated April 17, 2020).

[19] Un-insured deposits are about 49.1 per cent of total deposits, based on ₹5 lakh deposit insurance limit (Source: DICGC Annual Report, 2019-20).

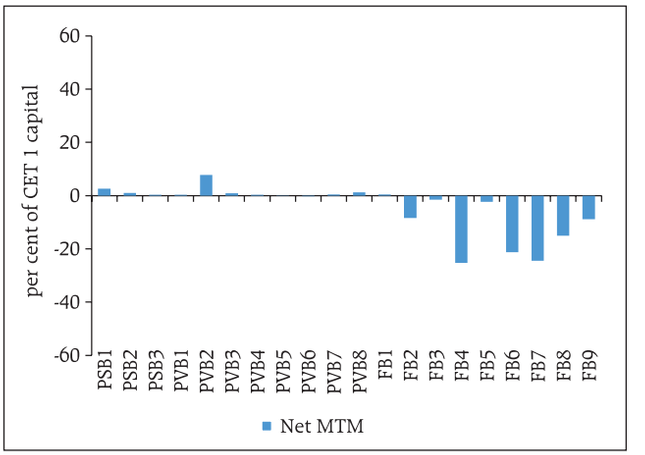
[20] Stress tests on derivatives portfolios were conducted for a sample of 20 banks, constituting the major active authorised dealers and interest rate swap counterparties.

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 stand-alone basis.

2.37 The results reveal that while some FBs showed significant negative net mark-to-market (MTM) impacts as a proportion to CET 1 capital, the impact was largely muted in case of PSBs and PVBs (Chart 2.18). However, since risks can only be transferred and not eliminated, they could be residing in corporate balance sheets. Going forward, an assessment of the hedging profile of corporates as given in the disclosures would help understand the true extent of risks.

2.38 The stress test results showed that the average net impact of interest rate shocks and exchange rate shocks are in the range of 2.5 per cent of the total capital funds (Chart 2.19). In the interest rate segment, derivatives' exposure remains short *i.e.*, they gain from an interest rate rise, which is similar to their positioning in March 2020. As regards exposures to forex derivatives, the pay-off profile is consistent with a small short USD positioning.

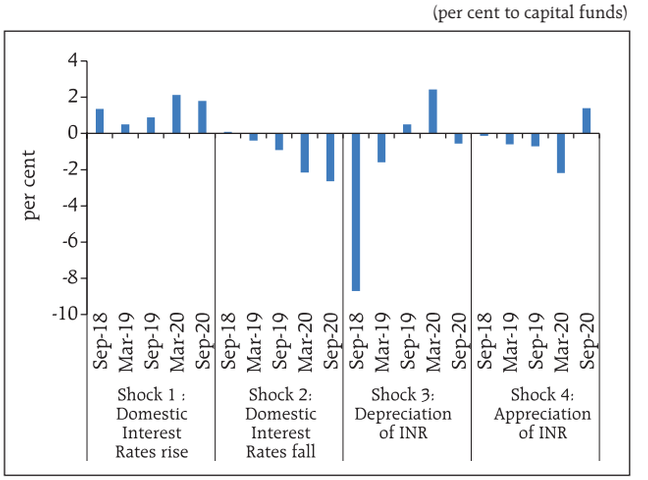
Chart 2.18: Mark-to market (MTM) of Total Derivatives Portfolio – Select banks, September 2020



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

Chart 2.19: 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).

II.2 Scheduled Primary (Urban) Cooperative Banks

2.39 The performance of scheduled primary (urban) cooperative banks (SUCBs) deteriorated between March 2020 and September 2020. At the system level, their GNPA ratio deteriorated from 9.89 per cent in March 2020 to 10.36 per cent in September 2020 while their provision coverage ratio[21] improved from 61.88 per cent to 65.13 per cent over this period. The CRAR at the system level[22], stood at 9.24 per cent in September 2020[23], down from 9.70 per cent reported in March 2020. SUCBs' liquidity ratio[24] increased from 33.95 per cent to 34.35 per cent during the period.

[21] Provision coverage ratio=provisions held for NPA*100/GNPAs

[22] Comprising 53 SUCBs

[23] Data are provisional and based on OSS Returns;

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

II.2.1 Stress Test – Credit Risk

2.40 The impact of credit risk shocks on CRARs of SUCBs was simulated under four different scenarios[25]. Four SUCBs had CRARs below the regulatory minimum requirement of 9 per cent even before the shock. The results show that (i) under a 1 SD shock to sub-standard assets, the system level CRAR would decline to 9.08 per cent and one SUCB would fail to achieve the minimum CRAR requirement (in addition to four SUCBs which had CRAR below 9 per cent even before the shock); (ii) under a 2 SD shock to sub-standard assets, CRAR would decline to 8.90 per cent and two more SUCBs (seven in all) would fail to achieve the minimum CRAR requirement; (iii) under a 1 SD shock to loss advances, system level CRAR declines to 8.52 per cent and four more SUCBs (in addition to four which already had CRAR below 9 per cent) would fail to maintain the minimum CRAR requirement; and (iv) under a 2 SD shock to loss advances, the system level CRAR declines to 7.51 per cent and two more SUCBs (ten in all) would fail to maintain the minimum CRAR requirement.

II.2.2 Stress Test - Liquidity Risks

2.41 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 ii) 100 per cent, with cash inflows remaining unchanged, indicated that 18 and 30 SUCBs, respectively, would face liquidity stress[26].

II.3 Non-banking Financial Companies

2.42 Non-banking financial companies (NBFCs) saw a decline in growth in 2019-20, largely due to isolated credit events in a few large NBFCs, challenges in accessing funds and the overall economic slowdown, with the pandemic's impact adding to the stress in the later period. During 2019-20, credit extended by NBFCs grew by 4.4 per cent as compared with 22 per cent in 2018-19. Gross NPAs of NBFCs increased from 5.3 per cent of total advances as on March 2019 to 6.3 per cent as on March 2020. Asset quality is expected to deteriorate further due to disruption of business operations caused by the pandemic, especially in the industry sector, one of the major recipients of NBFC credit.

II.3.1 Stress Test - Credit Risk

2.43 System level stress tests for the NBFC sector's credit risk were conducted for a sample of 200 NBFCs[27] with asset size of more than ₹1000 crore as on March 2020.

2.44 System level stress tests for the NBFC sector's aggregate credit risk were carried out under the three scenarios of baseline, medium and high risk. The baseline scenario presents the capital adequacy position of the NBFC sector as on March 2020 and medium and high risk scenarios present the capital adequacy position of the sector under 1 SD and 2 SD increases in GNPA. Under a high risk shock of 2 SD increase in the system level GNPA (GNPA of the sector increases from 6.8 per cent to 8.4 per cent), it is observed that the capital adequacy of NBFCs remained above 15 per cent, *i.e.*, at 24.5 per cent, 24.1 per cent and 23.7 per cent, respectively, for

[25] The four scenarios are: i) a 1 SD shock to GNPA (classified as sub-standard advances), ii) a 2 SD shock to GNPA (classified as sub-standard advances), iii) a 1 SD shock to GNPA (classified as loss advances), and iv) a 2 SD shock to GNPA (classified as loss advances). SD was estimated by using 10 years data (Annex 2).

[26] 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.

[27] The sample included 10 deposit taking and 190 Non-Deposit taking Systemically Important NBFCs. Total asset size of the sample was ₹29.68 lakh crore, which comprises around 81 per cent of total asset size of the sector. Detailed methodology of the stress tests is discussed in Annex 2.

baseline, medium and high risk scenarios of credit risk (Chart 2.20).

2.45 Stress tests at the individual NBFC level indicated that under the baseline, medium and high risk scenarios, CRAR of 3.3 per cent, 9.7 per cent and 10.3 per cent of NBFCs would fall below the minimum regulatory requirements.

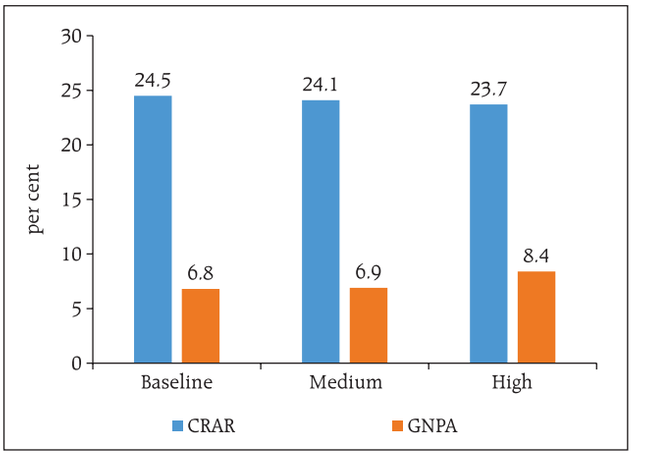
II.4 Interconnectedness

II.4.1 Network of the Financial System[28] [29]

2.46 A financial system can be visualised as a network with financial institutions as *nodes* and bilateral exposures as *links* joining these nodes. While these links enable efficiency gains and risk diversification, they can become conduits of risk transmission in case of a crisis. Understanding the nuances in propagation of risk through networks is useful for devising appropriate policy responses for safeguarding financial and macroeconomic stability.

2.47 The total outstanding bilateral exposures[30] among the entities in the financial system increased

Chart 2.20: Credit Risk in NBFCs – System Level

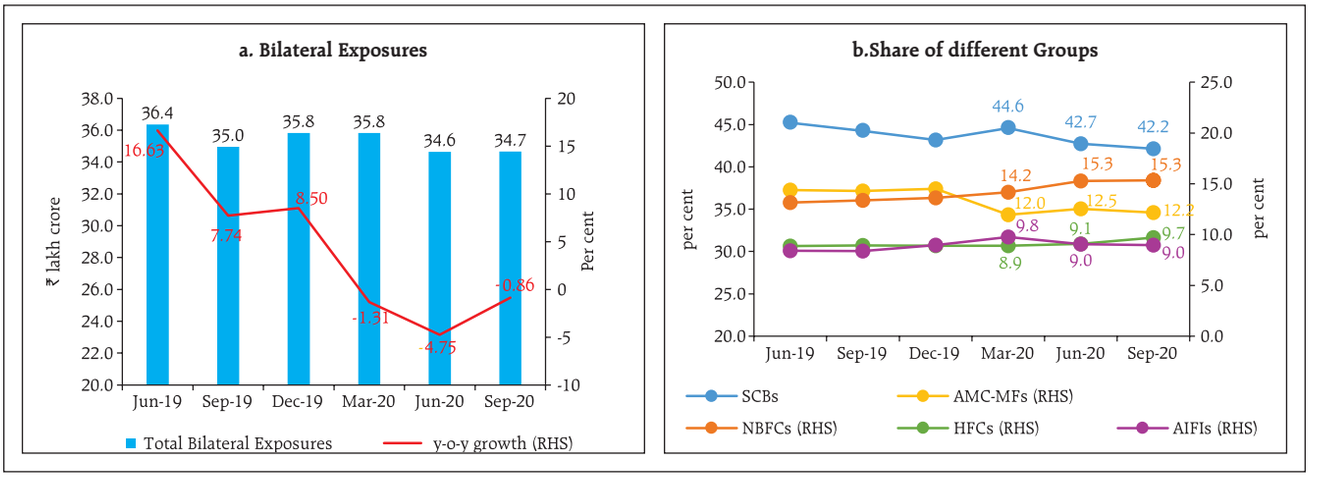


Source: RBI Supervisory Returns and staff calculations.

marginally after witnessing a sharp fall in June 2020, largely on account of reduced borrowing of PVBs from the financial system (Chart 2.21 a).

2.48 SCBs continued to have the largest bilateral exposures in the Indian financial system in September 2020, though their share declined in the first half of 2020-21. SCBs' lending to and borrowing

Chart 2.21: Bilateral Exposures between Entities in the Financial System



Source: RBI Supervisory Returns and staff calculations.

[28] 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.

[29] Analysis presented here and in the subsequent part is based on data of 190 entities from the following *eight sectors*: SCBs,SUCBs, AMC-MFs, NBFCs, HFCs, insurance companies, pension funds and AIFIs. These 190 entities covered include 70 SCBs; 20 SUCBs; 22 AMC-MFs (which cover more than 90 per cent of the AUMs of the mutual fund sector); 32 NBFCs (both deposit taking and non-deposit taking systemically important companies, which represent about 60 per cent of total NBFC assets); 21 insurance companies (that cover more than 90 per cent of assets of the sector); 14 HFCs (which represent more than 90 per cent of total HFC asset); 7 PFs and 4 AIFIs (NABARD, EXIM, NHB and SIDBI).

[30] Includes exposures between entities of the same sector.

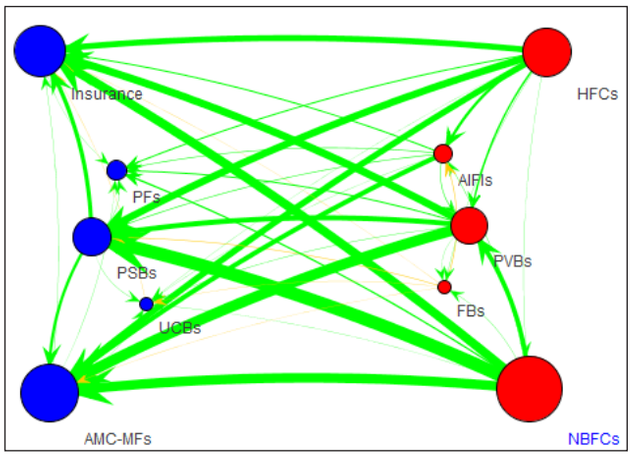
from other entities (including other SCBs) stood at 42.2 per cent of total lending and borrowings in the system (Chart 2.21 b). Among bank groups, PSBs had a net receivable position *vis-à-vis* the entire financial sector, which increased during the last one year. On the other hand, PVBs had a net payable position, which declined y-o-y. FBs were evenly balanced (Charts 2.22 and 2.23).

2.49 After a sizable decline during 2019-20 when their AUM reduced, the share of AMC-MFs remained stable in H1:2020-21. During the same period, the shares of NBFCs, HFCs, insurance companies and pension funds increased to 15.3 per cent, 9.7 per cent, 9.6 per cent, and 1.8 per cent, respectively (Chart 2.21 b). The share of AIFIs, on the other hand, reduced to 9.0 per cent.

2.50 In terms of inter-sectoral[31] exposures, AMC-MFs were the biggest fund providers in the system, followed by insurance companies, while NBFCs were the biggest receiver of funds, followed by HFCs. Among the entities which received funds from the financial system, PVBs recorded nearly 40 per cent decline (y-o-y), while payables of NBFCs and HFCs increased by 10.7 per cent and 1.8 per cent, respectively (Chart 2.23).

2.51 AMC-MFs recorded a significant decline in their receivables from the financial system during the last one year, while the same increased for PSBs and insurance companies, who were the other major fund providers (Chart 2.23).

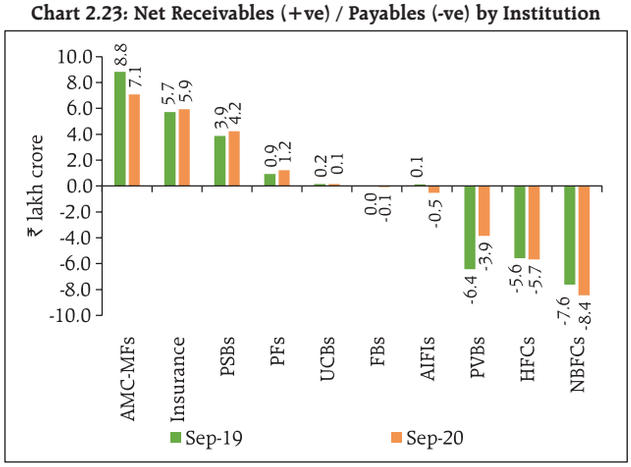
Chart 2.22: Network Plot of the Financial System, September 2020



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.

Chart 2.23: Net Receivables (+ve) / Payables (-ve) by Institution



Source: RBI Supervisory Returns and staff calculations

a. Inter-bank Market

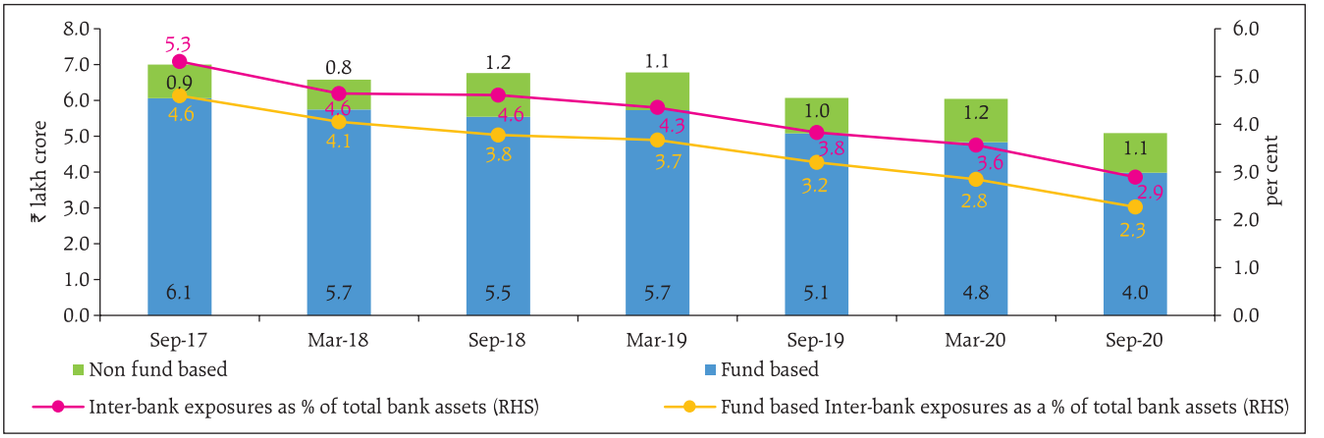
2.52 The inter-bank market continued to shrink, in keeping with the trend over recent years. The share of fund-based[32] inter-bank exposures in the

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

[32] 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 deposit 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.

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

Chart 2.24: Inter-bank Market



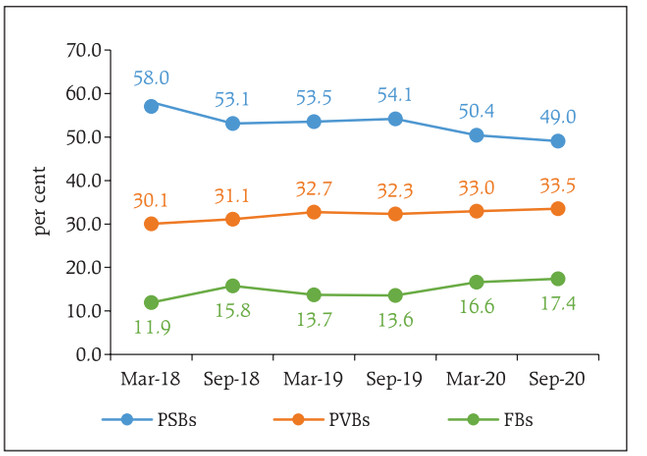
Source: RBI Supervisory Returns and staff calculations.

total assets of the banking system declined during the first half of 2020-21, in keeping with past trends, due to excess liquidity in the banking system (Chart 2.24). Non-fund-based inter-bank exposures declined marginally.

2.53 PSBs remained the dominant players in the inter-bank market, although their share continued to decline and stood below 50 per cent during H1:2020-21 while that of PVBs and FBs grew (Chart 2.25).

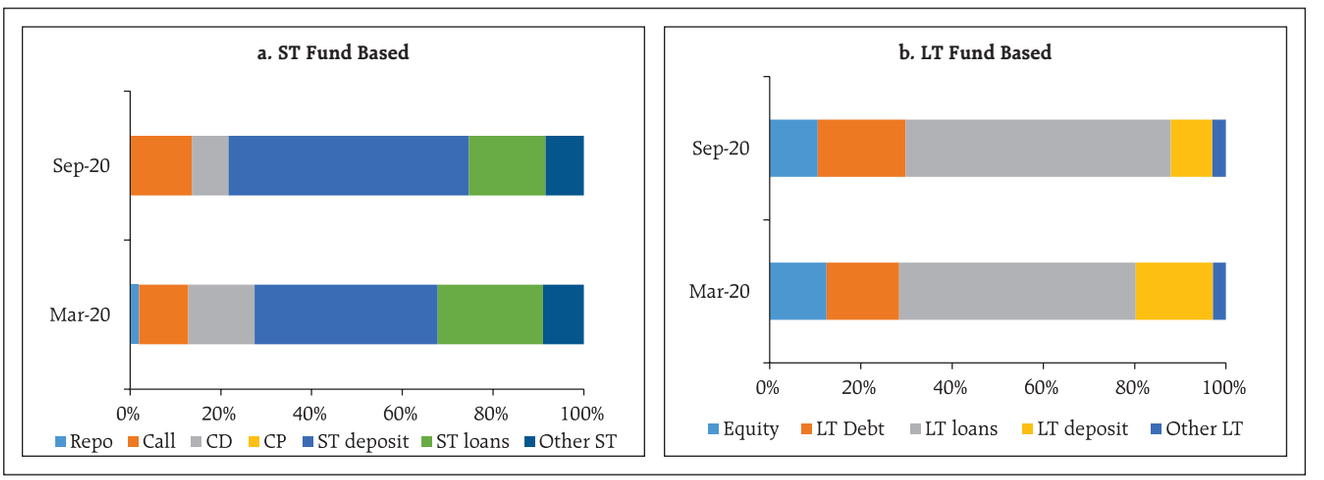
2.54 The inter-bank market was dominated by short term (ST) exposures to the extent of about 71 per cent, with ST deposits accounting for the highest share, followed by ST loans. In case of long term (LT) fund based inter-bank exposure, 58.2 per cent comprised of LT loans (Chart 2.26).

Chart 2.25: Different Bank Groups in the Inter-bank Market, September 2020



Source: RBI Supervisory Returns and staff calculations.

Chart 2.26: Composition of Fund based Inter-bank Market



Source: RBI Supervisory Returns and staff calculations.

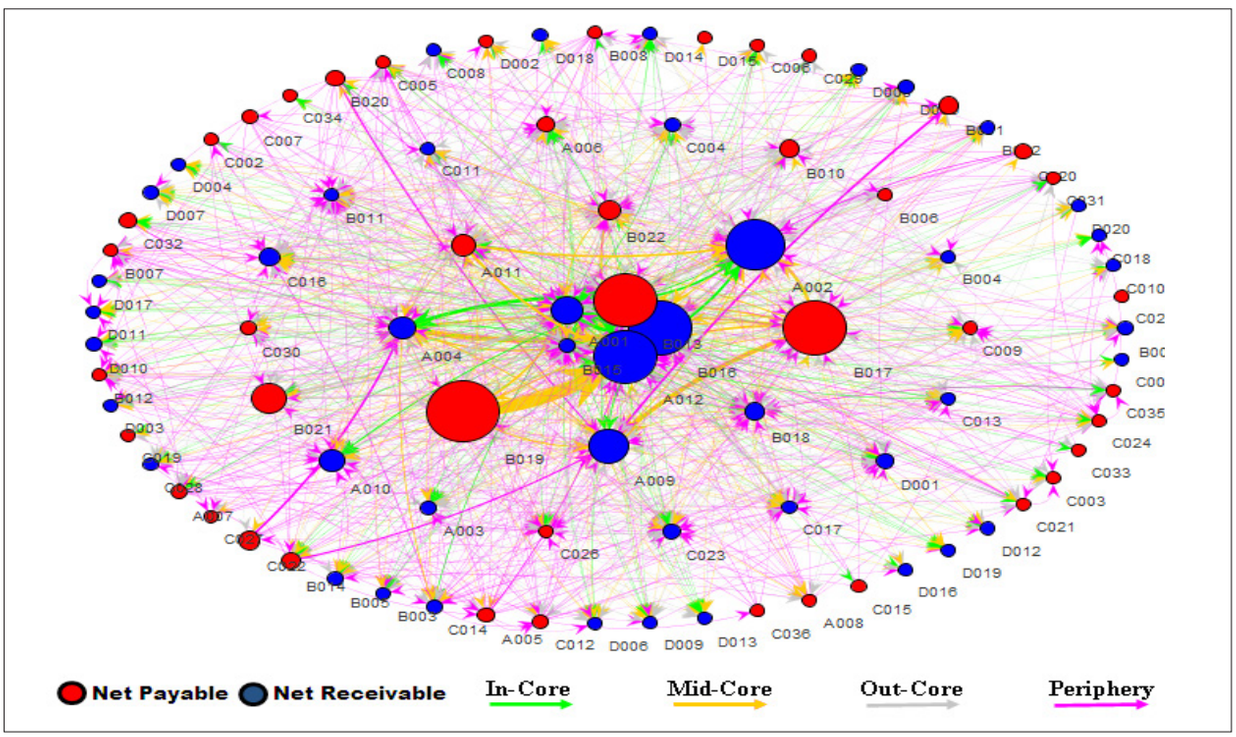
b. Inter-bank Market: Network Structure and Connectivity

2.55 The inter-bank market typically has a core-periphery network structure[33] [34]. At end-September 2020, there were five banks in the inner-most core and eight banks in the mid-core circle. This is in line with the pattern seen during the last six years, with the number of banks in the inner-most core ranging between two and five and comprising the biggest PSBs or PVBs. Most foreign banks and almost all old private banks continue to figure in the outermost periphery, making them the least connected banks in the system. The remaining PSBs and PVBs, along with a few major FBs, made up the mid and outer core. The merger of some PSBs with effect from April 2020 has impacted the mid-core and outer core (Chart 2.27).

2.56 A noteworthy point is that the most connected (and consequently in the inner-most core) entities could be either net lenders or net borrowers but their net receivables/payables could be smaller in absolute terms to those entities which are not as connected.

2.57 The degree of interconnectedness in the banking system (SCBs), as measured by the connectivity ratio[35], has edged up in September

Chart 2.27: Network Structure of the Indian Banking System (SCBs+ SUCBs) – September 2020



Source: RBI Supervisory Returns and Staff Calculations.

[33] 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.

[34] 70 SCBs and 20 SUCBs were considered for this analysis.

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

2020 after gradual decline over the last few years. The cluster coefficient[36], which depicts local interconnectedness (*i.e.*, tendency to cluster), has declined marginally over the last five years (Chart 2.28).

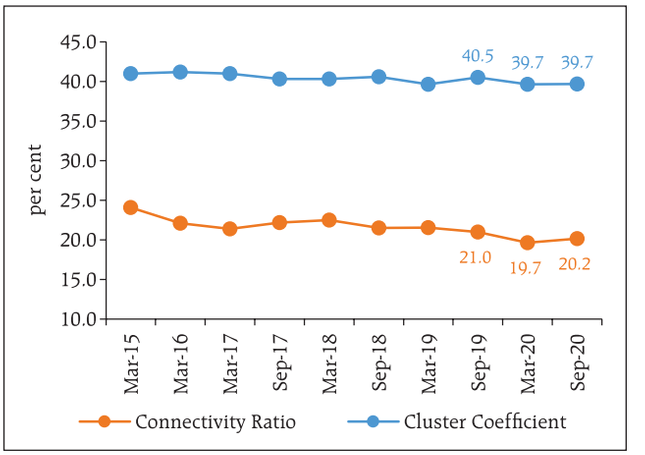
c. Exposure of AMC-MFs

2.58 AMC-MFs remained the largest net providers of funds to the financial system. Their gross receivables were ₹7.74 lakh crore (29 per cent of their average AUM) whereas their gross payables were ₹0.67 lakh crore as at end-September 2020.

2.59 The top recipients of their funding were SCBs, followed by NBFCs, HFCs and AIFIs. Their receivables from SCBs declined in 2019-20 and also in H1:2020-21. In absolute terms, while SCBs have seen a decline in their payables to AMC-MFs in H1:2020-21, they increased for NBFCs and HFCs *albeit* in varying degrees. In contrast, AIFIs' reliance on AMC-MFs, which has been increasing in earlier years, witnessed moderation during H1:2020-21 (Chart 2.29 a).

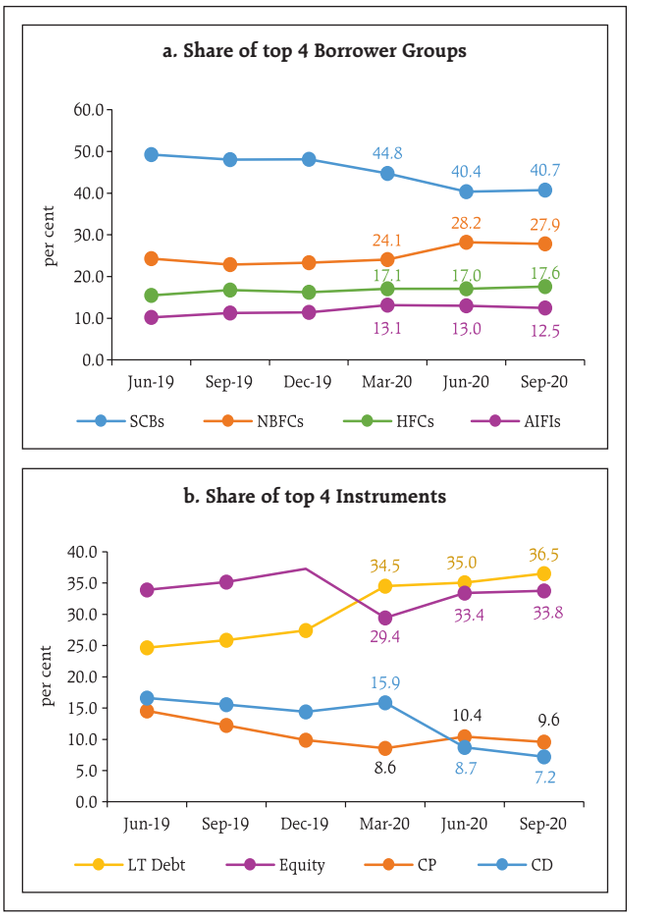
2.60 Instrument-wise, AMC-MFs' receivables saw a sharp increase in the share of equity funding during H1:2020-21. In the case of debt funding, AMC-MFs have shown a marked preference for long term debt over short term debt, which is reflected in the movement of their relative shares. While equity exposures to financial system participants by mutual funds do not amount to contractual claims, simultaneous holdings in debt and equity exposures of financial system participants by balanced mutual funds allow transmission of risk from equity market sell-off to the debt markets and vice versa. Given the interconnected nature, such sell-offs can potentially transmit asset market shocks across the financial system (Chart 2.29 b).

Chart 2.28: Connectivity Statistics of the Banking System (SCBs)



Source: RBI Supervisory Returns and staff calculations.

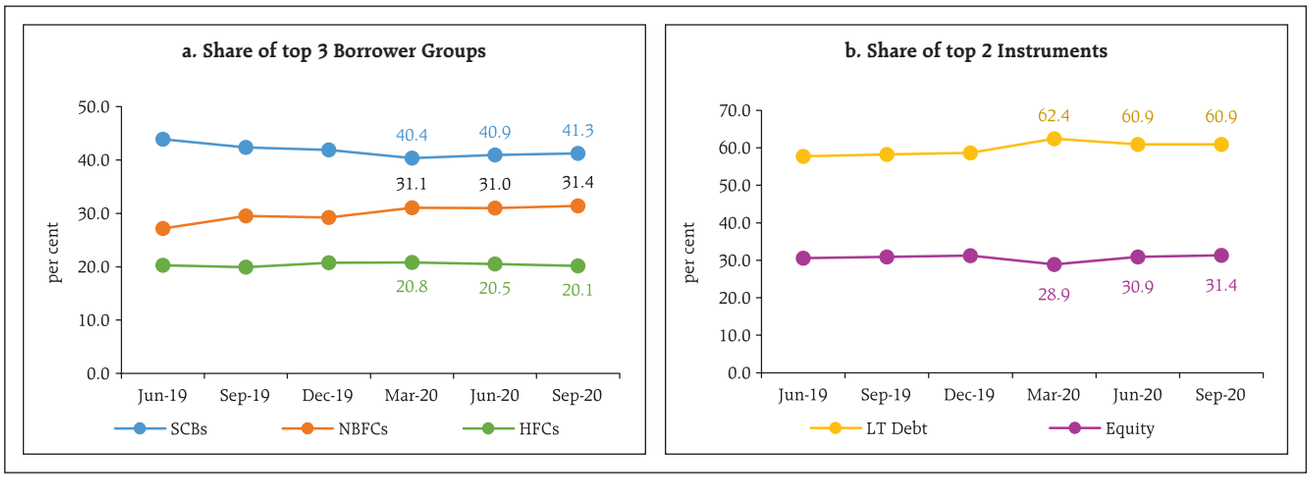
Chart 2.29: Gross Receivables of AMC-MFs from the Financial System



Source: RBI Supervisory Returns and staff calculations.

[36] *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.

Chart 2.30: Gross Receivables of Insurance Companies from the Financial System



Source: RBI Supervisory Returns and staff calculations.

d. Exposure of Insurance Companies

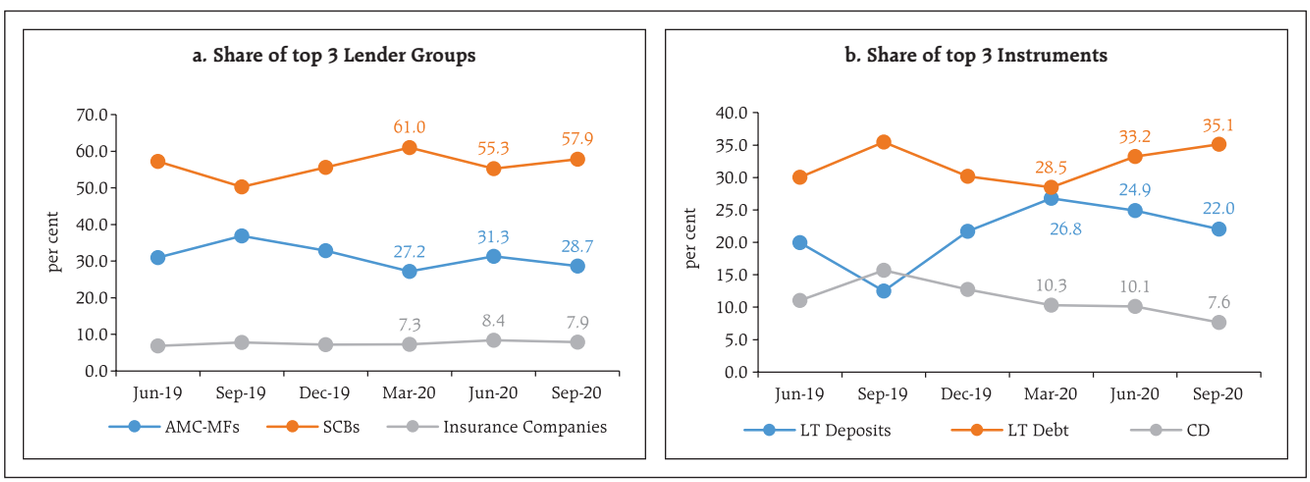
2.61 Insurance companies are the second largest net providers of funds to the financial system (gross receivables were ₹6.21 lakh crore and gross payables were ₹0.29 lakh crore in September 2020).

2.62 SCBs were the top recipients of their funds, followed by NBFCs and HFCs. LT debt and equity accounted for almost all the receivables of insurance companies, which had limited exposure to short-term instruments. LT debt of these companies mostly comprised of subscription to debt instruments issued by NBFCs and HFCs (Chart 2.30 a and b).

e. Exposure to AIFIs

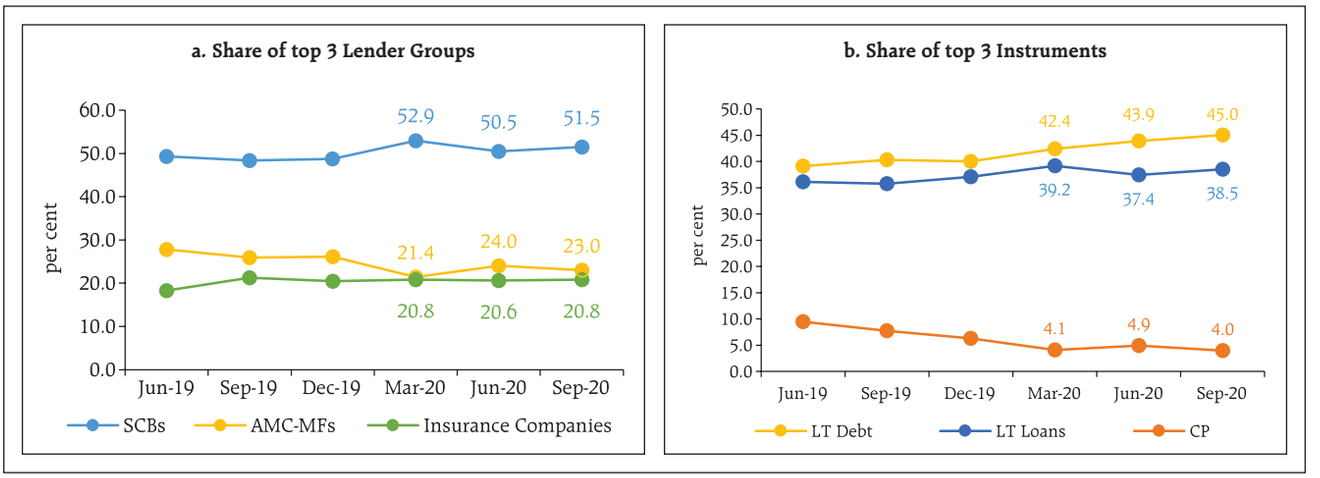
2.63 AIFIs were net borrowers of funds from the financial system and their gross payables increased to ₹3.36 lakh crore in H1:2020-21, whereas the gross receivables contracted to ₹2.83 lakh crore as at end-September 2020. The top fund providers to AIFIs were SCBs (primarily PVBs), followed by AMC-MFs and Insurance companies (Chart 2.31 a). These funds were provided mostly by the way of LT debt, LT deposits and CDs (Chart 2.31 b). The share of LT deposits declined for two successive quarters after its peak in March 2020.

Chart 2.31: Gross Payables of AIFIs to the Financial System



Source: RBI Supervisory Returns and staff calculations.

Chart 2.32: Gross Payables of NBFCs to the Financial System



Source: RBI Supervisory Returns and staff calculations.

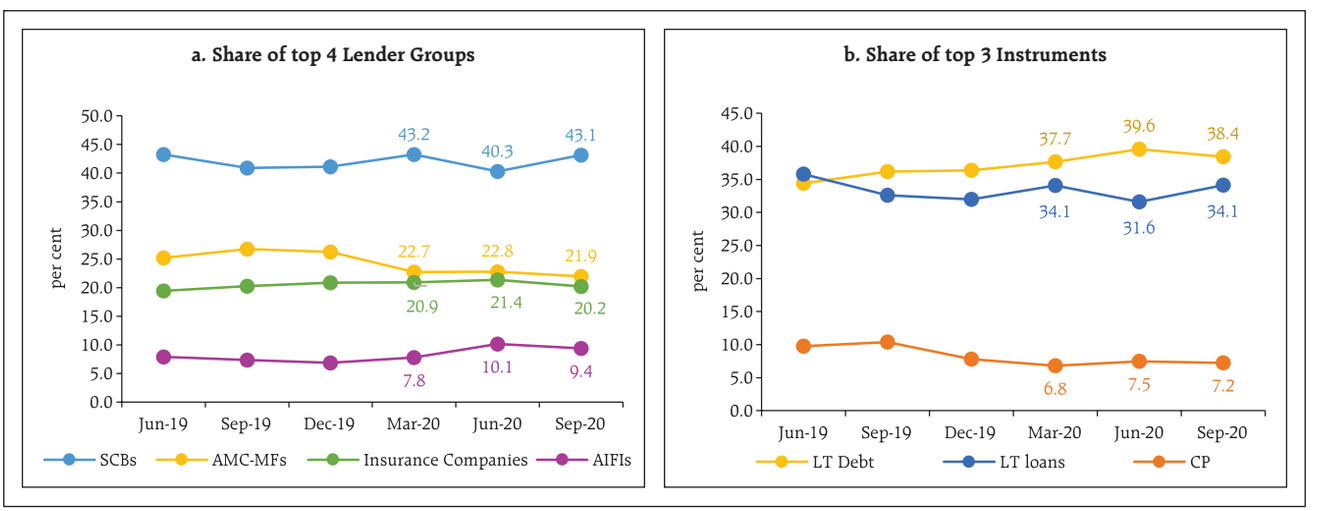
f. Exposure to NBFCs

2.64 NBFCs were the largest net borrowers of funds from the financial system, with gross payables of ₹9.37 lakh crore and gross receivables of ₹0.93 lakh crore as at end-September 2020. They obtained more than half of their funding from SCBs, followed by AMC-MFs and insurance companies (Chart 2.32 a). During H1:2020-21, the choice of instruments in the NBFC funding mix reflects an increasing preference for LT debt from SCBs which, *inter alia*, reflects the support through Targeted Long-term Repo Operations (TLTRO) (Chart 2.32 b).

g. Exposure to HFCs

2.65 HFCs were the second largest borrowers of funds from the financial system, with gross payables of around ₹6.20 lakh crore and gross receivables of ₹0.53 lakh crore as at end-September 2020. HFCs' borrowing profile was largely similar to that of NBFCs, except that AIFIs played a significant role in providing funds to HFCs. The share of AMC-MFs in funding HFCs declined marginally in H1:2020-21 after the sharp decline in 2019-20. In contrast, the share of SCBs moderated after growing in the previous year (Chart 2.33 a).

Chart 2.33: Gross Payables of HFCs to the Financial System



Source: RBI Supervisory Returns and staff calculations.

2.66 As is the case of NBFCs, LT debt and LT loans were the top two instruments through which HFCs raised funds from the financial system, with an increasing share of LT debt (by PVBs). Resource mobilisation through CPs (subscribed to by AMC-MFs and, to a lesser extent, by SCBs), which had been on a consistent decline post the IL&FS episode, picked up marginally in the first half of 2020-21 (Chart 2.33 b).

II.4.2 Contagion Analysis[37]

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

a. Joint Solvency[38]-Liquidity[39] Contagion Losses for SCBs due to Bank Failure

2.68 The impact of discrete shocks on the banking system in this analysis is seen in terms of the number of bank failures that take place and the amount of solvency and liquidity losses that are incurred.

2.69 A contagion analysis of the banking network based on the end-September 2020 position indicates that if the bank with the maximum capacity to cause contagion losses fails, it will cause a solvency loss of 2.5 per cent of total Tier 1 capital of SCBs and liquidity loss of 0.5 per cent of total HQLA of the banking system. In comparing these estimates with a similar exercise undertaken six months ago when solvency and liquidity losses were estimated at 4.3 per cent and 0.3 per cent, respectively, no comfort can be drawn, given that the extent of vulnerability, as the impact of COVID-19 on banks' balance sheet is yet to be reflected in full measure (Table 2.7).

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

2.70 NBFCs and HFCs are the largest borrowers of funds from the financial system. A substantial part of funding comes from banks. Therefore, failure of any NBFC[40] or HFC will act as a solvency shock to their lenders, which can further spread by contagion.

Table 2.7: Contagion Losses due to Bank Failure – September 2020

Trigger Code	% of Tier 1 capital of the Banking System	% of HQLA	Number of Bank defaulting due to solvency	Number of Bank defaulting due to liquidity
Bank 1	2.50	0.50	2	0
Bank 2	2.46	0.02	0	0
Bank 3	2.39	0.11	0	0
Bank 4	2.07	1.72	0	0
Bank 5	1.73	1.07	0	2

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.

[37] For methodology, please see Annex 2.

[38] 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.

[39] 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.

[40] Only Private NBFCs are considered.

2.71 An analysis of the possible solvency contagion losses to the banking system caused by idiosyncratic failure of a NBFC indicates that, as at end-September 2020, the failure of the NBFC with the maximum capacity to cause solvency losses to the banking system can knock off 2.26 per cent of the latter's total Tier 1 capital but it would not lead to failure of any bank. Failure of the HFC with the maximum capacity to cause solvency losses to the banking system will knock off 5.92 per cent of the latter's total Tier 1 capital but no bank would fail in such an event (Tables 2.8 and 2.9).

2.72 The losses on account of idiosyncratic failure may have been understated due to non-reflection of the impact of COVID-19 on banks' balance sheets.

Table 2.8: Contagion Losses due to NBFC Failure – September 2020

Trigger Code	Solvency Losses as % of Tier -1 Capital of the Banking System	Number of Defaulting banks due to Solvency
NBFC 1	2.26	0
NBFC 2	2.21	0
NBFC 3	1.86	0
NBFC 4	1.30	1
NBFC 5	1.24	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 2.9: Contagion Losses due to HFC Failure – September 2020

Trigger Code	Solvency Losses as % of Tier -1 Capital of the Banking System	Number of Banks Defaulting due to solvency
HFC 1	5.92	0
HFC 2	3.70	0
HFC 3	1.97	1
HFC 4	1.92	1
HFC 5	1.34	0

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

c. Solvency Contagion Impact[41] after Macroeconomic Shocks to SCBs

2.73 The contagion impact of the failure of an institution is likely to be magnified if macroeconomic shocks result in distress in the banking system in a generalised downturn in the economy. Such shocks may affect solvency of some SCBs which, in turn, would act as a trigger for further solvency losses. In the previous iteration, the shock was applied to the entity that could cause the maximum solvency contagion losses, whereas the initial impact of macroeconomic shocks on individual bank's capital is factored in from the macro-stress tests, in which a baseline and two (medium and severe) adverse scenarios have been considered for September 2021[42].

2.74 Initial capital loss due to macroeconomic shocks stood at 8.36 per cent, 12.39 per cent, and 17.25 per cent of Tier 1 capital for baseline, medium and severe stress scenarios, respectively. The number of banks that fail to maintain Tier I adequacy ratio of 7 per cent in the face of shocks ranged between three in the baseline and five in the medium stress scenario to eight in severe stress scenario. These banks had low Tier 1 capital in September 2020 (either already below 7 per cent or marginally higher).

2.75 Additional solvency losses to the banking system due to contagion (over and above the initial loss of capital due to the macro shocks), in terms

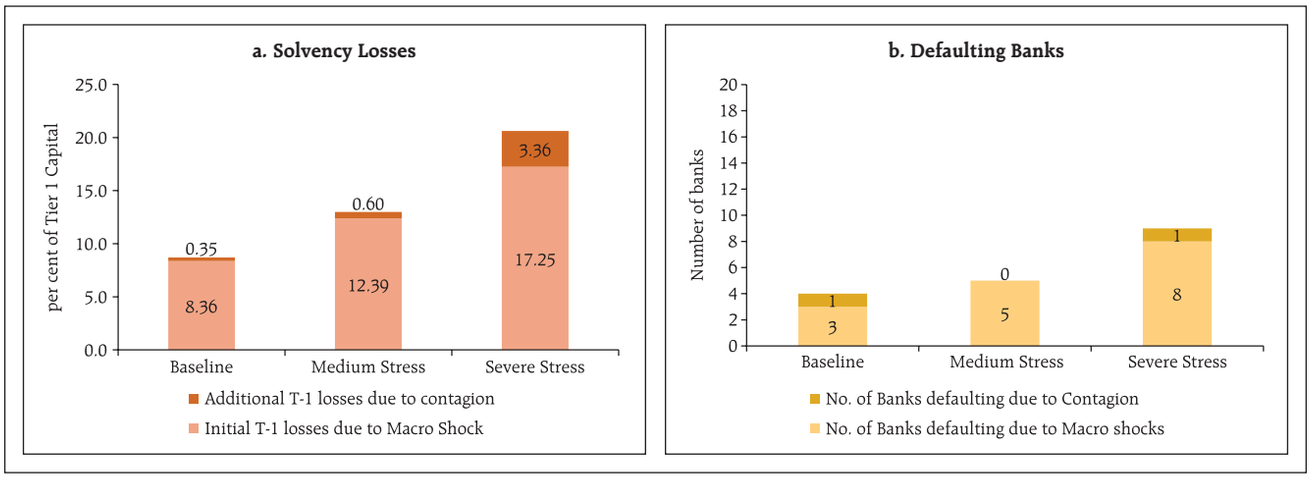
[41] Failure Criterion for both PSBs and PVBs has been taken as Tier 1 CRAR falling below 7 per cent.

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

a) The projected losses under a macro scenario (calculated as reduction in projected Tier 1 CRAR, in percentage terms, in September 2021 with respect to the actual value in September 2020) were applied to the September 2020 capital position assuming proportionally similar balance sheet structures for both September 2020 and September 2021.

b) Bilateral exposures between financial entities are assumed to be similar for September 2020 and September 2021.

Chart 2.34: Contagion Impact of Macroeconomic Shocks (Solvency Contagion)



Note: The projected capital in September 2021 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.

of Tier 1 capital of the banking system amounted to 0.35 per cent for the baseline, 0.60 per cent for medium stress and 3.36 per cent for severe stress scenario. Under such conditions, one additional bank may fail due to contagion in the baseline and severe stress scenario (Chart 2.34).

2.76 The shrinking size of the inter-bank market and improved capital adequacy has limited contagion risk in the banking system under various scenarios. Nevertheless, as COVID-19 induced stress plays out going forward, capital adequacy across bank groups could come under pressure and contagion losses due to macro shocks under adverse scenarios could get exacerbated, unless the capital position of banks is shored up substantively.

Summary and Outlook

2.77 In sum, the growing convergence of the Indian banking system with post-GFC regulatory and prudential standards, created capital and liquidity buffers which provided resilience in the current pandemic. Going forward, these cushions in banks' balance sheets will have to contend with the rollback of regulatory forbearances announced in the wake of the pandemic. Capital and asset quality ratios of SCBs will be tested as the true economic value of portfolios of banks and other financial intermediaries is impacted by the disruption caused by the pandemic.

2.78 Macro-stress tests for credit risk show that GNPA ratio of SCBs may worsen under various stress scenarios and capital ratios may be eroded, highlighting the need for proactive provisioning and building up adequate capital to withstand the imminent asset quality deterioration. The direction to banks not to make any dividend payment on equity shares from the profits pertaining to the financial year ended March 31, 2020 is intended to strengthen balance sheets so that they can step forward to support lending to the real economy as recovery gains traction.

2.79 In the non-bank space, the dominant positions occupied by mutual funds and insurance companies needs to be assessed against the fact that non-banking financial companies and housing finance companies remain the largest borrowers, with systemic implications. Meanwhile, shrinking of the inter-bank market has reduced the risk of bank failure due to contagion effects. On its part, the Reserve Bank has stepped up close and continuous monitoring of all regulated entities and markets with the goal of maintaining and preserving financial stability at all times.

Chapter III

Regulatory Initiatives in the Financial Sector

Extraordinary measures taken by central banks and other regulators to mitigate the impact of the pandemic have anchored financial stability and cushioned the deleterious effects of COVID-19 on economic activity. International standard setting bodies have also responded pro-actively to this evolving landscape. On the domestic front, financial sector regulators have maintained accommodative policies while being alert to the risks to financial stability. The Financial Stability and Development Council (FSDC) and its Sub-Committee remained alert to emerging challenges and coordinated initiatives by various regulators to strengthen financial sector resilience and stability.

Introduction

3.1 The COVID-19 pandemic continues to impose tremendous human and economic costs. Public institutions and authorities have maintained unprecedented measures to manage the fallout of the pandemic. Despite positive news on the development of its vaccine offsetting to some extent the gloom overshadowing global economic prospects on account of the second wave, high uncertainty prevails on the outlook for the global economic and financial system and its constituents.

3.2 The rest of this chapter begins by addressing recent regulatory and other measures taken globally in Section III.1. Measures taken by India's financial sector regulators in their domains are described in Sections III.2 to III.4. The final section concludes with some perspectives on the outlook.

III.1 Global Developments

3.3 Strong policy interventions by central banks to reduce interest rates, provide ample liquidity and ensure credit to the commercial sector have so far contained financial market volatility and reduced the likelihood of adverse macro-financial feedback loops in response to the pandemic. In aggregate, the U.S. Federal Reserve, Bank of England (BoE) , Bank of Japan (BoJ) and the European Central Bank (ECB) have grown their balance sheets by US$ 5.6 trillion this year alone (till end-November) through quantitative easing. They have been emboldened by inflation indicators continuing to be subdued, although there are some concerns that the overhang of liquidity has the potential for overpricing of financial assets. The ECB has recently decided to enhance the pandemic emergency purchase programme (PEPP) by €500 billion to a total of €1,850 billion, extend the horizon for net purchases under the PEPP to at least the end of March 2022 and to extend the reinvestment of principal payments from maturing securities purchased under the PEPP until at least the end of 2023.

3.4 The liquidity phase of the crisis is now giving way to the solvency phase as the impact of economic disruptions on the banking sector unfolds, especially in those sectors where the pandemic's impact has been the most destructive. This is visible from banks stepping up precautionary provisioning for loan losses even as surveys indicate tightening of lending standards in various parts of the world. In this context, the steps taken by major standard setting authorities in respect of regulatory treatment of direct relevance to banks' balance sheets, *viz.*, Capital, Liquidity and Expected Credit Loss (ECL) provisioning, are outlined below.

III.1.1 Capital

3.5 The Basel Committee on Banking Supervision (BCBS) announced that banks could use their capital buffers during the crisis to absorb financial shocks and to support the real economy by lending to

creditworthy households and businesses. It also encouraged supervisors to allow banks sufficient time to restore buffers, taking account of economic and market conditions as well as bank-specific circumstances. The Financial Stability Board (FSB) has supported the BCBSs' policy stance and approach.

III.1.2 Liquidity

3.6 The BCBS signaled that it was acceptable for banks to draw down their buffers of High-quality Liquid Asset (HQLA) securities to meet unforeseen liquidity demands, adding that supervisors may provide sufficient lead time before the buffers are restored. Some of the major regimes have introduced sunset clauses towards utilisation of such buffers. Illustratively, the ECB committed to allow banks to operate below the Liquidity Coverage Ratio (LCR) until at least end-2021 without automatically triggering supervisory actions. The US Federal Reserve (Fed) announced temporary measures extended upto March 31, 2021 to help increase the availability of intraday credit by suspending uncollateralised intra-day credit limits and permitting a streamlined procedure for secondary credit institutions to request collateralised intraday credit.

III.1.3 Expected Credit Loss (ECL) provisioning

3.7 The International Accounting Standards Board (IASB) issued a clarificatory statement[1] on application of International Financial Reporting Standards - 9 (IFRS-9) for accounting of expected credit losses in order to manage the economic uncertainty resulting from the pandemic. While IFRS-9 requires that lifetime ECLs be recognised when there is a significant increase in credit risk (SICR) on a financial instrument, the IASB cited the example of not automatically treating the extension of payment holidays to all borrowers in particular classes of financial instruments as cases involving SICR, emphasising that entities should not apply their existing ECL methodology mechanically. The IASB also opined that in the current stressed environment, IFRS-9 and the associated disclosures can provide much needed transparency to users of financial statements.

III.1.4 Operational Risk in Banks

3.8 The pandemic has purveyed heightened uncertainty and amplified operational risks in banks affecting personnel, processes, information systems and business continuity. Recognising the need for heightened operational resilience, the BCBS published a consultative document[2] on proposed principles for operational resilience and revision to its 'Principles for the Sound Management of Operational Risk' (PSMOR) which focuses on aspects such as business continuity planning, cyber security, and third-party risk management.

3.9 The Financial Action Task Force (FATF) issued a paper[3] discussing money laundering (ML) and/or terrorist financing (TF) risks arising from COVID-19. It posits that increased use of online services may result in on-boarding customers without sufficient customer due diligence (CDD) screening, thereby facilitating undetected movement of virtual assets and concealing of illicit funds. Such risks are incipiently magnified as financial institutions remain preoccupied with maintaining business continuity, allowing lags in identification and reporting suspicious transactions. To manage these potential vulnerabilities, the paper recommends that AML/combating the financing of terrorism (CFT) policy responses should include (i) a domestic assessment

[1] International Accounting Standards Board (2020): IFRS 9 and COVID-19, March.

[2] BIS (2020). Principles for Operational Resilience (consultative document). August.

[3] Financial Action Task Force (2020): "COVID-19-related Money Laundering and Terrorist Financing ", May.

of the impact of COVID-19 on AML/CFT risks and systems; (ii) strengthening communication with the private sector; (iii) encouraging the full use of a risk-based approach to due diligence; (iv) encouraging use of responsible digital identities while conducting transactions; and (v) pragmatic, risk-based AML/CFT supervision.

III.1.5 COVID-19 and the Insurance Sector

3.10 The International Association of Insurance Supervisors (IAIS) published a statement highlighting the impact of COVID-19 on the global insurance sector, emphasising the importance of effective policyholder protection and fair customer treatment during the crisis. It also cautioned against insurers being required to cover COVID-19 related losses retrospectively, drawing attention to the adverse impact this could have on solvency, capability to meet other types of claims, and on financial stability at large. The statement also noted that the crisis has served to highlight the limits on the protection that the insurance sector by itself can be expected to provide.

III.1.6 Other International Regulatory Developments in the Banking Sector

3.11 In July 2020, BCBS published the final revised standard[4] for Credit Valuation Adjustment (CVA) risk *viz.*, the risk faced by banks of incurring mark-to-market losses because of the deterioration in the creditworthiness of their counterparties in derivatives or securities financing transactions. The revision will result in reduced risk weights for CVA in both Standardised Approaches (SA) and Basic Approaches to CVA in respect of certain classes of counterparties. The revised market risk framework also introduced new 'index buckets' under which banks could, under certain conditions, calculate capital requirements by using credit and equity indices directly instead of looking through to the underlying constituents. The Committee has also agreed to adjust the scope of portfolios subject to CVA risk capital requirements by excluding some securities financing transactions (SFTs). The targeted revision has also revised overall calibration of the CVA risk framework, leading to a reduced value of the aggregate multiplier for banks using the SA-CVA approach.

3.12 The FSB and the BCBS published a report[5] on the findings of surveys on LIBOR transition undertaken by them. The report highlights the need for sustained efforts by both financial and non-financial institutions across jurisdictions to prepare for and facilitate the transition, noting that financial institutions in LIBOR jurisdictions have shown better progress in transitioning than those in non-LIBOR jurisdictions. The report recommends a three-pronged effort by authorities to support the transition involving (i) engaging with trade associations and periodically taking stock of LIBOR exposure of financial institutions; (ii) establishing a formal transition strategy and enhancing supervisory action in case of banks exhibiting tardiness in preparation; and (iii) promoting industry-wide coordination and exchange of information on best practices and challenges.

III.1.7 Holistic Review of the Market Turmoil in March 2020

3.13 The FSB published its review[6] of the unprecedented financial market turmoil in March 2020, which highlighted the fundamental repricing of risk and the heightened demand for safe assets as well as large and persistent imbalances in the

[4] BIS (2020): Targeted revisions to the credit valuation adjustment risk framework. July.

[5] Financial Stability Board (2020): Supervisory issues associated with benchmark transition, July.

[6] Financial Stability Board (2020): Holistic Review of the March Market Turmoil,November.

demand for and supply of liquidity needed to support intermediation. The review identified three main areas of focus going forward: (i) work to examine and address specific risk factors and markets that contributed to amplification shock; (ii) enhancing understanding of systemic risks in the non-banking financial intermediation (NBFI) space and the financial system as a whole, including interactions between banks and non-banks and cross-border spill-overs; and (iii) assessing policies to address systemic risks in the NBFI space.

III.1.8 Global Monitoring Report on Non-bank Financial Intermediation

3.14 The Financial Stability Board (FSB), in its recent report[7] on non-bank financial intermediation (NBFI), noted that the NBFI sector comprising mainly pension funds, insurance corporations and other financial intermediaries (OFIs)[8] grew at a faster pace than the banking sector and accounted for 49.5 per cent of the global financial system in 2019. The expansion of collective investment vehicles (CIVs), which are inherently susceptible to runs, drove much of the growth. In EMEs, both the pace of growth of the NBFI sector itself and credit expansion by non-bank entities dependent on short-term funding, were faster as compared to AEs.

III.1.9 Climate Change Risk

3.15 The FSB in its recent report[9] on climate-related risk has noted that the value of financial assets/liabilities could be affected either by continuation in climate change (physical risks), or by an adjustment towards a low-carbon economy (transition risks). The manifestation of physical risks could lead to a sharp fall in asset prices and increase in uncertainty. A disorderly transition to a low carbon economy could also have a destabilising effect on the financial system. Climate-related risks may also give rise to abrupt increases in risk premia across a wide range of assets amplifying credit, liquidity and counterparty risks. Such changes could lead to a self-reinforcing reduction in bank lending and insurance provision. The report also observes that the efficacy of actions taken by financial firms to mitigate climate-related risks may be hampered by lack of data with which to assess clients' exposures to climate-related risks or the magnitude of climate-related effects.

III.1.10 Risks from Outsourcing and Third-party Relationships

3.16 The FSB published a discussion paper[10] identifying the regulatory and supervisory issues relating to outsourcing and third-party relationships. One of the key concerns highlighted is the possibility of systemic risk arising from concentration in the provision of some outsourced and third-party services to financial institutions (FIs) wherein an outage or failure at a single third party could create a single point of failure with potential adverse consequences for financial stability.

III.1.11 Development of Capital Markets in Emerging Markets

3.17 The International Organization of Securities Commissions (IOSCO) published its final report[11] examining the challenges and opportunities that emerging market (EMs) jurisdictions face in developing their capital markets. Some challenges identified by the IOSCO include weak institutional and legal frameworks, low levels of economic development, and high levels of financial and social

[7] Financial Stability Board (2020): Global Monitoring Report on Non-Bank Financial Intermediation, December.

[8] OFIs (other financial intermediaries), a subset of NBFI sector include investment funds, captive financial institutions and money lenders, central counterparties, broker-dealers, finance companies, trust companies and structured finance vehicles.

[9] Financial Stability Board (2020): The Implications of Climate Change for Financial Stability, November.

[10] Financial Stability Board (2020): Regulatory and Supervisory Issues Relating to Outsourcing and Third-Party Relationships, November.

[11] IOSCO (2020): Development of Emerging Capital Markets: Opportunities, Challenges and Solutions, October.

risk. In addition, abusive related-party transactions, disclosure failures, corruption scandals, and undue political interference act as disincentives for investors. While recognising that there is no one-size-fits-all approach to capital markets development, the report sets out the following five key recommendations: (i) preparing a holistic strategy for development of capital markets; (ii) ensuring that capital markets are fair and efficient for capital raising by increasing institutional investor participation, providing diversified investment options, and ensuring market confidence; (iii) ensuring adequate resources, power and capacity to securities regulators; (iv) establishing strong national and international cooperation; and (v) developing and implementing an efficient workplan for investor education and guidance.

III.2 Domestic Developments

3.18 The Financial Stability and Development Council (FSDC) and its Sub Committee (FSDC-SC) continued to monitor evolving conditions in the financial system through formal and informal interactions. In its 23rd meeting on December 15, 2020 chaired by the Finance Minister, the Council reviewed major global and domestic macroeconomic developments and financial stability issues with special reference to vulnerability related issues and noted that the policy measures taken by the Government of India and the financial sector regulatory authorities have ensured a faster economic recovery in India relative to initial expectations, as reflected in the reduced contraction of GDP in Q2 of 2020-21. The economy has gained momentum and the path to recovery will be faster than what was predicted earlier. Discussions were held on further measures which may be required to be taken to ensure consistent support to the financial sector, while continuing to maintain financial stability. Challenges involved in smooth transition of London Interbank Offered Rate (LIBOR) based contracts to alternative benchmarks were discussed. It noted that a multipronged strategy involving relevant stakeholder institutions and departments is required in this regard.

3.19 At its 25th meeting held on August 31, 2020, the FSDC-SC reviewed global and domestic developments and the state of financial markets that impinge on financial stability. It discussed issues relating to inter-regulatory coordination and the working of its inter-regulatory technical groups. It also reviewed the initiatives and activities of National Centre for Financial Education (NCFE) and the functioning of State Level Coordination Committees (SLCCs) in various states/UTs. Regulators reaffirmed their commitment to continue coordinating on various initiatives and measures to strengthen the financial sector in these extraordinarily challenging times.

III.3 Initiatives from Regulators/Authorities

3.20 The Reserve Bank and other financial sector regulators have kept up their multidimensional efforts to maintain financial stability and to mitigate the impact of COVID-19. These measures are essentially directed at continuing and complementing the earlier liquidity and regulatory support to ease constraints posed by the pandemic for maintaining market integrity and resilience.

III.3.1 Credit Related Measures

3.21 The Reserve Bank announced a resolution framework to mitigate the impact of the pandemic-induced stress on borrowers and to facilitate revival of real sector activity in August 2020. It provides a window under the prudential framework to enable lenders to implement a resolution plan in respect of eligible corporate exposures without change in ownership, while classifying them as 'standard' but subject to specified conditions and also includes personal loans. Subsequently, broadly accepting the recommendations of the Expert Committee (Chairman: Shri K V Kamath) the Reserve Bank

notified the financial parameters and the sector-specific thresholds to be considered while finalising resolution plans for exposures other than personal loans under the resolution framework.

3.22 Continuing its support to the micro, small and medium enterprises (MSME) sector, the Reserve Bank extended the existing restructuring framework for MSMEs upto March 31, 2021 covering borrowers whose aggregate exposure, including non-fund exposures, does not exceed ₹25 crore and which are classified as 'standard' as on March 1,2020, without a downgrade in the asset classification, subject to certain conditions.

3.23 The Government of India as part of its 'Atma Nirbhar Bharat Abhiyan' (self-reliance) package extended the Emergency Credit Line Guarantee Scheme (ECLGS 1.0) upto March 31, 2021 and raised the loan size eligibility ceiling. The Government also launched a second version of the Scheme (ECLGS 2.0) offering credit guarantee for loans by banks and NBFCs to identified stressed sectors. The Reserve Bank permitted lending institutions to assign zero risk weight to the credit facilities extended under the scheme to the extent of guarantee coverage.

III.3.2 Support for the NBFC sector

3.24 NBFCs were adversely impacted by COVID-related stress due to their underlying business models. On the supply side, the sources of funds dried up, more so for the small and mid-sized NBFCs, on account of reduced risk appetite of banks for low rated and unrated exposures. The situation was worsened by the unprecedented redemption pressure overshadowing the mutual fund industry, resulting in a spike in spreads. On the demand side, it became difficult for NBFCs to find creditworthy projects and borrowers to lend to as a result of the pandemic induced stress.

3.25 A key measure taken by the Reserve Bank and Government of India during H1:2020-21 to ameliorate the liquidity constraints faced by NBFCs, was to set up a Special Purpose Vehicle (SPV) to purchase short-term papers from eligible NBFCs/HFCs, which could then utilise the proceeds to extinguish their existing liabilities. The special securities issued by the SPV were guaranteed by the Government of India and would be purchased by the Reserve Bank. Additionally, the scope of the Government scheme on partial credit guarantee (PCG) was expanded to cover the borrowings of lower-rated NBFCs, HFCs and MFIs.

III.3.3 Insurance Sector

3.26 In view of the multifarious risks arising in the wake of the COVID-19 pandemic, the Insurance Regulatory and Development Authority of India (IRDAI) constituted a Working Group to explore the possibility of addressing these risks through the mechanism of a "Pandemic Risk Pool". The Group has proposed a Government backstop of about ₹75,000 crore in the initial stages, investment of pool premium collected in Government securities or specifically designed Government bonds and mandatory participation for the sectors which are covered.

III.3.4 Customer Protection

3.27 In the context of the pandemic, the use of digital modes for conducting transactions gathered substantial traction. *Pari passu*, the risks of new users falling prey to various forms of online frauds also increased. In this regard, the Reserve Bank intensified its multi-lingual awareness campaigns on safe digital banking, instructions on limited liability of customers in fraudulent electronic transactions and the Ombudsman scheme, over different media platforms. The Reserve Bank also issued instructions[12] requiring authorised payment

[12] RBI (2020): "Increasing Instances of Payment Frauds – Enhancing Public Awareness Campaigns Through Multiple Channels", Circular No. RBI/2019-20/256 DPSS.CO.OD.No.1934/06.08.005/2019-20, June.

system operators and participants (banks as well as non-banks) to undertake targeted multi-lingual campaigns to educate their users on safe and secure use of digital payments.

III.3.5 Resolution and Recovery

3.28 Recent developments have necessitated calibration of the insolvency framework to prevent otherwise viable enterprises from being forced into insolvency proceedings on account of the financial stress induced by the pandemic. Towards this end, the Government of India, by notification, has raised the threshold amount of default required to initiate an insolvency proceeding from ₹1 lakh to ₹1 crore and has also inserted Section 10A in the IBC for suspension of initiation of the corporate insolvency resolution process (CIRP) of a corporate debtor for any default arising on or after March 25, 2020 for a period of six months, which was further extended by six months in two tranches of three months each i.e., up to March 24, 2021.

III.4 Other Regulatory Developments

3.29 In addition to taking targeted measures to address COVID-related dislocations, financial sector regulators kept up their efforts to strengthen the resilience of regulated entities, support robustness of market infrastructure and promote the ease of operations for market participants (Annex 3). Some of these initiatives are highlighted below.

III.4.1 Bilateral Netting of Contracts

3.30 In a major step towards promoting financial sector stability and development, the Bilateral Netting of Qualified Financial Contracts Act, 2020 came into effect from October 01, 2020. It recognises bilateral netting for all qualified financial contracts entered into between qualified financial market participants, and also ensures the enforceability of collateral associated with the contract. In its absence, when one of the counterparties to a set of financial contracts went into bankruptcy, there was uncertainty on enforceability of collateral and the other counterparty would have to continue to make the payment as per the financial contracts, though there would be uncertainty on receiving the payment from the counterparty who has gone into bankruptcy. The new legislation carries substantial benefits for the financial sector in terms of conserving capital for banks, encouraging market participants to use derivatives including credit default swaps (CDS) for risk hedging and risk mitigation. It will also help in deepening of the bond market by facilitating corporate bonds issuance by low rated issuers. It will also enable market participants to exchange margins for non-centrally cleared OTC derivatives (NCCDs) on a net basis.

Payment and Settlement Systems

III.4.2 Launch of RTGS 24x7

3.31 The Reserve Bank's Payment Systems Vision 2021 aspires to ensure efficient and uninterrupted availability of safe, secure, accessible and affordable payment systems. In pursuance of this vision, and to expand flexibility for businesses for effecting payments, the Reserve Bank made the Real Time Gross Settlement (RTGS) system available round the clock on all days of the year from December 14, 2020. India has become one of the few countries in the world to achieve this milestone. The RTGS 24x7x365 was implemented on the back of operationalising round the clock National Electronic Fund Transfer (NEFT) system a year ago. The RTGS presently handles around 6 lakh transactions daily for a value of around ₹4 lakh crore across 237 participant banks with the average ticket size of ₹57.96 lakh (November 2020).

III.4.3 Remittances through Indian Payment Systems

3.32 The payment and settlement systems vision of the Reserve Bank envisages the scope for enhancing

the global outreach of India's payment systems, including remittance services, through active participation and co-operation in international and regional fora by collaborating and contributing to standard-setting. In order to bestow undivided attention towards this goal, the National Payments Corporation of India (NPCI) was encouraged to incorporate a wholly owned subsidiary for international business, *viz.,* NPCI International Payments Limited. Work is being undertaken to strengthen the international presence of RuPay cards and build inter-regional partnerships to enhance foreign inward remittances to India using the Unified Payments Interface (UPI).

III.4.4 Digital Transactions – Streamlining Quick Response (QR) Code Infrastructure

3.33 Based on a review of the existing system of Quick Response (QR) Codes in India, measures were taken to reinforce the acceptance infrastructure and provide better user convenience through interoperability and enhanced system efficiency.
The measures include (i) continuation of the existing interoperable QR codes *viz.,* UPI QR and Bharat QR; (ii) migration by payment system operators using proprietary QR codes to one or more interoperable QR codes by March 2022; and (iii) continuation of the consultative process by the Reserve Bank to standardise and improve interoperable QR codes to enable beneficial features.

III.4.5 Oversight Framework for Financial Market Infrastructures (FMIs) and Retail Payment Systems (RPS)

3.34 With the changing payments and settlements ecosystem, the oversight framework for financial market infrastructures (FMIs) and retail payment systems (RPSs) has been modified by the Reserve Bank to incorporate the supervisory framework for payment system operators as well as supervisory considerations that have arisen in the intervening period. The framework details the oversight objectives and supervisory processes as well as the assessment methodology of FMIs and system-wide important payment systems under the IOSCO's Principles for financial market infrastructures (PFMIs). The Reserve Bank has laid down the point of arrival (PoA) and performance metrics (PM) to assess and monitor payment systems and participants.

III.4.6 LIBOR Transition in the Indian Context

3.35 The Reserve Bank has been monitoring international and domestic developments and sensitising banks about the need to be prepared for LIBOR cessation. The Indian Banks Association (IBA) has been tasked with working out the step-by-step transition plan.

3.36 In the domestic market, LIBOR linked exposures are spread across loan contracts (*e.g.*, external commercial borrowings [ECBs]), floating rate deposits, derivatives linked to LIBOR or to MIFOR (*i.e.*, Mumbai Interbank Forward Offer Rate, which is a domestic benchmark based on LIBOR) and sovereign loans raised from multilateral institutions which are referenced to LIBOR (Table 3.1). Also, there are trade contracts referenced to LIBOR, but these are short term in nature.

Table 3.1 : LIBOR Linked Exposures of Various Financial Contracts in India

Financial Contract	Exposure
External Commercial Borrowing (ECB)*	$74 billion
FCNR (B) Deposit*	$24 billion
Cross Currency Swap$	$83 billion
FCY Interest Rate Swap$	$260 billion
MIFOR Interest Rate Swap$	$91 billion

Note : *As on March 31, 2020; $ As on August 31,2020.
Source : Bloomberg and RBI staff calculations.

3.37 The key steps to be taken to ensure a smooth transition in the Indian context include: (i) development of alternate methodologies to replace MIFOR; (ii) development of fallback clauses that are customised to the Indian market but based on practices adopted globally; (iii) promoting stakeholder awareness to deal with issues around the contract renegotiation; and (iv) notifying a cut-off date closer to the LIBOR cessation date beyond which institutions should cease to enter into new contracts that make reference to LIBOR. This is also dependent on the evolution of the global adoption of financial contracts that reference alternative reference rates (ARRs).

III.4.7 Cyber Security

3.38 The Indian Computer Emergency Response Team (CERT-In) has undertaken several measures to strengthen cyber resilience of financial entities in the country. These include: (i) cyber security exercises/ drills; (ii) operating Cyber Swachhta Kendra (Botnet Cleaning and Malware Analysis Centre); (iii) disseminating cyber threat intelligence in real time; (iv) sharing tailored advisories with the CISO community in the financial sector; (v) releasing the report of the Secure Digital Payments working group for Asia Pacific CERT members to address security threats and evolve best practices to secure digital payments; (vi) developing a toolkit (as a member of the Financial Stability Board) on Cyber Incident Response and Recovery for enhancing cyber resilience; and (vii) establishment of Financial Sector Computer Security Incident Response Team (CSIRT-Fin) under the umbrella of CERT-In since mid-May 2020.

3.39 The Reserve Bank has been placing emphasis on digital banking, which has a massive customer base now. There is a need for all financial entities to invest adequately in secure, robust, scalable and fault-tolerant IT infrastructure so that they remain competitive, expansion plan is well supported and public confidence is maintained. Inability to manage the operational risk/s, particularly, controlling the incidence of frauds, both cyber-related and otherwise, is another visible area of concern in the arena of fraud risk management. The Reserve Bank takes appropriate supervisory action on case-to-case basis depending on concerns / deficiencies.

3.40 With an aim to strengthen the cyber resilience of the primary (urban) co-operative banks (UCBs) against the evolving IT and cyber threat environment, the Reserve Bank released the 'Technology Vision for Cyber Security: 2020-2023' for UCBs, based on inputs from various stakeholders. It envisages a five-pillared strategic approach covering (i) governance oversight; (ii) Utile technology investment; (iii) appropriate regulation and supervision; (iv) robust collaboration; and (v) developing necessary IT and cyber security skills sets. It aspires to (a) involve more oversight by banks' Board over cyber security; (b) enable UCBs to better secure their IT assets; (c) implement an offsite supervisory mechanism framework for UCBs on cyber security related controls; (d) develop a forum where UCBs can share best practices and discuss practical issues and challenges; and (e) implement a framework for providing awareness/ training for effective management of the associated risks by UCBs.

III.4.8 Risk Mitigation Measures

3.41 In the context of the use of multiple operating accounts by large borrowers, the Reserve Bank issued revised instructions aimed at improving credit discipline on opening current accounts for customers who have availed cash credit (CC) / overdraft (OD) facilities from the banking system. The formats of the Long Form Audit Report to be used by Statutory Auditors were reviewed and revised. All authorised payment systems operators and participants were advised to undertake targeted multi-lingual campaigns by way of short message services (SMSs)

and advertisements in print and visual media, to educate their users on safe and secure use of digital payments. In addition, instructions on reporting of frauds to law enforcement agencies, early warning signal (EWS) mechanisms, red-flagged accounts and commissioning of forensic audit are being reviewed. The Institute of Chartered Accountants of India (ICAI) is in the process of developing forensic accounting and investigation standards (FAIS) aimed at standardising the work undertaken by its members in this area.

III.4.9 Deposit Insurance

3.42 With the limit of deposit insurance in India raised to ₹5 lakh, insured deposits stood at ₹68,71,500 crore in March 2020 constituting 50.9 per cent of total assessable deposits at ₹1,34,88,900 crore. Fully protected accounts constituted 98.3 per cent of the total number of accounts. Of the total premium of ₹13,234 crore collected from member banks during 2019-20, commercial banks contributed 93 per cent and co-operative banks accounted for the remaining seven per cent. The premium received during H1: 2020-21 was ₹8,540 crore. The Deposit Insurance and Credit Guarantee Corporation (DICGC) sanctioned aggregate claims of ₹80.7 crore in respect of 10 co-operative banks during 2019-20.

Table 3.2 : Insured Deposits of Cooperative Banks(₹ crore)

Quarter ended	STCBs/ DCCBs Under Direction	UCBs Under Direction	Weak UCBs except (3)	Total (2+3+4)
(1)	(2)	(3)	(4)	(5)
June 2020	4,945	11,697	5,151	21,793
September 2020	4,945	11,688	5,151	21,784

Source: DICGC.

3.43 In case of observations of serious irregularities observed during inspections, the Reserve Bank issues directions to co-operative banks to protect the interests of depositors and in public interest. As at end-September 2020, insured deposits of banks under direction and weak banks constituted about 0.3 per cent of the total insured deposits of commercial and co-operative banks, and 18.2 per cent of the deposit insurance fund (Table 3.2).

III.4.10 Corporate Insolvency Resolution Process (CIRP)

3.44 As at the end of Q2:2020, the number of CIRPs admitted since the inception of the Insolvency and Bankruptcy Code (IBC) stood at 4008, with the manufacturing sector accounting for the largest share (Table 3.3 and 3.4).There was a sharp decline in the number of CIRPs during Q1 and Q2:2020 as compared to previous quarters, owing to temporary

Table 3.3 : Corporate Insolvency Resolution Process

(Number)

Quarter	CIRPs at the beginning of the Period	Admitted	Closure by				CIRPs at the end of the Period
			Appeal/ Review/ Settled	Withdrawal under Section 12A	Approval of Resolution Plan	Commencement of Liquidation	
2016-17	0	37	1	0	0	0	36
2017-18	36	705	90	0	20	90	541
2018-19	541	1152	141	95	80	306	1071
Q1:2019-20	1071	301	45	31	26	96	1174
Q2:2019-20	1174	588	46	43	33	155	1485
Q3:2019-20	1485	623	71	43	40	150	1804
Q4:2019-20	1804	441	62	46	36	135	1966
Q1:2020-21	1966	81	7	21	20	25	1974
Q2:2020-21	1974	80	10	12	22	68	1942
Total	**NA**	**4008**	**473**	**291**	**277**	**1025**	**1942**

These CIRPs are in respect of 3936 corporate debtors.
This excludes one corporate debtor, which has moved directly from BIFR to resolution.
Source: Compilation from website of the NCLT and filing by Insolvency Professionals.

Table 3.4 : Sectoral Distribution of CIRPs as on September 30, 2020

Sector	No. of CIRPs						
	Admitted	Closure by					Ongoing
		Appeal/ Review/ Settled	Withdrawal under Section 12 A	Approval of Resolution Plan	Commencement of Liquidation	Total	
Manufacturing	1639	163	118	140	449	870	769
Food, Beverages & Tobacco Products	208	17	10	15	58	100	108
Chemicals & Chemical Products	164	16	15	19	38	88	76
Electrical Machinery & Apparatus	118	14	4	5	45	68	50
Fabricated Metal Products	92	8	11	4	28	51	41
Machinery & Equipment	183	25	20	10	45	100	83
Textiles, Leather & Apparel Products	279	27	18	19	98	162	117
Wood, Rubber, Plastic & Paper Products	195	17	18	20	38	93	102
Basic Metals	286	26	11	35	73	145	141
Others	114	13	11	13	26	63	51
Real Estate, Renting & Business Activities	793	123	75	34	166	398	395
Real Estate Activities	188	36	16	5	18	75	113
Computer and related activities	115	15	12	1	29	57	58
Research and Development	5	1	1	1	0	3	2
Other Business Activities	485	71	46	27	119	263	222
Construction	428	70	36	26	76	208	220
Wholesale & Retail Trade	398	39	22	16	127	204	194
Hotels & Restaurants	93	15	9	10	20	54	39
Electricity & Others	124	11	3	10	22	46	78
Transport, Storage &Communications	119	15	7	9	40	71	48
Others	414	37	21	32	125	215	199
Total	**4008**	**473**	**291**	**277**	**1025**	**2066**	**1942**

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

suspension of the process, in the wake of the pandemic situation.

3.45 Of the CIRPs initiated, 277 ended in resolutions up to end-September 2020. Realisation by creditors under resolution plans in comparison to liquidation value stood at 185.2 per cent, while the realisation was 43.6 per cent in comparison to their claims (Table 3.5). Significantly, out of the above 277 resolutions, 91 corporate debtors were under Board for Industrial and Financial Reconstruction

Table 3.5 : Outcome of CIRPs initiated Stakeholder-wise, as on September 30, 2020

Outcome	Description	Financial Creditor	Operational Creditor	Corporate Debtor	Total
Status of CIRPs	Closure by Appeal/Review/Settled	124	343	6	473
	Closure by Withdrawal u/s 12A	88	198	5	291
	Closure by Approval of Resolution Plan	157	80	40	277
	Closure by Commencement of Liquidation	444	438	143	1025
	Ongoing	917	958	67	1942
	Total	**1730**	**2017**	**261**	**4008**
CIRPs yielding Resolution Plans	Realisation by FCs (% of Liquidation Value)	192.09	112.40	142.77	185.15
	Realisation by FCs as % of their Claims	46.84	21.80	25.30	43.56
	Average time taken for Closure of CIRP	444	406	443	433
CIRPs yielding Liquidations	Liquidation Value as % of Claims	6.35	9.19	9.89	7.20
	Average time taken for Closure of CIRP	336	304	306	318

Source: IBBI.

(BIFR) processes or defunct. The CIRPs which yielded resolution plans by the end of September 2020 took an average of 384 days (after excluding the time excluded by the Adjudicating Authority) for conclusion of the process.

3.46 Out of the CIRPs closed, nearly half yielded orders for liquidation. In 73.5 per cent of these cases (751 out of 1022 for which data is available), the corporate debtors were earlier with BIFR and / or defunct (Table 3.6) and the economic value in most cases had already eroded before they were admitted into CIRP. These corporate debtors had assets, on average, valued at less than five per cent of the outstanding debt amount.

Table 3.6 : CIRPs Ending with Orders for Liquidation till September 30, 2020

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	304	337	110	751
Resolution Value > Liquidation Value	67	35	26	128
Resolution Value ≤ Liquidation Value*	374	404	116	894

*: Includes cases where no resolution plans were received and cases where liquidation value is zero or not estimated.

Note: 1. There were 57 CIRPs, where corporate debtors were in BIFR or non-functional but had resolution value higher than liquidation value.

2. Data of 3 CIRPs is awaited.

Source: IBBI.

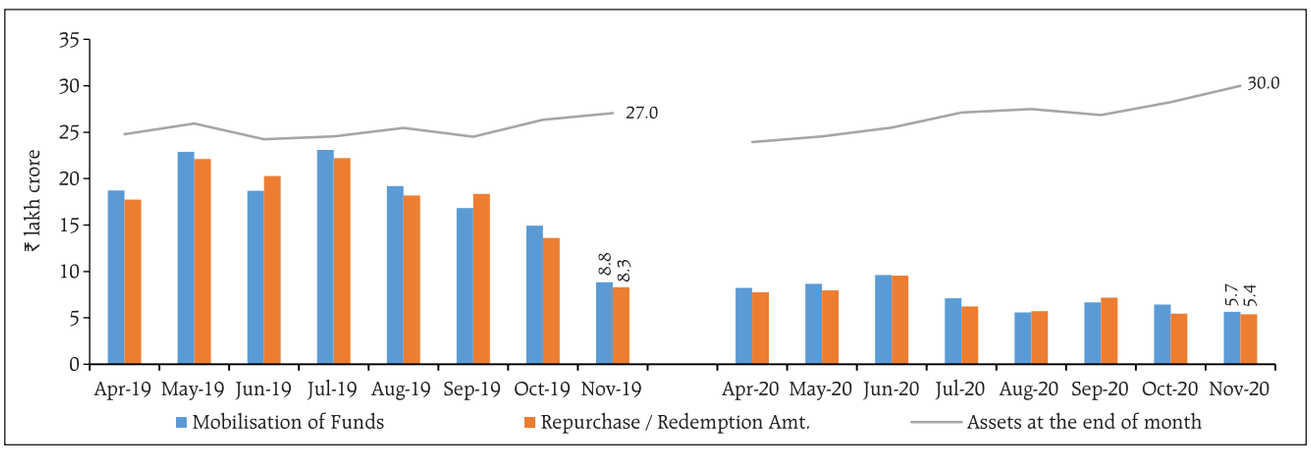
III.4.11 Mutual Funds

3.47 During the first half of 2020-21, net inflow of ₹1.5 lakh crore into mutual fund schemes was much higher than that of ₹0.6 lakh crore during the same period in the previous year. Income/debt-oriented schemes attracted the major share of the inflows (₹1.2 lakh crore) whereas growth/equity-oriented schemes accounted for a relatively meagre amount (₹2,496 crore). All other schemes together recorded inflows of ₹0.3 lakh crore.

3.48 The mutual fund industry's assets under management (AUM) increased by 10.9 per cent (y-o-y) at the end of November 2020 (Chart 3.1).

3.49 Systematic investment plans (SIPs) continued to remain a favoured choice for investors. During April–September 2020, the number of folios of SIPs increased by 22 lakh (Table 3.7).

Chart 3.1: Trends in Resource Mobilisation by Mutual Funds and AUM



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

Table 3.7: SIPs in 2020-21 (April 01, 2020 to September 30, 2020)

Existing at the beginning of the period (excluding STP)	Registered during the period	Matured during the period	Terminated prematurely during the period	Closing no. of SIPs at end of period	SIP AUM at the beginning of the period	SIP AUM at the end of the period
(Number in lakhs)					(in ₹ crore)	
315	72	15	35	337	2,38,821	3,75,968

Source: SEBI.

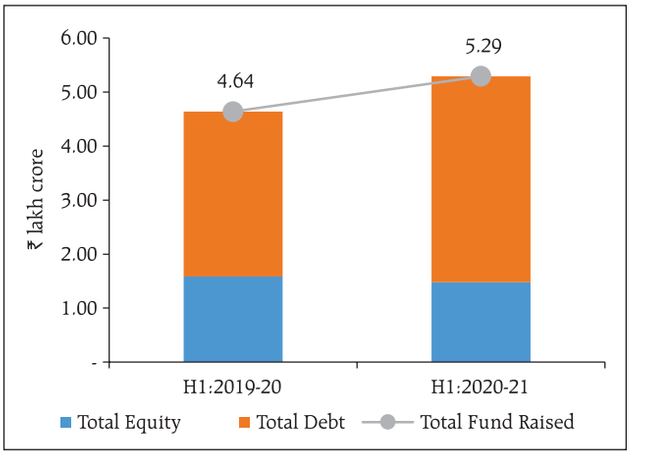
III.4.12 Capital Mobilisation - Equity and Corporate Bonds

3.50 Despite the pandemic, fund mobilisation from the primary market during the first half of 2020-21 was 14.1 per cent higher than in the corresponding period in 2019-20. This was owing to an increase of 24.9 per cent in funds raised through debt placements (through public issue and private placement). Fund mobilisation through equity declined by 6.6 per cent during the period (Chart 3.2).

3.51 During the first half of 2020-21, funds raised through QIPs went up by 152 per cent over the same period in the previous year, while those raised through preferential allotment fell by 78.3 per cent. Funds mobilised through public issues almost doubled during this period. In case of debt, private placement of debt increased by 27.7 per cent during H1 of 2020-21 compared to the same period in the previous year (Chart 3.3).

Chart 3.2: Capital Mobilisation in the Primary Market

(₹ lakh crore)



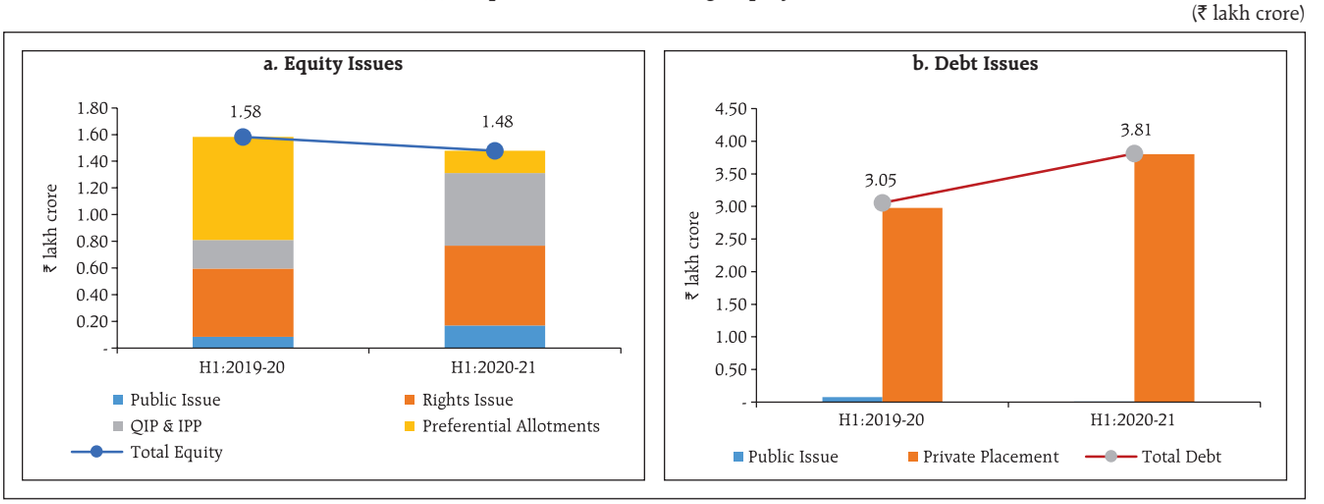
Source: SEBI.

III.4.13 Credit Ratings

3.52 On an aggregate basis, there was an increase in the share of downgraded/ suspended companies in total outstanding ratings during the quarter ending June 2020, as compared with the prior two quarters.

Chart 3.3 : Capital Mobilisation through Equity and Debt Issues

(₹ lakh crore)



Source: SEBI.

This share went down significantly, however, during the quarter ending September 2020 (Chart 3.4).

3.53 The rating downgrades during H1:2020-21 spanned various sectors; however, the proportion of downgrades relating to the NBFC and HFC sector as well as banks and financial services went down significantly during the September 2020 quarter as compared to the preceding quarter (Chart 3.5).

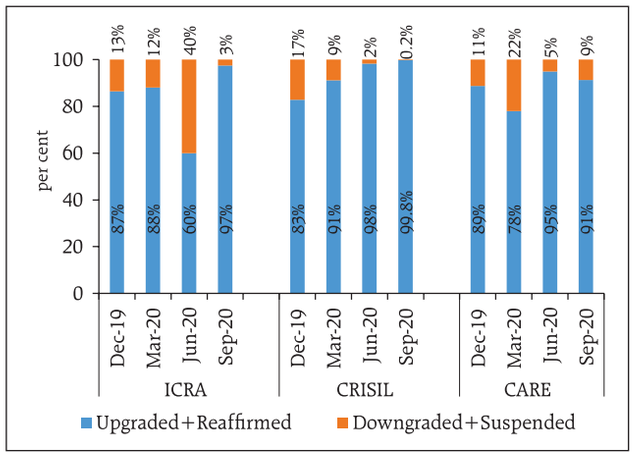
III.4.14 Commodity Derivatives Market

3.54 The impact of the COVID-19 pandemic on global commodity prices has been mixed, with the energy sector bearing the brunt and metals and agriculture prices falling less steeply in comparison (Chart 3.6). Precious metal prices continued to rise during the pandemic on safe haven demand. Of late, commodity prices have reverted from their lows in March/April 2020, boosted by a rebound in economic activity. The metal price surge has been led by the industrial upturn and surge in consumption by China.

Domestic Commodity Derivatives Market

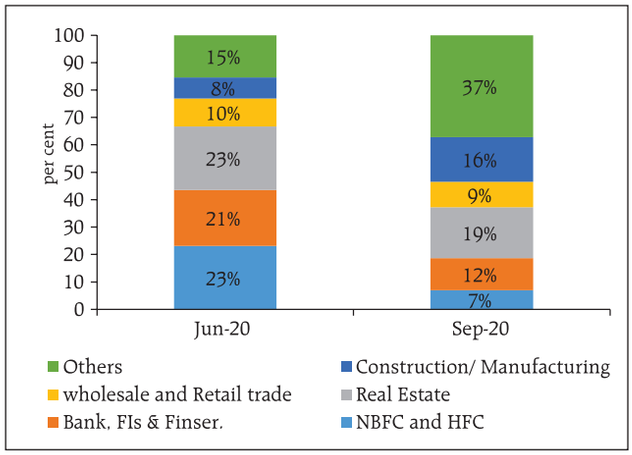
3.55 Favourable monsoons enabled a robust kharif crop and raised expectations of softening food prices as the lockdown related supply disruptions eased. Reflecting this, the benchmark commodity derivative indices, MCX iCOMDEX composite and Nkrishi index gained 27.2 per cent and 15.3 per cent,

Chart 3.4: Debt Issues of Listed Companies in terms of Rating Action



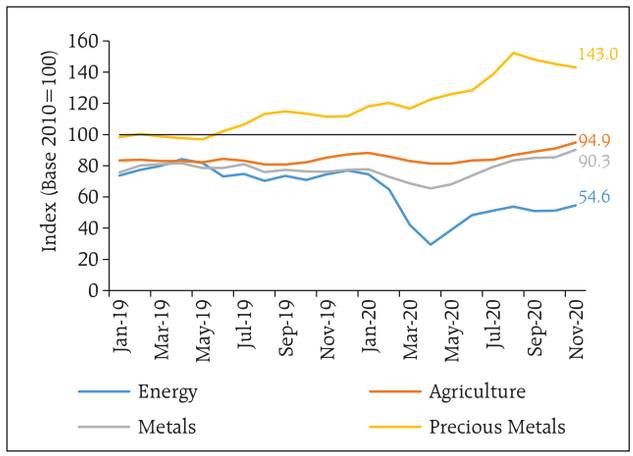
Source: Individual CRAs.

Chart 3.5: Distribution of Rating Downgrades- Sector wise



Source: Individual CRAs.

Chart 3.6: Movement of Global Commodity Price Indices

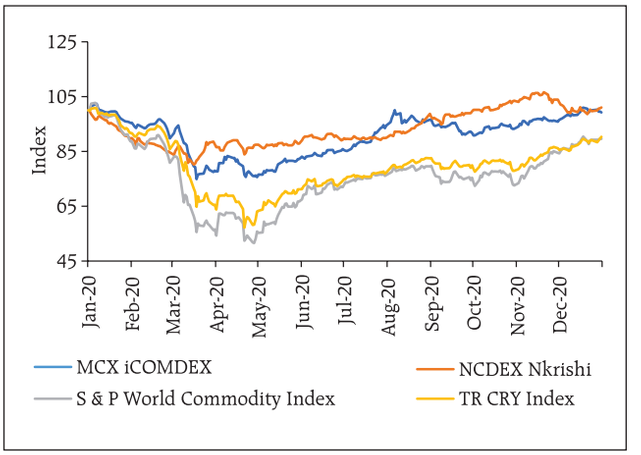


Source: World Bank.

respectively, during the financial year so far (up to December 31, 2020) (Chart 3.7).

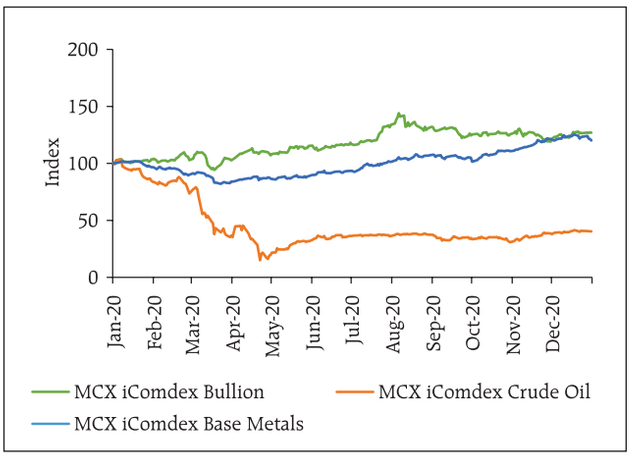
3.56 The recovery in the indices was more pronounced post July 2020 and the iCOMDEX Bullion index climbed by 23.7 per cent during the current financial year, as the safe haven demand for precious metals, especially gold, led to a historic rally in prices. The iComdex Crude oil index recovered from its record low in April 2020 rising by 10.1 per cent. The iComdex base metal index showed the most robust movement, with an increase of 42.9 per cent during 2020-21 so far (up to December 31, 2020) (Chart 3.8).

Chart 3.7: Domestic and International Commodity Futures Indices



Source: MCX, NCDEX and Bloomberg.

Chart 3.8 : Select Sectoral Indices



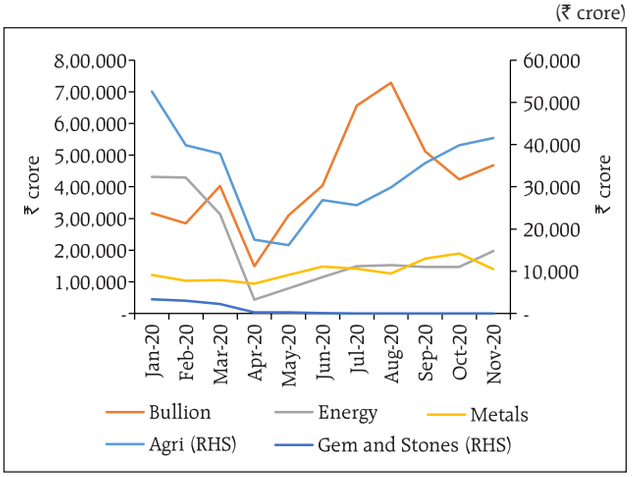
Source: MCX.

Trading Activity in the Commodity Derivatives Market

3.57 Despite an across-the-board decline of turnover in all segments except bullion, which increased by 93 per cent, the aggregate turnover in the commodity derivatives market, showed a marginal uptick of 3.2 per cent during 2020-21 (up to November 2020) as compared with the corresponding period last year (Chart 3.9 and Table 3.8). While the turnover of futures contracts declined by 2.8 per cent, that of the options segment increased by 227.6 per cent, driven by introduction of commodity options at BSE and NSE since June 2020. In contrast to the uptrend witnessed in turnover, the total traded contracts at NCDEX and MCX declined (y-o-y) by 31.2 per cent and 34.5 per cent, respectively, during the current year so far (up to November 2020). Traded volumes (in tonnes) in the metal and energy segments at MCX and the agri segment at NCDEX fell by almost 50 per cent.

Chart 3.9 : Commodity Derivatives Turnover at Exchanges (Futures and Options)

(₹ crore)



Source: BSE, ICEX, MCX, NCDEX and NSE.

Table 3.8: Segment-wise Turnover in Commodity Derivatives (Futures and Options)

(₹ crore)

Period/Turnover	Agri	Bullion	Energy	Metals	Gems and Stones	Total Turnover
2020-21 (April-November)	2,33,199	36,51,498	10,32,070	11,34,603	554	60,51,924
2019-20 (April-November)	4,05,549	18,85,570	24,23,082	11,33,187	16,728	58,64,116
y-o-y change (per cent)	-42.5	93.7	-57.4	0.1	-96.7	3.2
Share in Total Turnover (per cent; Nov,20)	4	60	17	19	0	100

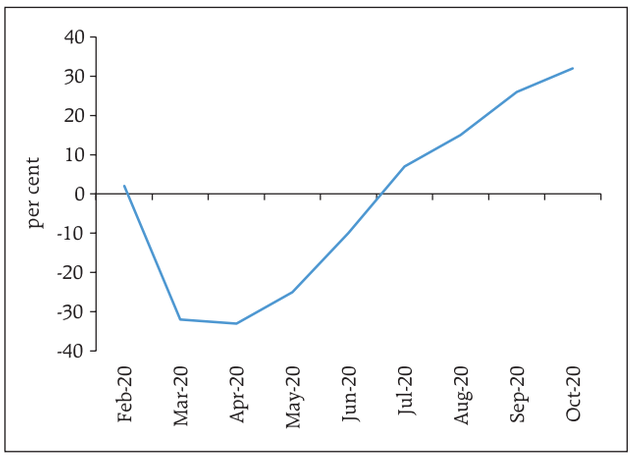
Source: BSE, ICEX, MCX, NCDEX and NSE.

3.58 Notwithstanding the overall challenging milieu, new products such as options in goods contracts in the agri segment and trading of index futures products like Agridex futures, Bulldex futures and Metaldex futures were introduced. The Index futures segment at MCX recorded a total turnover of ₹19,529 crore and that at NCDEX was ₹295 crore during this period.

III.4.15 Insurance

3.59 The impact of COVID-19 on new business premiums pertaining to life insurance was discernible in the negative double-digit growth rates registered beginning March 2020 and continuing up to June 2020 (Chart 3.10). This contraction was, however, completely offset in the subsequent months. New business premiums increased by 3 per cent on an y-o-y basis as at the end of October 2020. During the period, customers showed an increased preference for non-linked Insurance products that offer explicitly guaranteed benefits as compared with unit-linked insurance products.

Chart 3.10 : New Life InsuranceBusiness Premiums – Growth (m-o-m)



Source: IRDAI.

3.60 The impact of COVID-19 on the premium collection figures of non-life insurers was mixed. "Pull" products like fire and health insurance performed well, but regulatorily mandated insurance products dependent on economic factors (*e.g.*, marine, motor and crop insurance) did not fare well. Marine insurance contracted due to the fall in cargo movement. Crop insurance declined as some states opted out of the Pradhan Mantri Fasal Bima Yojana. While new motor insurance premium collections improved on account of higher vehicle sales post-

lockdown, premium collections from vehicle owners impacted by the work-from-home model were lower.

3.61 Regulatory initiatives taken by the Insurance Regulatory and Development Authority of India (IRDAI) had a positive impact on the growth of premiums in the health insurance business (Table 3.9).

3.62 Insurance premiums collected under various COVID-19 specific policies stood at around ₹865 crore for an insured sum of ₹13 lakh crore up to end-September 2020. Senior citizens (above 60 years in age) accounted for about seven per cent of the lives covered under 'Corona Kavach' policy and four per cent of lives covered under 'Corona Rakshak' and other COVID-19 specific products (Table 3.10).

3.63 From April to November 2020, the life insurance industry has received 12753 claims (where death was due to COVID-19 and related complications) worth ₹990 crore. In terms of value they constitute 0.3 per cent of total premium income in the same period. 11,464 death claims amounting to ₹687 crore have been settled and 1259 claims amounting to ₹303 crore are under process. This has no significant impact on the financials of the life insurers, so far. The claim paid ratio on the basis of number of claims is 92.76 per cent with respect to individual claims and 95.44 per cent in Group for the period April-September 2020 in comparison to 90.09 per cent and 96.47 per cent for the corresponding period last year. Thus, there is no significant impact of COVID-19 overall on death claim settlement.

III.4.16 Pension Funds

3.64 Enrolment as well as Assets under Management (AUM) of the National Pension System (NPS) and Atal Pension Yojana (APY) increased

Table 3.9: Growth in Health Insurance sector*

Type of Business	Q1:2020-21	Q1:2019-20	% Change	H1:2020-21	H1:2019-20	% Change
Government Business	631	961	-34.4	1,843	2,567	-28.2
Group Business	7,776	7,180	8.3	14,929	12,908	15.7
Individual Business	4,990	4,025	24.0	11,927	8,879	34.3
Total	**13,397**	**12,166**	**10.1**	**28,699**	**24,354**	**17.8**

Note *: Excluding Personnel Accident and Travel Insurance

Source: General Insurance Council.

Table 3.10 : Business in COVID specific Insurance Products
(April 1, 2020 to September 30, 2020)

Type of business / Units	No. of Policies	Lives covered	Total Sum Insured	Gross Premium
	Number		₹ Crore	
Corona Kavach	19,58,677	32,86,692	1,12,253	469.66
Corona Rakshak	3,80,270	4,42,812	7,481	57.03
Other COVID Specific products	36,954	73,39,399	11,70,851	338.12
Total	**23,75,901**	**1,10,68,903**	**12,90,585**	**864.81**

Source: IRDAI.

on a y-o-y basis (Table 3.11). In the effort towards financial inclusion of the unorganised sector and the low-income groups, 391 banks were registered under APY with the aim of expanding the coverage of citizens under the pension net.

Table 3.11 : Subscribers and AUM: NPS and APY

Sector	Subscribers (in lakhs)		AUM (₹ crore)	
	September 2019	September 2020	September 2019	September 2020
Central Government	20.26	21.30	1,24,703	1,60,606
State Government	45.51	48.97	1,86,849	2,50,260
Corporate	8.77	10.46	36,340	50,730
All Citizen Model	10.24	13.58	11,127	16,224
NPS Lite	43.40	43.17	3,631	4,068
APY	178.21	236.85	8,743	13,042
Total	**306.39**	**374.32**	**3,71,393**	**4,94,930**

Source: PFRDA.

III.4.17 International Financial Services Centres Authority (IFSCA)

3.65 The International Financial Services Centres Authority[13] (IFSCA) was set up in April 2020 to develop a strong global connect and focus on the needs of the Indian economy as well as to serve as an international financial platform for the entire region and the global economy as a whole. Specifically, the Authority is aiming to develop GIFT-IFSC as a destination for fund-raising by both Indian and foreign issuers, fintech start-ups and innovations, sustainable and green financing, bullion trading, aircraft leasing and financing, global in-house centres, fund management, international banking and reinsurance. It introduced frameworks for Regulatory Sandbox, Real Estate Investment Trusts (REITs) and Infrastructure Investment Trusts (InvITs) in IFSC and listing of depository receipts in IFSC, among others.

Summary and Outlook

3.66 Overall, the authorities' initial response to the COVID-19 pandemic was massive given the enormity of the problem. Prompt measures across monetary, liquidity, fiscal and financial regulatory domains kept the financial system well-lubricated and smoothly functioning. These early measures contained volatility and imbued confidence to the financial markets. In the medium run, the pandemic support packages have to be unwound in a calibrated manner with minimal disruption to restore the prudential norms to pre-pandemic levels.

3.67 Unrelated to the pandemic, the focus continues on other developmental and risk mitigation measures, including cyber security and the payments system, which would consolidate past gains and ensure the robust functioning of financial markets, underpinning financial stability enduringly.

[13] IFSCA was established in April 2020 as a unified regulator for development and regulation of financial institutions, financial services and financial products in the International Financial Services Centres (IFSCs). The country's first IFSC operates at the Gujarat International Finance Tec (GIFT) City, Gandhinagar.

Annex 1

Systemic Risk Survey

A systemic risk survey (SRS), the nineteenth in the series[1], was conducted during October-November 2020, to capture the perceptions of experts, including market participants, on the major risks faced by the Indian financial system. The survey results, based on 31 respondents, are encapsulated below.

Outlook on Major Risk Categories

2. In the broad category of risks to the financial system, respondents rated select institutional risks (*viz.,* asset quality deterioration; additional capital requirements; level of credit growth; and cyber risk) as 'high' (Figure 1 and 2). Global risks, macroeconomic risks and financial market risks were perceived as 'medium' in magnitude but certain components therein (*viz.,* global and domestic growth; domestic inflation; fiscal deficit; corporate vulnerabilities; infrastructure development; and equity price volatility) remain high (Figure 2).

3. This represents a clear shift from the SRS for April 2020[2], which was conducted during the early months of the pandemic and risks for all the major groups were rated as 'high'. Also, unlike in the previous survey round in which risks to economic growth (global and domestic) and fiscal deficit were assessed 'very high', none of the risks were categorised 'very high' by the respondents this time around.

Figure 1: Major risk groups identified in Systemic risk survey (October 2020)

Major Risk Groups	Oct-20	Apr-20	Change in Risk Perception
A. Global Risks			Decline
B. Macro-economic Risks			Decline
C. Financial Market Risks			Decline
D. Institutional Risks			Decline
E. General Risks			Decline

Source: RBI's Systemic risk survey (April 2020 & October 2020).

Note:
Risk Category

Very high	**High**	**Medium**	**Low**	**Very low**

[1] Responses for April 2020 round of SRS were received during April-May 2020 and those for October 2020 round were received during October-November 2020.
[2] Please see: https://www.rbi.org.in/Scripts/PublicationReportDetails.aspx?UrlPage=&ID=1150 for the results of the previous survey round.

Figure 2: Various risks identified in Systemic risk survey (October 2020)*

	Risk items	Oct-20	Apr-20	Change in Risk Perception
A. Global Risks	Global growth			Decline
	Sovereign risk / contagion			Decline
	Funding risk (External borrowings)			Decline
	Commodity price risk			Decline
	Other global risks			Decline
B. Macro-economic Risks	Domestic growth			Decline
	Domestic inflation			**Increase**
	Current account deficit			Decline
	Capital inflows/ outflows (Reversal of FIIs, Slowdown in FDI)			Decline
	Sovereign rating downgrade			Decline
	Fiscal deficit			Decline
	Corporate sector risk			Decline
	Pace of infrastructure development			Decline
	Real estate prices			Decline
	Household savings			Decline
	Political uncertainty/ governance /policy implementation			Decline
	Other macroeconomic risks			**Increase**
C. Financial Market Risks	Foreign exchange rate risk			Decline
	Equity price volatility			Decline
	Interest rate risk			Decline
	Liquidity risk			Decline
	Other financial market risks			Decline
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			**Increase**
	Operational risk			Decline
	Other institutional risks			No change
E. General Risks	Terrorism			**Increase**
	Climate related risks			**Increase**
	Social unrest (Increasing inequality)			Decline
	Other general risks			**Increase**

Source: RBI's Systemic risk survey (April 2020 & October 2020).

Note:
Risk Category

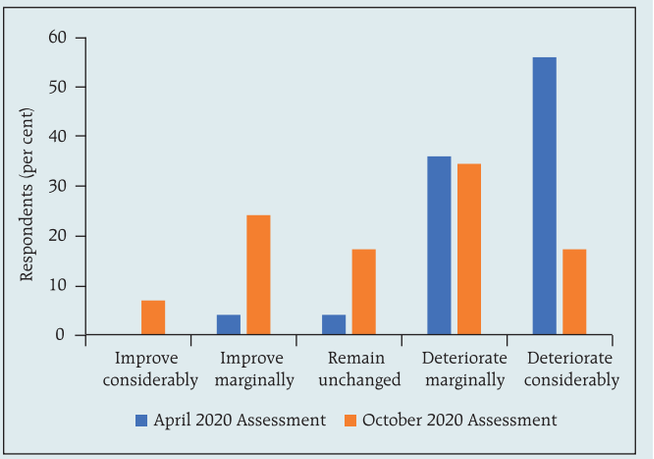
Very high	High	Medium	Low	Very low

* The risk perception, as it emanates from the systemic risk survey conducted at different points in time (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 Financial System

4. Over a third of the respondents expected marginal deterioration in the prospects of the Indian banking sector over the next one year on account of the negative impact on earnings, lower net interest margins, elevated asset quality concerns and a possible increase in provisioning requirements. On the other hand, about 24 per cent of the respondents felt that prospects are going to improve marginally (Chart 1). Even as the respondents expecting deterioration exceeded those expressing optimism over the next one year, the overall responses indicate a better outlook as compared with the previous round of the survey.

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



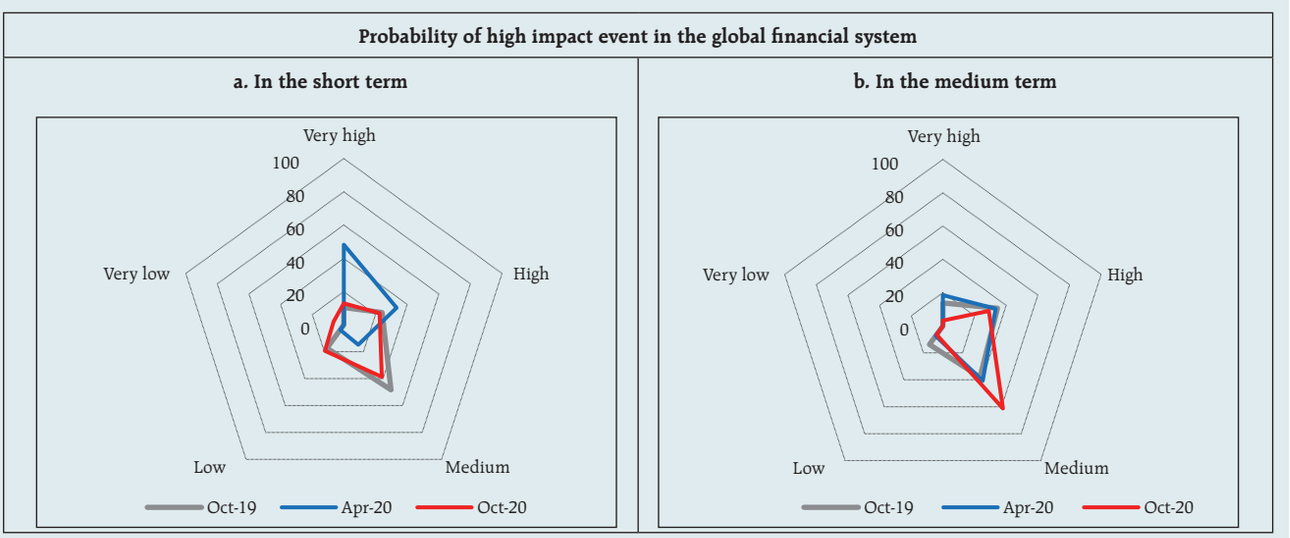
Source: RBI's Systemic risk survey (April 2020 and October 2020).

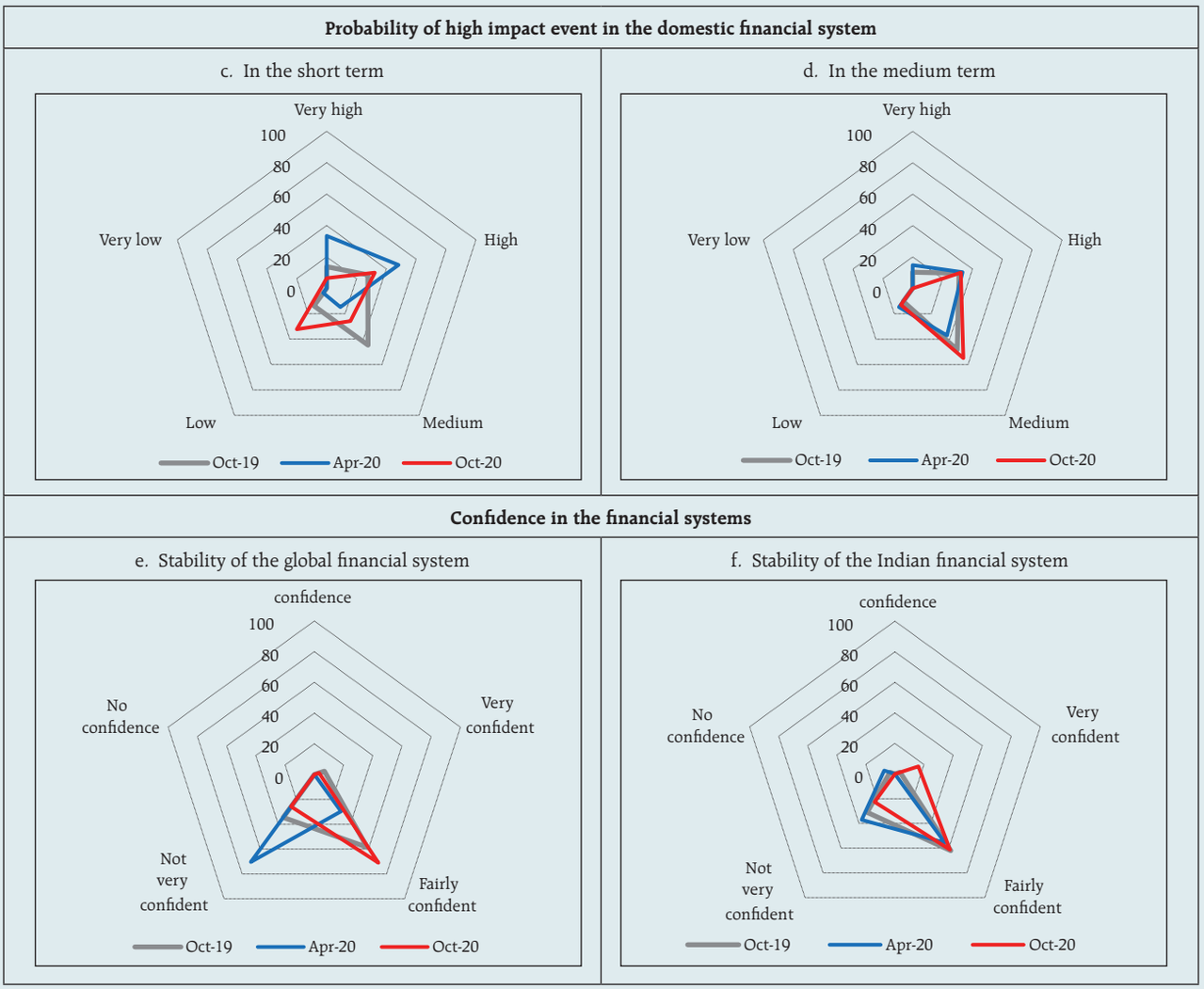
5. The majority of the respondents expect a 'medium' probability of occurrence of a high impact event in the financial system, in India as well as globally, in the medium term (one to three years). In the short-term (up to one year), the possibility of occurrence of a high impact event was assessed as low for India and 'medium' globally. These assessments contrasted with the previous round of the survey in which a high/very-high probability was assigned to the occurrence of a high impact event in the Indian/global financial system in the short-term.

6. Respondents also expressed higher confidence about financial stability than in the previous round of the survey. The share of respondents who were 'fairly confident' about the stability of the global and the Indian financial system stood at 71 per cent and 61.3 per cent, respectively (Chart 2).

Chart 2: Perception on occurrence of high impact events and confidence in the financial systems

Respondents (per cent)





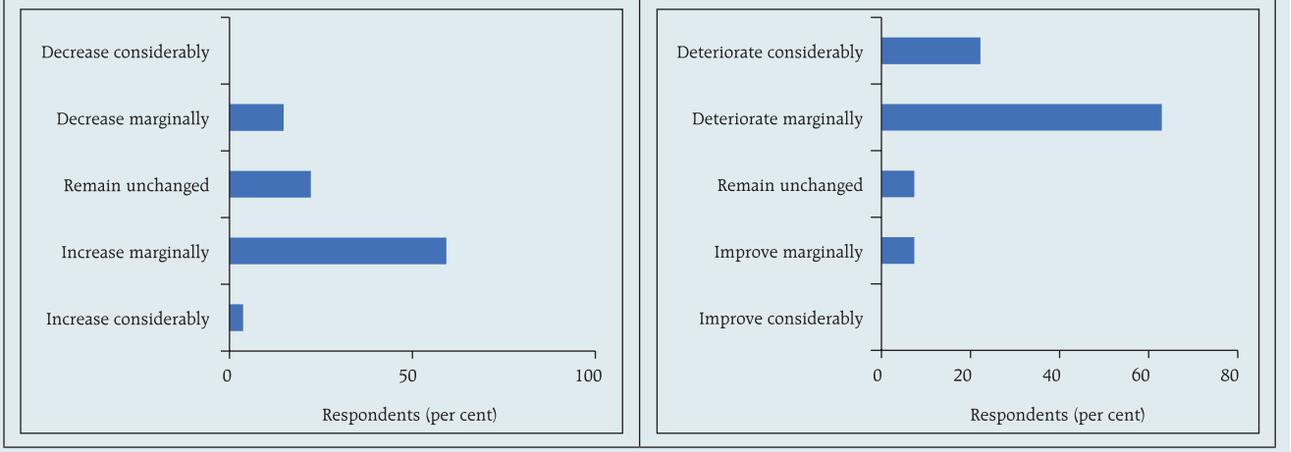
Source: RBI's Systemic risk surveys (October 2019, April 2020 and October 2020).

7. The majority of the respondents felt that credit demand would increase marginally over the next three months with better economic prospects. Average credit quality is expected to deteriorate marginally over this period (Chart 3) as the impact of the moratorium and lockdown is yet to play out completely in the books of banks. Poor repaying capacity of borrowers in many sectors, coupled with a decline in collection efficiency due to localised lockdowns, may also translate into a lower quality book.

COVID-19 Pandemic and Recovery

8. The survey respondents felt that tourism and hospitality, construction and real estate, aviation, automobiles and retail were the major sectors adversely affected by the COVID-19 pandemic (Table 1). Compared to the last survey round, more respondents expected recovery prospects for tourism and hospitality, aviation and automobile sectors. The slow pace of overall economic recovery and lingering uncertainty about the duration of the pandemic is, however, likely to moderate the revival prospects for the

Chart 3: Outlook on credit demand and its quality (October 2020)



Source: RBI's Systemic risk survey (October 2020).

travel, tourism and hospitality sectors. Demand and pricing pressures are expected to continue for the real estate sector (particularly for residential and retail sub-segments) over the next six months. For other sectors, gradual reduction in pandemic related restrictions may lead to marginal improvements.

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

(per cent of respondents)

Sector	Prospects of recovery in the next 6 months			
	Good	Moderate	No change	Bleak
Tourism and Hospitality		29	16.1	54.8
Construction and Real Estate	5	30	35	30
Aviation	5.3	36.8	10.5	47.4
Automobiles		71.4	14.3	14.3
Retail		66.7	16.7	16.7

Source: RBI's Systemic risk survey (October 2020).

9. Participants were asked to rank the major impediments to a robust economic recovery post COVID-19 in India (Table 2). Lack of robust private sector investment emerged as the topmost concern, followed by declining consumer spending/ confidence.

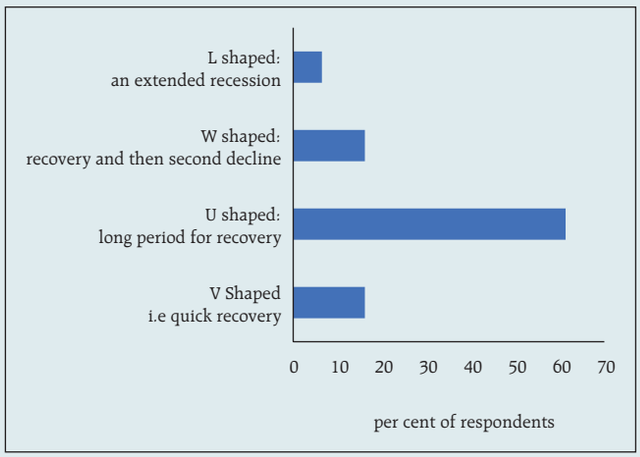
Table 2: Major Impediments to a Robust Economic Recovery post COVID-19

Concern	Rank
Lack of robust private sector investment	1
Declining consumer confidence/spending	2
Supply chain disruptions	3
Financial impact on operations and/or liquidity and capital	4
Workforce reduction/Employee stress	5
Lack of information for decision making	6
Impact on tax and trade issues	7
Lower productivity	8

Source: RBI's Systemic risk survey (October 2020).

10. Over 60 per cent of the respondents predicted that the post COVID-19 economic recovery is likely to be U-shaped, *i.e.*, immediate fall followed by a longer period to recovery (Chart 4), which was similar to the findings of the last survey. Another 16 per cent of the respondents expected a quick V-shaped recovery, which was not expected by any respondent in the previous survey round.

Chart 4: Possible shape of economic recovery (October 2020)



Source: RBI's Systemic risk survey (October 2020)

Risks to Domestic Financial Stability

11. The survey participants cited the following major factors as posing risks to domestic financial stability, going forward:

- Inflationary pressures coupled with poor GDP growth could limit the policy space for rate cuts and keep yields under pressure.
- The continuing adverse impact on MSMEs due to lack of cash flows, low demand, lack of man power and lack of capital could lead to prolonged stress in the sector and large-scale permanent closure of units with associated implications for employment.
- Real estate prices and cash flows in commercial real estate could undergo a major structural correction due to transformation in the model of conducting work, resulting in further pressure on real estate developers and lending to the sector.
- Ongoing stress in specific segments of the service economy, *viz.*, hotels, entertainment, travel, tourism and taxi services could lead to credit stress on corporate and retail assets in the financial system.
- For NBFCs, growth prospects in the immediate future could be affected by the dampened outlook for housing and vehicle finance, funding challenges especially for lower rated NBFCs in a confidence-sensitive scenario and tightening underwriting standards on expectation of increasing delinquencies.
- India is among the top three nations identified by investors as likely to suffer from significant debt distress. A global risk aversion towards EM assets could lead to massive capital outflows and create pressure on the rupee as well as on bond yields. In this context, uncertainty on the roadmap for tapering unconventional measures taken by the regulators could impact investor confidence.

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 1. 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. While bank group-wise slippage ratios are modelled using (i) multivariate regression and (ii) vector autoregression (VAR), the system level slippage ratio is 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, 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:

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

  where, α_1, β_1, β_2, β_3, β_4, β_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.

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

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 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 two different but complementary econometric models: multivariate regression and VAR. The final projection is derived by averaging the projections based on these two 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.

Estimation of GNPAs from slippages

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

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

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 5.8 per cent, 6.3 per cent, 6.7 per cent and 7.6 per cent respectively; recovery rates of 3.3 per cent, 2.6 per cent, 2.5 per cent and 2.5 per cent, respectively; write-off rates of 6.0 per cent, 7.3 per cent, 5.2 per cent and 4.3 per cent respectively; upgradation rates of 1.2 per cent, 1.2 per cent, 1.4 per cent and 1.1 per cent respectively during quarters ending December 2020, March 2021, June 2021 and September 2021.

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. ΔGDP 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: 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 I: 1 SD shock on GNPA (classified into sub-standard advances).
- Scenario II: 2 SD shock on GNPA (classified into sub-standard advances).
- Scenario III: 1 SD shock on GNPA (classified into loss advances).
- Scenario IV: 2 SD shock on GNPA (classified into 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 I: Cash outflows in the 1-28 days time-bucket goes up by 50 per cent (no change in cash inflows).
- Scenario II: 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 1SD and 2SD under medium and high-risk scenarios. Baseline scenario was presented based on

capital adequacy position of NBFCs reported as on March 2020. Credit exposure and RWA were assumed to grow at 75 per cent of 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 on provisioning requirements. Provisioning requirements were applied at 10% for substandard advances, at the existing proportion as on March 2020 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 EBPT for FY2019-20 to calculate new profit before tax (PBT). Tax rate of 22 per cent was applied to calculate profit after tax and complete PAT was accrued to existing capital with no dividend payment assumption. Based on new capital and RWA, new Capital to Risk weighted Assets Ratio 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

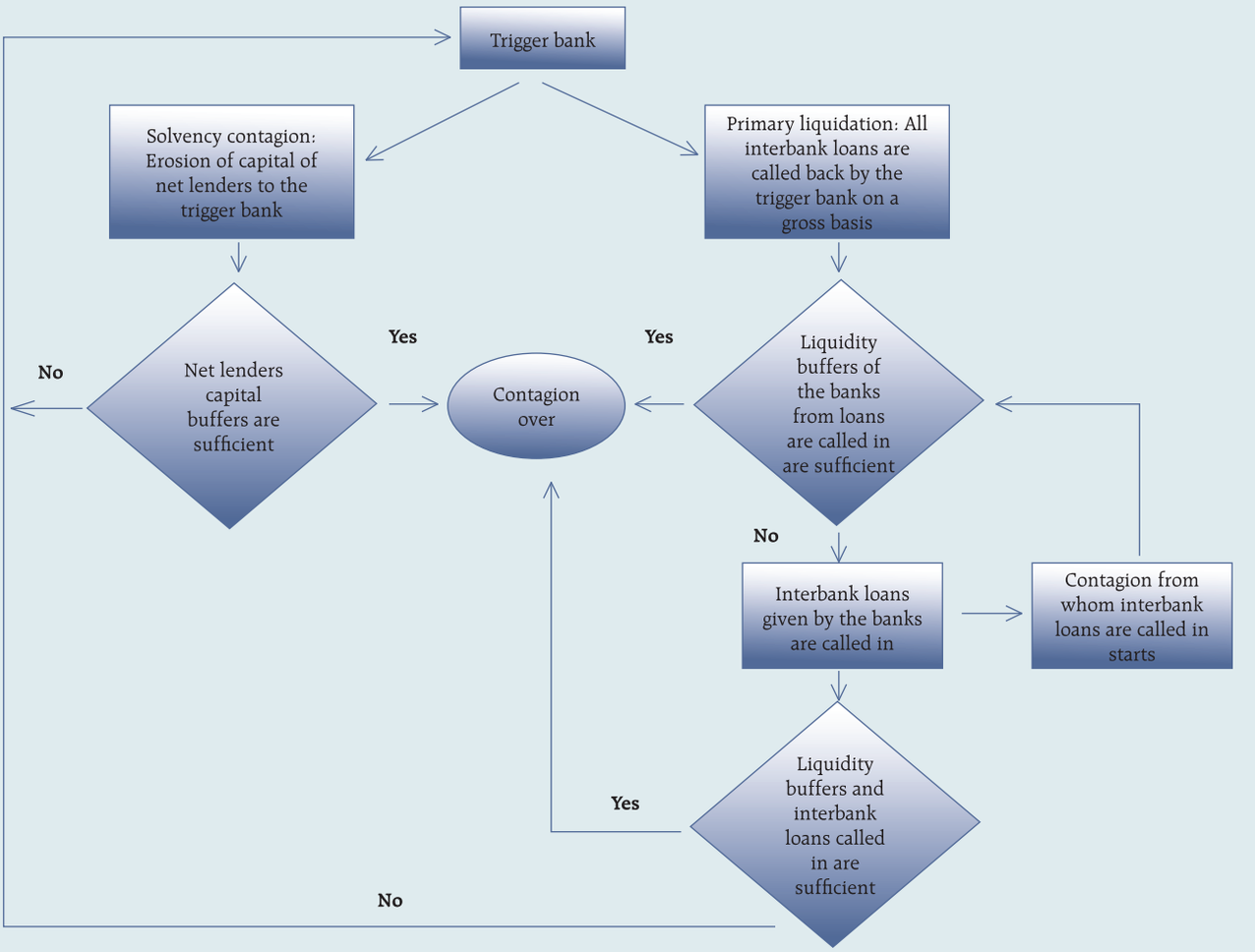
While the solvency contagion analysis assesses potential loss to the system owing to failure of a net borrower, liquidity contagion estimates potential loss to the system due to the failure of a net lender. The analysis is conducted on gross exposures between banks. The exposures include fund based and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

Date	Regulatory Measure	Rationale
June 24, 2020	**Loans sourced by banks and NBFCs over Digital Lending Platforms**: The key instructions issued to banks and NBFCs are: (i) To disclose names of digital lending platforms engaged as agents on the website of banks/ NBFCs. (ii) To direct digital lending platforms to disclose the name of the bank / NBFC on whose behalf they are interacting with the customer. (iii) To issue loan sanctioning letter on the letter head of the bank/ NBFC concerned. (iv) Furnishing copy of the loan agreement and all quoted enclosures at the time of sanction. (v) Ensuring effective oversight and awareness about grievance redressal mechanism.	To create transparency in digital lending and safeguarding customer interest.
August 06, 2020	**Increase in Loan to Value (LTV) ratio for gold loans:** LTV for loans against pledge of gold ornaments and jewellery for non-agricultural purposes has been enhanced from 75 per cent to 90 per cent up to March 31, 2021.	To mitigate the economic impact of the COVID-19 pandemic on households, entrepreneurs and small businesses.
August 06, 2020 and December 14, 2020	**Review of instructions for opening of Current accounts:** The revised instructions provide that no bank shall open current accounts for customers who have availed credit facilities in the form of cash credit (CC)/ overdraft (OD) from the banking system and all transactions shall be routed through the CC/OD account only. In case of customers who have not availed CC/OD facility from any bank, banks may open current accounts under certain conditions. Additional caveats have been placed for opening and operating the current account. The instructions were modified in December 2020 to exclude specific accounts which are stipulated under various statutes and regulatory instructions, from the restrictions placed in terms of the above-mentioned circular.	To improve credit discipline.

Date	Regulatory Measure	Rationale
August 06, 2020	**Resolution Framework for COVID-19-related Stress:** The instructions permit lenders to implement a resolution plan in respect of eligible exposures while classifying such exposures as standard, subject to specified conditions.	To facilitate revival of real sector activity and mitigate the impact of COVID-19 on the ultimate borrowers.
August 13, 2020	**Revised regulatory framework for Core Investment Companies -** Based on the recommendations of the Working Group to Review the Regulatory and Supervisory Framework for CICs and inputs received from stakeholders, the guidelines for CICs were revised.	To address complexity and multiple leveraging in the group; to strengthen risk management and corporate governance practices and induce transparency through disclosures.
September 01, 2020	**SLR holdings in HTM category**: Banks have been permitted to hold under Held to Maturity (HTM) category, SLR securities acquired on or after September 1, 2020 up to an overall limit of 22 per cent of NDTL, up to March 31, 2021. The dispensation was extended upto March 31, 2022 and further, it was also decided that enhanced HTM limit shall be restored to 19.5 per cent in a phased manner vide a circular issued on October 12, 2020.	To engender orderly market conditions and ensure congenial financing costs. To give more certainty to the markets about the status of these investments.
September 07, 2020	**Resolution Framework for COVID-19 related Stress – Financial Parameters:** The financial ratios and sector-specific thresholds to be considered by lending institutions while finalising the resolution plans in respect of eligible borrowers were specified.	To facilitate resolution of exposures other than personal loans, affected by COVID-19 related stress, based on objective parameters.
October 07, 2020	**Interest Subvention Scheme for MSMEs – Co-operative banks:** Co-operative Banks have been included as Eligible Lending Institutions from 3rd March 2020. The scheme provides an interest relief of 2% per annum to eligible MSMEs with coverage limited to all term loans/working capital to the extent of Rs 1 crore. The validity of the Scheme has been extended to March 31, 2021	To boost lending to the MSME sector.
October 12, 2020	**Regulatory Retail Portfolio – Revised Limit for Risk Weight:** The threshold limit of ₹5 crore for aggregated retail exposure to a counterparty was increased to ₹7.5 crore.	To reduce the cost of credit for the segment consisting of individuals and small businesses (*i.e.* with turnover of upto ₹50 crore), and also to harmonise with the Basel guidelines.

Date	Regulatory Measure	Rationale
October 16, 2020	Individual Housing Loan – Rationalisation of Risk Weights: The risk weights in respect of housing loans were rationalised, irrespective of the amount of the loan, for all new housing loans sanctioned, from the date of the circular and up to March 31, 2022.	To rationalise risk weights as a countercyclical measure.
October 22, 2020	**Review of regulatory framework for Housing Finance Companies (HFCs):** The revised regulatory framework for HFCs was notified.	While introducing the concept of principal business for HFCs and also defining housing finance, the revised guidelines aim at harmonizing the regulations of HFCs with that of NBFCs in a non-disruptive manner.
November 05, 2020	**Review of the Co-origination Model:** The scheme was recast as a "Co-Lending Model" (CLM), wherein banks are permitted to co-lend with all registered NBFCs (including HFCs) based on a prior agreement, and the co-lending banks will take their share of the individual loans on a back-to-back basis in their books. However, NBFCs shall be required to retain a minimum of 20 per cent share of the individual loans on their books.	To improve the flow of credit to the unserved and underserved sector of the economy and make available funds to the ultimate beneficiary at an affordable cost, considering the lower cost of funds from banks and greater reach of the NBFCs.
December 4, 2020	**Declaration of dividends by banks**: Banks were advised not to make any dividend payment on equity shares from the profits pertaining to the financial year ended March 31, 2020	To conserve capital to support the economy and absorb losses.
December 4, 2020	**Regional Rural Banks- Access to Call/Notice/ Term Money Market:** RRBs were permitted to participate in the call/notice and term money markets both as borrowers and lenders	To facilitate more efficient liquidity management by the RRBs.
December 4, 2020	**Regional Rural Banks- Access to RBI's Liquidity Facilities:** Liquidity Adjustment Facility (LAF) and Marginal Standing Facility (MSF) were extended to Scheduled RRBs.	To provide an additional avenue for liquidity management to Regional Rural Banks (RRBs).
December 14, 2020	**24x7 Availability of Real Time Gross Settlement (RTGS) System:** RTGS was made available for customer and inter-bank transactions round the clock, with effect from December 14, 2020.	To support global integration of Indian financial markets, facilitate India's efforts to develop international financial centers and to provide wider payment flexibility to domestic corporates and institutions.

2) The Securities and Exchange Board of India

Date	Regulatory Measure	Rationale
June 05, 2020	**Framework for Regulatory Sandbox**: SEBI regulated entities were granted certain facilities and flexibilities to experiment with Fintech solutions in a live environment and on limited set of real customers for a limited time frame.	For promoting innovation while protecting customers interests.
June 12, 2020	**Investment by the sponsor or asset management company in the scheme:** Sponsor or AMC are required to invest not less than one percent of the amount which would be raised in the new fund offer or fifty lakh rupees, whichever is less, and such investment shall not be redeemed unless the scheme is wound up	To ensure that sponsors or AMC of mutual funds have skin in the game.
June 23, 2020	Operational framework for **transactions in defaulted debt securities** post maturity date/ redemption date.	To permit lifting existing restrictions on trading of defaulted debt securities.
June 24, 2020	**Guidelines for Order-to-trade ratio (OTR)** for Algorithmic Trading were reviewed and modified	To rationalise algorithmic trading.
July 1, 2020	**Standard Operating Procedure (SOP)** was prescribed **for SEs / CCs / Depositories in cases where Trading Member(TM)/Clearing Member (CM) is likely to default** in repayment of funds or securities to clients.	To protect the interest of non-defaulting clients of a TM and /or non-defaulting clients/ TM(s) of the CM, in the likely event of default by TM / CM.
July 20, 2020	**Framework to Enable Verification of Upfront Collection of Margins from Clients in Cash and Derivatives segments**: Operational guidelines were issued for stock exchanges and clearing corporations to adopt a framework to enable verification of upfront collection of margins from clients in cash and derivatives segments.	To align and streamline the risk management framework of both cash and derivatives segments.
July 21, 2020	**Review of Stress Testing Methodology for Positions with Early Pay-in**: The norms related to core Settlement Guarantee Fund and standardised stress testing for credit for commodity derivatives were reviewed.	To address the concern regarding high stress loss figures on positions with early pay-in.

Date	Regulatory Measure	Rationale
September 01, 2020	**Review of debt and money market securities transactions disclosure:** Daily disclosure of the details of debt and money market securities transacted (including inter scheme transfers) in mutual fund schemes with a time lag of 15 days, were prescribed	To further enhance transparency in disclosure of portfolio of debt schemes.
September 21, 2020	**Alternate Risk Management Framework Applicable in case of Near Zero and Negative Prices for commodity prices** was introduced	To enable risk management framework to handle extreme volatility in commodity prices.
October 5, 2020	**Product Labelling in Mutual Fund schemes – Risk-o-meter:** Detailed guidelines were issued for evaluation of risk levels of a scheme, which shall be depicted by a risk-o-meter, to be evaluated on monthly basis starting January 2021.	To enhance disclosure to investors enabling them to take informed decisions.
October 6, 2020	**Additional framework for issuance, listing and trading of Perpetual Non-Cumulative Preference Shares (PNCPS) and Innovative Perpetual Debt Instruments (IPDIs)/ Perpetual Debt Instruments (PDIs)** was prescribed.	The nature and contingency impact of these instruments and the fact that full import of the discretion is available to an issuer, may not be understood in the truest form by retail individual investors. In this regard, additional framework related to issuance, listing and trading of PNCPS and IPDIs which are proposed to be listed, has been prescribed.
October 13, 2020	Standardised procedure to be followed by Debenture Trustee(s) in case of 'Default' by Issuers of listed debt securities was notified.	For enforcement of security and/or entering into an Inter-Creditor Agreement.
November 03, 2020	Creation of Security in issuance of listed debt securities and 'due diligence' by debenture trustee(s)	To ensure adequacy of assets for purpose of security creation.
November 05, 2020/ September 11. 2020	**Asset Allocation of Multi Cap Funds and Introduction of "Flexi Cap Fund" as a new category under Equity Schemes:** Multi Cap schemes of mutual funds are required to invest a minimum of 25 per cent each in large, mid and small cap stocks, with the balance 25 per cent giving flexibility to the fund manager. Further, MFs can convert an existing scheme to Flexi Cap Fund or launch a new scheme under Flexi Cap Fund.	To diversify underlying investments across caps and at the same time provide more flexibility to mutual funds.

Date	Regulatory Measure	Rationale
November 06, 2020	**Norms regarding holding of liquid assets in open ended debt schemes and stress testing of open ended debt schemes:** MFs are required at least 10% of their net assets in liquid assets (*i.e.* in cash, G-sec, T-bills and repo on Govt. Securities) in all open ended debt schemes (except overnight fund, liquid fund, Gilt Fund and Gilt fund with 10 year constant duration) and monthly stress testing is prescribed for all open ended debt schemes (except overnight funds).	To augment the liquidity risk management framework of open ended debt schemes.
November 12, 2020	Monitoring and Disclosures by Debenture Trustee(s).	To enable investors to ascertain the duties discharged by Debenture Trustee(s) and to enhance the accountability on part of Debenture Trustee(s).
December 21, 2020	Core Settlement Guarantee Fund, Default Waterfall and Stress Test for Limited Purpose Clearing Corporation (LPCC).	To ensure availability of adequate funds to meet out all the contingencies.

3) Insurance Regulatory and Development Authority of India

Date	Regulatory Measure	Rationale
June 26, 2020	Guidelines to all General and Health Insurers to offer **Individual COVID Standard Health Policy** were issued.	For offering customers a standardised insurance product covering COVID-19 expenses.
September 25, 2020	IRDAI has developed a methodology for **identification and supervision of Domestic Systemically Important Insurers (D-SIIs)**, and identified Life Insurance Corporation of India, General Insurance Corporation of India and The New India Assurance Co. Ltd as D-SIIs for the year 2020-21.	To identify D-SIIs and to subject such insurers to enhanced monitoring mechanism.

4) Pension Fund Regulatory and Development Authority

Date	Regulatory Measure	Rationale
	Digital Solutions	PFRDA has allowed comprehensive and digitally enabled solutions to meet subscribers' varied needs from on-boarding to exit, to increase the outreach of NPS.
June 08, 2020	Aadhaar based offline paperless KYC verification process for NPS On-boarding.	
June 15, 2020	OTP based authentication for paperless on-boarding.	
September 03, 2020	e- Nomination facility for NPS subscribers.	
October 29, 2020	Video Based Customer Identification Process (VCIP) for NPS.	
August 24, 2020	**Ombudsman for resolving grievances under NPS and APY**: PFRDA appointed an Ombudsman for resolution of complaints or grievances under the ambit of PFRDA (Redressal of Subscribers Grievances) Regulations, 2015.	To facilitate expeditious and inexpensive redressal of pension fund subscriber's grievances.
September 25, 2020	**Introduction of RFQ platform for Corporate Bond transactions**- Request for Quote (RFQ) to replicate the OTC market for purchase/sale of securities under NPS schemes and other pension schemes administered by PFRDA.	To bring about greater transparency, centralization and pooling of investor interest and, therefore, a more efficient and liquid secondary market.

5) The Insolvency and Bankruptcy Board of India

Date	Regulatory Measure	Rationale
June 30, 2020	**IP Regulations were amended** to allow the Insolvency Professional Entities (IPEs) to provide support services to any IP	To further professionalise insolvency services and enable IPs' access to regulated support services.
August 05, 2020	**Liquidation Process Regulations were amended** clarifying the fees payable to the liquidator on the amount realised but not distributed and on the amount distributed but not realised.	To provide clarity on fees payable to liquidator.
August 05, 2020	**Voluntary Liquidation Process Regulations were amended** to provide that a corporate person may replace the liquidator by appointing another insolvency professional as liquidator	To facilitate appointment of another resolution professional as the liquidator to conduct the voluntary liquidation process.

Date	Regulatory Measure	Rationale
August 07, 2020	**CIRP Regulations were** amended to facilitate ease of coordination and communication between the authorised representative and the creditors in the class he represents and streamline the process of voting on compliant resolution plans.	To facilitate insolvency proceedings.
September 24, 2020	**Application to Adjudicating Authority Rules** were amended to provide that a financial creditor when initiating CIRP against a corporate debtor (CD), shall serve a copy of the application to the registered office of the CD and to the Board before filing with the Adjudicating Authority.	To facilitate timely communication of initiation of CIRP to the CD against whom application has been filed and to facilitate effective data management and dissemination by IBBI.

6) International Financial Services Centres Authority (IFSCA)

Date	Regulatory Measure	Rationale
October 19, 2020	**Regulatory Sandbox:** A framework for "Regulatory Sandbox" was introduced	To enable entities operating in the capital market, banking, insurance and financial services to avail themselves of certain facilities and flexibilities to experiment with innovative fintech solutions in a live environment with a limited set of real customers for a limited time frame.
October 21, 2020	**Real Estate Investment Trusts (REITs) and Infrastructure Investment Trusts (InvITs):** These entities were permitted to list on the stock exchanges in GIFT IFSC.	To prescribe the regulatory framework for listing of REITs and InvITs incorporated in any FATF compliant jurisdictions on the stock exchanges in GIFT IFSC.
October 28, 2020	**Depository Receipts:** The regulatory framework for listing of Depository Receipts was laid down	To provide the framework for listing Global Depository receipts in IFSC.
November 13, 2020	**IFSCA (Global In-house Centres) Regulations, 2020:** The IFSCA (Global In-house Centres) Regulations, 2020 were notified.	To provide the regulatory framework for global in-house centres in IFSC, creating an opportunity for global financial institutions to conduct their global back-end activities in GIFT-IFSC.
November 20, 2020	**IFSCA (Banking) regulations, 2020:** The IFSCA (Banking) Regulations, 2020 were notified.	To provide principle-based regulations, balancing the objectives of risk mitigation and financial innovation.

Date	Regulatory Measure	Rationale
December 11, 2020	**The International Financial Services Centres Authority (Bullion Exchange) Regulations, 2020:** The regulatory framework for the bullion exchange, clearing corporations, depositories and vaults was laid down. Spot trading in bullion was introduced.	To provide the regulatory framework for bullion spot market in IFSC.