Financial Stability Report
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Foreword

We are in the midst of an unprecedented situation brought on by the COVID-19 pandemic, which has extracted unconscionable human and economic casualties. Its spread, intensity and duration has imparted extreme uncertainty not experienced in our lifetime. The loss of livelihood has been particularly severe on the vulnerable and disadvantaged.

Governments, central banks and other public agencies across countries have made coordinated efforts to alleviate financial stress and build confidence. These policy responses have stabilised the financial system and markets, although the outlook remains highly uncertain.

This report coincides with a growing disconnect between the movements in certain segments of financial markets and real sector activity. The pandemic hit India in a period of growth moderation. The ensuing disruptions in demand conditions and supply chains have been aggravated by global spillovers. Of late, signs of a gradual recovery from the nationwide lockdown are becoming visible.

The challenges that lie ahead have to be addressed with the overarching objective of preserving long term stability of the financial system, which is critical for nurturing the recovery. Going forward, once we enter the post-pandemic phase, the focus would be on calibrated unwinding of regulatory and other dispensations. Financial intermediaries will have to undertake reappraisal of their business models. Asset markets have to adapt to a new normal in a non-disruptive manner. Contagion risks warrant constant vigilance by all stakeholders in the financial system.

The financial system in India remains sound; nonetheless, in the current environment, the need for financial intermediaries to proactively augment capital and improve their resilience has acquired top priority. In the evolving milieu, while risk management has to be prudent, extreme risk aversion would have adverse outcomes for all.

In the period of social distancing, information technology platforms have worked well and these gains need to be consolidated. There is no room for complacency on cyber security.

Financial sector stability is a prerequisite for giving confidence to businesses, investors and consumers. We need to remain extremely watchful and focused.

Shaktikanta Das
Governor

July 24, 2020

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List of Select Abbreviations

ACB	Audit Committee of the Board
ACC	Additonal Credit Claims
AEs	Advanced Economies
AFS	Available For Sale
AIFI	All-India Financial Institutions
AMC	Asset Management Companies
AMFI	Association of Mutual Funds in India
APP	Asset Purchase Programme
APY	Atal Pension Yojana
ARC	Asset Reconstruction Company
AUM	Assets Under Management
BCBS	Basel Committee on Banking Supervision
BIFR	Board for Industrial and Financial Reconstruction
BOE	Bank of England
BOJ	Bank of Japan
BSI	Banking Stability Indicator
CAGR	Compounded Annual Growth rate
CBLO	Collateralised Borrowing and Lending Obligations
CCyB	Countercyclical Capital buffer
CD	Corporate Debtor / Certificate of Deposit
CDS	Credit Default Swap
CERT-In	Indian Computer Emergency Response Team
CET	Common Equity Tier
CIRP	Corporate Insolvency Resolution Process
COVID-19	Corona Virus Disease 2019
CP	Commercial Paper
CPI	Consumer Price Index
CRA	Credit Rating Agencies
CRAR	Capital to Risk-weighted Assets Ratio
CRILC	Central Repository of Information on Large Credits
CRR	Cash Reserve Ratio
CSF	Consolidated Sinking Fund
CSITE	Cyber Security and IT Risk
CTRF	Contingent Term Repo Facility
EBPT	Earnings Before Profit and Tax
ECB	European Central Bank
ECL	Expected Credit Loss
EIF	European Investment Fund
EMs	Emerging Markets
EPF	Employee Provident Fund
ETF	Exchange Traded Fund
EU	European Union
FB	Foreign Bank
FDI	Foreign Direct Investment
FII	Foreign Institutional Investor
FIs	Financial Institutions
FPI	Foreign Portfolio Investment
FSB	Financial Stability Board
FSDC	Financial Stability and Development Council
FSP	Financial Service Providers
GDP	Gross Domestic Product
GFC	Global Financial Crisis
GFSR	Global Financail Stability Report
GNPA	Gross Non Performing Assets
G-SIB	Global Systemically Important Bank
HFC	Housing Finance Companies
HFT	Held For Trading
HQLA	High Quality Liquid Assets
IAIS	International Association of Insurance Supervisors

IBC	Insolvency and Bankruptcy Code
IEA	International Energy Agency
IFCI	Industrial Finance Corporation of India
IIF	International Institute of Finance
IMF	International Monetary Fund
IOSCO	International Organization of Securities Commissions
IRAC	Income Recognition & Asset Classification
IRACP	Income Recognition, Asset Classification and Provisioning
IRDAI	Insurance Regulatory and Development Authority of India
JGB	Japanese Government Bond
KCC	Kisan Credit Card
KYC	Know Your Customer
LB	Large Borrowers
LCR	Liquidity Coverage Ratio
LT	Long Term
MFs	Mutual Funds
MFIs	Micro Finance Institutions
MSME	Micro, Small & Medium Enterprises
MTM	Mark To Market
MUDRA	Micro Units Development and Refinance Agency
NABARD	National Bank for Agriculture and Rural Development
NAV	Nat Asset Value
NBFC	Non Banking Financial Company
NBFC-D	Non Banking Financial Company - Deposit Taking
NBFC-ND-SI	Non Banking Financial Company - Non-Deposit Taking - Systemically Important
NCD	Non-convertible Debentures
NCLT	National Company Law Tribunal
NDTL	Net Demand and Time Liabilities
NEFT	National Electronic Funds Transfer
NII	Net Interest Income
NIM	Net Interest Margin
NNPA	Net Non Performing Assets
NPA	Non-performing Asset
NPS	National Pension System
NSFE	National Strategy on Financial Education
OC	Operational creditors
OECD	Organisation for Economic Co-operation and Development
OMO	Open Market Operations
OOI	Other Operating Income
OPEC	Organization of the Petroleum Exporting Countries
PELTRO	Pandemic Emergency Longer-term Refinancing Operation
PEPP	Pandemic Emergency Purchase Programme
PFRDA	Pension Fund Regulatory and Development Authority
PMFBY	Pradhan Mantri Fasal Bima Yojana
PMI	Purchasing Managers' Index
PSB	Public Sector Bank
PSU	Public Sector Undertaking
PVB	Private Sector Bank
QE	Quantitative Easing
QIP	Qualified Institutional Placement
REIT	Real Estate Investment Trusts
ROA	Return on Assets
ROE	Return on Equity

RTGS	Real-Time Gross Settlement
SCB	Scheduled Commercial Bank
SD	Standard Deviation
SIDBI	Small Industries Development Bank of India
SE	Supervised Entity
SFB	Small Finance Banks
SIP	Systematic Investment Plan
SLR	Statutory Liquidity Ratio
SMA	Special Mention Account
SRS	Systemic Risk Survey
ST	Short Term
SUCB	Scheduled Urban Cooperative Banks
TCS	Tax Collected at Source
TDS	Tax Deducted at Source
TFSME	Term Funding Scheme with Additional Incentives for Small to Mid-size Enterprises
TLTRO	Targeted Long Term Repo Operations
UCB	Urban Co-operative Banks
UNCTAD	United Nations Conference on Trade and Development
VAR	Value at Risk
WEO	World Economic Outlook
WTI	West Texas Intermediate

Overview

Macro-Financial Risks

The global economy is facing a sharp and broad-based contraction as COVID-19 takes its toll on top of already sluggish and slowing macroeconomic conditions. Resolute and wide-ranging actions by central banks and governments have restored a semblance of normalcy in financial markets, but the recovery depends on a host of factors, and especially on the intensity and duration of the pandemic and the discovery of a vaccine. Global geopolitical tensions, overleveraged non-financial sectors - particularly elevated debt levels among governments, businesses and households -, the ongoing losses of jobs and incomes impart heightened uncertainty to the outlook.

Domestic Economy and Markets

On the domestic front, the near-term economic prospects appear severely impacted by lockdown induced disruptions to both supply and demand side factors, diminished consumer confidence and risk aversion. While financial sector regulators and the Government have taken policy measures to ensure financial intermediation functions normally, and distress faced by disadvantaged sections of society is mitigated, the down side risks to short term economic prospects are high. Policy measures have so far kept financial markets from freezing up, and eased liquidity stress facing financial institutions and households. Consequently, borrowing costs have ebbed and illiquidity premia have shrunk. Nonetheless, risk aversion and lackluster demand have impeded the fuller flow of finance from both banks and non-banks into the economy.

Financial Institutions: Soundness and Resilience

Credit growth (y-o-y) of scheduled commercial banks (SCBs)[1], which had considerably weakened during the first half of 2019-20, slid down further to 5.9 per cent by March 2020 and remained muted up to early June 2020. This moderation was broad-based across all bank groups.

The capital to risk-weighted assets ratio (CRAR) of SCBs edged down to 14.8 per cent in March 2020 from 15.0 per cent in September 2019; the gross non-performing assets (GNPA) ratio fell to 8.5 per cent from 9.3 per cent and the overall provision coverage ratio (PCR) improved to 65.4 per cent from 61.6 per cent over this period.

Macro stress tests for credit risk indicate that the GNPA ratio of all SCBs may increase from 8.5 per cent in March 2020 to 12.5 per cent by March 2021 under the baseline scenario. If the macroeconomic environment worsens further, the ratio may escalate to 14.7 per cent under very severe stress.

In terms of network analysis, the total outstanding bilateral exposures among constituents of the financial system narrowed during 2019-20. In terms of inter-sectoral exposures, asset management companies/mutual funds (AMC-MFs), followed by insurance companies, were the biggest fund providers in the system, while non-banking financial companies (NBFCs) were the biggest receiver of funds, followed by housing finance companies (HFCs). AMC-MFs recorded a sharp decline in their receivables from the financial system, while public sector banks (PSBs) and insurance companies experienced an increase. Payables of NBFCs and HFCs increased marginally.

The size of the inter-bank market continued to shrink which, along with better capitalisation of PSBs, has led to a reduction in exposure to contagion losses that could result from a hypothetical idiosyncratic failure of a bank/ NBFC/ HFC and macroeconomic distress.

[1] SCBs, for the purpose of this analysis, only include public sector banks, private sector banks and foreign banks. Analysis is based on Reserve Bank's Supervisory Returns which cover only their domestic operations.

Regulatory Initiatives in the Financial Sector

In India, financial sector regulators have taken initiatives spanning monetary stimulus and regulatory reliefs to offset COVID-19's impact. Significant regulatory actions have been put in place to ease operational constraints due to the lockdown as also for maintaining market integrity and resilience in the face of severe risk aversion by market participants. Looking ahead, as the focus shifts from pandemic-proofing large sections of society to post-pandemic unwinding of stimulus and support packages in a calibrated manner, the challenge would be to establish normalcy without disrupting markets and the health of financial intermediaries.

Assessment of Systemic Risk

The Indian financial system remains stable, notwithstanding the significant downside risk to economic prospects. According to the latest systemic risk survey, all major risk groups, *viz.,* global risks, risk perceptions on macroeconomic conditions, financial market risks and institutional positions were perceived as 'high', affecting the financial system. Among macroeconomic risks, risks to domestic growth and fiscal housekeeping were perceived to be 'very high', while risks on account of reversal/slowdown in capital flows, corporate sector vulnerabilities, real estate prices and household savings were perceived to be 'high'.

Chapter I

Macro-Financial Risks

The COVID-19 pandemic is unprecedented in its pan global impact and the toll it is taking on life and livelihood. Public authorities have also responded on a massive scale to contain its fallout and mitigate its deleterious consequences. In India, financial markets have broadly stabilised in response to fiscal and monetary stimulus. Subdued bank credit shows clear signs of risk aversion. Adequate levels of foreign exchange reserves provide a buffer. Nevertheless, there remains some disconnect between financial market optimism and the weakening of the real economy. The pandemic has the potential to amplify financial vulnerabilities, including corporate and household debt burdens in the case of severe economic contraction. Restarting financial sector reforms on their path of convergence with global best practices and standards while adapting to the specific requirements of India's developmental strategy should regain focus, going forward.

Introduction

1.1 Global economic activity has been brought to a standstill by the COVID-19 pandemic, which is turning out to be unprecedented in its pan global impact and the toll it is taking on life and livelihood. Public authorities have also responded on a massive scale with monetary and fiscal stimuli, health care and administrative measures to contain its fallout and mitigate its deleterious consequences. A key objective of the policy response has been to keep financial markets from freezing up, financial intermediaries unstressed and functioning normally, and the lifeblood of finance flowing, especially to the vulnerable and disadvantaged, while preserving financial stability and restoring strong, sustainable and inclusive growth.

1.2 Against this backdrop, this chapter begins with an overview of global macroeconomic and financial market developments. Section I.1 examines specific challenges posed by the pandemic in the form of sudden stops/reversals in cross border flows, asset market volatility and contagion, and commodity market spillovers. Section I.2 discusses corporate sector resilience, and the evolving dynamics of bank and non-bank financial intermediation. The chapter concludes by drawing on the responses received for the systemic risk survey, conducted periodically by the Reserve Bank of India (RBI).

I.1 Global Backdrop

I.1.1 Macroeconomic Developments and Outlook

1.3 The first signs of the imminent tectonic shifts that COVID-19 would cause became visible when global financial markets turned increasingly volatile in January 2020 with panic sell-offs, flight to safety and wealth erosion in equity markets across advanced and emerging economies alike. Sovereign bond yields fell to record lows and liquidity stress threatened to stall fixed income markets. Incipient weakening of demand was also reflected in commodity price movements, especially of crude oil, though supply disruptions imparted upside pressure on food prices. As the outbreak spread with an explosive suddenness and speed, lockdowns and social distancing halted economic activity across 200 countries with over 14.3 million infections and 0.6 million deaths at the time of going to press. Sharp reductions in GDP growth in advanced economies(AEs) ranging from (-) 3.4 per cent to (-) 14.2 per cent and in emerging markets (EMs) between 2.9 per cent and (-) 6.8 per cent (year-on-year or y-o-y basis) in Q1:2020 have been exacerbated in

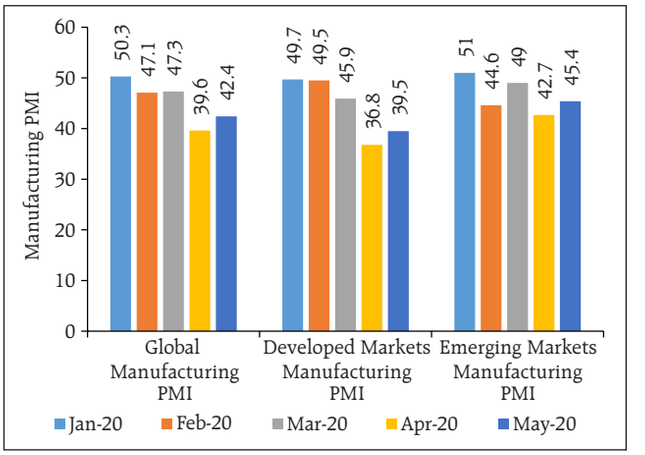
the ensuing months by a collapse in manufacturing as reflected in purchasing managers' indices (PMIs), which have plunged into contractionary territory. Although rates of contraction in output, new orders and employment have eased after April, they are still among the lowest levels registered during the survey's 22-year history (Chart 1.1). Crude oil prices have recovered after sharp falls in March and the first half of April; Brent crude prices traded above USD 40 per barrel on June 30, 2020, up from the lows of April 2020.

1.4 Meanwhile, according to the United Nations Conference on Trade and Development (UNCTAD), global trade contracted by 7.27 per cent (q-o-q) in value in Q1:2020 and is expected to decline by 27 per cent in Q2 (Chart 1.2).

1.5 In its June 2020 update, the International Monetary Fund (IMF) has projected that global output would contract by 4.9 per cent in 2020, under the baseline assumption of gradual recovery in activity starting in the second half of 2020 (Table 1.1). The OECD has projected a "double – hit" scenario in which a second wave of infections erupts in the later part of 2020; in this scenario, the global economy could contract by 7.6 per cent in 2020.

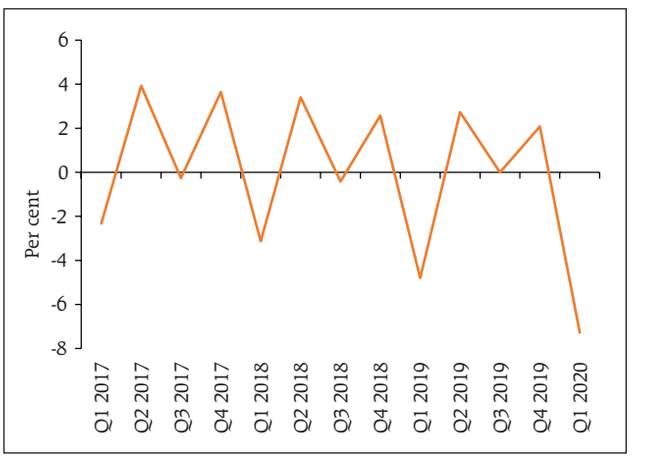
1.6 Against this backdrop, swift and unprecedented central bank measures have resulted in a turnaround in asset prices, narrowed credit spreads significantly from their earlier peaks and helped improve investor sentiment towards EMs. The pandemic, however, could amplify financial vulnerabilities, including corporate and household debt burdens in the case of severe economic contraction. Globally, banks bracing up for the incidence of bad assets have generally increased their provisions, as a prudential measure. Yet, given the potential adverse impact of asset impairment on banking sector capital and profitability, the Basel Committee on Banking Supervision (BCBS) has endorsed strategies such as forbearance / treatment

Chart 1.1: Global Purchasing Managers' Indices (PMI)



Source: Bloomberg.

Chart 1.2: Volume Growth of World Merchandise Trade
(quarter on quarter)



Source: United Nations Conference on Trade and Development (UNCTAD).

Table 1.1: Growth Projections

	2019	2020*	2021*
World Output	2.9	(-)4.9	5.4
Advanced Economies	1.7	(-)8.0	4.8
Emerging Market & Developing Economies	3.7	(-)3.0	5.9

Note: *Projections.
Source: World Economic Outlook (WEO) Update, June 2020, IMF.

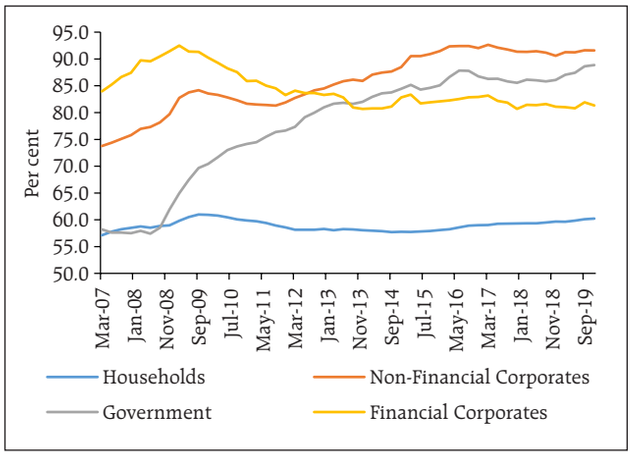
of moratorium, so long as supervisors make sure that the banks use the flexibility prudently and due disclosures are being made so as to enable market participants to assess the rationale and potential impact of such actions by the banks. In its June 2020 update of Global Financial Stability Report (GFSR), the IMF has warned about tightening of global financial conditions much more than in the baseline scenario. It noted that the recent easing of financial conditions on the back of 'swift, bold and unprecedented' policy measures has buoyed up asset prices. Consequently, there is disconnect between financial market optimism and the weakening of the real economy, with sudden risk-on-risk-off shifts in sentiment. This has exposed other financial system vulnerabilities, such as limiting market access for some economies, which are facing refinancing risks. Country authorities have been advised to closely monitor financial vulnerabilities and safeguard financial stability while they engage in repair and revival of the economy.

1.7 Notable amongst potential concerns is that the global economy is more leveraged now than at the time of the global financial crisis (GFC). Global debt has increased across all sectors and stood at USD 255 trillion in Q4:2019. At over 322 per cent of gross domestic product (GDP) (Chart 1.3), global debt is now almost 40 percentage points (USD 87 trillion) higher than it was at the onset of the GFC. The International Institute of Finance (IIF) cautions that if net government borrowing doubles from 2019 levels and there is a 3 per cent contraction in global economic activity (in nominal terms - a bearish outcome relative to the IMF's projections), the world's debt pile will surge from 322 per cent of GDP to over 342 per cent in 2020. Thus, in the post COVID-19 world, the challenge will be to engineer a seamless "reverse bail-in" – conversion of financial claims on the real economy into equity.

1.8 There has been a major increase in the financial liabilities of emerging markets (EMs) since

Chart 1.3: Global Leverage

(as per cent of GDP)

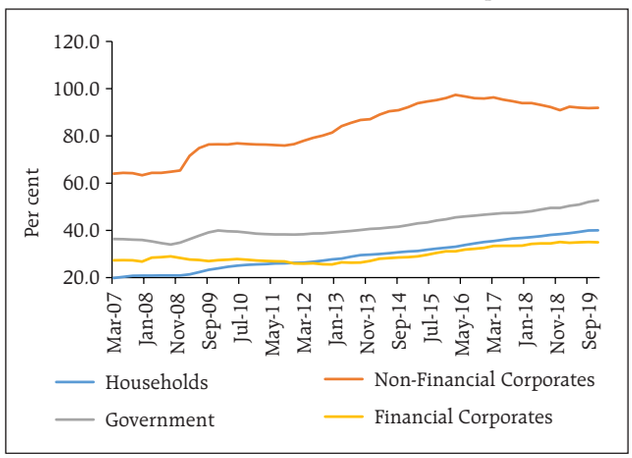


Source: International Institute of Finance (IIF).

the GFC: the debt of the 30 major EMs (EM-30) surged from USD 22 trillion in Q4:2007 to USD 71 trillion in Q4:2019. Furthermore, their leverage as a proportion to GDP increased from 147 per cent in Q4:2007 to 220 per cent over the period (Chart 1.4). Foreign currency debt of EM-30 in Q4:2019 reached USD 5.3 trillion of which they will need to refinance USD 0.73 trillion by December 2020. Excluding China, foreign currency debt makes up 20 per cent of EMs' debt outside the financial sector. By end-2020, global bonds and loans of over USD 20 trillion will fall due for repayment, of which EMs' share stands at USD 4.3 trillion.

Chart 1.4: Emerging Markets (EMs) Leverage

(as per cent of GDP)



Source: IIF.

I.1.2 Capital Flows and Exchange Rate Volatility

1.9 Cumulative capital outflows since the COVID-19 outbreak are already significantly higher than during GFC and dwarf stress events such as the taper tantrum in 2013 (Chart 1.5); although sentiment has reversed, capital flows are trickling back to EMs *albeit* with considerable differentiation and reallocation. Any abrupt interruption in capital flows would put EMs at a high risk as their external financing needs are significant in the face of imminent high external debt amortisation. Also, the commodity exporting EMs would face sizeable terms of trade losses.

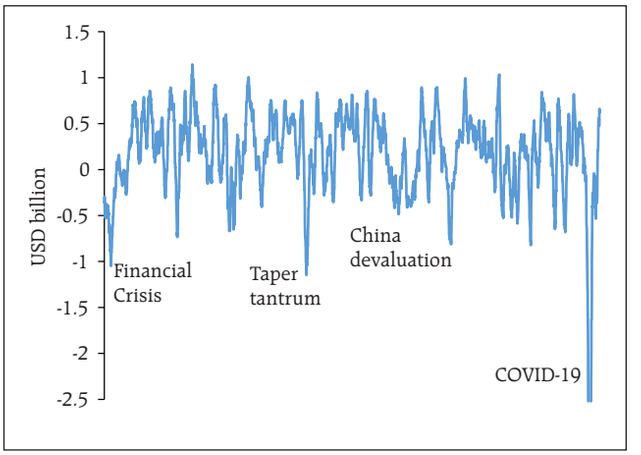
1.10 Global bond markets are pricing in a prolonged economic slowdown in Europe and a shallow recovery in the US, post the pandemic lockdown. The underlying unease in market sentiment has the potential to cause asset price and exchange rate volatility in EMs, with implication for the real economy.

1.11 Looming over the global financial landscape is the fear of dollar shortage impeding the economic recovery. The October 2019 Global Financial Stability Report highlighted increased cross border portfolio allocation by life insurers in search of yields with a significant share of such assets in USD. Such cross-border portfolio allocation leads to currency and duration mismatches, opening up a new risk transmission channel. The Report also warned that lower for longer yields may prompt institutional investors to seek riskier and more illiquid investments to earn their targeted return. Such risk taking may further lead to build up of financial vulnerabilities among investment funds, pension funds, and life insurers with adverse implication for financial stability. The recent strains in the funding markets on account of runnable money-like liabilities (Table 1.2), necessitated the US Federal Reserve's (Fed) intervention in the form of repo and swaps.

I.1.3 Risk-off Trades and Asset Market Contagion in Emerging Markets

1.12 EM local currency bond portfolio returns are significantly higher relative to September 2018

Chart 1.5: EMs' Daily Flows (28 day moving average)



Note: As on June 22, 2020.
Source: IIF.

Table 1.2: US Money Markets

	Outstanding/ Total Assets (USD, billion)	Growth, Q4: 2018-Q4: 2019 (per cent)	Average annual growth (per cent)
Total runnable money-like liabilities*	15,517	9.80	4.00
Uninsured deposits	5,173	6.60	10.60
Repurchase agreements	3,998	12.50	5.90
Domestic money market funds**	3,604	18.60	4.30
Commercial papers	1,045	4.90	2.10
Securities lending***	578	(-)3.70	5.60
Bond mutual funds	4,440	16.70	9.00

Note: The data extends through Q4: 2019. Growth rates are measured from Q4 of the year immediately preceding the period through Q4 of the final year of the period.
* average annual growth is from Q4: 2003 to Q3: 2019.
** average annual growth is from Q4: 2001 to Q3: 2019.
*** average annual growth is from Q4: 2000 to Q3: 2019.
Source: Financial Stability Report, May 2020, Board of Governors of the Federal Reserve System. Available at: https://www.federalreserve.gov/publications/files/financial-stability-report-20200515.pdf.

levels, attributable to extraordinary monetary policy stimulus (Chart 1.6). USD returns have trailed local currency returns in the recent period, raising hedging costs.

1.13 A similar pattern is playing out in the equity portfolio (Chart 1.7). The feedback loop between currency movements and EM flows (reflected in an almost one-for-one correspondence in EM-ETF USD returns and EM equity flows) is, however, being reflected in across-the-board EM asset sell-offs along with sharp EM currency depreciations. Index inclusion may buffer for idiosyncratic risks, but it also entails undesirable volatility in currencies in the wake of sell-offs of EM assets when global spillovers occur.

I.1.4 Commodity Market Spillovers

1.14 Meanwhile, amidst sharp pull back in demand, the forward curve for Brent futures has changed from backwardation to contango (Chart 1.8). The April 21, 2020 negative prices reading in West Texas Intermediate (WTI) crude futures point to tight storage conditions but equally benchmark rollover related technical conditions.

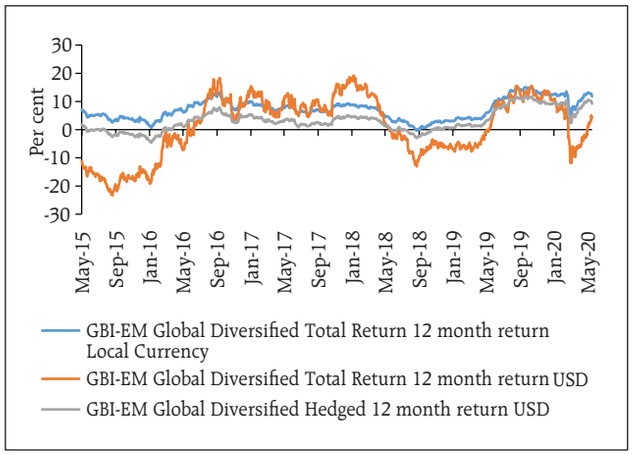
1.15 Open interest in Brent options (both Puts and Calls), where calls above the USD 40 strike clearly dominate over puts below a USD 20 strike, implying that the market clearly discounted the possibility of such low crude prices going forward (Table 1.3).

Table 1.3: Brent Options Open Interest
(as on June 26, 2020)

	Contracts expiring in			
	Sep-20	**Oct-20**	**Nov-20**	**Dec-20**
Puts with strike between USD 0 - USD 20	13,078	4,831	1,023	34,037
Calls with strike greater than USD 40	2,59,200	60,378	25,895	4,54,012

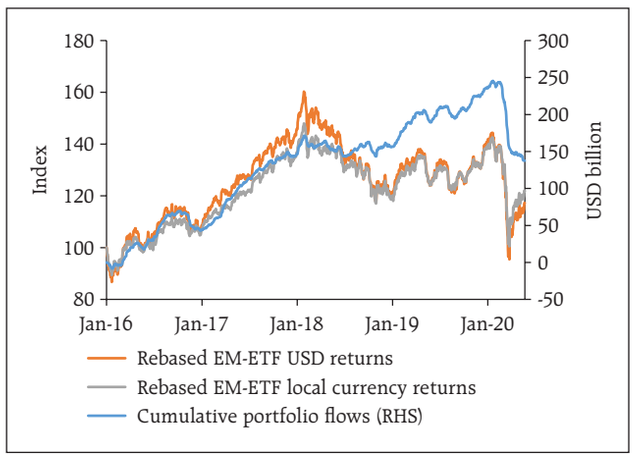
Source: Bloomberg.

Chart 1.6: Emerging Market Bond Returns (Annualised)



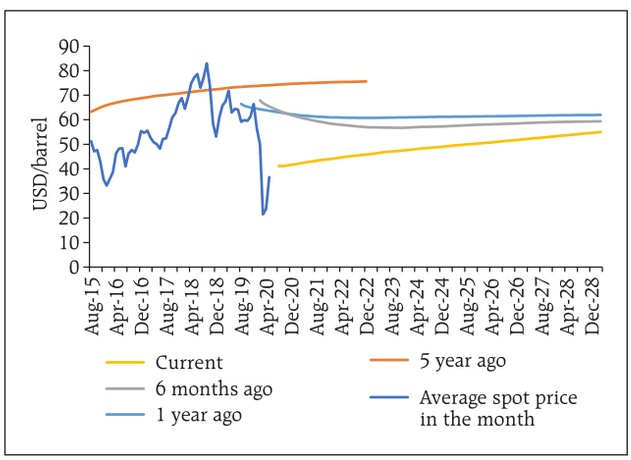
Source: JP Morgan.
Note: Information has been obtained from sources believed to be reliable, but J.P. Morgan does not warrant its completeness or accuracy. The index is used with permission. The index may not be copied, used, or distributed without J.P. Morgan's prior written approval. Copyright 202[0],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

Chart 1.7: Capital Market Returns and Emerging Market Portfolio Flows



Source: Bloomberg and IIF.

Chart 1.8: Brent Futures



Note: As on June 26,2020
Source: Bloomberg.

1.16 In its June 2020 Oil Market Report, the International Energy Agency (IEA) projected global oil demand to fall by 8.1 million barrels/day (mb/d), the largest in history, before recovering by 5.7 mb/d in 2021. In China, oil demand recovered fast in March-April and India's demand rose sharply in May. On the supply side, record output cuts from Organisation of Petroleum Exporting Countries plus (OPEC+) and steep declines from other non-OPEC producers saw global oil production fall by a massive 12 mb/d in May. To further speed up the market rebalancing, OPEC+ decided on June 6 to extend their historic output cut of close to 10 mb/d through July.

1.17 Demand for industrial metals witnessed severe contraction and their prices have been bearish in the early part of 2020, although the decline is not as severe as that of crude. Unlike oil, where spot market prices are likely to be significantly affected in the short term by inventory overhang, rebalancing in prices for industrial metals is not likely to be susceptible to inventory issues, implying a more robust price rebound if demand rebalances.

1.18 Adverse commodity price shocks can cause financial instability through various channels. First, a decline in commodity prices can impair the ability of commodity exporting countries to meet their international debt obligations, leading to risk-off behaviour affecting EM capital flows as a whole. Second, a contraction in budgetary revenues may induce some of the major commodity exporters to draw down their international balances, potentially impairing international banking sector liquidity.

I.2 Domestic Macro-Financial Developments

1.19 On the heels of a prolonged 8-quarter slowdown, GDP growth in India slumped to its lowest level since the GFC to 4.2 per cent in 2019-20, with Q4:2019-20 growth (y-o-y) at 3.1 per cent turning out to be lowest in the history of the current (2011-12 based) GDP series.

I.2.1 Recent Macroeconomic Developments

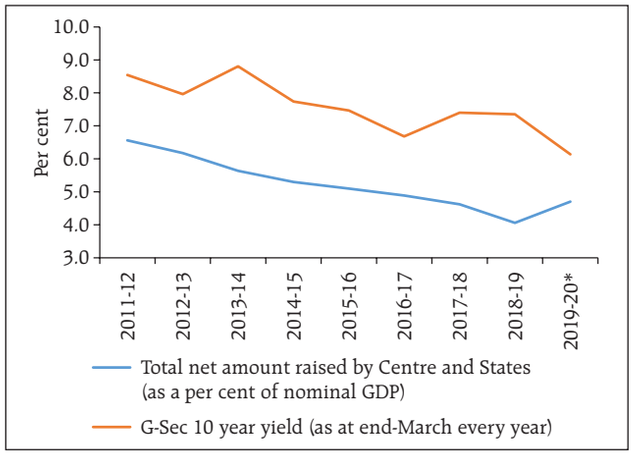
1.20 High frequency indicators point to a sharp dip in demand beginning March 2020 across both urban and rural segments. Domestic economic activity virtually came to a standstill in April 2020; although for several sectors the contraction became less severe from May 2020. Early data arriving for June 2020 indicate some plateauing much below pre-COVID-19 levels. Agriculture and allied activities, however, showed continued resilience on the back of all-time production highs and huge buffer stocks of rice and wheat. Above normal rains predicted for 2020-21 also boded well for agricultural production. PMI (Manufacturing) has also consistently improved from 27.4 in April to 30.8 in May and further to 47.2 in June 2020. For the fiscal year as a whole, there is still heightened uncertainty about the duration of the pandemic. As such, the downside risks to growth remain significant and full restoration in economic activity would be contingent upon the support for robust health infrastructure, recovery in demand conditions and fixing of supply dislocations, in addition to the state of global factors like trade and financial conditions.

1.21 Central Government finances are likely to suffer some deterioration in 2020-21, with fiscal revenues badly hit by COVID-19 related disruptions even as expenditures come under strain on account of the fiscal stimulus. For State finances, the additional burden of lower federal transfers may accentuate downside risks to the outlook. There was a sharp uptick in net borrowings by general government in 2019-20 (Chart 1.9). A number of measures, including enhanced ways and means limits, relaxation of rules governing withdrawals from the Consolidated Sinking Fund (CSF) to ease the redemption pressure on states, and the RBI's liquidity support measures have so far contained spillovers to bond markets.

1.22 The current account balance turned into a small surplus (0.1 per cent of GDP) during Q4: 2019-20 on account of lower trade deficit and a sharp rise in net invisible receipts. India's merchandise exports contracted by 7.6 per cent in H2:2019-20, compared to a contraction of 2.5 per cent in H1. Imports fell by 10.5 per cent in H2:2019-20 after a fall of 5.2 per cent in H1:2019-20 (Chart 1.10). During April-May 2020-21, exports and imports collapsed, with contractions of 47.5 percent and 54.7 per cent (y-o-y), respectively. India's trade deficit stood at USD 3.1 billion in May 2020, the lowest recorded trade deficit since February 2009. Compared to April 2020, trade deficit narrowed during May with exports in May improving more than imports.

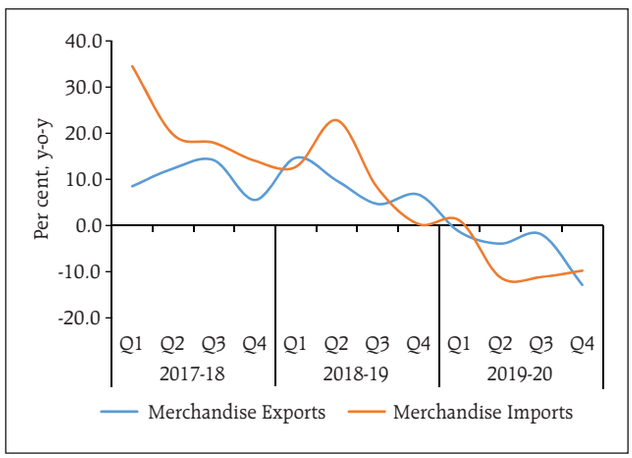
1.23 Foreign portfolio investment (FPI) flows, which registered net inflows up to February 2020, reversed into net outflows since March 2020. During 2019-20, FPIs became net sellers to the tune of USD 3 billion, primarily due to a USD 16 billion sell-off during March 2020 - one of the highest FPI monthly net outflows till date, although FPI flows have shown significant recovery in May and June (Chart 1.11).

Chart 1.9: Net Borrowings (Central and State Governments) and G-Sec 10-year Yield



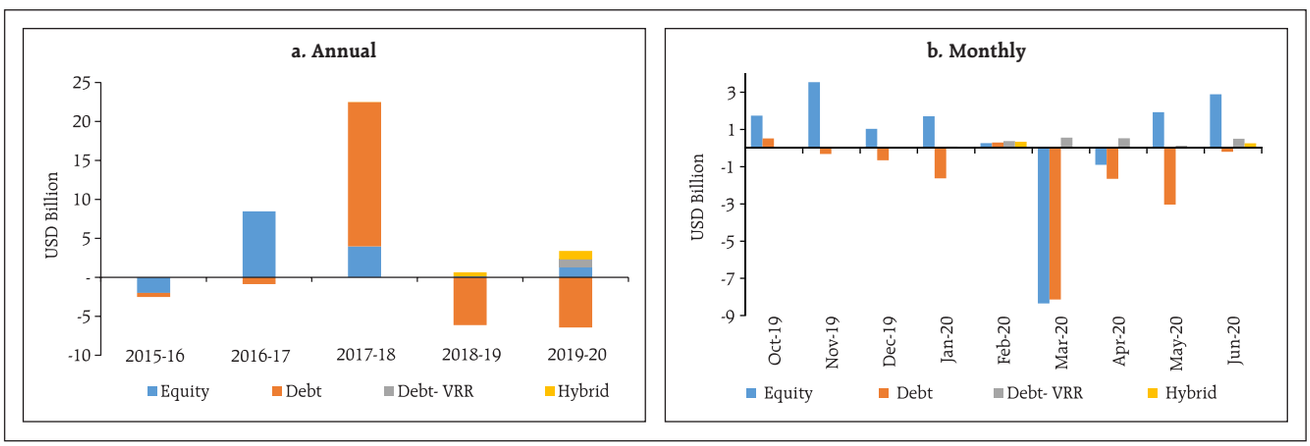
Note: *GDP first advance estimate.
Source: Reserve Bank of India (RBI).

Chart 1.10: India's Merchandise Trade Growth



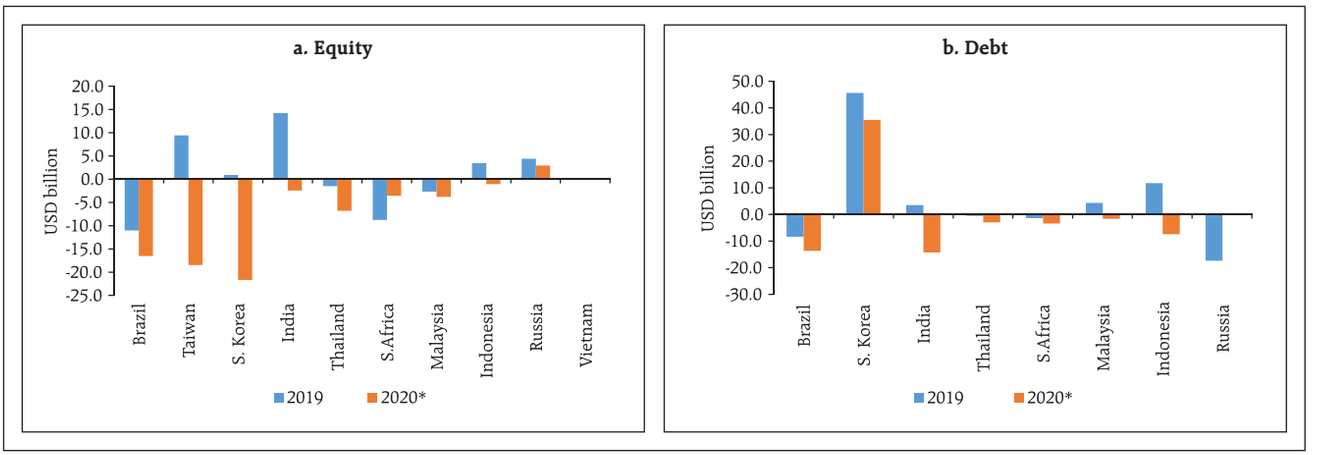
Source: Directorate General of Commercial Intelligence & Statistics (DGCI&S).

Chart 1.11: Foreign Portfolio Investment Flows



Source: National Securities Depository Limited (NSDL).

Chart 1.12: FPI Flows – Emerging markets



Note: *as on June 30, 2020.
Source: Bloomberg.

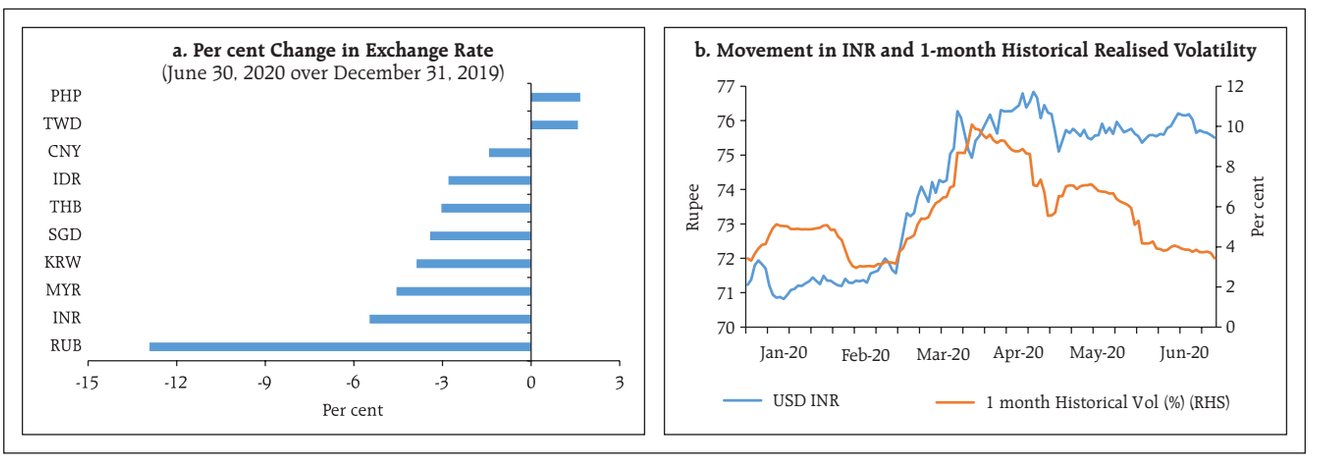
1.24 A comparative analysis of portfolio flows to emerging markets *vis-à-vis* India generally reflects the risk averse behaviour (Chart 1.12).

1.25 In the foreign exchange market, the INR has depreciated relative to peer EM currencies on a year to date basis, although in more recent weeks, it has traded with an appreciating bias and underlying realised volatility has moderated (Chart 1.13).

I.2.2 Corporate Sector

1.26 The performance of the private corporate sector deteriorated in successive quarters of 2019-20 and the contraction during the last quarter was particularly severe due to the COVID-19 pandemic. During the year, nominal sales and net profits of 1,640 listed private non-financial companies declined (y-o-y) by 3.4 per cent [10.2 per cent in Q4:2019-20] and 19.3 per cent [65.4 per cent in Q4:2019-20], respectively, despite the corporate tax rate reduction of September 2019, which brought down the effective tax rate (ratio of tax provision to profit before tax) by nearly 3.0 per cent y-o-y in 2019-20. This poor performance was led by the manufacturing companies, as services sector companies, especially those in the IT sector remained in positive terrain.

Chart 1.13: Exchange Rate Movements and Realised Volatility



Source: Bloomberg.

1.27 Deleveraging by the private corporate sector over the recent years stalled during the second half of 2019-20 as leverage ratios (measured by the debt to asset ratio) increased due to higher borrowings[1]. Incremental borrowings were used towards creating financial assets (loans and advances to subsidiary/ other companies and financial investments) and not for capex formation, as demand conditions remained muted.

1.28 An analysis of a sample of 3,760 listed non-financial firms (68 PSU and 3692 Non-PSU) during 2015-19[2] shows that Non-PSU companies deleveraged substantively relative to public sector undertakings (PSUs) (Chart 1.14). Notwithstanding this improvement in debt profiles, stagnant operating profit to sales ratios during the period reflect the challenging business environment.The ratio of interest expenses to operating profits for PSUs was lower compared to Non-PSUs. However, despite significant moderation in interest rates, this ratio has remained sticky for both PSUs and Non-PSU companies, indicating interest cost overhang. Both groups also show deteriorating liquidity positions, as measured by the current ratio (Chart 1.14).

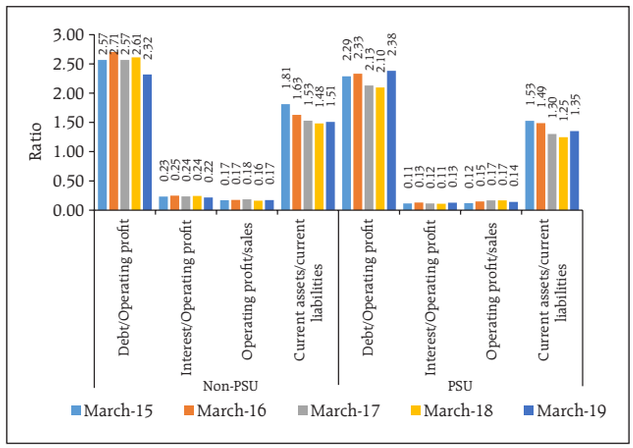
1.29 The leverage ratios for a constant sample of 1,488 listed, non-PSU and non-financial firms (Chart 1.15) show that deleveraging among the 'Others' category is particularly pronounced, with a correspondingly pronounced deterioration in the current ratio.

1.30 The corporate sector's credit demand has been modest. Not surprisingly, therefore, SCBs' credit growth is characterised by a robust but slowing retail credit growth across bank groups, coupled with decelerating wholesale credit growth (Chart 1.16).

I.2.3 Loan Moratorium and Bank Credit

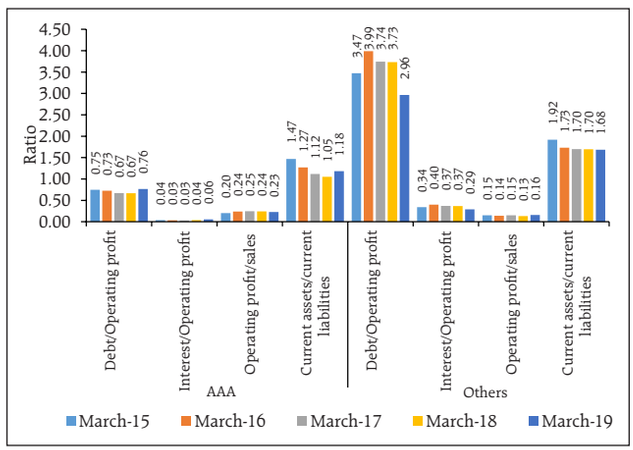
1.31 Consequent upon the outbreak of COVID-19 pandemic in India, the RBI had announced

Chart 1.14: Leverage and Profitability - Listed Non-Financial Firms, by Ownership



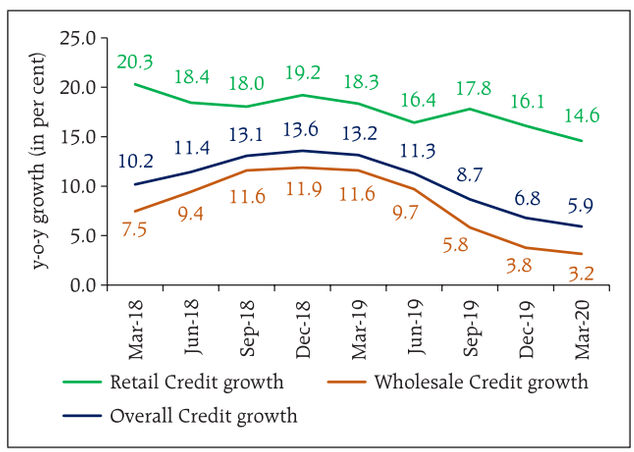
Source: Capitaline.

Chart 1.15: Leverage and Profitability - Non-PSU Listed and Non-Financial Firms, by Ratings



Note : Companies shown as AAA were rated AAA throughout the period 2015-2019.
Source: Capitaline, Prime database.

Chart 1.16: Credit Growth, Scheduled Commercial Banks



Source: RBI Supervisory Returns and Staff Calculations.

[1] Based on the unaudited half-yearly results of 967 Non-PSU non-financial listed companies.

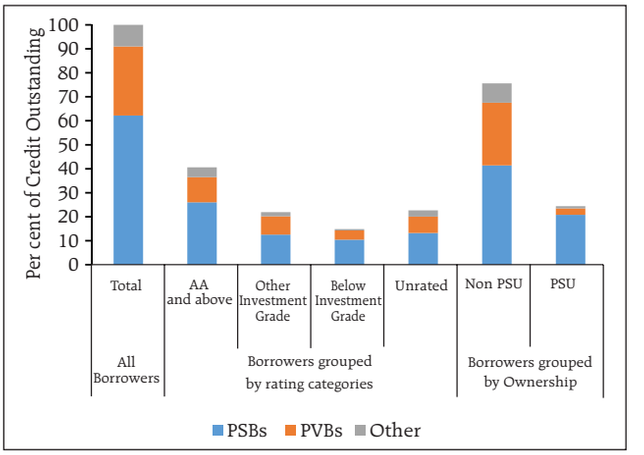
[2] Financials for 2019-20 were available for small number of companies in the sample.

regulatory and supervisory measures to *inter-alia* mitigate the burden of debt servicing and enable the continuity of viable businesses and households. Supervised Entities (SEs) have largely implemented these regulatory relief measures. Nearly half of the customers accounting for around half of outstanding bank loans opted to avail the benefit of the relief measures (Table 1.4).

1.32 Of wholesale credit outstanding[3] at the end of March 2020, public sector banks (PSBs) accounted for 62 per cent while private sector banks (PVBs) provided close to 29 per cent. Investment grade borrowers accounted for about 63 per cent of the total credit outstanding; non-government obligors constituted 76 per cent (Chart 1.17).

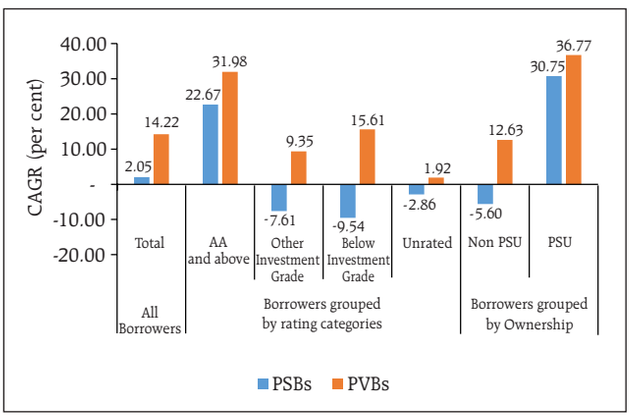
1.33 To place credit growth in 2019-20 in various cohorts in perspective, wholesale credit growth in various borrower categories was analysed over the last 3 years. Among the PSBs, there was a sharp credit contraction across all rating categories except 'AA and above' as also among non-PSU obligors. In contrast, PVBs registered positive credit growth across all rating categories and across both PSU and non-PSU obligors, indicating less overall risk aversion compared to PSBs, even as the latter may be trying to improve their risk management practices (Chart 1.18). However, the behaviour of PVBs in

Chart 1.17: Wholesale Credit Outstanding by Borrower Categories/ Lender Groups, March 2020



Source: Central Repository for Information on Large Credits (CRILC), Prime database.

Chart 1.18: Wholesale Credit Growth (based on CAGR over the last 3 years) across various Borrower Categories



Source: CRILC, Prime database.

Table 1.4: Analysis of Loan Moratorium Availed as on April 30, 2020.

Sector	Corporate		MSME		Individual		Others		Total	
	% of total customers	% of total outstanding	% of total customers	% of total outstanding	% of total customers	% of total outstanding	% of total customers	% of total outstanding	% of total customers	% of total outstanding
PSBs	28.8	58	73.9	81.5	80.3	80	48.8	63.7	66.6	67.9
PVBs	21.6	19.6	20.9	42.5	41.8	33.6	39.1	40.9	49.2	31.1
FBs	32.6	7.7	73.3	50.4	8.4	21.1	75.8	4.8	21.4	11.5
SFBs	78.8	43.7	90.5	52.3	90.9	73.2	64.6	12.3	84.7	62.6
UCBs	63.4	69.3	66.5	65.5	56.8	62	35.6	59.2	56.5	64.5
NBFCs	39.7	56.2	60.7	61.1	32.5	45.9	37.3	41.4	29	49
SCBs	24.7	39.1	43.1	65.3	52.1	56.2	45.7	55.7	55.1	50
System	30.8	41.9	45.8	65	50.4	55.3	45.7	54.6	**48.6**	**50.1**

Source: RBI Supervisory Returns.

[3] Only funded amount outstanding has been considered. Only credit to companies (which account for about 88 per cent of the total funded amount outstanding to wholesale obligors) has been considered as opposed to credit to other organisational forms such as cooperatives,partnerships,trusts and societies.

the past two quarters is in sharp contrast to their behaviour in the past three years as further analysis ahead shows.

1.34 During 2019-20, there was moderation in aggregate credit growth driven by PVBs, reflecting heightened risk aversion as well as muted demand in sluggish macroeconomic conditions (Table 1.5).

1.35 Analysis of credit flow based on ownership revealed that PSU sector was the major recipient. Quarter on quarter flow of credit to non-PSU firms in Q4: 2019-20 was comparable to that in the previous year but PSBs dominated credit provisions in Q4: 2019-20 in contrast to a year ago (Table 1.6).

1.36 Analysis of credit flow based on rating grades for non-PSU obligors reveals that the rating cohort of AA and above had predominantly accessed credit during Q3 and Q4: 2019-20. The relative lack of access to credit for borrowers rated A and below during this period is common across both PSBs and PVBs. The behaviour of PVBs in respect of rating cohort A and below is in particular contrast to their credit growth profile in 2018-19 (Table 1.7).

1.37 Analysis based on the days past due (dpd) was undertaken to understand the impact of impairment on credit growth induced by COVID-19. Consistent with previous observations, PVBs show risk averse behaviour in this disaggregation as well, since the only cohort they show positive credit growth in is the unimpaired category in both quarters (Table 1.8).

Table 1.5: Disaggregated Wholesale Credit Growth (quarter-on-quarter unless mentioned otherwise) (per cent)

	FY:18-19	Jun-19	Sep-19	Dec-19	Mar-20	FY:19-20
PSBs	2.61	-2.58	-0.33	-0.91	7.13	3.08
PVBs	23.79	-3.15	3.82	0.25	1.37	2.19
Aggregate	8.52	-2.76	0.99	-0.54	5.24	2.79

Source: CRILC.

Table 1.6: Disaggregated Wholesale Credit Growth-based on Ownership
(q-o-q) (per cent)

	Dec-18		Mar-19		Dec-19		Mar-20	
	Non-PSU	PSU	Non-PSU	PSU	Non-PSU	PSU	Non-PSU	PSU
PSBs	-0.96	7.35	-4.34	14.83	-2.03	1.84	1.38	20.78
PVBs	2.36	3.73	9.38	8.41	-0.70	14.17	-0.89	30.15
Aggregate	0.17	6.97	0.45	14.18	-1.51	3.04	0.49	21.78

Source: CRILC.

Table 1.7: Disaggregated Wholesale Credit Growth in Non-PSU Obligors
(q-o-q) (per cent)

	PVBs				PSBs			
	Dec-18	Mar-19	Dec-19	Mar-20	Dec-18	Mar-19	Dec-19	Mar-20
AA and above	3.83	6.57	-0.43	5.14	2.13	-0.92	0.67	7.91
A and below	5.13	13.35	-0.56	-2.62	-1.94	-4.36	-3.35	-2.75
Unrated	-3.03	6.32	-1.23	-4.76	-2.28	-7.90	-2.67	1.41

Source: CRILC, Prime database

Table 1.8: Wholesale Credit Growth in various Transition Credit Cohorts
(q-o-q) (per cent)

	PSBs		PVBs	
	SMA as in March 2020	Unimpaired as in March 2020	SMA as in March 2020	Unimpaired as in March 2020
SMA as in December 2019	4.7	3.2	-2.9	-3.7
Unimpaired as in December 2019	6.5	11.2	-1.4	2.4

Note: Any obligor whose exposure is classified as Special Mention Account (SMA) - 1/2 in any of the lending banks in a given period is labelled SMA exposure. Alternatively, the exposure is labelled unimpaired. Please refer to footnote 7 of Chapter II for further enunciation of SMA categories.
Source: CRILC.

1.38 An analysis of sectoral allocation of credit shows that sectors with lower credit risk weights have generally dominated credit growth. The central and state PSUs have dominated the credit growth in respect of civil supplies while agriculture and allied services may have been preferred for the priority sector dispensation. Some sectors like generation/ distribution of electricity with relatively lower risk weight and low credit growth may have been experiencing lacklustre demand, though they seem to be picking up recently (Table 1.9).

1.39 Analysis of excess liquidity (excess Statutory Liqudity Ratio (SLR) / Liquidity Coverage Ratio (LCR)) of select PSBs[4] as also the top-5 PVBs showed that the latter, in general, were not liquidity constrained but were risk averse (Chart 1.19).

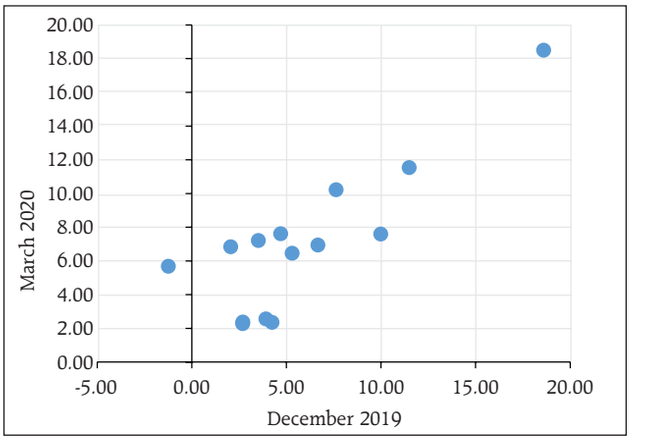
1.40 The long-term rating momentum (quarterly upgrades versus downgrades) shows an adverse rating downgrade movement starting in Q3:2018-19 (Chart 1.20). The average risk weights of PSBs and PVBs for their wholesale credit exposures improved from 85 per cent in March 2019 to 81.75 per cent in March 2020, notwithstanding the downward rating momentum.

Table 1.9: Sectoral Credit Growth

Sector	Growth rate in the last quarter (per cent)	Growth rate - FY19-20 (per cent)	Average Risk Weight (per cent) (as on March 2020)
Mfg. of fuel products	49.49	29.14	47.18
Wholesale/Retail services	11.76	8.89	104.54
Financial Services	10.20	14.07	40.80
Mfg. Basic Metals and Metal products	5.27	-5.25	87.66
Agriculture & Allied	4.37	1.25	121.90
Postal, Telecommunication and IT services	4.10	7.61	63.90
Mining/Oil and gas extraction	3.31	-5.93	95.92
Mfg. of Chemicals, Rubber and Glass	2.92	-0.03	88.35
Mfg. of misc. items	2.86	2.61	135.97
Generation/Distribution of electricity	2.84	-3.87	77.39

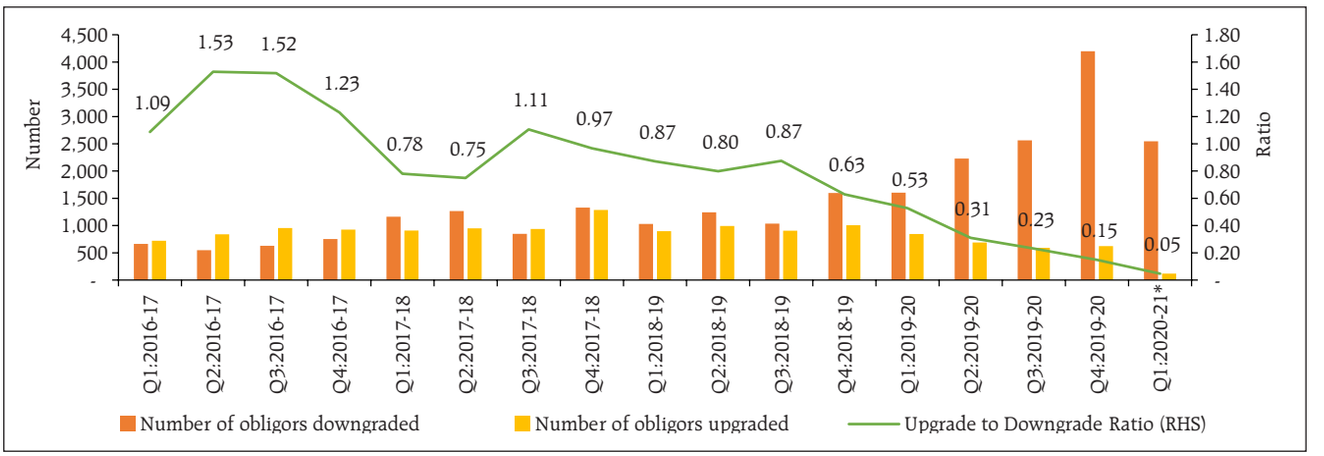
Source: CRILC , Prime database.

Chart 1.19: Excess Liquidity/NDTL - Select PSBs and Major PVBs



Source: RBI Supervisory Returns and Staff Calculations.

Chart 1.20: Long-term Ratings Movement and Number of Obligors



Note : * Till end-May 2020
Source: Prime database.

[4] Since the merger of 10 PSBs into 4 entities is operational with effect from April 1, 2020, a standalone liquidity appraisal with respect to these 10 PSBs as on March 31, 2020 may not be appropriate. Hence. for the purpose of this analysis only PSBs which are not under the purview of the mergers are considered.

1.41 A fixed cohort of obligors that was downgraded during April-September 2019 was tracked over a period to look at the evolution of creditworthiness. The incremental delinquency rate of this cohort shows a sharp upward movement in December 2019, implying soft credit conditions even before the pandemic (Chart 1.21).

1.42 The quality of banks' performing portfolios has implications for credit provisions as also financial stability (Tables 1.10, 1.11 and 1.12). Abstracting from moratorium effects, the share of standard assets (assets with 0 days past due and SMA-0 payment status) in the performing portfolios improved relative to 2017 and 2018.

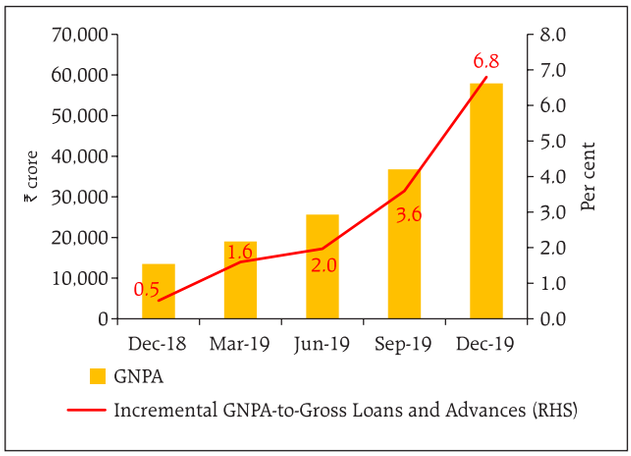
1.43 Moreover, the composition of standard assets also shows a relatively larger share of assets rated 'AA' and above, implying increasing resilience to shocks (Table 1.11).

1.44 The ratings distribution of performing portfolios that are vulnerable (SMA 1 and SMA 2 categories) also throws up 'AA' and above as the largest rating grade, implying that not all higher rated obligors are impervious to shocks / risk aversion.

I.2.4 Developments in Non-bank Financial Intermediation

1.45 In recent years, mutual funds have generated strong investor appetite, especially among households, as an alternative avenue for financial savings, and this tilt has been shaping the landscape of financial intermediation in India. The net assets under management (AUM) of debt/income oriented mutual fund schemes in India grew by about 70 per cent during 2015-2020 (5 years) to ₹11.80 lakh crore by end-March 2020. Asset management companies, being large net providers of funds to the financial system, impact the funding market in a non-trivial manner. It is in this context that the RBI constituted a special liquidity window for mutual funds (MFs) to mitigate the effects of COVID-19 and to insulate them from the spillovers of the credit risk fund

Chart 1.21: Incremental GNPA Ratio of Downgraded Companies



Source: RBI Supervisory Returns and Staff Calculations.

Table 1.10: SCBs' Performing Portfolios and their Composition

	Mar-17	Mar-18	Mar-19	Jun-19	Sep-19	Dec-19	Mar-20
Standard Asset with 0 dpd and SMA-0	85.15	86.25	95.75	94.75	94.08	94.59	93.97
Performing but vulnerable (SMA 1/2)	14.85	13.75	4.25	5.25	5.92	5.41	6.03

Source: CRILC.

Table 1.11: Ratings Distribution of Standard Portfolios of SCBs
(0 days past due and SMA-0) (as a per cent of the portfolio)

	Mar-18	Mar-19	Jun-19	Sep-19	Dec-19	Mar-20
'AA' and above	39.04	45.27	45.38	46.11	45.39	47.46
Investment grade till rating grade 'A'	28.55	27.41	27.23	26.49	27.17	26.04
Sub-investment grade	8.77	6.78	7.22	6.55	6.92	7.34
Unrated	23.64	20.54	20.17	20.85	20.52	19.16

Source: CRILC, Prime database.

Table 1.12: Ratings Distribution of Performing but Vulnerable Portfolios of SCBs (SMA-1 /2)

	Mar-18	Mar-19	Jun-19	Sep-19	Dec-19	Mar-20
'AA' and above	41.89	20.72	15.65	12.79	29.38	40.44
Investment grade till ratings 'A'	26.64	24.58	17.12	24.32	20.82	13.65
Sub-investment grade	18.54	35.29	39.84	35.21	27.05	17.54
Unrated	12.92	19.41	27.39	27.69	22.76	28.37

Source: CRILC, Prime database.

Table 1.13: Trends in Resource Mobilisation by Mutual Funds (₹ crore)

Particulars	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-June 2020
Gross Mobilisation	14,93,175	8,82,234	11,50,581	11,51,675	8,82,288	13,12,136	26,47,640
Redemption	13,59,693	8,27,815	12,12,078	10,31,527	8,84,273	15,24,873	25,23,561
Net Inflows/ Outflows	1,33,482	54,419	-61,497	1,20,149	-1,986	-2,12,737	1,24,079
Assets at the end of Period	26,32,824	27,04,699	26,54,075	27,85,804	27,22,937	22,26,203	25,48,848

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

redemption pressures, in the interest of overall financial stability.

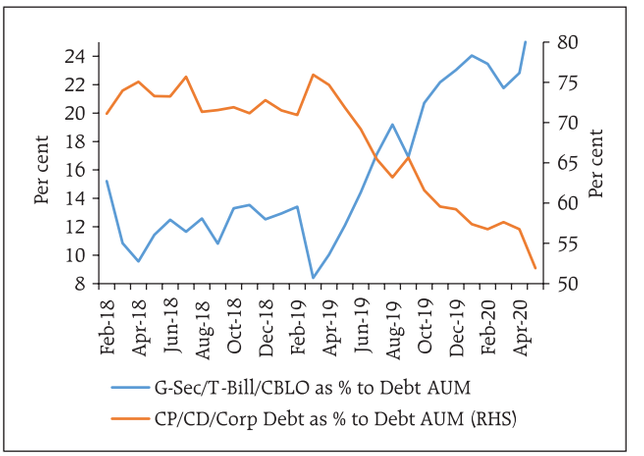
1.46 Resource mobilisation by MFs suffered from idiosyncratic shocks such as corporate defaults during the second half of 2019-20, with pressure intensifying in March 2020 (Table 1.13). Open ended debt-oriented schemes accounted for net outflows of ₹1,94,900 crore during March 2020. Given this significant volatility, the liquid securities being held in income/debt-oriented schemes are of systemic importance.

1.47 Deployment of debt AUM in government securities as a proportion to total debt AUM has been on an uptrend since March 2019, notwithstanding the dip in March 2020 due to redemption pressure (Chart 1.22). Moreover, the proportion of liquid securities in holdings of debt mutual funds reached an all-time high in April 2020 reflecting risk aversion and liquidity storing.

1.48 Volatility in net asset value (NAV) of three representative schemes shows dislocation in the asset markets induced by the draw down in debt funds in March 2020 (Chart 1.23). Even daily dividend schemes, which are considered relatively risk free, were impacted by the lockdown, as reflected in movements of NAVs.

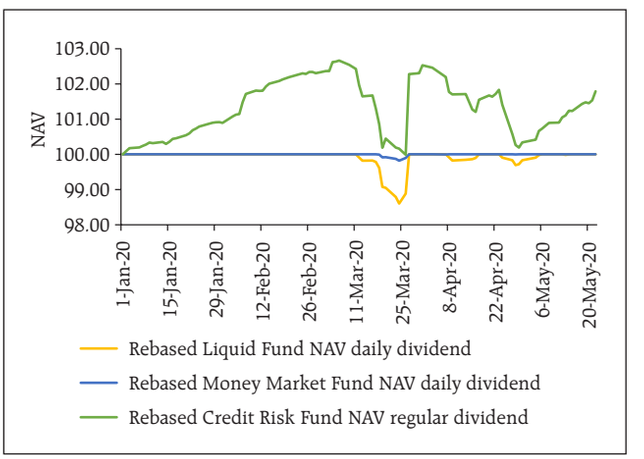
1.49 There are a few idiosyncratic features of the Indian debt asset management funds which may possibly make such funds more susceptible to runs. The December 2018 edition of the Financial Stability Report (FSR) highlighted the role of non-retail investor dominance in debt funds (in the wake of the IL&FS crisis). Corporates and high net-worth

Chart 1.22: MFs' Investments in G-Sec/T-Bills/ CBLO and Spread Products



Note : CBLO - Collateralised Borrowing Lending Obligation; CP - Commercial Paper; CD - Certificate of Deposit.
Source: SEBI.

Chart 1.23: Representative Movements in Rebased Net Asset Values of three Schemes



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

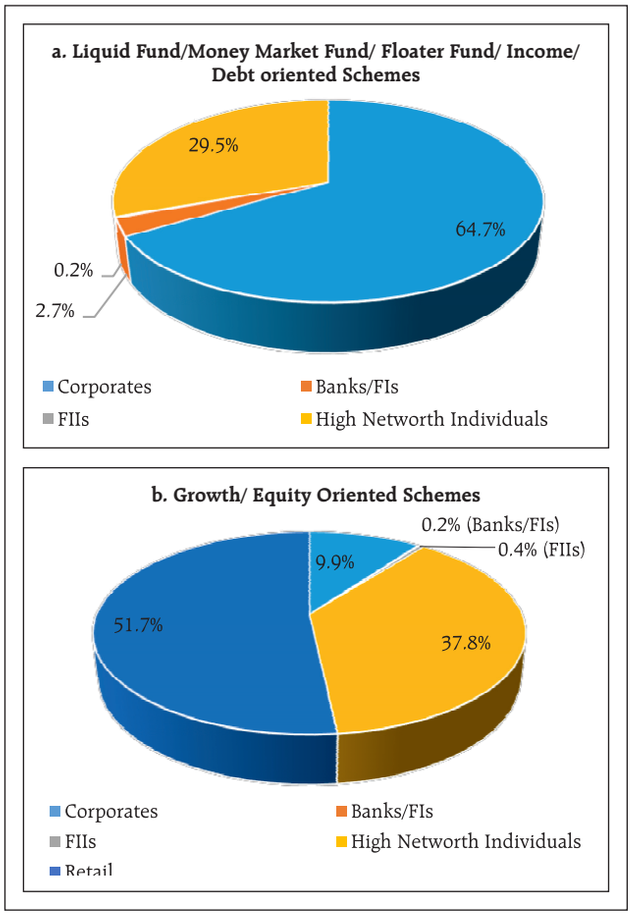
individuals comprise more than 90 per cent of the aggregate assets under management (AUM) for debt funds (Chart 1.24); in sharp contrast, their share in equity funds stands at a more balanced 48 per cent.

1.50 While expense ratios are capped through regulations, large fund houses have the advantage of spreading their fixed costs over a large AUM to be cost competitive. Hence, corporate dominance in investments may lead to concentration in fund management as smaller fund houses are unable to compete on expense ratios. Between March 2019 and March 2020, the share of the top 5 funds in the total liquid fund corpus increased from 55 per cent to 61 per cent. Moreover, a large fund size is also incentive compatible from an investor point of view, as such funds have significant systemic spill-overs, potentially improving possibilities of bailouts.

1.51 In theory, corporate fleet footedness in terms of exit can be diversified by ensuring that no single investor contributes a disproportionate share of investments to any scheme of a given asset management company (AMC). Extant regulations specify single investor concentration norms for diversifying the investor base. However, when the investor profile is dominated by risk averse investors, as is the case in money market/debt mutual funds, there is a strong possibility of a few corporates distributing their surplus over four/five fund houses and hence exits during times of stress could still be concerted.

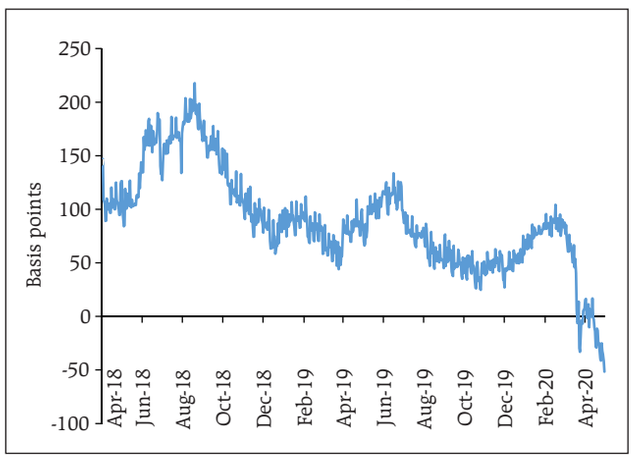
1.52 The debt fund management industry is extremely competitive and portfolio performance plays an important role in incremental fund flows. Such behaviour typically masks illiquidity premium as (short-run) excess returns. Excess returns, although substantial, turned negative in the wake of COVID-19 related dislocations (Chart 1.25). Given the recent churn in debt mutual funds, risk appetite of the sector and consequent investment allocation assumes importance.

Chart 1.24: Investor Profiles of Debt and Equity Funds
(as on December 31, 2019)



Note: FIs – Financial Institutions, FIIs – Foreign Institutional Investors.
Source: AMFI.

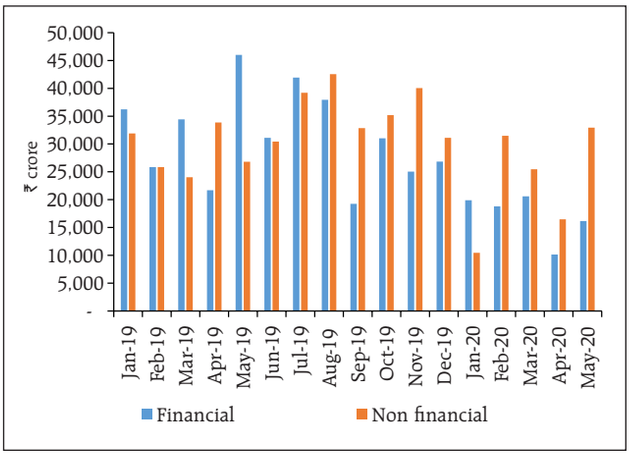
Chart 1.25: Excess Returns in Liquid Funds*



Note: *Returns differentials between the CRISIL liquid fund index and the 3-month constant maturity T-Bill portfolio[5]
Source: Bloomberg.

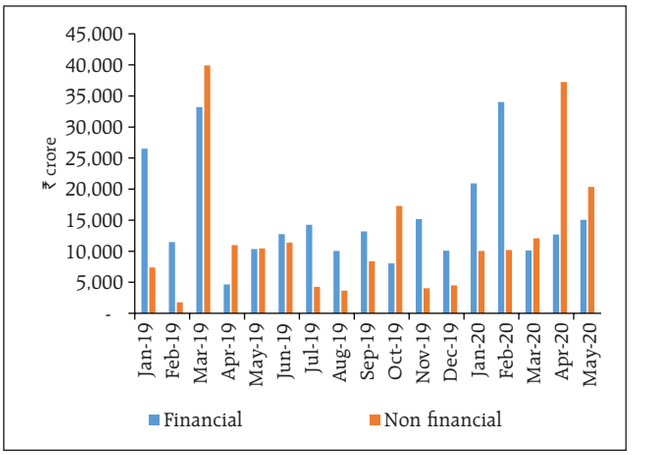
[5] The constant duration portfolio was chosen to be 3 months since liquid funds can invest in instruments with residual maturity up to 91 days.

Chart 1.26: CP Issuances: Non-PSU obligors



Source: Prime database

Chart 1.27: NCD Issuances: Non-PSU Obligors



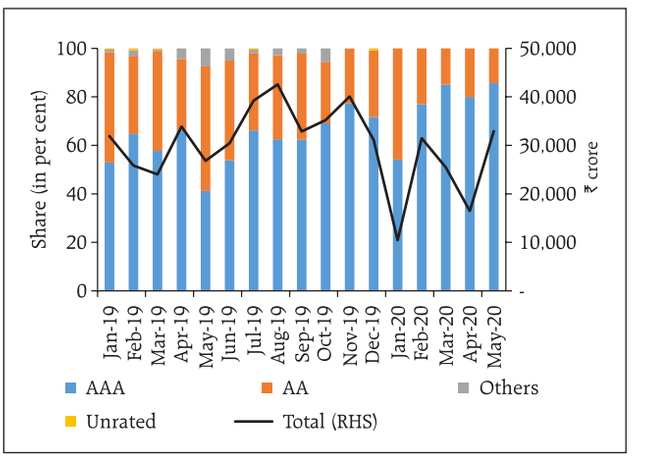
Source: Prime database

1.53 Supported by the RBI's liquidity measures, both Non-Convertible Debentures (NCD) and Commercial Paper (CP) markets are functioning normally notwithstanding the disruption induced by COVID-19 (Charts 1.26 and 1.27).

1.54 CP issuances by financials, however, show a declining tendency, with recent issuances being dominated by non-financial companies (Chart 1.26).

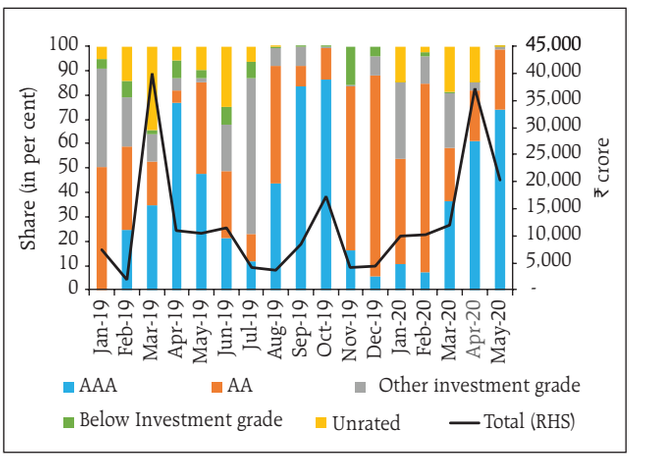
1.55 Ratings dispersion of CPs versus NCDs shows a more varied rating profile in respect of NCDs, notwithstanding their relatively longer tenor of investment, with domination by 'AAA'/'AA' rating grades (Charts 1.28 and 1.29).

Chart 1.28: CP issuances - Non-Financial Non-PSU Obligors



Source: Prime database

Chart 1.29: NCD issuance – Non-Financial Non-PSU obligors



Source: Prime database

Table 1.14: Issuances and Near-term Maturities of CPs and NCDs of Non-financial Non-PSU Obligors

(₹ crore)

	Issuances			Maturing						
	Mar-20	Apr-20	May-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20
'AAA'	26,100	35,865	43,310	28,044	2,732	20,225	21,840	13,820	23,354	7,026
'AA'	6,440	11,064	9,720	12,928	10,312	9,789	8,337	2,747	8,176	3,631
Others	5,015	6,801	272	9,898	12,560	3,261	7,723	6,713	1,853	6,594
Total	37,555	53,730	53,302	50,870	25,604	33,275	37,901	23,279	33,383	17,251

Source: Prime database

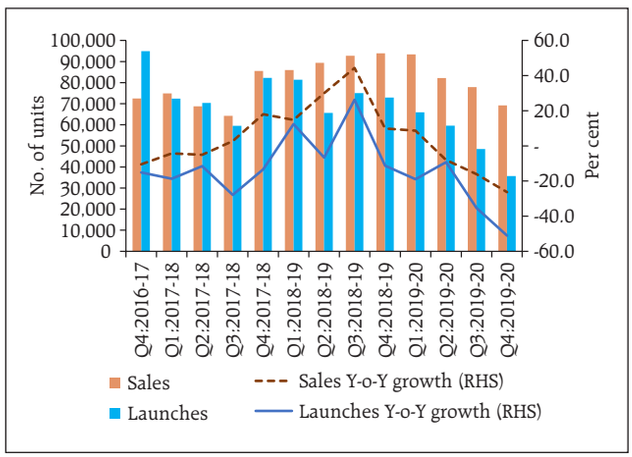
1.56 Near-term maturities in respect of CPs and NCDs show a wide dispersion across rating grades, although maturities in respect of higher ratings dominate (Table 1.14).

I.2.5 Housing Market

1.57 With the COVID-19 outbreak, demand and liquidity constraints intensified in the housing sector. House sales and launches, which had declined by 16 per cent and 35 per cent (y-o-y), respectively, during Q3:2019-20 were pulled down by around 26 per cent and 51 per cent, respectively, during Q4:2019-20 (Chart 1.30).

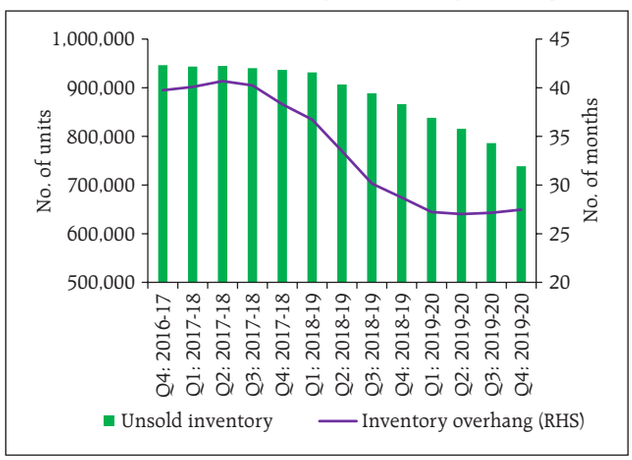
1.58 A nation-wide ebbing of consumer confidence triggered a preference for purchases of completed houses, which adversely affected the sale of under-construction houses. As new house launches plunged, the stock of unsold houses shrank and the inventory overhang (i.e. average number of months required to sell a house) dropped (Chart 1.31).

Chart 1.30: House Launches and Sales



Source: Prop Tiger Datalabs

Chart 1.31: Unsold Inventory and Inventory Overhang



Source: Prop Tiger Datalabs.

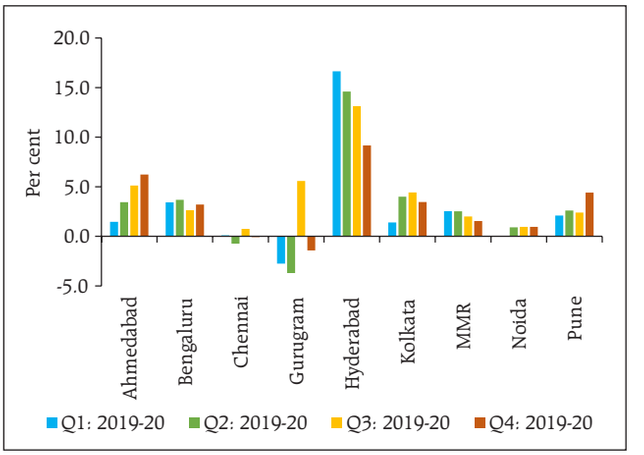
1.59 Under-construction projects constitute 70-80 per cent of the unsold inventory. House price growth remained contained in most cities in 2019-20 (Chart 1.32). With the suspension of construction activities across the country from mid-March, completion of under-construction projects is likely to be delayed, constraining new demand.

I.2.6 Systemic Risk Survey[6]

1.60 In the latest systemic risk survey (SRS), all major risk groups *viz.*, global risks, risk perceptions on macroeconomic conditions, financial market risks and institutional positions affecting the financial system were perceived as 'high'. Within the macroeconomic risks group, risks to domestic growth and the fiscal deficit were perceived to be in the 'very high' category, while risks on account of reversal of FIIs/slowdown in FDI, corporate sector vulnerabilities, collapsing real estate prices and household savings were perceived to be 'high risk' category.

1.61 About 56 per cent of the respondents opined that the prospects of the Indian banking sector are going to deteriorate considerably in the next one year, as earnings of the banking industry may be negatively impacted due to slow recovery post lockdown, along with lower net interest margins, elevated asset quality concerns and a possible increase in provisioning requirements. The top three sectors identified as adversely affected by the COVID-19 pandemic are: (i) tourism and hospitality; (ii) construction and real estate; and (c) aviation. Their prospects of recovery in the next six months appear bleak. A majority of the respondents opined that higher emphasis on localisation will take precedence over globalisation, going forward, and more regional trade pacts would be preferred.

Chart 1.32: City-wise Weighted Average Price Growth



Source: Prop Tiger Datalabs.

Summary and Outlook

1.62 Overall, there is an unprecedented uncertainty about global growth, though financial markets have broadly stabilised in response to unprecedented fiscal and monetary stimulus. A combination of fiscal, monetary and regulatory interventions in India has kept financial markets from freezing and financial intermediaries functioning normally. Bank credit shows clear signs of risk aversion. Non-bank intermediation, after facing turbulent times, is stabilising as a result of timely and calibrated regulatory interventions. Capital flows are tentatively picking up even as external financing needs remain subdued. Commodity market spillovers, except for oil, remain contained. Adequate levels of foreign exchange reserves provide a buffer. While the uncertainties still remain, restarting financial sector reforms on their path of convergence with global best practices and standards while adapting to the specific requirements of India's developmental strategy should be the focus, going forward.

[6] The systemic risk survey (SRS) captures experts' perceptions on the major risks being faced by the financial system on a 10-point scale. Experts include market participants, academics and rating agencies. SRS is conducted on a half-yearly basis and reported in the FSR (Annex 1).

Chapter II

Financial Institutions: Soundness and Resilience

Bank credit growth moderated across constituent bank groups during the second half of 2019-20. The profitability ratios of Scheduled Commercial Banks (SCBs), although better in FY 2019-20 relative to FY 2018-19, have declined in the second half of FY 2019-20 and the outlook is weighed down by the moratorium's implications for loan classification. Macro-stress tests for credit risk indicate that under the baseline scenario, SCBs' gross non-performing assets (GNPA) ratio may increase from 8.5 per cent in March 2020 to 12.5 per cent (14.7 per cent in a very severe stress scenario) by March 2021, whereas the system-level[1] capital to risk-weighted assets ratio (CRAR) may fall from 14.6 per cent in March 2020 to 13.3 per cent (11.8 per cent in a very severe stress scenario) by March 2021. Banks' exposure to NBFCs/HFCs has increased. Contagion risks through financial networks have moderated due to higher capital buffers as also the shrinking interbank market.

Introduction

2.1 The deterioration in the macroeconomic and financial environment since the December 2019 FSR, globally and domestically, impinged on credit demand, asset quality, capital adequacy and profitability of scheduled commercial banks which are bracing up for the fuller impact of COVID-19. Stress on non-banking financial companies and co-operative banks, that had mounted in the wake of credit events in 2019, has been exacerbated by risk aversion and flight to safety among banks, leading to funding constraints and differentiation in market access. The outlook remains clouded with considerable uncertainty as the pandemic takes its toll. In the interregnum, however, financial markets have stabilised in response to recent policy measures and liquidity stress experienced by several financial intermediaries has eased.

2.2 Against this backdrop, this chapter sets out to evaluate the soundness and resilience of banks and NBFCs. Section II.1 presents an assessment of SCBs' credit performance, asset quality, capital adequacy and risks. It also evaluates their resilience against macroeconomic shocks through stress tests for credit risk, which are supplemented by (a) bank level single factor sensitivity analysis for credit, interest rate, liquidity, concentration and equity price risks; and (b) bottom-up stress tests for capital and liquidity as well as derivatives portfolios. Section II.2 undertakes an examination of recent performance of scheduled urban cooperative banks (SUCBs) and the results of stress tests for credit and liquidity risks. Section II.3 discusses the major financial parameters of NBFCs, the recent disruptions in the sector and the results of stress tests at system level as well as for individual NBFCs. An analysis of the ratings distribution of the underlying assets for special mention accounts (SMAs) is presented in section II.4. The concluding section II.5 presents a detailed analysis of the network structure and connectivity of the Indian financial system, including the inter-bank market, exposure of / to various groups of financial entities and the results of contagion analysis under adverse scenarios.

II.1 Scheduled Commercial Banks[2]

2.3 The recent period is marked by a structural shift in the performance of India's commercial banking sector. A reduction in the overhang of

[1] Analyses are 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 53 SCBs (including public sector banks (PSBs), private sector banks (PVBs) and foreign banks (FBs)) accounting for 98 per cent of the assets of the total banking sector have been considered.

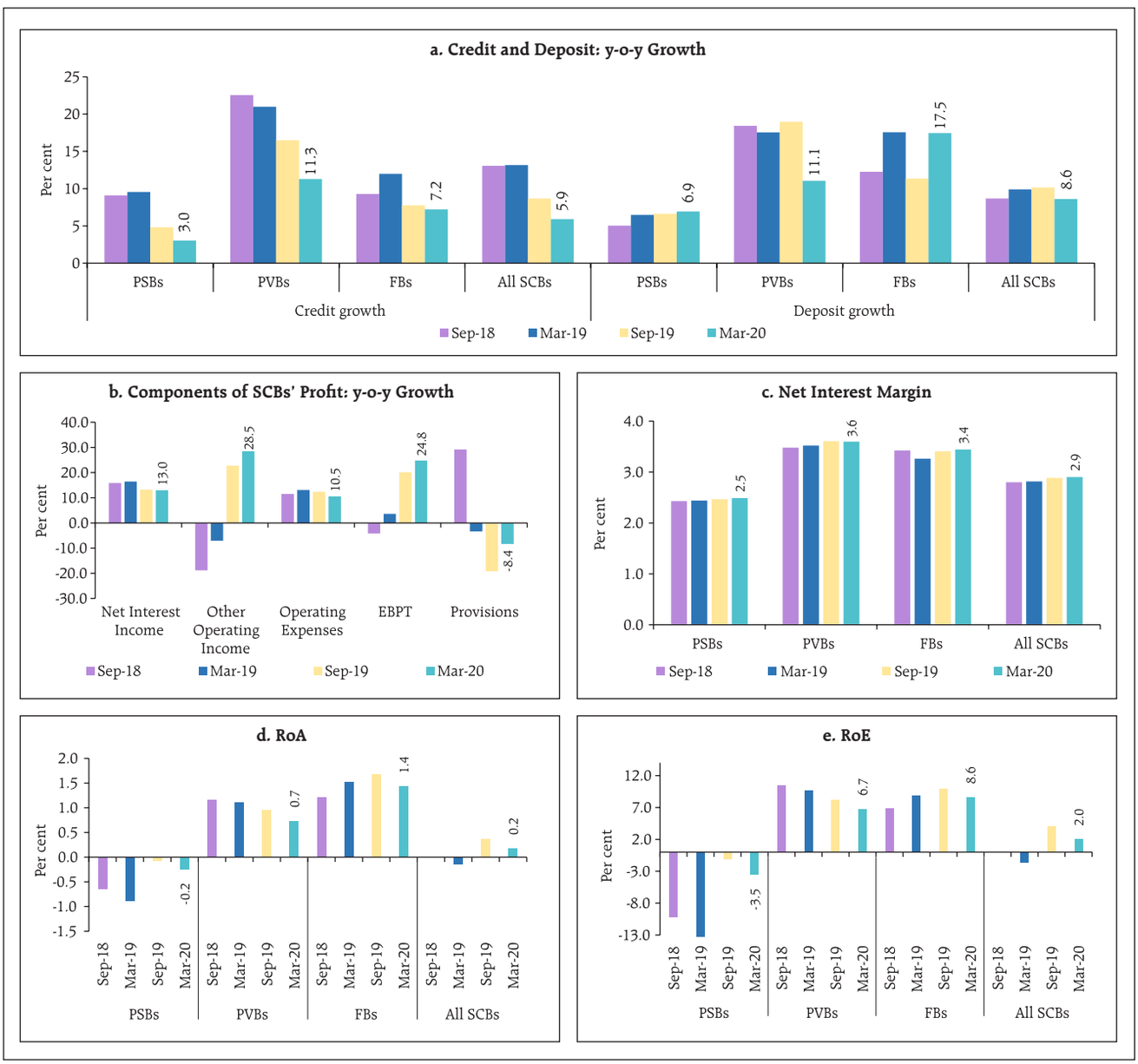
[2] The analyses done in the chapter are based on latest available data as of June 10, 2020, which are provisional. SCBs only include public sector banks, private sector banks and foreign banks. To ensure comparability of data across the years, IDBI Bank is included under public sector banks for the analyses in this section though it has been declared a private sector bank for regulatory purposes from January 21, 2019.

stressed assets continued up to the early part of 2019-20, and fresh slippages were arrested, despite a prolonged slowdown in global and domestic growth impinging on credit demand. Towards the close of the financial year, these slow moving improvements were overwhelmed and halted by the outbreak of COVID-19. The regulatory dispensations that the pandemic has necessitated in terms of the moratorium on loan instalments and deferment of interest payments may have implications for the financial health of SCBs, going forward.

II.1.1 Performance – Assets and Earnings

2.4 Credit growth (y-o-y) of SCBs, which had considerably weakened during the first half of 2019-20, slid down further to 5.9 per cent by March 2020 (Chart 2.1) and remained muted up to early June 2020. This moderation was broad-based across

Chart 2.1: Select Performance Indicators



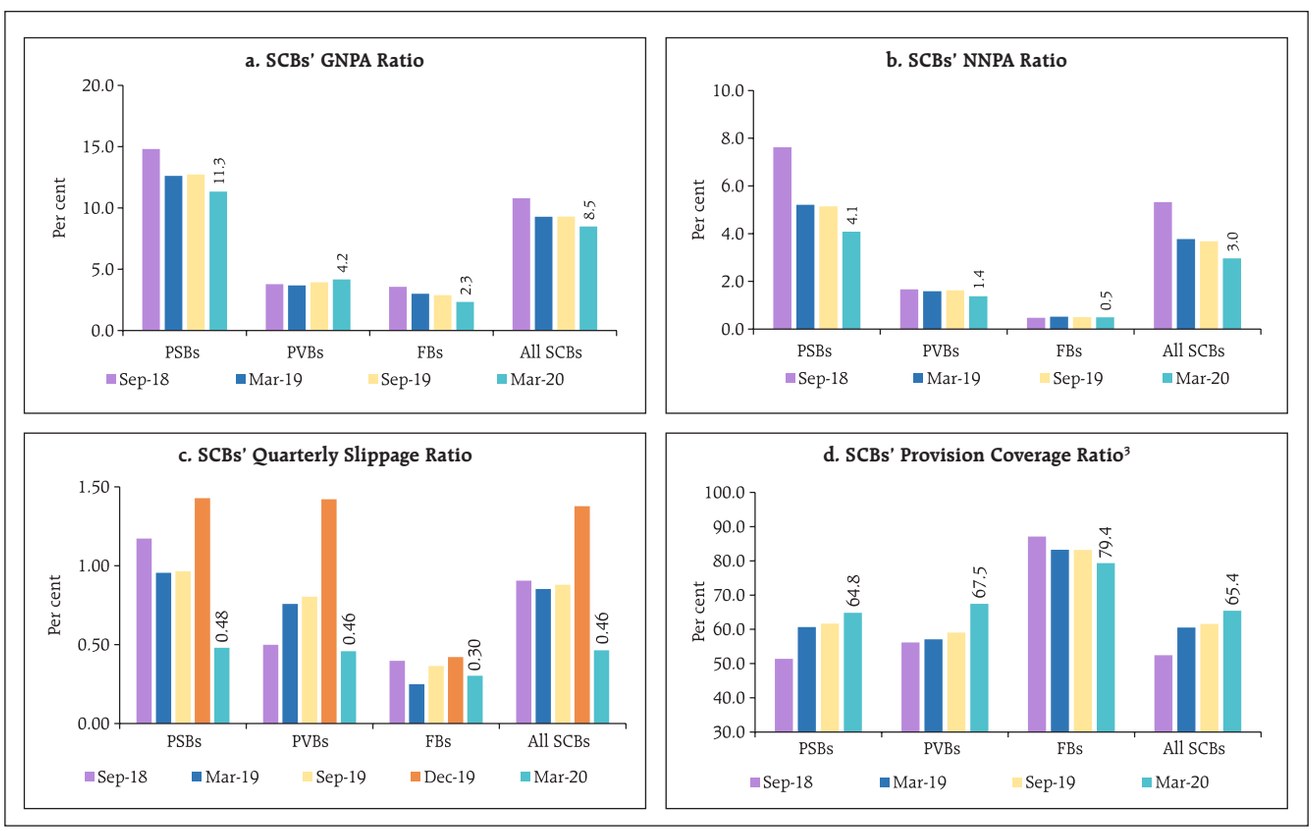
Source: RBI Supervisory Returns and Staff Calculations.

all bank groups. Year-on-year (y-o-y) deposit growth also moderated during the second half of 2019-20, mainly on account of PVBs (Chart 2.1 a), although a pick-up has occurred in the early months of 2020-21, reflecting COVID-19 related precautionary savings behaviour. Commercial banks' earnings before provisions and taxes (EBPT) were supported by increases in other operating income (OOI) and some moderation in the growth of operating expenses (Chart 2.1 b). Net interest income (NII) slowed down marginally, taking down net interest margins (NIM) to the September 2019 level (Chart 2.1 c). Profitability ratios, *viz.*, return on assets (RoA) and return on equity (RoE), declined in the second half of FY 2019-20 across all bank groups (Chart 2.1 d and Chart 2.1 e).

II.1.2 Asset Quality and Capital Adequacy

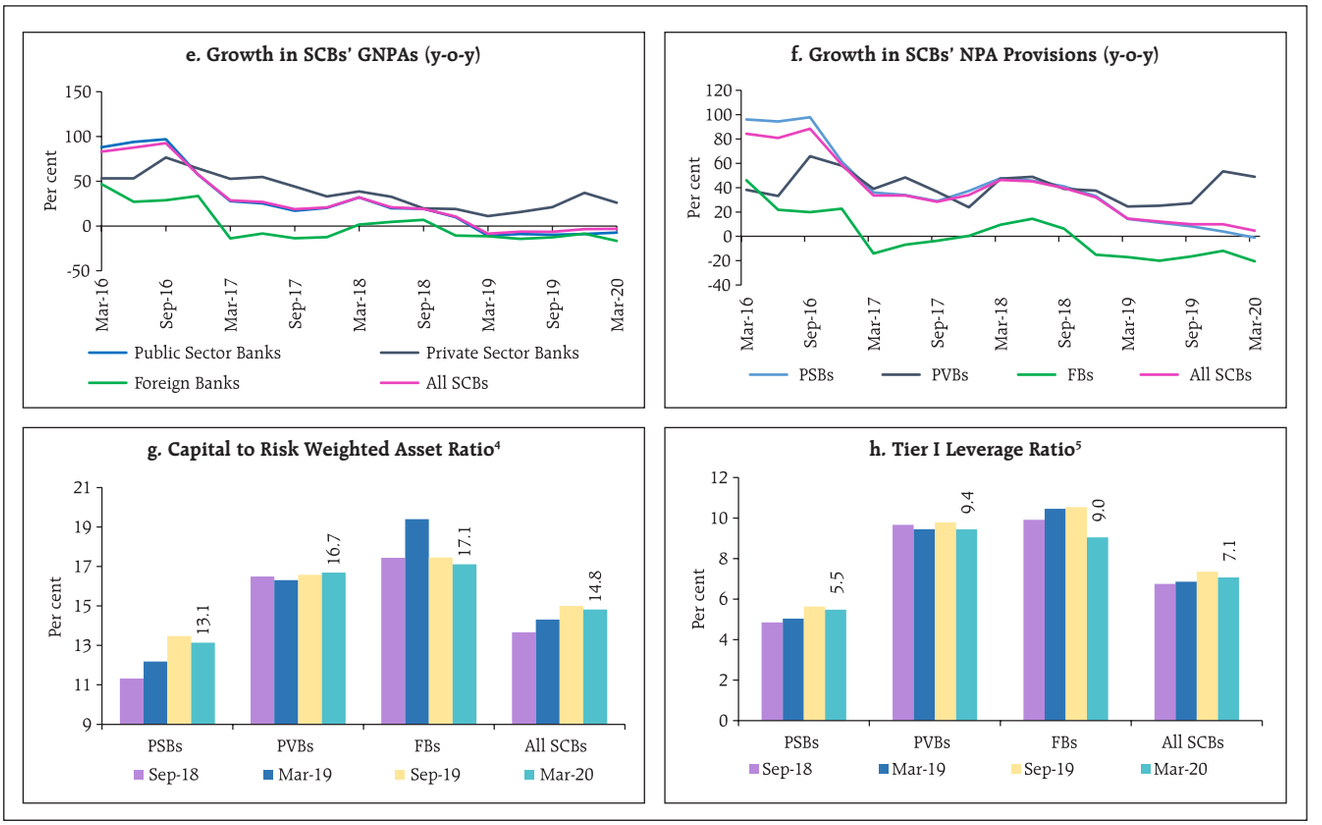
2.5 The gross and net non-performing asset (GNPA and NNPA) ratios of all SCBs which had reached 9.3 per cent and 3.7 per cent in September 2019 have come down to 8.5 per cent and 3.0 per cent in March 2020 (Chart 2.2 a & b). This is evident from the receding quarterly slippage ratios (calculated as new accretion to NPAs in the quarter as a ratio to the standard advances at the beginning of the quarter) across all bank groups (Chart 2.2 c). As a result, the provision coverage ratio (PCR) of SCBs improved to 65.4 per cent in March 2020 from 61.6 per cent in September 2019 (Chart 2.2 d). NPA provisions have been decelerating for PSBs and FBs since March 2019 (Chart 2.2 f).

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



[3] 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.

2.6 The capital to risk-weighted assets ratio (CRAR) of SCBs edged down to 14.8 per cent in March 2020, mainly due to reduction of CRARs of the PSBs. Their RoA continued to be negative as a group, notwithstanding lukewarm credit growth and moderate slippages. Among bank groups, PVBs recorded a marginal rise in CRAR whereas the ratio weakened for PSBs and FBs (Chart 2.2 g). Tier I leverage ratio contracted in March 2020 for all bank groups (Chart 2.2 h).

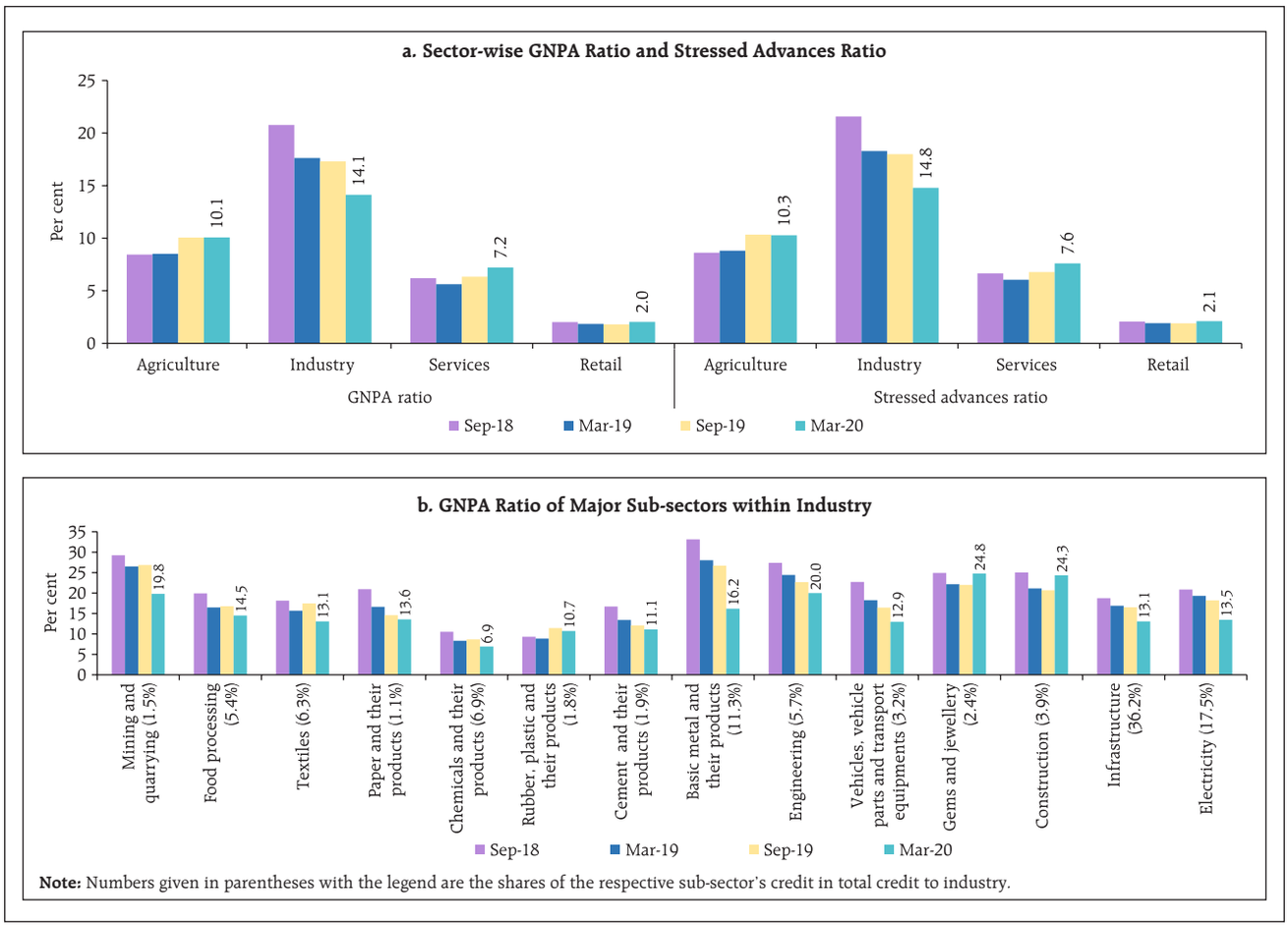
II.1.3 Sectoral Asset Quality

2.7 Sectorally, the quality of bank loans to services sector worsened in March 2020. The GNPA ratio of the retail loan sector also edged up (Chart 2.3 a). Among major sub-sectors within industry, GNPA ratios in respect of construction and gems and jewellery sectors swelled up in March 2020 (Chart 2.3 b). On the other hand, the infrastructure sector (with a share of 36.2 per cent in bank credit to the industrial sector), basic metals (11.3 per

4 The CRAR pertains to all SCBs.

5 Tier I leverage ratio is the ratio of Tier I capital to total assets.

Chart 2.3: Sectoral Asset Quality Indicators



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

Source: RBI Supervisory Returns and Staff Calculations.

cent) and electricity (17.5 per cent) have shown a perceptible decline in GNPA ratios. This has implications for aggregate asset quality of the banking sector.

II.1.4 Credit Quality of Large Borrowers

2.8 Large borrowers[6] accounted for 51.3 per cent and 78.3 per cent of the aggregate loan portfolio and GNPAs, respectively, of SCBs in March 2020 (Chart 2.4 a). Both these shares have declined since March 2018 implying that, on an incremental basis, credit and NPA accretions are occurring in the small borrower category in the recent period. The outstanding amount under SMA[7]-0, SMA-1, SMA-2 and restructured standard loan categories and NPAs of large borrowers declined during the quarter ending March 2020 (Chart 2.4 b). GNPA ratios of large borrowers edged down during the quarter

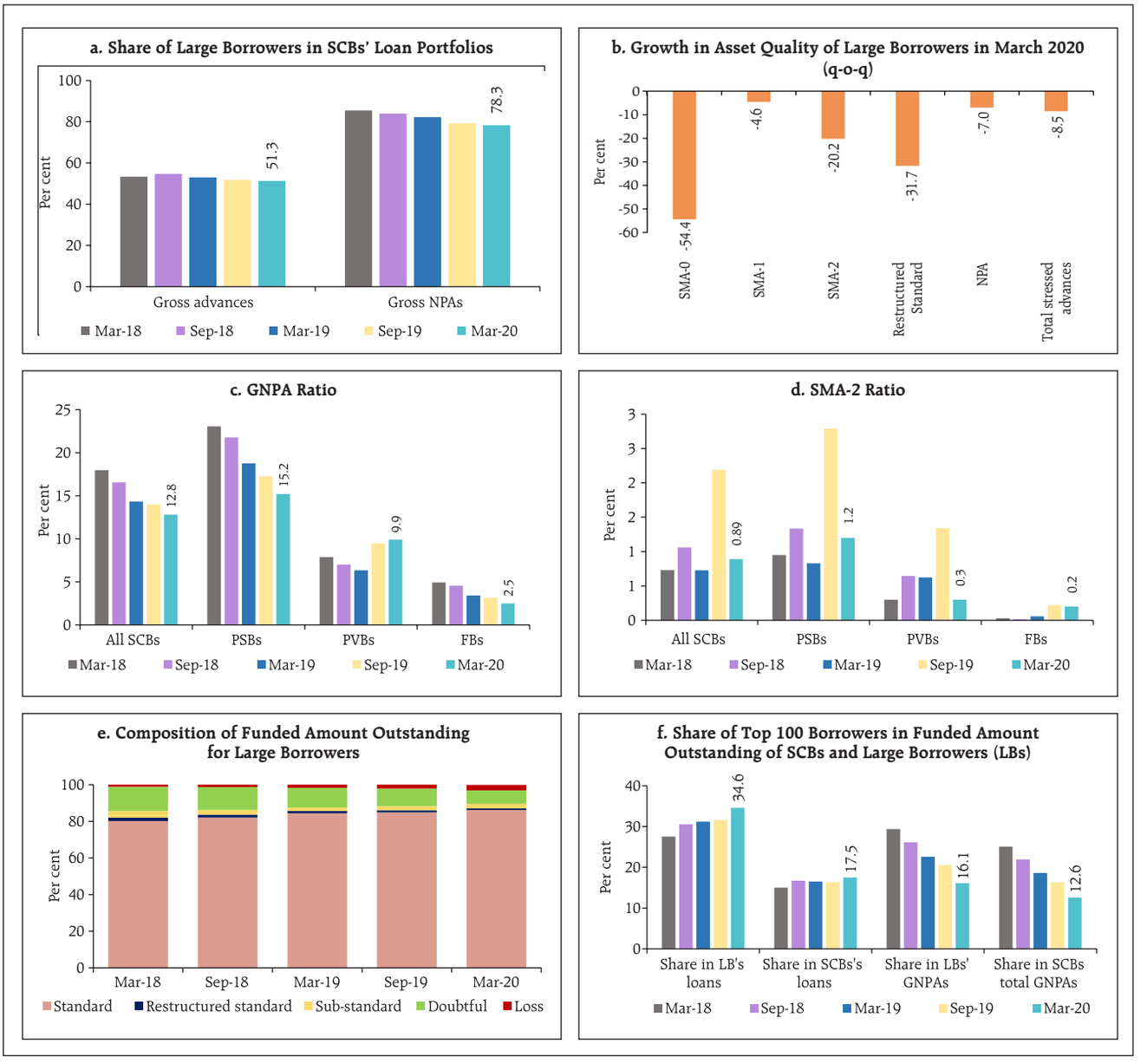
6 A large borrower is defined as one who has aggregate fund-based and non-fund-based exposure of ₹5 crore and above. This analysis is based on SCBs' global operations.

7 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.

across all banks, except for PVBs (Chart 2.4 c). SMA-2 ratios of large borrowers plunged across all bank groups, except for foreign banks (Chart 2.4 d). At the same time, the share of loss assets has been rising within the funded amount for large borrowers (Chart 2.4 e).

2.9 The top 100 borrowers accounted for 17.5 per cent of gross advances, but only 12.6 per cent of GNPAs of SCBs in March 2020 (Chart 2.4 f). Since the SMA ratios factor in the COVID-19 related regulatory moratorium, a separate analysis to assess the quality of the SMA assets by examining the ratings distribution is presented in Section II.4.

Chart 2.4: Select Asset Quality Indicators of Large Borrowers

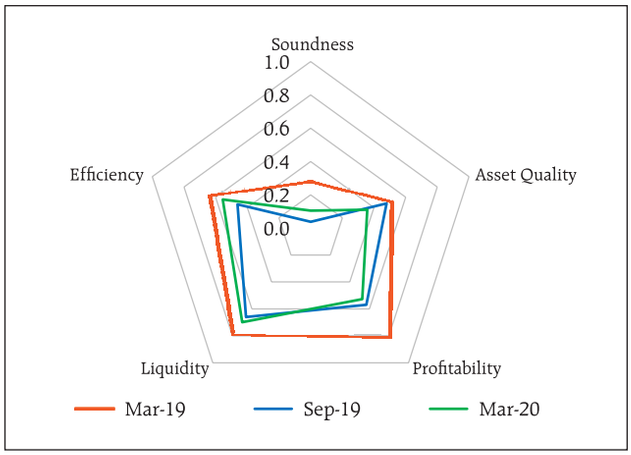


Source: RBI Supervisory Returns and Staff Calculations.

II.1.5 Risks

2.10 The banking stability indicator (BSI)[8] shows that, among the five dimensions considered for assessing the changes in underlying conditions and risk factors, SCBs have recorded deterioration in soundness, liquidity and efficiency in March 2020 as compared with the September 2019 position, whereas asset quality and profitability showed marginal improvement (Chart 2.5). Nevertheless, no comfort can be drawn on this front since any loss of income of banks during COVID-19 will be visible only from the first quarter of 2020-21.

Chart 2.5: Banking Stability Map

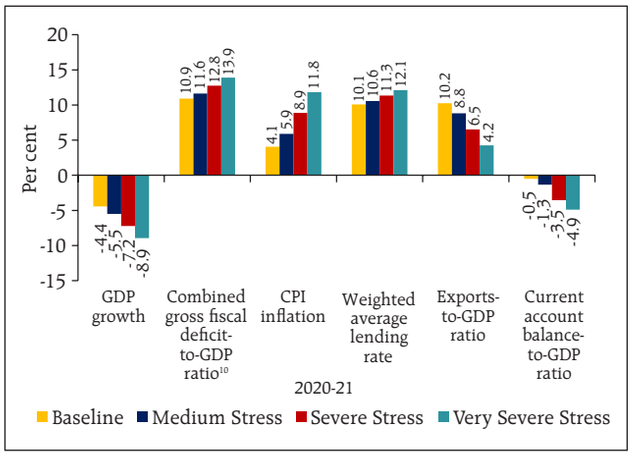


Note: Away from the centre signifies increase in risk.
Source: RBI Supervisory Returns and Staff Calculations.

II.1.6 Resilience – Macro Stress Tests

2.11 The resilience of Indian banking in the face of macroeconomic shocks was tested through macro-stress tests which attempt to assess the impact of cumulative shocks on SCBs' balance sheet and generate projections of GNPA ratios and CRARs over a one year horizon under a baseline and three adverse[9] (medium, severe and very severe) scenarios. The baseline scenario is derived from the forecasted values of macroeconomic variables[10]. As the asset classification in March 2020 could have been influenced by the regulatory moratorium in the face of the COVID-19 pandemic, the projections for this exercise are built up using data from June 2011 up to the quarter ended December 2019 (instead of March 2020). The medium, severe and very severe adverse scenarios have been obtained by applying 0.25 to one standard deviation (SD) shocks, 1.25 to two SD shocks and 2.25 to three SD shocks, respectively, to each of the macroeconomic variables, increasing the shocks by 25 basis points in each subsequent projection quarter (Chart 2.6).

Chart 2.6: Macroeconomic Scenario Assumptions
(Assessment under stringent hypothetical adverse economic conditions and should not be interpreted as forecasts)



2.12 Given the fact that impact of moratorium is still uncertain and evolving, the exact nature of how the same will play out on the quality of banking

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

9 The adverse scenarios are stringent assessments under hypothetical adverse economic conditions and model outcomes should not be interpreted as forecasts.

10 GDP growth,combined gross fiscal deficit-to-GDP ratio, CPI inflation, weighted average lending rate, exports-to-GDP ratio and current account balance-to-GDP ratio. Combined Gross fiscal deficit (GFD) represents the aggregate fiscal deficit of centre and states as against GFD of centre used previously.

assets is difficult to ascertain accurately. Therefore, this will only be ascertainable with passage of time, and outcomes would be disseminated in the forthcoming publications of RBI, from time to time.

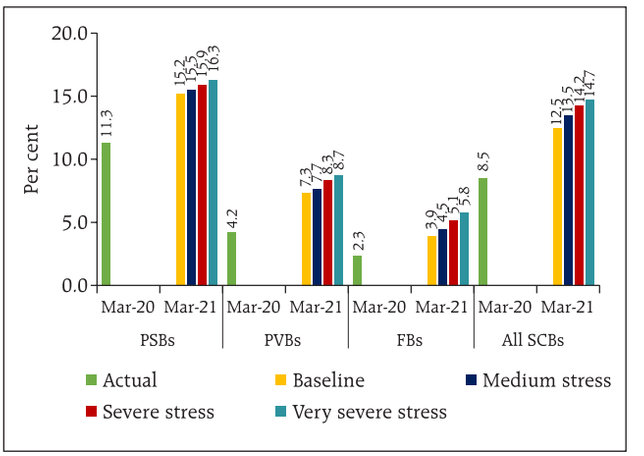
2.13 The stress tests indicate that the GNPA ratio of all SCBs may increase from 8.5 per cent in March 2020 to 12.5 per cent by March 2021 under the baseline scenario (Chart 2.7). If the macroeconomic environment worsens further, the ratio may escalate to 14.7 per cent under the very severely stressed scenario.

2.14 Among the bank groups, PSBs' GNPA ratio of 11.3 per cent in March 2020 may increase to 15.2 per cent by March 2021 under the baseline scenario; the GNPA ratio of PVBs and FBs may increase from 4.2 per cent and 2.3 per cent to 7.3 per cent and 3.9 per cent, respectively, over the same period.

2.15 The system level CRAR is projected to drop from 14.6 per cent in March 2020 to 13.3 per cent in March 2021 under the baseline scenario and to 11.8 per cent under the very severe stress scenario (Chart 2.8 a).

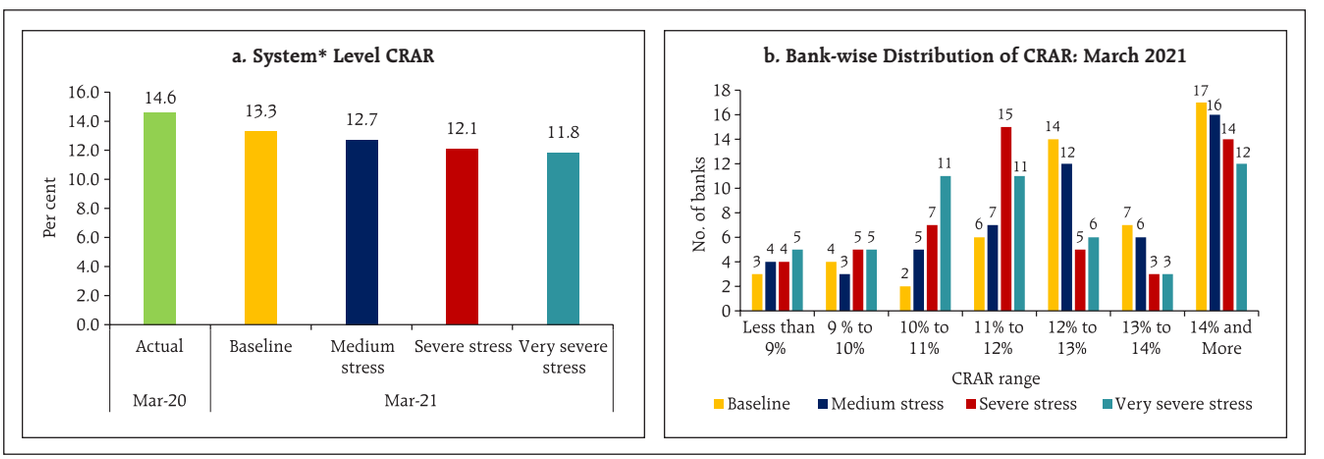
2.16 Stress test results indicate that, five banks may fail to meet the minimum capital level by March 2021 in a very severe stress scenario. This, however, does not take into account the mergers or any further recapitalization, which will further increase systemic resilience (Chart 2.8 b).

Chart 2.7: Projection of SCBs' GNPA ratios



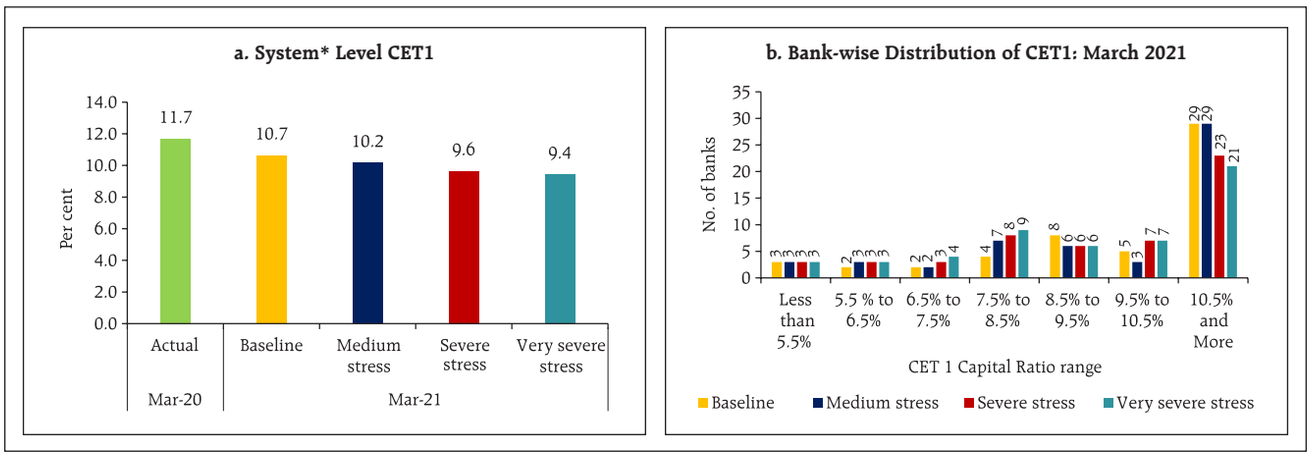
Note: The system level GNPAs are projected using three complementary econometric models- Multivariate Regression; Vector Autoregression (VAR) and Quantile Regression; and averaging the resulting GNPA ratios. For bank group level projections, average of Multivariate Regression and VAR results are used.
Source: RBI Supervisory Returns and Staff Calculations.

Chart 2.8: CRAR Projections



* For a sample of 53 select banks accounting for 98 per cent of the assets of the total banking sector.
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.

Chart 2.9: Projection of CET 1 Capital Ratio



* For a sample of 53 select banks accounting for 98 per cent of the assets of the total banking sector.
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.

2.18 While the regulatory moratorium may be holding back some stress, the industry-wise composition of good quality loans (*i.e.*, standard advances which have not yet turned into SMA; and SMA-0 loans) of PSBs and PVBs reveals that some of the industries with higher share of such loans across bank groups are severely affected by the COVID-19 crisis (Table 2.1).

II.1.7 Sensitivity Analysis[11]

2.19 In order to assess vulnerabilities of SCBs under various scenarios[12], a number of single-factor sensitivity stress tests[13] were carried out on quarterly data from March 2011 up to March 2020 to simulate credit, interest rate, equity prices and liquidity risks materialising under a top-down[14] sensitivity analysis.

Table 2.1: Top 10 Industries with High Share of Good Quality Assets

Public Sector Banks		Private Sector Banks	
Industry	**Share of good quality loans of the industry as share of total good quality loans as on March 2020**	**Industry**	**Share of good quality loans of the industry as share of total good quality loans as on March 2020**
NBFCs- general purpose loans	10.4	NBFCs- general purpose loans	7.9
Generation of Electricity	9.8	Generation of Electricity	6.0
NBFCs- in the housing sector	7.7	Real Estate Activities	5.5
Developmental Financial Institutions	4.6	Manufacturing of Basic Iron and Steel	4.1
Manufacturing of Refined Petroleum Products	4.6	NBFCs- in the housing sector	3.6
Manufacturing of Basic Iron and Steel	4.4	Construction/ Maintenance of Roads	2.4
Construction/Maintenance of Roads	3.9	Basic Telecom Services	2.4
Public Utility Services through Consumer Coops.	3.3	Manufacturing of Refined Petroleum Products	2.4
Collection and Distribution of Electricity	2.5	Manufacturing of Basic Non-ferrous Metals	1.7
Real Estate Activities	2.3	Manufacturing of Cement, Lime and Plaster	1.7

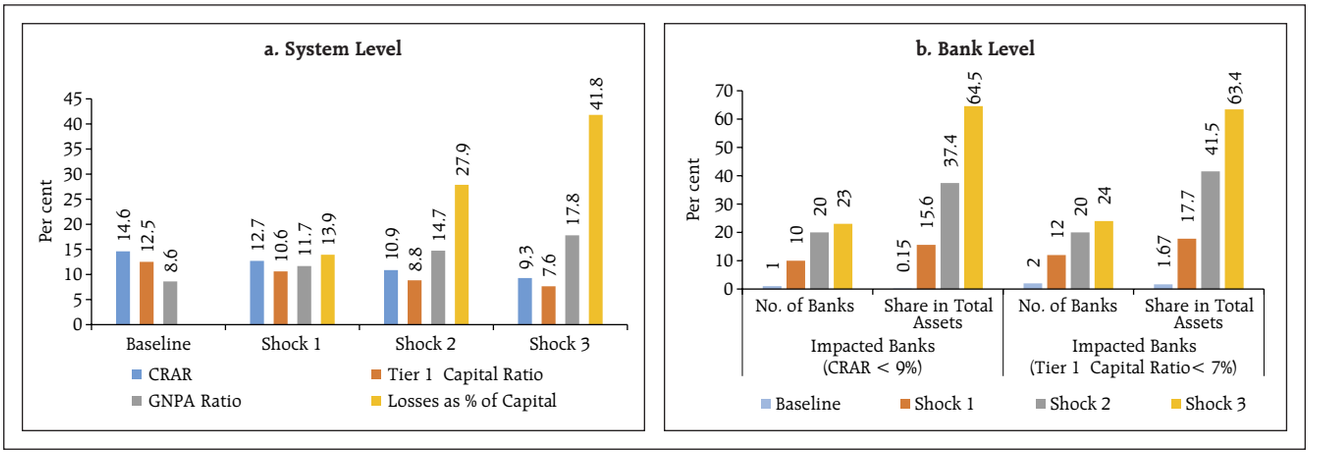
Source: RBI Supervisory Returns and Staff Calculations.

[11] Under the macro stress tests, the shocks were in terms of adverse macroeconomic conditions while in sensitivity analysis shocks are applied to single factors like GNPAs, interest rate, equity prices, deposits, *etc.*, at a time. Also, macro stress tests for GNPA ratios were applied at the system and major bank group levels, whereas the sensitivity analysis was done at system and bank levels.

[12] Single factor sensitivity analysis stress tests were conducted for a sample of 53 SCBs accounting for 98 per cent of the assets of the total banking sector. The shocks designed under various hypothetical scenarios are extreme but plausible.

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

Chart 2.10: Credit Risk - Shocks and Outcomes



Shock 1: 1 SD shock on GNPAs
Shock 2: 2 SD shock on GNPAs
Shock 3: 3 SD shock on GNPAs
Note: System of select 53 SCBs.
Source: RBI Supervisory Returns and Staff Calculations.

a. Credit Risk

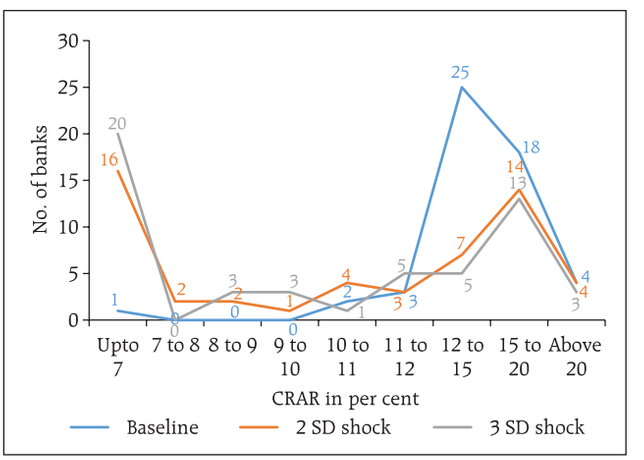
2.20 Under a very severe shock of 3 SD[15] to the system level GNPA (*i.e.*, if the GNPA ratio of 53 select SCBs moves up from 8.6 per cent to 17.8 per cent), the system-level CRAR would decline from 14.6 per cent to 9.3 per cent and the Tier-1 capital ratio would decline from 12.5 per cent to 7.6 per cent. The impairment in capital at the system level could thus be about 41.8 per cent. The results of reverse stress test show that it requires a shock of 3.26 SD to bring down the system-level CRAR to 9 per cent.

2.21 Bank-level stress test results show that 23 banks[16] with a share of 64.5 per cent in SCBs' total assets might fail to maintain the required CRAR under the scenario of 3 SD shock to the GNPA ratio (Chart 2.10). In such an extreme shock scenario, the CRAR of all the 18 PSBs is likely to go down to 9 per cent.

2.22 Under the scenario of 3 SD shock to the GNPA ratio, CRAR would fall below 7 per cent for as many as 20 banks (Chart 2.11) which would dominate the list of banks witnessing large capital erosion.

2.23 15 and 20 banks would record over six percentage points decline in CRAR under 2 SD and 3 SD shocks, respectively (Chart 2.12).

Chart 2.11: CRAR-wise Distribution of Banks
(under 2 SD and 3 SD shocks on GNPA ratio)



Note: System of select 53 SCBs.
Source: RBI Supervisory Returns and Staff Calculations.

[14] Top down stress tests were based on specific scenarios and on aggregate bank-wise data to give a comparative assessment of the impact of a given stress across banks.

[15] The standard deviation (SD) of the GNPA ratio is estimated by using quarterly data since 2011. One SD shock approximates a 36 per cent increase in the level of GNPAs.

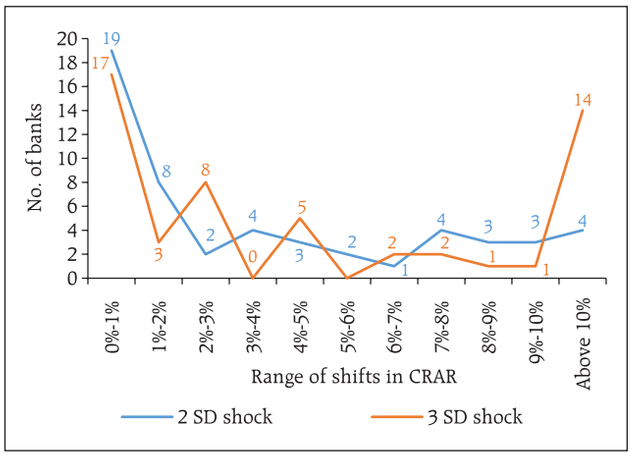
[16] Among these banks, one bank had its CRAR less than 9 per cent before the shocks were applied.

b. Credit Concentration Risk

2.24 Stress tests on banks' credit concentration with respect to top individual borrowers according to their stressed advances showed that, in the extreme scenario of the top three individual borrowers failing to repay[17], the impact was significant for three banks, which together account for 2.7 per cent of the total assets of SCBs. Under the assumed scenarios of failure of the top 1, top 2 and top 3 borrowers, the impact on CRAR at the system level would be 34, 51 and 63 basis points, respectively (Chart 2.13).

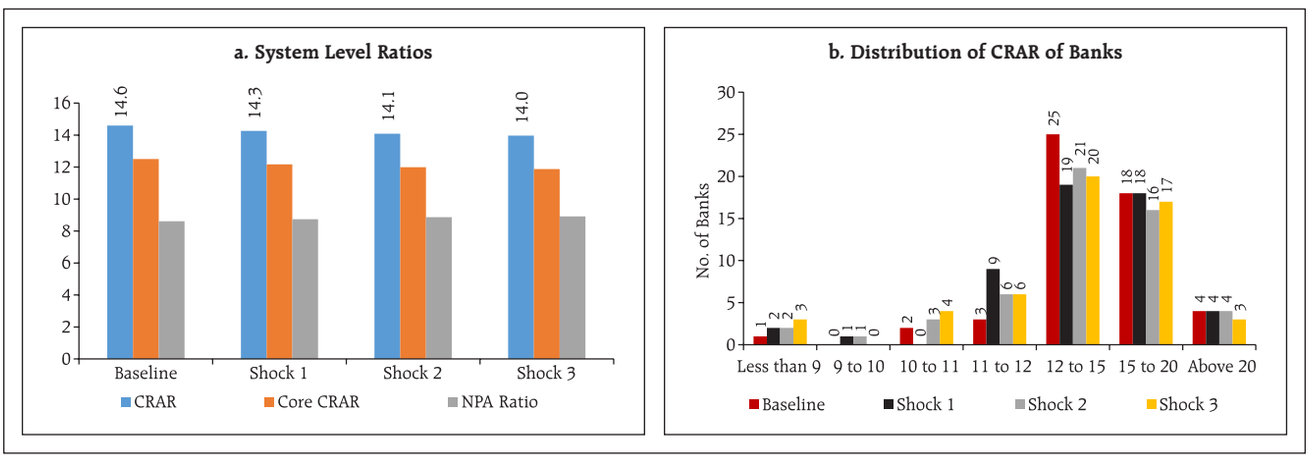
2.25 Stress tests on banks' credit concentration, considering top individual borrowers according to their standard exposures showed that in the extreme scenario of top three individual borrowers failing to repay[18], the impact was significant for two banks (Chart 2.14). Under the assumed scenario of default by all the top three individual borrowers, CRAR at the system level would go down by 140 basis points.

Chart 2.12: Range of Shifts in CRAR
(under 2 SD and 3 SD shocks on GNPA ratio)



Note: System of select 53 SCBs.
Source: RBI Supervisory Returns and Staff Calculations.

Chart 2.13: Credit Concentration Risk: Individual Borrowers – Stressed Advances

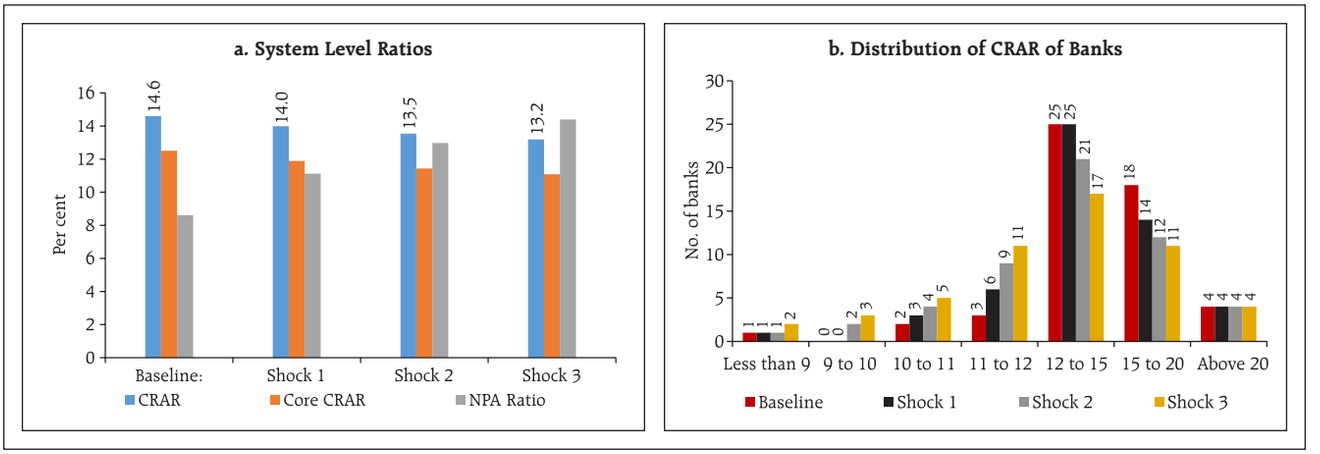


Note: For a system of select 53 SCBs.
Shock 1: Topmost stressed individual borrower fails to meet its payment commitments.
Shock 2: Top 2 stressed individual borrowers fail to meet their payment commitments.
Shock 3: Top 3 stressed individual borrowers fail to meet their payment commitments.
Source: RBI Supervisory Returns and Staff Calculations.

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

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

Chart 2.14: Credit Concentration Risk: Individual Borrowers – Exposure



Note: For a system of select 53 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: The Reserve Bank's supervisory returns and staff calculations.

Table 2.2: Credit Concentration Risk: Group Borrowers' Exposure

Shocks		System Level				Bank Level	
		CRAR	Core CRAR	NPA Ratio	Losses as % of Capital	Impacted Banks (CRAR < 9%)	
Baseline (Before Shock)		14.6	12.5	8.6	---	**No. of Banks**	**Share in Total Assets of SCBs (in %)**
Shock 1	The top 1 group borrower fails to repay	13.8	11.7	11.9	6.0	1	0.2
Shock 2	The top 2 group borrowers fail to repay	13.1	11.0	14.7	10.9	1	0.2
Shock 3	The top 3 group borrowers fail to repay	12.6	10.4	17.0	15.0	2	1.1

Note: For a system of select 53 SCBs.
Source: RBI Supervisory Returns and Staff Calculations.

2.26 Under the scenarios of default by group borrowers in the banks' credit exposure concentration, stress tests reveal that the system level capital losses[19] could be around (a) 6.0 per cent, if the top-most group borrower defaults and (b) 10.9 per cent, if the top two group borrowers default. Two banks will not be able to maintain their CRAR level at 9 per cent if top three group borrowers default (Table 2.2).

c. Sectoral Credit Risk

2.27 Sensitivity analysis of bank-wise vulnerability due to their exposures to certain sub-sectors (shocks based on subsector-wise historical SDs of GNPA ratio) reveals varying magnitude of increase in the GNPAs of banks in different sub-sectors (Table 2.3).

2.28 The resulting losses due to increased provisioning and reduced income were taken into account to calculate banks' stressed CRAR and

Table 2.3: Decline in System Level CRAR
(basis points, in descending order)

	1SD	2SD	3SD
Infrastructure - Energy (55%)	10	20	29
Basic Metal and Metal Products (74%)	10	17	22
All Engineering (38%)	3	5	7
Infrastructure - Transport (29%)	3	6	6
Textiles (29%)	2	4	5
Infrastructure - Communication (78%)	2	3	5
Construction (27%)	2	3	5
Food Processing (25%)	1	3	4
Vehicles, Vehicle Parts and Transport Equipment (52%)	1	2	3
Gems and Jewellery (24%)	1	1	2

Note: For a system of select 53 banks.
Note: Numbers in parentheses represent the growth in GNPAs due to 1SD shock to the subsector's GNPA ratio.
Source: RBI Supervisory Returns and Staff Calculations.

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

risk weighted assets (RWAs). A 2SD shock to the infrastructure – energy segment and basic metals and metal products segment would reduce the system level CRAR by 20 bps and around 17 bps, respectively (Table 2.3). Although the impact of even a 3 SD shock in various sectors is seen to be limited, the cumulative impact may be sizable for a few banks.

d. Interest Rate Risk

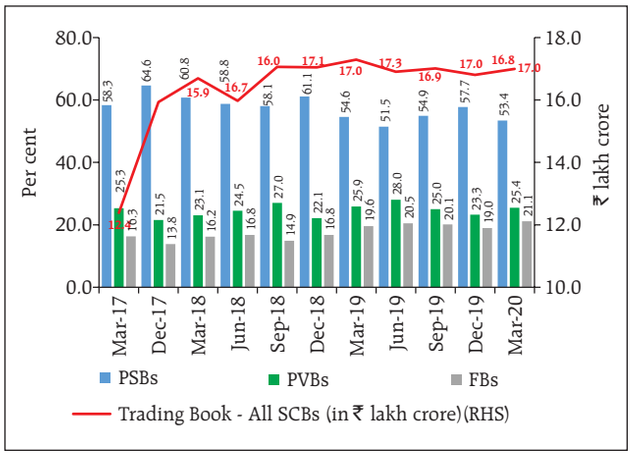
2.29 The market value of the portfolio subject to fair value for a sample of 52 SCBs accounting for 98 per cent of the total assets of the banking system stood at ₹17 lakh crore as on end-March 2020 (Chart 2.15). About 91.7 per cent of the investments subjected to fair value were classified as available for sale (AFS).

2.30 The sensitivity (PV01[20]) of the AFS portfolio of PSBs and PVBs declined *vis-a-vis* the December 2019 position, whereas it marginally increased for FBs. In terms of PV01 curve positioning, the tenor-wise distribution indicates continuing bias of PSBs in favour of 5-10 year tenor and a marginal decrease in the proportion of PV01 in the 1-5 year bucket with a corresponding marginal increase in the longer maturity tenors. PVBs and FBs, however, continue to place their bets in the 1-5 year tenor bucket, though the proportion was lower for PVBs in this case (Table 2.4).

2.31 Softening interest rates and the resultant impact on yield curve movements across the tenors led to surge in profit booking by banks (Chart 2.16). PSBs and PVBs continued to book profits on securities trading for the quarter ended March 2020, while FBs reversed losses in the previous quarter (Table 2.5).

2.32 PVBs and FBs continue to have significant interest rate exposure in their held for trading (HFT) portfolios relative to their AFS book. The PV01 tenor-

Chart 2.15: Trading Book Portfolio: Bank Group-wise



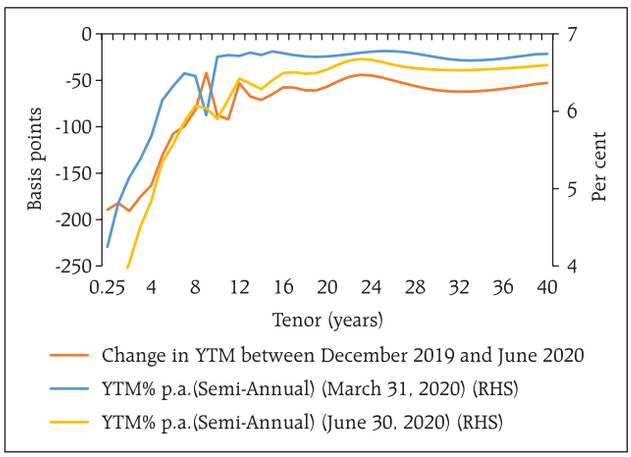
Source: Individual Bank Submissions and Staff Calculations.

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

	Total (in ₹ crores)	< 1 year	1 year-5 year	5 year-10 year	> 10 years
PSBs	212.4 (255.8)	6.4 (5.8)	25.4 (29.3)	54.4 (51.8)	13.9 (13.1)
PVBs	43.7 (46.4)	20.0 (18.2)	49.2 (51.7)	25.0 (25.2)	5.7 (5.0)
FBs	43.9 (41.1)	6.4 (8.3)	64.2 (60.5)	10.1 (9.9)	19.4 (21.3)

Note: Values in the brackets indicate December 2019 figures.
Source: Individual Bank Submissions and Staff Calculations.

Chart 2.16: Yield Curves (G-Sec) and Shift in Yields Across Tenors since December 2019



Note: Current as on June 30, 2020.
Source: Fixed Income Money Markets and Derivatives Association of India (FIMMDA).

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

wise distribution for PVBs shows dominant exposure in the 1-5-year tenor, similar to AFS positioning, while FBs seem to have increased PV01 sensitivity in the 5-10 year tenor (Table 2.6).

2.33 Any hardening of interest rates would depress investment income under the AFS and HFT categories (direct impact). A parallel upward shift of 2.5 percentage points in the yield curve will lower the CRAR by about 69 basis points at the system level while it would reduce system level capital by 5.5 per cent (Table 2.7).

e. Equity Price Risk

2.34 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 57 basis points in the baseline under a 55 per cent drop in equity prices (Chart 2.17). The impact of a drop in equity prices for the overall system is limited as banks typically have a low proportion of capital market exposures on their balance sheets due to regulatory limits.

f. Liquidity Risk: Impact of a Deposit Run-off

2.35 The liquidity risk analysis aims to capture the impact of a possible run on deposits and increased demand for unutilised portions of sanctioned / committed / guaranteed credit lines. Banks, in general, may be in a position to withstand liquidity shocks with their high-quality liquid assets (HQLAs)[21].

2.36 Under the assumed scenarios, there would be increased withdrawals of un-insured deposits[22] and a simultaneous increase in usage of the unutilised

Table 2.5: OOI - Profit/(loss) on Securities Trading

(₹ crore)

	30-Jun-19	30-Sep-19	31-Dec-19	31-Mar-20
Public Sector Banks	3912.66	8993.73	4184.28	8375.85
Private Sector Banks	2545.25	2590.44	2291.46	4110.63
Foreign Bank Group	225.21	926.75	-58.74	223.53

Source: RBI Supervisory Returns and Staff Calculations.

Table 2.6: Tenor-wise PV01 Distribution of HFT portfolio

(per cent)

	Total (in ₹ crore)	< 1 year	1 year-5 year	5 year-10 year	>10 years
PSBs	0.2 (1.2)	4.8 (1.1)	17.8 (43.4)	71.0 (49.9)	6.5 (5.6)
PVBs	11.0 (7.7)	11.3 (6.7)	64.9 (77.8)	19.3 (0.4)	4.5 (15.0)
FBs	18.7 (10.2)	3.7 (4.7)	33.2 (48.0)	33.6 (23.6)	29.5 (23.7)

Note: Values in the brackets indicate December 2019 figures
Source: Individual Bank Submissions and Staff Calculations.

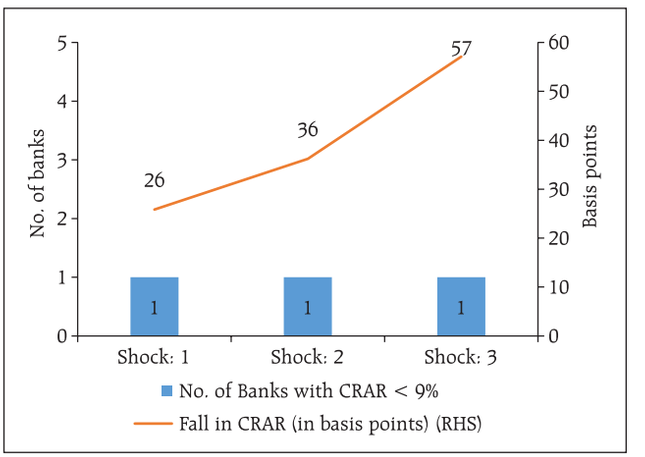
Table 2.7: Interest Rate Risk – Bank groups - Shocks and Impacts

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

	Public Sector Banks		Private Sector Banks		Foreign Banks		All SCBs	
	AFS	HFT	AFS	HFT	AFS	HFT	AFS	HFT
Modified Duration	2.3	2.7	1.2	1.5	1.5	2.9	1.9	2.1
Reduction in CRAR (bps)	82		32		138		69	

Source: Individual Bank Submissions and Staff Calculations.

Chart 2.17: Equity Price Risk



Note: For a system of select 53 SCBs.
One bank had CRAR less than 9 per cent before the shocks were applied.
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.

[21] In view of the implementation of the liquidity coverage ratio (LCR) with effect from January 1, 2015 in India, the definition of liquid assets was revised for stress testing. HQLAs were computed as cash reserves in excess of required CRR, excess SLR investments, SLR investments at 2 percent of NDTL (under MSF) and additional SLR investments at 14.5 per cent of NDTL (following the Circular DBR.BP.BC.No.4/21.04.098/2018-19 September 27, 2018 and the First Bi-Monthly Monetary Policy 2019-20 dated April 4, 2019.).

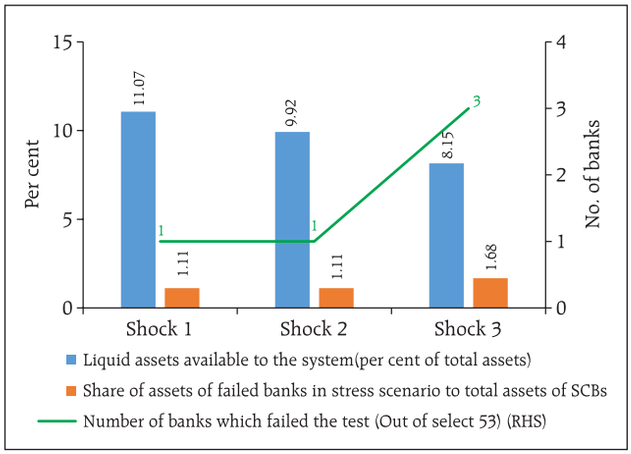
portions of sanctioned working capital limits as well as utilisation of credit commitments and guarantees extended by banks to their customers. Using their HQLAs required for meeting day-to-day liquidity requirements, 50 out of the 53 banks in the sample will remain resilient in a scenario of sudden and unexpected withdrawals of around 15 per cent of deposits along with the utilisation of 75 per cent of their committed credit lines (Chart 2.18).

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

2.37 The bottom-up stress tests (sensitivity analyses) carried out for select banks[23] (sensitivity analyses) with March 31, 2020 as the reference date, also testified to the banks' general resilience to different kinds of shocks. While confirming the top-down stress tests results in general, the bottom-up stress tests show that, owing to better capitalisation of PSBs, average CRAR remains above 9 per cent though some banks may have to contend with stressed CRAR positions falling below the regulatory minimum of 9 per cent (Chart 2.19).

2.38 In certain scenarios, bottom-up stress tests of the impact of liquidity shocks on select banks' liquid assets ratios[24] show that HQLAs enable banks

Chart 2.18: Liquidity Risk – Shocks and Outcomes



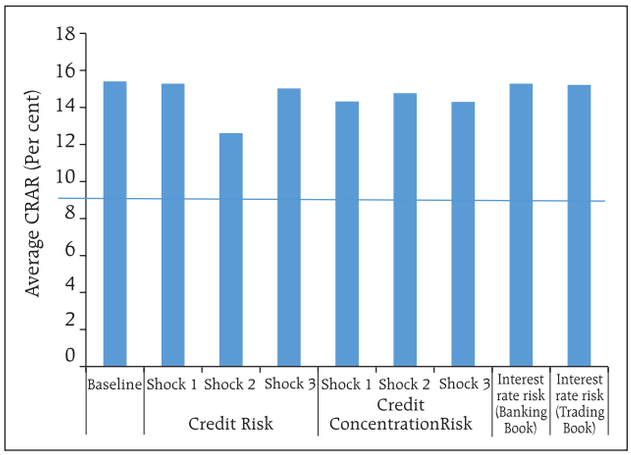
Note: 1. A bank was considered to have 'failed' in the test when it was unable to meet the requirements under stress scenarios with the help of its liquid assets – the stock of liquid assets turned negative under stress conditions.

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

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

Source: RBI Supervisory Returns and Staff Calculations.

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



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

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

[22] Un-insured deposits are about 72 per cent of total deposits (Source: DICGC Annual Report, 2018-19).

[23] Stress tests were conducted on a sample of 19 select banks. The same set of shocks was used for conducting top-down and bottom-up stress tests (Annex 2).

in the sample to sustain pressures from sudden and unexpected withdrawal of deposits by depositors (Chart 2.20). Banks, on an average, have higher liquid asset ratios compared to the exercise carried out based on March 2019 liquid assets.

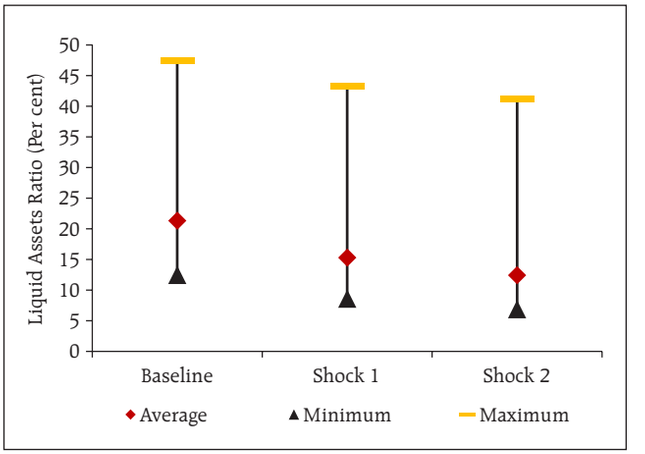
II.1.9 Bottom-up Stress Tests: Derivatives Portfolio

2.39 A series of bottom-up stress tests (sensitivity analyses) on derivative portfolios of select banks[25] was conducted with the reference date of March 31, 2020. The banks in the sample were subjected to four separate shocks on interest and foreign exchange rates, where the shocks on interest rates ranged from 100 to 250 basis points, while 20 per cent appreciation/depreciation shock was assumed for exchange rates. The stress tests were carried out for individual shocks.

2.40 The impact of the sharp moves reflected in mark-to-market (MTM) valuation as a proportion to CET 1 capital (Chart 2.21) are mostly muted for individual banks, particularly PSBs and PVBs. Since risks can only be transferred and not eliminated, a thorough assessment of hedging profile of corporates as given in the disclosures would help understand the true extent of risks, going forward.

2.41 The average net impact of interest rate and exchange rate shocks are in the range of 2.5 per cent of the total capital funds and the profit and loss (P&L) effect is almost symmetric in opposite shocks. A rise in domestic interest rates leads to P&L gains and *vice versa*, implying that the interest rate positions are in the nature of a net short. Similarly, exchange rate shocks in the form of INR depreciation leads to P&L gains and *vice versa,* implying that the foreign exchange book is positioned to gain from INR depreciation (Chart 2.22).

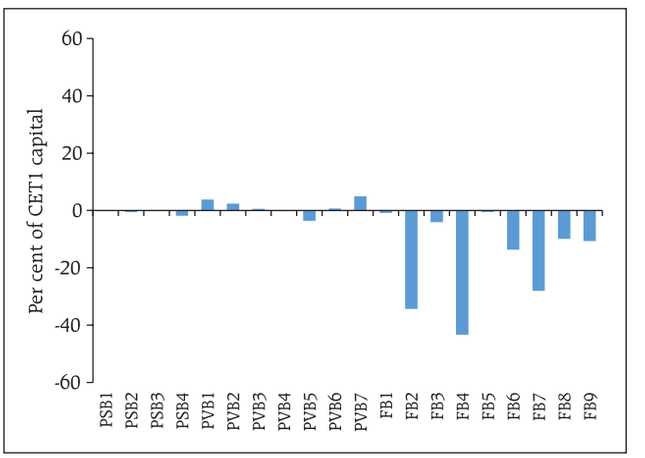
Chart 2.20: Bottom-up Stress Tests — Liquidity Risk



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

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

Chart 2.21: Net MTM of Total Derivatives Portfolio – Select Banks, March 2020



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

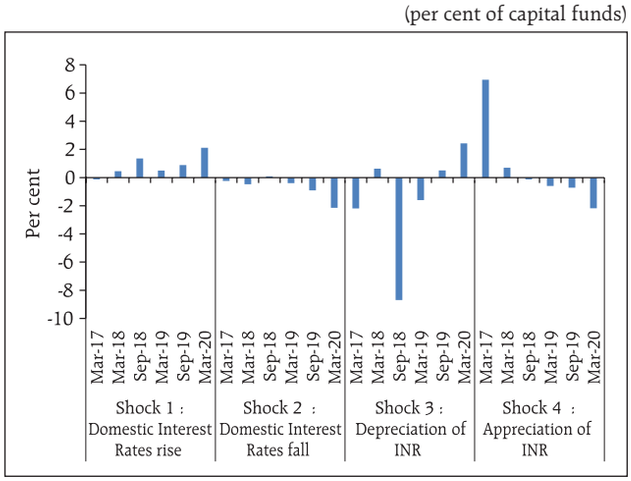
[24] Liquid Assets Ratio = $\frac{Liquid\ Assets}{Total\ Assets}$ X 100. Under shock scenarios, the negative liquid assets ratio reflects the percentage deficit in meeting the required deposit withdrawal.

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

2.42 The battery of stress tests gives plausible scenarios, at the system-level as well as at individual bank level, of the impact of COVID-19 on banks' balance sheets. In this context, the RBI has instructed banks to assess the impact of COVID-19 under severe but plausible scenarios on their balance sheets, asset quality, liquidity, profitability and capital adequacy for the financial year 2020-21. Banks have also been advised to ensure that such analyses are supplemented with possible mitigating measures, including capital and liquidity planning with the objective of ensuring uninterrupted credit supply to different sectors of the economy.

Chart 2.22: Stress Tests – Impact of Shocks on Derivatives Portfolio of Select Banks – (change in net MTM on application of a shock)

(per cent of 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 Urban Cooperative Banks

2.43 The performance of scheduled urban cooperative banks (SUCBs) broadly remained stable between September 2019 and March 2020. At the system level[26], the CRAR of SUCBs remained at 9.8 per cent for both the quarters. Their GNPAs declined from 10.5 per cent of gross loans and advances to 9.9 per cent and their provision coverage ratios[27] increased from 40.9 per cent to 61.4 per cent over this period. SUCBs' RoAs improved but remained in negative territory in March 2020 at -1.8 per cent as against -3.6 per cent observed in September 2019 whereas liquidity ratios[28] remained stable at 34.0 per cent.

II.2.1 Stress Test – Credit Risk

2.44 The impact of credit risk shocks on CRAR of SUCBs was simulated under four different scenarios.[29] The results show that (i) under a 1 SD shock to GNPAs classified as loss assets, system level CRAR would decline to 9.1 per cent and two SUCBs would fail to achieve the minimum CRAR requirement; in addition to 3 which had CRARs below 9 per cent even before the shock; (ii) under a 2 SD shock to GNPAs classified as sub-standard assets, one additional UCB would fail to achieve the 9 per cent CRAR minimum; and (iii) under a 2 SD shock to GNPAs classified as loss advances, system level CRAR declines to 8.1 per cent and eight more UCBs would fail to maintain the minimum CRAR requirement.

II.2.2 Stress Test - Liquidity Risks

2.45 A stress test on liquidity was carried out using two different scenarios of increase in cash outflows in the 1 to 28 day time bucket by i) 50 per cent, and ii) 100 per cent, with cash inflows remaining unchanged. Under the two scenarios, 20 banks and 34 banks, respectively, would face liquidity stress.[30]

[26] Comprising 54 SUCBs.

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

[28] Liquidity ratio = (cash + dues from banks + dues from other institutions + SLR investment) *100/total assets.

[29] 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).

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

II.3 Non-Banking Financial Companies

2.46 A total of 9,601 NBFCs were registered with the RBI at end-March, 2020 of which 66 were deposit-accepting (NBFCs-D) and 278 were systemically important non-deposit accepting NBFCs (NBFCs-ND-SI). All NBFCs-D and NBFCs-ND-SI, including Government owned NBFCs, are subject to prudential regulations such as capital adequacy requirements and provisioning norms, along with reporting requirements. Although the combined balance sheet size of the NBFCs is about one fifth of that of SCBs, the importance of the former lies in last mile credit delivery and niche segment support in the Indian financial system.

II.3.1 Asset Quality and Capital Adequacy

2.47 The GNPA ratio of the NBFC sector declined during successive quarters till December 2019, however, surged in March 2020 quarter. The net NPA ratio was marginally lower in March 2020 quarter than the previous year. The CRAR of the sector stood at 19.6 per cent in March 2020, which was lower than its level a year ago (Table 2.8).

II.3.2 Post COVID-19 Response

2.48 Banks and market borrowings account for over 70 per cent of total outside liabilities of the NBFC sector. With the waning of market confidence, the share of long-term market debt [*i.e.*, non-convertible debentures (NCDs)] in total borrowings of the NBFC sector declined from 49.1 per cent at end-March 2017 to 40.8 per cent at end-December 2019. The consequent funding gap was met through bank borrowings, which rose from 23.1 per cent of total borrowings to 28.9 per cent over this period.

2.49 The declining share of market funding for NBFCs is a concern as it has the potential to accentuate liquidity risk for NBFCs as well as for the financial system. Smaller / mid-sized and AA or lower rated / unrated NBFCs have been shunned by both banks and markets, accentuating the liquidity tensions faced by NBFCs which was also reflected in the lacklustre response to the Targeted Long-Term Repo Operations 2.0 (TLTRO 2.0).

2.50 In the aftermath of the IL&FS crisis, NBFCs have been facing differentiation in market access and financial conditions, with only the higher rated entities able to raise funds. They have also started maintaining liquidity cover of two to three months, despite the higher costs. In the context of COVID-19, however, risks to the sector and consequently, systemic risks can intensify. IndAS accounting could impinge on the balance sheet risks, especially asset quality and provisioning; finances of NBFC-MFIs; contagion from Mutual Funds due to redemption pressures and customer confidence.

Table 2.8: Asset Quality[31] and CRARs[32] of NBFCs

(Per cent)

	GNPA Ratio	NNPA Ratio	CRAR
Mar-2015	4.1	2.5	26.2
Mar-2016	4.5	2.5	24.3
Mar-2017	6.1	4.4	22.1
Mar-2018	5.8	3.8	22.8
Mar-2019	6.1	3.3	20.1
Sep-2019	5.6	2.9	19.9
Dec-2019	5.9	3.1	19.5
Mar-2020*	6.4	3.2	19.6

*: Provisional
Source: RBI Supervisory Returns

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

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

II.3.3 Stress Tests

2.51 System-level stress tests for the NBFC sector's aggregate credit risk for the quarter ending December 2019 were carried out under three scenarios: increase in GNPA by (i) 1 SD; (ii) 2 SD; and (iii) 3 SD. It is assessed that the sector's CRAR would decline from 19.4 per cent to 17.2 per cent in the first scenario, to 16.4 per cent in the second scenario and to 15.2 per cent in the third scenario.

2.52 Stress tests results on individual NBFCs indicate that, under the above-mentioned three scenarios, 11.2 per cent, 14.0 per cent and 19.5 per cent of the companies would not be able to comply with the minimum regulatory capital requirements of 15 per cent.

II.4 SMA Ratio Analysis

2.53 A rating mapping of special mention account (SMA) assets has been carried out on Non-PSU obligors, a cohort highly vulnerable to risk aversion, in order to examine the resilience of corporates, especially in view of the regulatory moratorium. The aggregate share of AA and above ratings in the SMA[33] category for Non-PSU obligors has been low relative to their presence in the standard category[34] for non-financial Non-PSU obligors as on March 2020 (Tables 2.9 & 2.10). The SMA analysis was

Table 2.9: Share of Ratings Category in SMA (SMA 1 & 2) Loans to Non-PSU Obligors

(per cent)

	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18	Sep-18	Dec-18	Mar-19	Jun-19	Sep-19	Dec-19	Mar-20
AAA	0.0	4.2	0.0	0.2	14.7	21.5	0.0	2.1	0.0	0.0	0.7	0.0	1.8
AA	6.9	8.6	6.4	18.3	16.3	16.6	18.8	11.1	2.8	0.2	1.2	1.9	0.2
AA and Above	**6.9**	**12.8**	**6.5**	**18.6**	**31.0**	**38.1**	**18.8**	**13.1**	**2.8**	**0.2**	**1.9**	**1.9**	**1.9**
A	17.4	12.5	15.4	14.6	15.5	5.2	2.3	9.1	14.6	7.8	3.8	5.6	13.4
BBB	17.1	16.5	11.3	14.1	16.4	16.6	16.0	15.6	16.5	13.2	16.4	15.0	18.8
BB	12.3	11.3	16.3	12.8	12.0	13.2	18.4	17.1	12.8	18.0	15.8	18.1	9.3
B	4.3	5.5	5.1	3.8	4.2	3.3	6.1	7.2	5.5	6.6	6.5	9.7	6.9
C	2.1	1.7	1.0	1.3	0.2	0.7	5.1	1.2	1.1	3.1	0.5	0.8	1.7
D	20.6	18.9	26.4	18.4	10.0	10.8	17.1	20.5	23.9	26.9	30.5	19.1	24.0
Unrated	19.3	20.9	18.0	16.5	10.6	12.1	16.2	16.1	22.8	24.2	24.7	29.7	24.0

Source: Prime database, RBI Supervisory Returns and Staff Calculations.

Table 2.10: Share of Ratings category - Standard Loans (0 days past due and SMA-0) to Non-PSU Non-financial Obligors

(per cent)

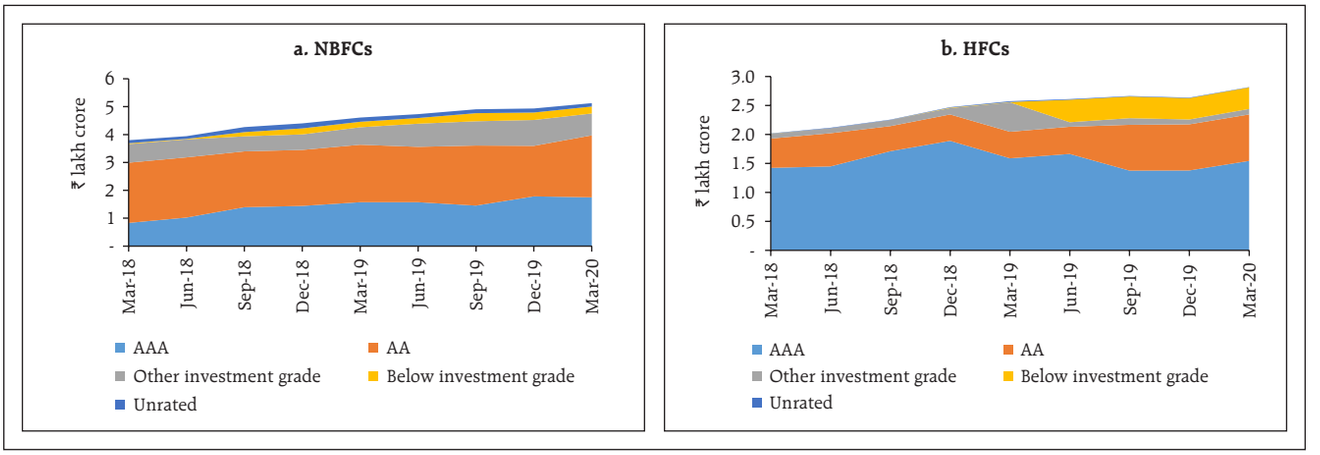
	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18	Sep-18	Dec-18	Mar-19	Jun-19	Sep-19	Dec-19	Mar-20
AAA	3.4	3.6	4.4	4.2	3.4	2.3	4.3	4.3	5.7	5.7	6.3	6.1	6.4
AA	16.2	16.5	16.3	17.8	19.4	21.2	21.2	21.1	19.9	19.9	20.4	20.4	20.6
AA and above	**19.6**	**20.0**	**20.7**	**22.0**	**22.8**	**23.5**	**25.5**	**25.4**	**25.6**	**25.6**	**26.7**	**26.5**	**27.0**
A	19.2	20.5	19.9	19.5	18.4	18.5	17.6	19.5	20.3	20.2	19.8	19.3	18.9
BBB	18.8	18.5	18.6	16.8	16.9	18.1	17.3	17.1	15.8	16.3	15.3	17.1	15.9
BB	7.9	7.1	7.3	8.5	8.6	7.7	8.7	7.4	7.8	7.3	6.8	6.4	7.2
B	3.2	3.2	2.9	3.0	2.8	2.8	2.9	2.8	2.7	2.6	2.8	2.8	3.8
C	0.2	0.2	0.3	0.1	0.1	0.1	0.4	0.2	0.1	0.1	0.1	0.2	0.3
Unrated	31.1	30.6	30.2	30.1	30.3	29.2	27.6	27.6	27.8	27.8	28.5	27.5	26.8

Source: Prime database, RBI Supervisory Returns and Staff Calculations.

[33] An obligor is considered as an SMA for the banking sector if it has been classified as SMA 1 or SMA 2 by any bank in a given quarter.

[34] Standard asset is defined as an asset that is 0 days past due or in SMA -0 category.

Chart 2.23: Non-PSU NBFC/HFC - Funded Amount Outstanding to Banks



Source: CRILC, Prime database.

conducted on aggregate obligors rather than on non-financial obligors, since the presence of financial obligors in the SMA category has been generally sparse. Nonetheless, both standard and SMA asset categories show sizeable and comparable presence of the unrated cohort. Moreover, as noted in Chapter 1, flow of credit to Non-PSU obligors in the rating grade A and below has been somewhat restrained, specifically from PVBs in Q4:2019-20 with the onset of COVID-19. Consequently, the financial health of this cohort is vital for systemic stability.

2.54 Given the importance of non-banking financial intermediation in the credit spectrum and the high funding of the sector through banking channels (Chart 2.23), the dispersion of NBFCs and HFCs across the impairment spectrum for given rating grades show a good payment record of NBFCs prior to the imposition of moratorium (Tables 2.11 & 2.12). The impact of the moratorium on private NBFCs/HFCs can be substantial, with proportion of assets under the moratorium for NBFCs averaged between 39-65 per cent based on underlying assets with approximately 50 per cent of the aggregate assets under moratorium as on end April 2020. Based on the disclosures made by NBFCs/ HFCs, the assets under moratorium are dominated by wholesale customers and real-estate developers, although retail portfolios in the micro-loans and auto loan segments have also been affected. Access of NBFCs/HFCs to capital markets, both debt and equity, is of significant importance to the sector.

2.55 Given the uncertainty relating to cash flows induced by COVID-19, the short-term maturities of market liabilities of Non-PSU NBFCs/ HFCs become relevant. There are significant near-term maturities across all rating grades (Table 2.13). The partial credit

Table 2.11: Asset Impairment Status of Bank Loans to Non-PSU NBFCs, March 2020 (per cent)

Non-PSU NBFCs	Standard (0 days past due and SMA-0)	SMA (SMA 1/ SMA 2)	Non-performing
AAA	99.1	0.9	0.0
AA	100.0	0.0	0.0
Other investment grade	88.6	11.4	0.0
Below investment grade	5.2	1.4	93.4
Unrated	96.2	0.1	3.7

Source: Prime database, RBI Supervisory Returns and Staff Calculations.

Table 2.12: Asset Impairment Status of Bank Loans to Non-PSU HFCs, March 2020 (per cent)

Non-PSU HFCs	Standard (0 days past due and SMA-0)	SMA (SMA 1/ SMA 2)	Non-performing
AAA	100.0	0.0	0.0
AA	100.0	0.0	0.0
Other investment grade	100.0	0.0	0.0
Below investment grade	1.1	0.0	98.9
Unrated	93.4	0.0	6.6

Source: Prime database, RBI Supervisory Returns and Staff Calculations.

Table 2.13: Issuances and Near-term maturities of CPs & NCDs of Non-PSU NBFCs/HFCs

(₹ crore)

	Issuances			Maturing						
	Mar-20	Apr-20	May-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20
AAA	21,885	17,465	22,980	34,680	8,363	19,454	27,645	15,735	24,792	11,802
AA	7,427	3,351	7,377	19,520	6,517	7,142	8,815	4,622	5,790	4,389
Others	937	694	138	2,885	3,413	4,037	1,658	1,887	3,589	2,559
Total	**30,249**	**21,510**	**30,495**	**57,084**	**18,293**	**30,633**	**38,117**	**22,243**	**34,171**	**18,750**

Source: Prime database, RBI Supervisory Returns and Staff Calculations.

guarantee scheme wherein Government would absorb up to 20 per cent of the first loss assumes critical importance in this context.

II.5 Interconnectedness

II.5.1 Network of the Financial System[35] [36]

2.56 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 (Box 2.1).

Box 2.1: Pandemics to Financial Crises – Importance of Understanding Networks and Contagion

Financial network analysis tackles questions relating reasons for the growing interconnectedness of the financial system; whether connections tend to amplify or dampen systemic shocks; and whether the structure of the network matters. This helps to identify structural features relevant for setting policy (Glasserman and Young, 2016). Further, attempts were made to understand how the network structure interacts with other potential sources of contagion. One aspect that came out emphatically during the global financial crisis (GFC) is that the health of individual financial institutions may not ensure the health of the financial system as a whole. Given interconnectivity, extreme stress can disrupt normal functioning of the markets and asset market illiquidity could lead to solvency issues and finally result in contagion – akin to virus spreading from the infected to the healthy through various forms of contact. In the run-up to the GFC, leverage levels had increased, reliance on short-term funding was high and capital buffers at some banks were extremely thin. All of these factors affect the stability of the financial system to varying degrees. The key issue is how the network of obligations relates to these potential sources of contagion, and whether it serves to amplify or dampen them. Network connections can be net positive for the financial system by providing opportunities for investment, risk diversification and liquidity management. At the same time, network connections can also have a negative effect by creating channels through which shocks can spread, and thus leading to contagion.

Foreseeing financial contagion is, however, a challenge, involving balancing of the efficiency inducing aspects of financial networks, on the one hand, and not reacting to false alarms on the other. Financial networking related concepts require adaptation for application in the pandemic domain. While networked entities are inevitably affected by a default in one of the elements in the chain, pandemic transmission is probabilistic - a

(contd...)

[35] 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.

[36] Analysis presented here and in the subsequent part is based on data of 199 entities from the following eight sectors: SCBs, scheduled UCBs (SUCBs), AMC-MFs, NBFCs, HFCs, insurance companies, pension funds and AIFIs. These 199 entities covered include 78 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); 15 HFCs (which represent more than 90 per cent of total HFC asset); 7 PFs and 4 AIFIs (NABARD, EXIM, NHB and SIDBI).

healthy person coming in contact with an infected one will catch the infection with a certain probability. Such probabilistic connections imply that contagion impact is best approximated through a pooled approach rather than through a case by case one. In this regard, it is somewhat similar to modelling of asset price "bubbles" in behavioural finance wherein asset price movements induce psychological effect in others probabilistically and not deterministically.

The analogy between pandemics and financial crises goes back to the Asian financial crisis - "Asian flu" - for the first time. The use of the term contagion seldom applied to crises in the financial markets before the global financial crisis.

The utility of urban agglomerations (or *networks),* which have currently turned themselves into epicentres of COVID-19 pandemic transmission, comes up for scrutiny. Urban agglomeration is cost saving, with associated network effects, leading to economies of scale. Elements which, in the natural course of business, allow the seamless flow of expertise and creative inputs flowing from one domain to another related domain, leads to links for spread of contagion in the context of a pandemic.

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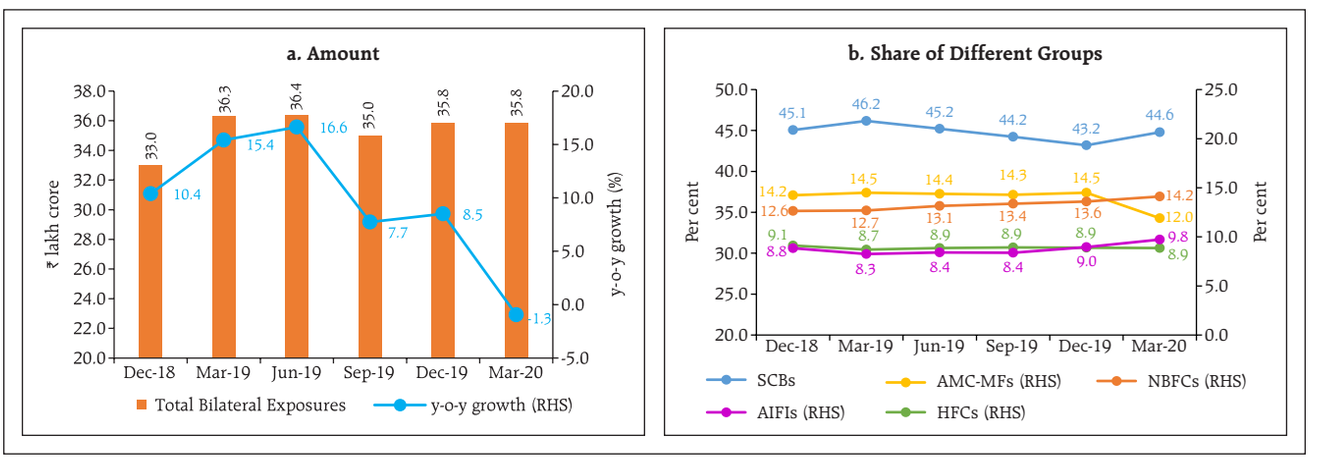
Ulrich Beck, Scott Lash, Brian Wyne (1992), Risk Society-Towards a New Modernity, Sage Publications.

2.57 The total outstanding bilateral exposures[37] among the entities in the financial system marginally declined during 2019-20 (Chart 2.24 a).

2.58 Notwithstanding a secular decline in share, SCBs had the largest bilateral exposures in the Indian financial system in March 2020. SCBs' lending to and borrowing from other entities (including other SCBs) stood at 44.6 per cent of total lending and borrowings in the system (Chart 2.24 b). Among bank groups, PSBs had a net receivable position *vis-*

Chart 2.24: Bilateral Exposures between Entities in Financial System



Source: RBI Supervisory Returns and Staff Calculations.

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

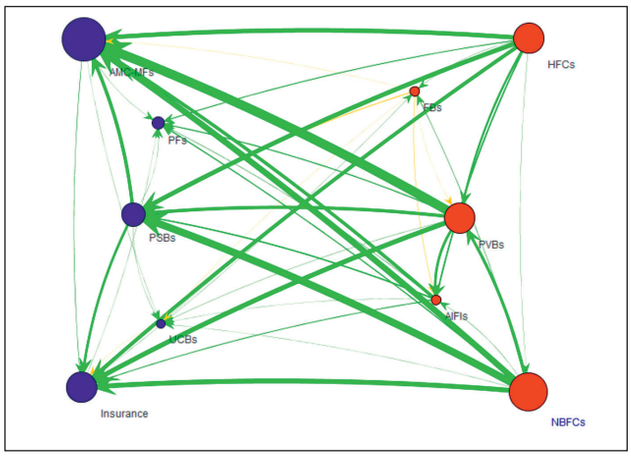
à-vis the entire financial sector, whereas PVBs had a net payable position and FBs were evenly balanced (Charts 2.25 and 2.26).

2.59 AMC-MFs veered away from trend performance and registered a sizable decline in their share during 2019-20, while their AUM fell. On the other hand, the share of AIFIs increased during the year as deposits from SCBs, borrowings from AMC-MFs and refinancing to PVBs and HFCs expanded. The shares of NBFCs, HFCs, insurance companies and pension funds also increased during 2019-20 and stood at 14.2 per cent, 8.9 per cent, 8.8 per cent and 1.6 per cent, respectively, in March 2020 (Chart 2.24 b).

2.60 In terms of inter-sectoral[38] exposures, AMC-MFs, followed by insurance companies, were the biggest fund providers in the system, while NBFCs were the biggest receivers of funds, followed by HFCs. Among the entities which received funds from the financial system, PVBs recorded a decline of 22 per cent, while payables of NBFCs and HFCs increased marginally (Chart 2.26).

2.61 Among the fund providers to the financial system, AMC-MFs recorded a sharp decline in their receivables from the financial system, which increased for PSBs and insurance companies (Chart 2.26).

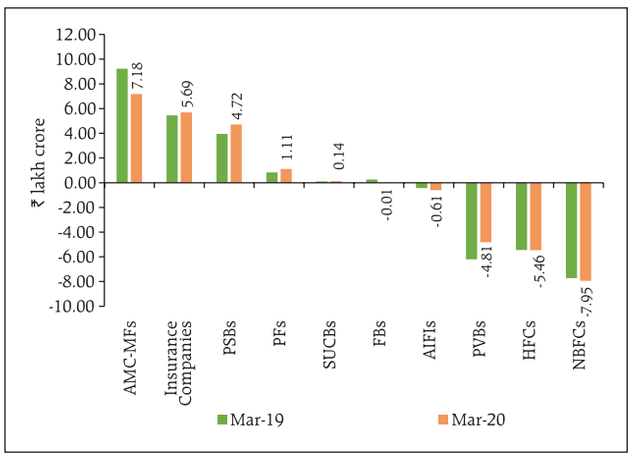
Chart 2.25: Network Plot of the Financial System, March 2020



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



Source: RBI Supervisory Returns and Staff Calculations.

a. Inter-bank market

2.62 The size of the inter-bank market (both fund-based[39] and non-fund-based[40]) has been persistently declining over the last few years. Fund-based inter-bank exposures as a share of total assets of the banking system moderated further during the year

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

[39] 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/Notice/Term Money; commercial paper; certificates of deposits; short-term loans; short-term deposits and other short-term exposures. Data on Long-term exposures are collected across five categories – Equity; Long-term Debt; Long-term loans; Long-term deposits and Other long-term liabilities.

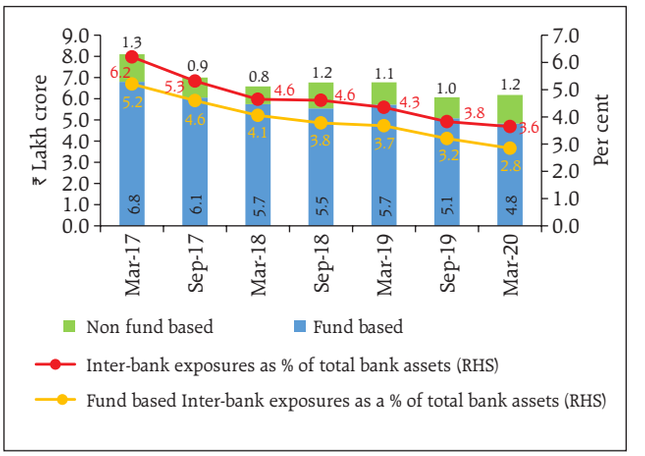
[40] Non-Fund based exposure includes - outstanding bank guarantees, outstanding Letters of Credit, and positive mark-to-market positions in the derivatives market (except those exposures for which settlement is guaranteed by the CCIL).

due to excess liquidity in the banking system as well as due to the impact of LCR norms, which incentivise secured funding over unsecured inter-bank market funding. (Chart 2.27).

2.63 PSBs remained the dominant players in the inter-bank market, followed by PVBs and FBs as at end-March 2020 (Chart 2.28).

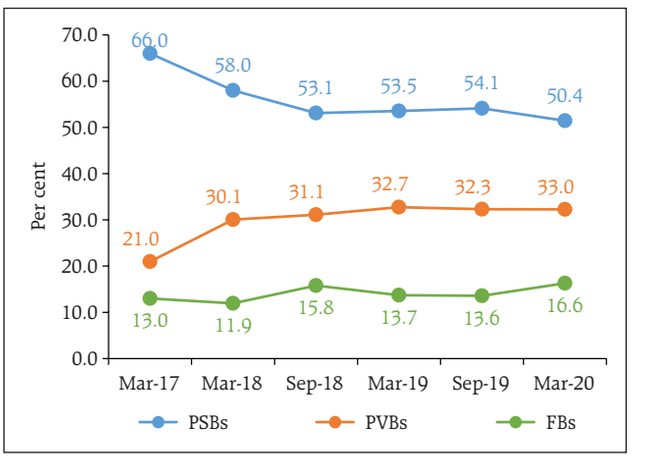
2.64 Around 70 per cent of the fund-based inter-bank market was short-term (ST) in nature, in which ST deposits had the highest share, followed by ST loans. The composition of long-term (LT) fund-based inter-bank exposure shows that LT loans constituted slightly more than half of LT exposure followed by LT deposits (Chart 2.29).

Chart 2.27: Inter-bank market



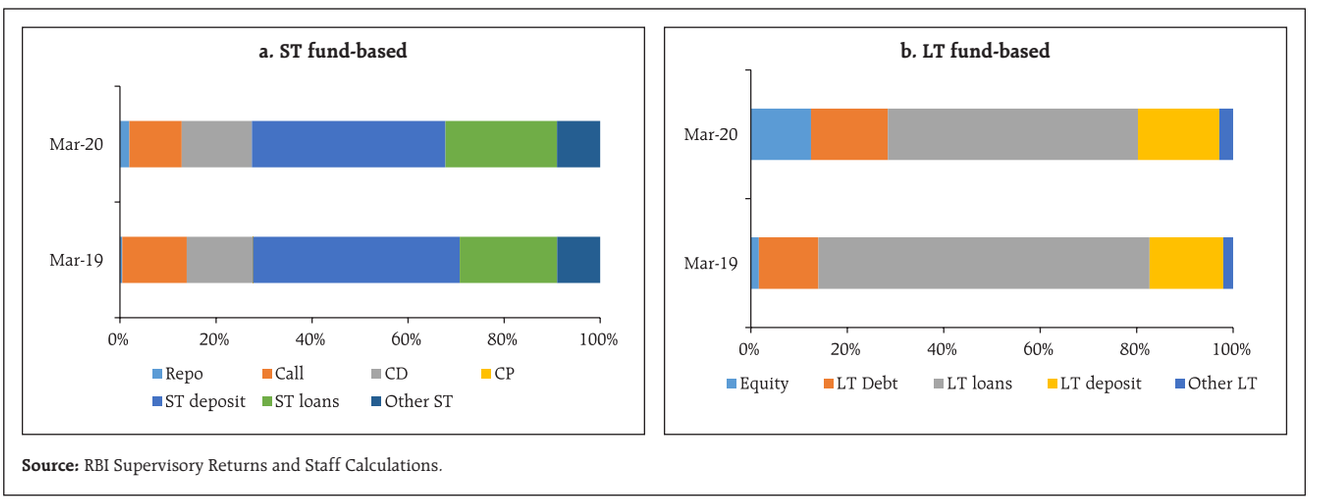
Source: RBI Supervisory Returns and Staff Calculations.

Chart 2.28: Different Bank Groups in the Inter-bank Market



Source: RBI Supervisory Returns and Staff Calculations

Chart 2.29: Composition of Fund-based Inter-bank Market

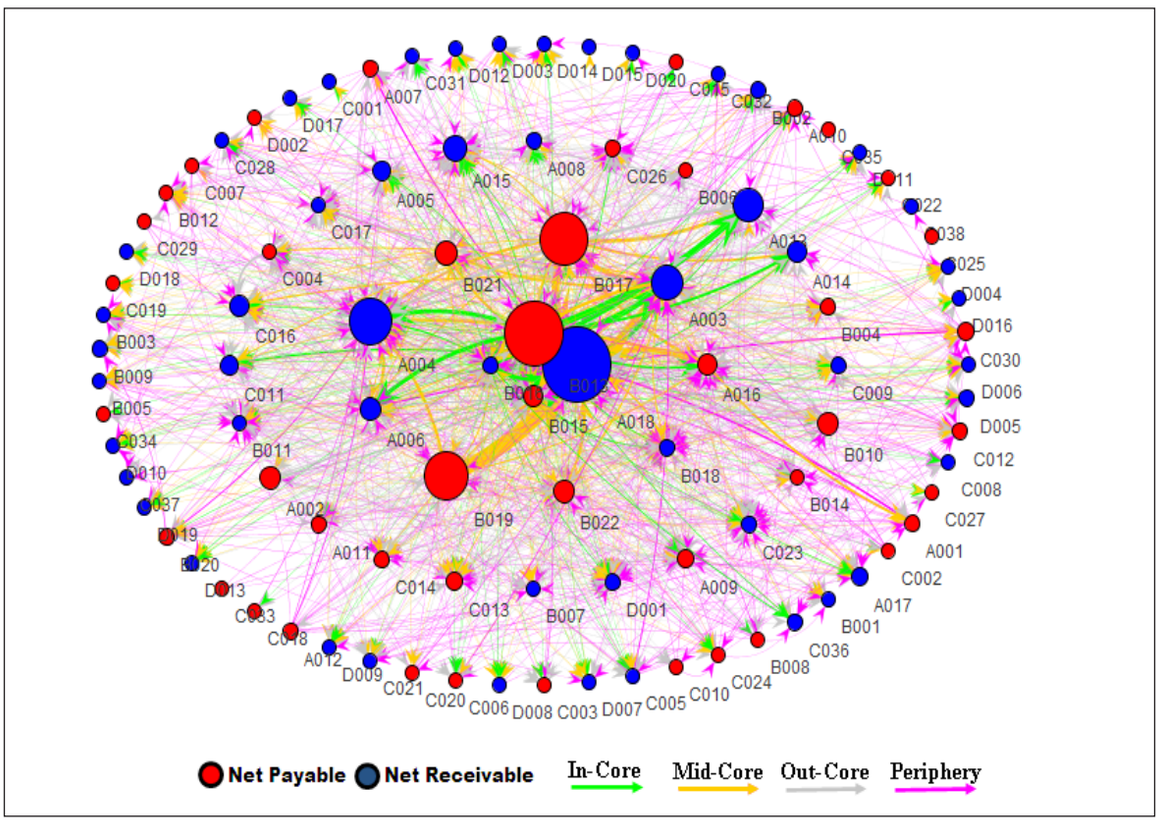


Source: RBI Supervisory Returns and Staff Calculations.

2.65 The inter-bank market typically has a core-periphery network structure[41] [42]. At end-March 2020, there were 4 banks in the inner-most core and 9 banks in the mid-core circle. This is in line with the pattern seen during the last 5 years, with the number of banks in the inner-most core ranging between 2 and 5. These are usually the biggest PSBs or PVBs. Most foreign banks and almost all old private banks are usually in the outermost periphery, making them the least connected banks in India. The remaining PSBs and PVBs, along with a few major FBs, make up the mid and outer core. The merger of some PSBs with effect from April 2020 would largely impact the mid-core and outer core (Chart 2.30).

2.66 The degree of interconnectedness in the banking system (SCBs), as measured by the connectivity ratio[43], has been declining slowly over the last few years. This is in line with a shrinking inter-bank market, as mentioned earlier. The cluster coefficient[44], which depicts local interconnectedness

Chart 2.30: Network Structure of the Indian Banking System (SCBs+ SUCBs) – March 2020



Source: RBI Supervisory Returns and Staff Calculations.

[41] 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.

[42] 78 SCBs and 20 SUCBs were considered for this analysis.

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

[44] *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.

(*i.e.*, tendency to cluster), has remained almost constant over the last 5 years (Chart 2.31).

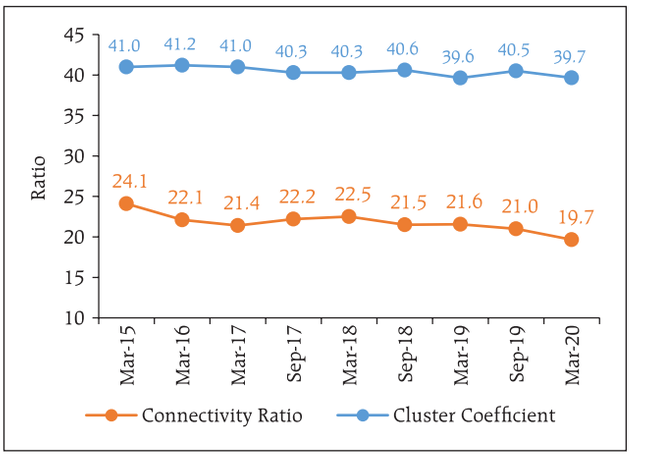
b. Exposure of AMCs-MFs

2.67 Notwithstanding the recent decline in AUM, AMC-MFs' gross receivables were around ₹7.86 lakh crore (29.5 per cent of their average AUM) whereas their gross payables were around ₹0.68 lakh crore as at end-March 2020.

2.68 The top recipients of their funding were SCBs followed by NBFCs, HFCs and AIFIs. Their receivables from SCBs, which had gone up sharply in 2018-19, registered a decline in 2019-20. In absolute terms, however, SCBs, NBFCs and HFCs have all seen a decline in their payables to AMC-MFs. In contrast, AIFIs' reliance on AMC-MFs increased as they expanded refinancing provided to other financial institutions. Funding from AMC-MFs was a big way of subscription to debt and CDs issued by AIFIs. (Chart 2.32 a).

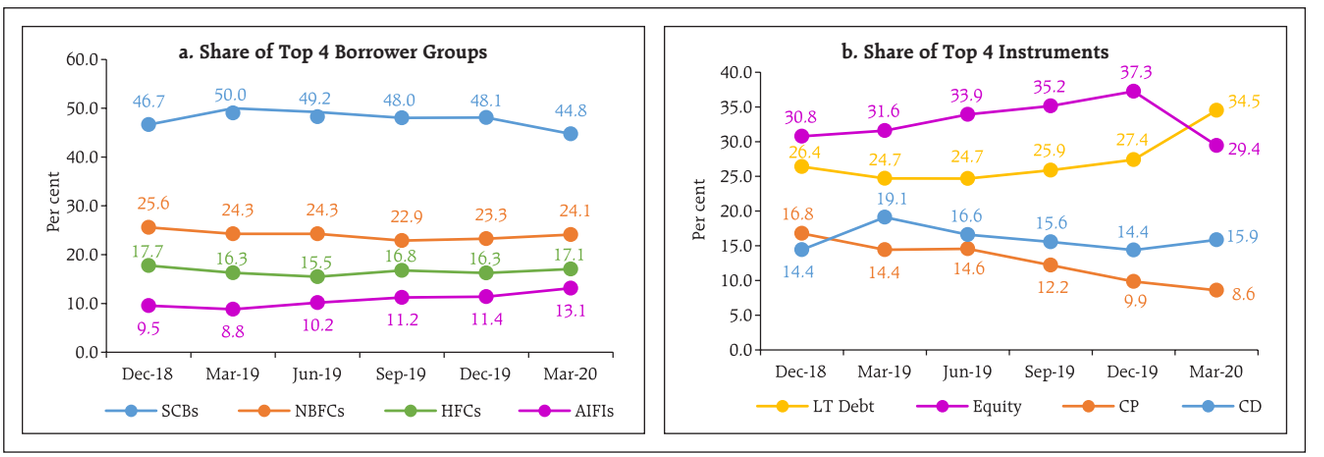
2.69 Instrument-wise, AMC-MFs' receivables saw a sharp increase in the share of equity funding, especially in recent quarters which, however, reversed in Q4: 2019-20, but was compensated by an increase in debt funding. AMC-MFs continued to show preference for CDs over CPs (Chart 2.32 b).

Chart 2.31: Connectivity Statistics of the Banking System (SCBs)



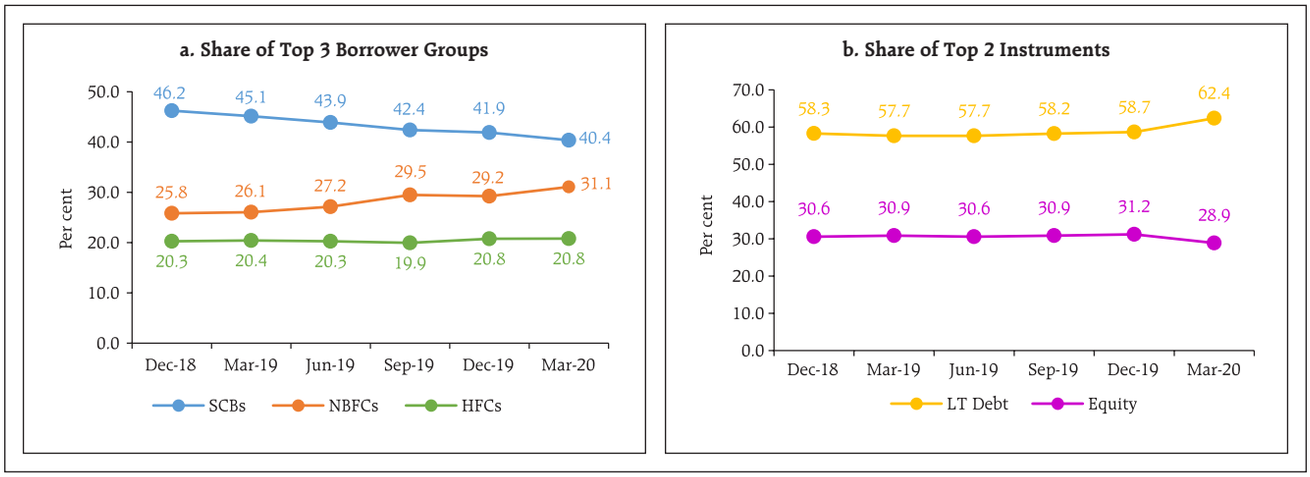
Source: RBI Supervisory Returns and Staff Calculations.

Chart 2.32: Gross Receivables of AMC-MFs from the Financial System



Source: RBI Supervisory Returns and Staff Calculations.

Chart 2.33: Gross Receivables of Insurance Companies from the Financial System



Source: RBI Supervisory Returns and Staff Calculations.

c. Exposure of Insurance Companies

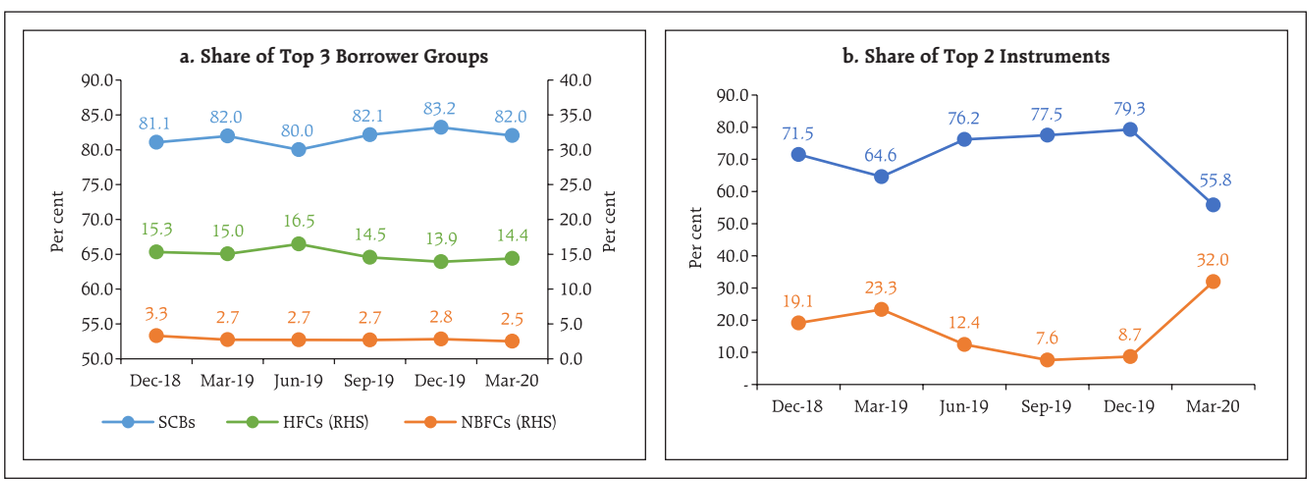
2.70 Insurance companies are the second largest net providers of funds to the financial system (gross receivables were ₹5.93 lakh crore and gross payables were ₹0.24 lakh crore in March 2020).

2.71 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, who had only limited exposure to short-term instruments. The share of LT debt, which had been falling, gradually saw a reversal in 2019-20 as these companies subscribed to debt issued by NBFCs and AIFIs (Chart 2.33 a and b).

d. Exposure of AIFIs

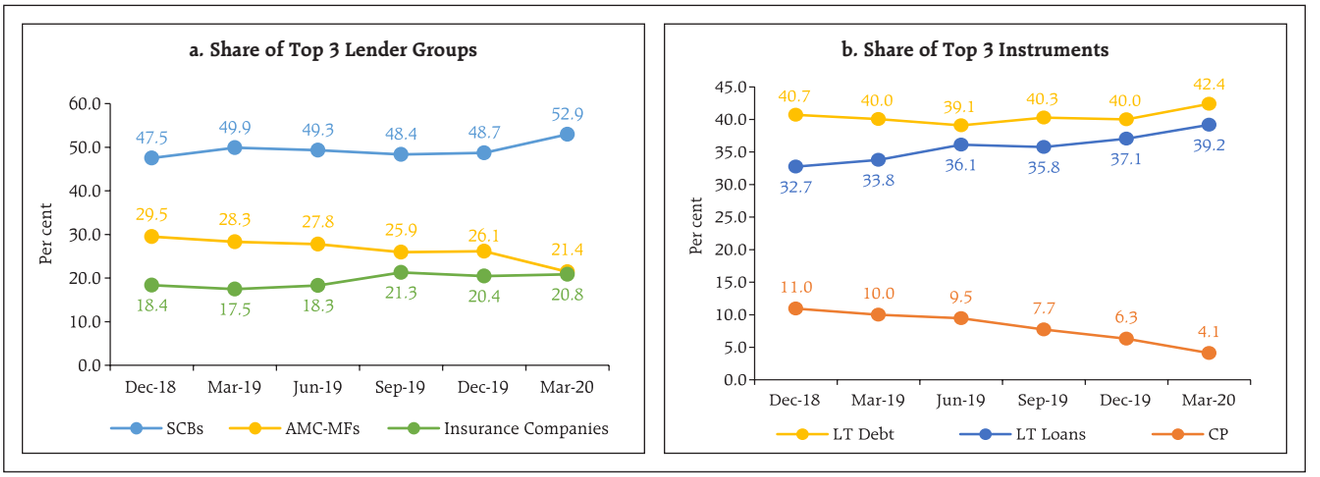
2.72 Gross receivables of AIFIs increased by around 16 per cent y-o-y to ₹ 3.18 lakh crore as at end March 2020. The top recipients of funds provided by them were SCBs (primarily PVBs), followed by HFCs and NBFCs. Instrument-wise, these funds primarily took the form of loans – both LT and ST refinancing purposes (Chart 2.34 a and b).

Chart 2.34: Gross Receivables of AIFIs from the Financial System



Source: RBI Supervisory Returns and Staff Calculations.

Chart 2.35: Gross Payables of NBFCs to the Financial System



Source: RBI Supervisory Returns and Staff Calculations.

e. Exposure to NBFCs

2.73 NBFCs were the largest net borrowers of funds from the financial system, with gross payables of ₹8.84 lakh crore and gross receivables of ₹0.89 lakh crore as at end-March 2020. They obtained more than half of the funds from SCBs, followed by AMC-MFs and insurance companies (Chart 2.35 a).

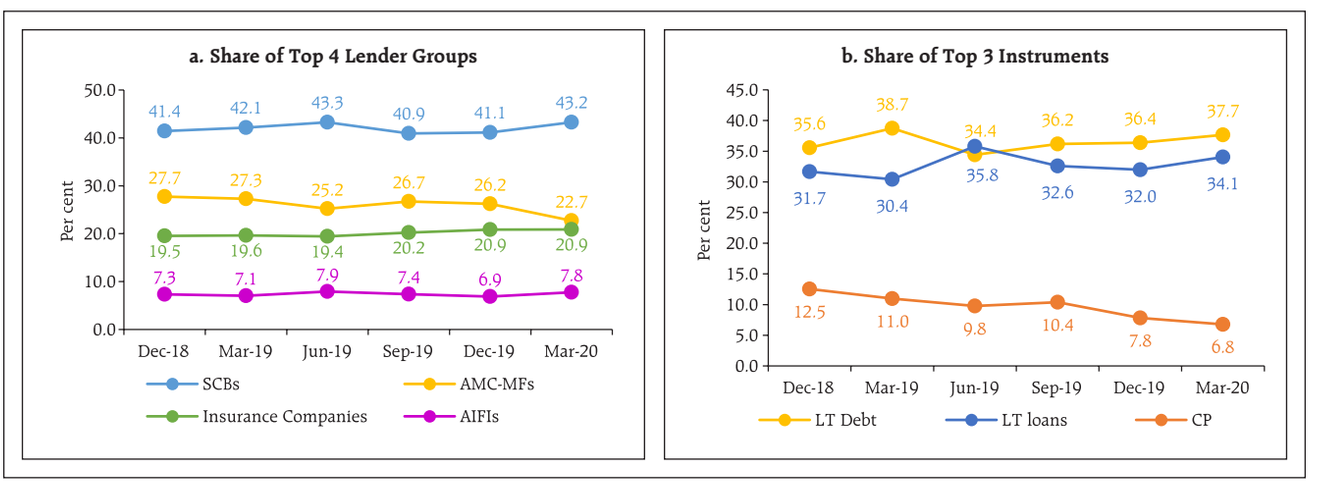
2.74 The choice of instruments in the NBFC funding mix reflects the increasing role of LT Loans (provided by SCBs and AIFIs) and LT debt (held by insurance companies and AMC-MFs) and a declining share of CPs (subscribed to by AMC-MFs and SCBs) (Chart 2.35 b).

f. Exposure to HFCs

2.75 HFCs were the second largest borrowers of funds from the financial system, with gross payables of around ₹5.91 lakh crore and gross receivables of ₹0.45 lakh crore as at end-March 2020. HFCs' borrowing profile was 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 has come down sharply in the last quarter. In contrast, the share of SCBs has increased (Chart 2.36 a).

2.76 As is the case of NBFCs, LT debt, LT loans, and CPs were the top three instruments through which HFCs raised funds from the financial system,

Chart 2.36: Gross Payables of HFCs to the Financial System



Source: RBI Supervisory Returns and Staff Calculations.

though their funding mix has been in a flux in the last six quarters. Reliance on CP (subscribed to by AMC-MFs and, to a lesser extent, by SCBs) has been on a consistent decline over the last six quarters. This was compensated by an increasing share of LT loans (from banks and AIFIs) and LT debt (Chart 2.36 b).

2.77 The aggregate funding by PSBs for stressed NBFCs/HFCs is increasing (Table 2.14 and Chart 2.26). This has implications for contagion if there is an adverse selection bias in NBFCs'/HFCs' credit portfolio. Also, an over-reliance on bank funding makes the NBFCs uncompetitive over a host of financial products, especially in those where the sector has to compete with banks and hence NBFCs' portfolio choices may tend to have an adverse selection bias[45].

II.5.2 Contagion Analysis[46]

2.78 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[47]-Liquidity[48] Contagion Losses for SCBs due to Bank Failure

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

2.80 A contagion analysis of the banking network[49] based at end-March 2020 position indicates that if the bank with the maximum capacity to cause contagion losses fails, it will cause a solvency loss of 4.30 per cent of total Tier 1 capital of SCBs and liquidity loss of 0.30 per cent of total high quality liquid assets (HQLA) of the banking system. Lower losses as at end-March 2020 relative to a year ago reflect a better capitalised public sector

Table 2.14: Net Funding Sources of Select Classes of Financial Intermediaries from Financial System

(₹crore)

		Sep-19				Mar-20			
		Users of Funds							
		PSB	PVB	NBFC	HFC	PSB	PVB	NBFC	HFC
Source of Funds	AIFIs	-54,249	1,35,195	8,063	42,956	-84,353	97,172	7,904	45,555
	PSBs	-	1,22,443	2,50,694	1,53,810	-	1,33,892	3,02,375	1,67,220
	PVBs	-1,22,443	-	84,518	55,889	-1,33,892	-	90,529	44,442
	AMCs	1,03,736	3,33,158	2,06,488	1,51,440	91,248	2,37,978	1,74,517	1,29,605

Source: RBI Supervisory Returns and Staff Calculations.

45 Financial Stability Report, June 2019.

46 For methodology, please see Annex 2.

47 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.

48 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: 16.5 per cent of NDTL + excess SLR + excess CRR.

49 Two SCBs, which did not meet the solvency criteria at the beginning before the initiation of contagion, have been excluded from this exercise.

banking system and a shrinking inter-bank market (Table 2.15).

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

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

2.82 An analysis of the possible solvency contagion losses[50] to the banking system caused by idiosyncratic failure of any NBFC indicates that, as at end-March 2020, contagion losses on account of failure of the top three PSU NBFCs ranged between 4.3 per cent to 5 per cent of the banking system's Tier-1 capital. Furthermore, Non-PSU NBFCs with the maximum capacity to cause solvency losses to the banking system could knock off 2.7 per cent of the latter's total Tier 1 capital but it would not lead to failure of any bank (Table 2.16).

2.83 Failure of the HFC with the maximum capacity to cause solvency losses to the banking system will knock off 6.77 per cent of the latter's total Tier 1 capital but without failure of any bank (Table 2.17).

2.84 Although SCBs' lending to NBFCs and HFCs has gone up as noted earlier (Charts 2.35 and 2.36; Table 2.14), the losses as at end-March 2020 were lower than a year ago due to a better capitalised public sector banking system and a shrinking inter-bank market.

Table 2.15: Contagion Losses due to Bank Failure – March 2020

Trigger	% of Tier 1 capital of the Banking System	% of HQLA	Number of Banks defaulting due to solvency losses	Number of Banks defaulting due to liquidity losses
Bank 1	4.30	0.30	1	0
Bank 2	3.23	0.35	1	0
Bank 3	1.87	2.47	0	2
Bank 4	1.74	1.65	0	4
Bank 5	1.72	1.01	0	0

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

Table 2.16: Contagion Losses due to Non-PSU NBFC Failure – March 2020

Trigger	Solvency Losses as % of Tier -1 Capital of the Banking System	Number of Defaulting banks due to Solvency Losses
NBFC 1	2.71	0
NBFC 2	2.17	0
NBFC 3	1.88	0
NBFC 4	1.57	0
NBFC 5	1.29	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 2.17: Contagion Losses due to HFC Failure – March 2020

Trigger	Solvency Losses as % of Tier -1 Capital of the Banking System	Number of Banks Defaulting due to solvency losses
HFC 1	6.77	0
HFC 2	3.64	0
HFC 3	1.65	0
HFC 4	1.63	0
HFC 5	1.20	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.

[50] Two SCBs did not meet the solvency criterion (Tier I CRAR less than or equal to 7 per cent) before the initiation of contagion. These two banks have been excluded from this exercise.

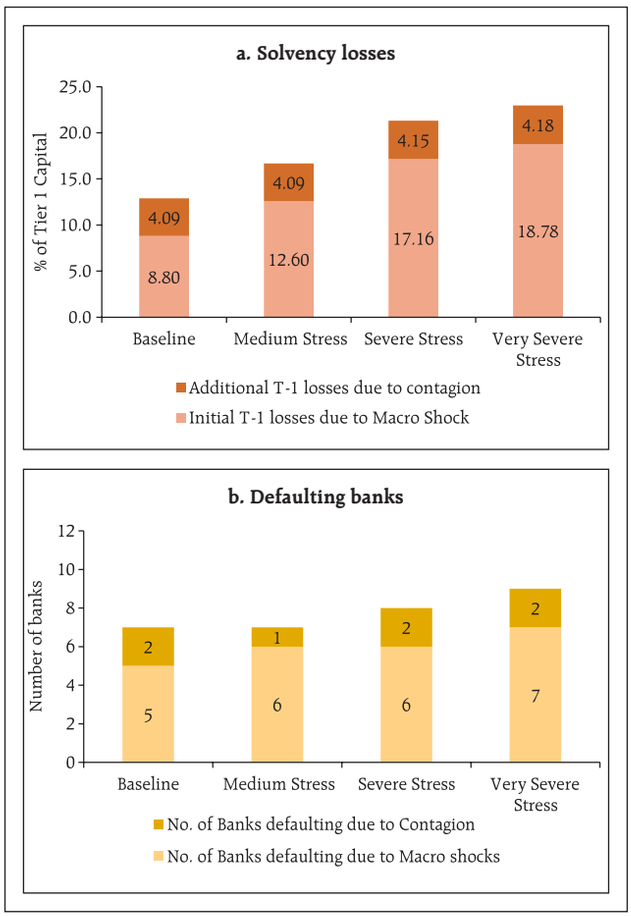
c. Solvency Contagion Losses[51] for SCBs due to Macroeconomic Shocks

2.85 The contagion impact of the failure of a bank is likely to be magnified if macroeconomic shocks result in distress in the banking system in a generalised downturn in the economy. Macroeconomic shocks cause some SCBs to fail the solvency criterion, which then acts 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. In this iteration, however, the initial impact of macroeconomic shocks on individual bank's capital was taken from the macro-stress tests in which a baseline, three (medium, severe and very severe) adverse scenarios were considered for March 2021[52].

2.86 Initial capital loss due to macroeconomic shocks is 8.80 per cent, 12.60 per cent, 17.16 per cent and 18.78 per cent of Tier 1 Capital for baseline, medium, severe and very severe stress scenarios, respectively. The number of banks that fail to maintain Tier I adequacy ratio of 7 per cent due to macroeconomic shocks are 5 in the baseline, 6 each in medium and severe stress scenarios and 7 in the very severe stress scenario. At the end of March 2020, these banks had low Tier 1 capital (either already below 7 percent or marginally higher).

2.87 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 of Tier 1 capital of the banking system is 4.09 per cent in the case of baseline and medium stress scenarios and 4.15 and 4.18 per cent in case of severe stress and very severe stress scenarios, respectively. Under such conditions, two additional banks fail due to contagion in the baseline scenario, severe and very severe stress scenarios, while one additional bank fails in the medium stress scenario. The contagion impact is low because these are relatively smaller banks with limited borrowings in the inter-bank market and also because other banks are well capitalised. Going forward, merger of two of the failing banks with stronger banks (which became effective on April 01, 2020) will further increase systemic resilience (Chart 2.37).

Chart 2.37: Contagion Losses due to Macroeconomic Shocks



Note: The projected capital in March 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: The Reserve Bank's supervisory returns and staff calculations.

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

[52] The contagion analysis used the results of the macro-stress tests and made the following assumptions:
a) The projected losses under a macro scenario (calculated as reduction in projected Tier 1 CRAR, in percentage terms, in March 2021 with respect to the actual value in March 2020) were applied to the March 2020 capital position assuming proportionally similar balance sheet structures for both March 2020 and March 2021.
b) Bilateral exposures between financial entities are assumed to be similar for March 2020 and March 2021.

2.88 In sum, in the wake of COVID-19 induced disruptions, the regulatory dispensations extended across regulatory jurisdictions are intended to minimise the risks in an effort to protect solvency of the overall system. As a consequence, there will inevitably be an increased stress in the financial system. Given the importance of the overall system to function as a going concern, the policy measures have ensured the resilience of the financial system.

2.89 The banking system may need to augment its capital to cater to a post-COVID-19 revival in the economy. A shrinking inter-bank market along with higher capitalisation have moderated the inter-bank contagion risks. While the exposure of mutual funds to NBFCs/HFCs moderated, the same of banks increased. Mutual funds have to improve their liquidity framework to contain spillovers.

Chapter III

Regulatory Initiatives in the Financial Sector

In their response to COVID-19 pandemic, central banks and other regulators as well as standard setting bodies have gone beyond the policy measures undertaken during the Global Financial Crisis (GFC) to address sagging demand conditions, sector-specific liquidity stress and financial stability and other concerns. Such policy actions find justification in the immediate circumstances, but they have also to balance regulatory and supervisory principles that ensure transparency with long-term stability of the financial system. On the domestic front, the Government of India and the financial sector regulators took several steps to deal with the pandemic-induced disruptions. The Financial Stability and Development Council (FSDC) along with its Sub Committee (FSDC-SC) have been alert to emerging challenges.

3.1 COVID-19 has taken a colossal toll of lives and livelihood and posed a cataclysmic threat to global financial stability. During Q1:2020, prices of risk assets collapsed, and market volatility spiked, with expectations of widespread defaults leading to a surge in borrowing costs. Given the unprecedented nature of the crisis, central banks have been called to the frontline again and have mobilised an unprecedented defence, involving both conventional and unconventional instruments – interest rate reduction; funding liquidity and market liquidity expansion; asset purchases; credit easing; macroprudential policies; and swap lines - to keep financial markets and financial intermediaries functional, and to preserve global financial stability. As a result of these measures[1], equity markets recovered from their troughs, credit spreads narrowed from peaks, investor confidence improved, and risk appetite is gaining traction.

III.1 Monetary Policy

3.2 As COVID-19 exploded into a pandemic, central banks' first line of defence was to reduce policy interest rates in order to ease borrowing costs and financial stress. Among the systemically important central banks, the US Federal Reserve (US Fed) cut its target for the Federal funds rate by 150 bps to a range of 0 to 0.25 per cent in a space of less than 2 weeks. The Bank of England (BoE) reduced its policy rate by 65 bps in little more than a week to 0.1 per cent. Among other advanced economies, central banks had little room available as they were either close to the zero lower bound or already in the negative interest rate territory as in the case of European Central Bank (ECB) and the Bank of Japan (BoJ), the latter maintaining 10-year JGB yields at around 0 per cent under its yield curve control policy.

3.3 Central banks in developing countries also cut their policy rates sizeably relative to their own histories. Among the large emerging market economies, the Banco Central do Brasil cut its policy rate by 75 bps; the South African Central Bank reduced its policy rate by 100 bps; the Central Bank of the Republic of Turkey reduced its policy rate by 100 bps and Bank Indonesia lowered its policy rate by 50 bps. Central banks also provided forward guidance on the future path of policy rates, indicating a highly accommodative policy stance going forward.

[1] Global Financial Stability Report Update, International Monetary Fund, June 2020.

III.2 Funding and Market Liquidity

3.4 Central banks in both developed and developing countries also resorted to extraordinary infusion of liquidity in the wake of the pandemic. The US Fed, which was offering USD 100 billion in overnight repo and USD 20 billion in 2-week repo, expanded the facility, offering USD 1 trillion in daily overnight repo, USD 500 billion in one month repo and USD 500 billion in 3-month repo. In addition, it established - re-established in some cases - a series of facilities aimed at providing funding liquidity or improving market liquidity to ensure the smooth functioning of financial markets and to maintain the flow of credit in the economy. Central banks in other major economies, both advanced and emerging, also took several measures to provide liquidity, with several of them tailored to the country-specific context (Table 3.1). These monetary authorities are continuously recalibrating these facilities in terms of size, duration and collaterals accepted. In a similar vein, central banks in developing countries have also established facilities for providing liquidity and supporting economic activities. These facilities are commensurate with the stage of development of their financial systems and the headroom available. Central banks in emerging markets (EMs) have also proactively infused liquidity to prevent sudden insolvencies and thereby support financial stability. In India, the Reserve Bank of India (RBI) along with the Ministry of Finance and other financial sector regulators made robust interventions to offset the impact of the pandemic, which are detailed later in the section on 'Domestic Developments'.

Table 3.1 : COVID-19 Liquidity Facilities

Central Bank	Policy Action Details
Bank of England	New term funding scheme with additional incentives for small and medium-sized enterprises (TFSME), financed by the issuance of central bank reserves.
	Establishment of a COVID corporate financing facility which will provide funding to businesses by purchasing commercial papers of up to one-year maturity issued by firms making a material contribution to the UK economy.
	Activation of the contingent term repo facility (CTRF) - a temporary enhancement to its sterling liquidity insurance facilities.
	Term funding scheme for small and medium-sized enterprises (TFSME). TFSME allows eligible banks and building societies to access 4-year funding at rates close to the bank's rate.
	Extended the use of the government's long-established Ways and Means (W&M) facility temporarily by providing short term liquidity to the government.
Bank of Japan	Committed to purchasing up to yen 12 trillion in ETFs and yen 180 billion in J-REITs.
	Committed to purchasing 3.2 trillion yen in commercial papers and 4.2 trillion yen in corporate bonds.
	Increased the maximum amount of additional purchases of CP and corporate bonds and conducted purchases with the upper limit of the amount outstanding of about 20 trillion yen in total. Maximum amounts of additional purchases of CP and corporate bonds will be increased from 1 trillion yen to 7.5 trillion yen for each asset. Other than the additional purchases, the existing amounts outstanding of CP and corporate bonds will be maintained at about 2 trillion yen and about 3 trillion yen respectively.
European Central Bank	Eased the collateral standards by adjusting the main risk parameters of the collateral framework and expanding the scope of additional credit claims (ACC) to include claims related to the financing of the corporate sector.
	Expanded the range of eligible assets under the corporate sector purchase programme (CSPP) to non-financial commercial papers, making all commercial papers of sufficient credit quality eligible for purchase under CSPP; conducted LTROs and TLTROs.
	Approved the creation of a guarantee fund worth EUR 25 billion by raising money from the European Union (EU) member states pro rata.
	Decided to conduct a new series of seven pandemic emergency longer-term refinancing operations (PELTROs).

Table 3.1 : COVID-19 Liquidity Facilities *(Contd.)*

Banco Central do Brazil	Introduced special temporary liquidity line.
	Conducting repurchase operations — with up to one-year term — backed by federal government securities.
Bank Indonesia	Expanded monetary operations by providing banks and corporates a term-repo mechanism with tenures up to one year.
	Increased the frequency of FX swap auctions for 1, 3, 6 and 12-month tenures from three times per week to daily auctions to ensure adequate liquidity.
Central Bank of the Republic of Turkey	Changed the Turkish lira and foreign exchange operations conducted at the Central Bank of the Republic of Turkey (CBRT) to include asset-backed securities and mortgage-backed securities in the collateral pool.
	Liquidity provided via repo auctions with maturities up to 91 days with an interest rate that is 150 basis points lower than the one-week repo rate.
Bank of Russia	Raised the maximum aggregate limit under irrevocable credit lines for systemically important credit institutions from 1.5 to 5 trillion roubles for the period April 1, 2020 to March 31, 2021.
	Increased the limit on its FX swap operations to provide US dollars with the maturity date of 'today' to USD 5 billion.
People's Bank of China	Injected RMB100 billion via the medium-term lending facility.
South African Reserve Bank	Adjusted the standing facilities (SF) borrowing rate--the rate at which SARB absorbs liquidity-- to a repo rate less 200 basis points. Previously, the borrowing rate was the repo rate less 100 points.
	Provided intra-day liquidity support to clearing banks with intra-day overnight supplementary repurchase operations (IOSROs).

Source: COVID-19 Financial Response Tracker, Yale Program on Financial Stability (YPFS).

III.3 Asset Purchases

3.5 Many central banks resumed large-scale asset purchases, or 'quantitative easing' (QE), a key tool used in response to the GFC to overcome the zero lower bound which has been hit by most AE central banks. The US Fed announced its intention to increase its holdings of Treasury securities and agency mortgage-backed securities (MBS) by at least USD 500 billion and USD 200 billion, respectively, to support the smooth functioning of financial markets. Subsequently, it went for open-ended purchases and also widened the purchases to include commercial mortgage-backed securities to support smooth market functioning and effective transmission of monetary policy to broader financial conditions and the economy. Market activity subsequently improved, and the Fed tapered its purchases through April and May. On June 10, however, the Fed indicated it would stop tapering and would buy at least USD 80 billion a month in Treasuries and USD 40 billion in residential and commercial mortgage backed securities until further notice. Between mid-March and mid-June, the Fed's portfolio of outrightly held securities grew from USD 3.9 trillion to USD 6.1 trillion. Likewise, the BoE increased its holdings of UK government and sterling non-financial investment-grade corporate bonds by £200 billion. The BoJ decided to (a) actively purchase ETFs and Japan real estate investment trusts (J-REITs) to support their issuance; and (b) conduct further active purchases of both JGBs and T-bills, with a view to maintaining stability in the bond market and stabilising the entire yield curve at a lower level. The ECB launched a new temporary asset purchase programme - the Pandemic Emergency Purchase Programme (PEPP) - directed at private and public sector securities to the tune of €750 billion. It also added a temporary envelope of additional net asset purchases of €120 billion until end-2020 to the existing asset purchase programme (APP). Central banks in developing countries largely resorted to traditional open market operations (OMOs) in respective government securities to support the financial markets' functioning and some

of them fashioned unconventional liquidity tools in response to the extraordinary situation.

III.4 Credit Facilities

3.6 As QE programs appeared to reach a wall in their efficacy – while overall borrowing costs eased, risk averse financial intermediaries and markets continued to discriminate against entities lower down in the credit risk curve - central banks made efforts to ensure credit flow to productive sectors. The US Fed established new facilities to support large corporations, small businesses, states and municipalities and, in an unprecedented move, decided to provide up to USD 2.6 trillion in loans although utilisation levels of the various programs have been significantly small relative to the outlay. The ECB recalibrated its targeted lending operations by expanding the range of acceptable collaterals with reduced haircuts for its refinancing operations, and also introduced pandemic emergency longer-term refinancing operations (PELTROs). The BoE introduced a 4-year concessional funding facility for banks, with provisions for additional funding for lending to small and medium sized enterprises.

3.7 These credit easing measures have helped in alleviating panic selling and in stabilising market conditions, including through announcement effects. In the US, corporate bond prices have been boosted across the rating spectrum, fuelling a record surge in new corporate bond sales, backed by the Fed's purchases of USD 3 billion out of the budgeted USD 750 billion for corporate debt purchases till June 3. It is noteworthy that companies have been reluctant to utilise these facilities in jurisdictions with strong market oversight and corporate governance in view of perceptions of stigma (Table 3.2).

Table 3.2 : Credit Support Intervention

Country	Program Name	Total Funding	Coverage Ratio	Program Description
Australia	Coronavirus SME Guarantee Scheme	AUD 40 billion (USD 27.5 billion)	50%	Guarantee on new unsecured loans to be used for working capital
				SMEs with revenue up to AUD 50 million are eligible
				Maximum total size of loans is AUD 250,000
				Three year term
				Initial 6 months repayment holiday
				Government is encouraging lender to provide facilities that SMEs only have to draw if needed (means that SME will only incur interest on the amount they draw down)
				Begins in April 2020 and available through September 30 2020
Austria	Bridge-Finance Guarantees due to the Coronavirus Crisis (operated by Austria Wirtschaftservice aws)	EUR 9 billion	100% up to EUR 500,000; 90% up to EUR 27.7 million; (previously offered 80% up to EUR 1.5 million)	Updated initial program after EU amended Temporary Framework
				For loans up to EUR 500k, 100% guarantee with 3 month Euribor + 75 bps interest, but 2 years interest free. No guarantee fees. Can be combined with a guarantee on up to EUR 1.5 million with coverage of 90%.
				For loans up to EUR 27.7 million, 1% interest with a guarantee fee between 0.25% and 1%
				Loan term of 5 years
	NÖBEG	EUR 20 million	80%	Lower Austria only, SMEs in the tourism and trade and membership in chamber of commerce
				Working capital loan of EUR 500k max, 5 year term
				Government pays the processing fee and guarantee commission
Brazil	Operations Guarantee Fund	BRL 15.9 billion (USD 3 billion)	100%	Launched on June 10
				Guarantees loans for micro and small enterprises in the National Support Program for Micro and Small Enterprises (Pronampe)
				Up to 85% of a portfolio can be guaranteed

Table 3.2 : Credit Support Intervention *(Contd.)*

Country	Program Name	Total Funding	Coverage Ratio	Program Description
				30% of gross 2019 revenue cap
				36 month term with 8 month grace period
				Must commit to preserving the number of employees from the date of contracting the loan to 60 days after receiving the last instalment
Bulgaria	Program for liquidity support through portfolio guarantees for micro and SMEs suffering from the declared emergency and COVID-19 outbreak	BGN 1.6 billion expected portfolio (USD 919 million)	80%	Max loan size of BGN 300k
				Can guarantee up to 80% of the bank's loan portfolio
				5 year term
				36 month grace period on principal and interest
				Reduced collateral requirements, max set at 20%
Chile	FOGAPE	USD 3 billion (to mobilize USD 24 billion)	Not predetermined, guarantee rights are auctioned	Loan size equal to 3 months of sales
				Term of 24 to 48 months with 6 month grace period
				Maximum interest of 300 bps above benchmark
				UF25,000 in sales and less eligible for the program
				Auction guarantees to bank, the first offer was in May and worth rights for UF 30 million or USD 1 billion.
Denmark	Garantiordning for udlån til små- og mellemstore virksomheder	DKK 1 billion (USD 151 million)	70%	For SMEs only that expect to experience a 30% decline in revenue
				Term max of 7 years
EU	InnovFin SME Guarantee and COSME Loan Guarantee Facility	EUR 1 billion (to mobilize EUR 8 billion)	80% (up from 50%)	The EC unlocked EUR 1 billion from the EFSI budget to guarantee the EIF allowing the EIF to issue a special guarantee for 100,000 SMEs
				Guarantees offered through the EIF to the market via a call for expressions of interest
Finland	Finnerva Start Guarantee	Part of EUR 2 billion package	80%	For companies operating for a maximum of 3 years
				Coverage ratio is up to 80%
				Guarantee fee of max 1.75%
				Service fee is reduced to 0.1%
				Minimum loan size of EUR 10,000 and maximum guarantee is EUR 80,000
				One firm can receive another guarantee but 2 months required between, total per firm is EUR 160,000
	Finnerva SME Guarantee	Part of EUR 2 billion package	80%	For companies operating more than 3 years
				Maximum loan size of EUR 150,000
				Investment and working capital, but not repayment of existing debt
				Minimum EUR 10,000
				One firm can receive another guarantee, but 2 months required between, total per firm is EUR 240,000 (guarantee size not loan size)
				No collateral required
				Guarantee fee based on the company's rating given by the Suomen Asiakastieto (0.95% for AAA or AA+ and 1.75% for AA, A+, A and B)
France	State Guaranteed Loan	EUR 300 billion	90% for loans to firms with less than 5000 employees; 80% for loans to firms with 5000 employees or more or EUR 1.5 b in turnover	Emergency aid under COVID response on March 16

Table 3.2 : Credit Support Intervention *(Concld.)*

Country	Program Name	Total Funding	Coverage Ratio	Program Description
				Companies of all sizes with loan size up to 3 months of 2019 turnover or 2 years of payroll for companies created after January 2019
				Tiered system
Germany	ERP-Gründerkredit-Universell	N/A	90% for SMEs; 80% for large enterprises; Not predetermined, guarantee rights are auctioned	Interest between 1-2.12%
				Entrepreneur loan
				For acquisitions, running costs, and material and goods warehouse
				Loans up to EUR 800k have 10 year terms, more than 800k have 6 year terms
	KfW Schnellkredit (Quick Loan 2020)	N/A	100%	New scheme launched after initial take up of <100% guaranteed loan was low
				3% interest up to EUR 800,000
				Companies with more than 10 employees
				No repayment for first 2 years
				Cannot be used for refinancing
				"Limitless"
	KfW-Unternehmerkredit	N/A	90%	Initially 80% guarantee but expanded to 90%
				Up to EUR 100 million and 2 years no repayment
				Interest between 1-2.12%
				Entrepreneur loan
Greece	COVID-19 Business Guarantee Fund within the Hellenic Development Bank	EUR 2.25 billion	80%	Introduced the new fund on April 30
				1-5 year terms only for new loans
				Fund loss on a financial intermediary's total portfolio is capped at 40% for SMEs and self-employed and 30% for large enterprises
Iceland	Guarantee scheme in response to the pandemic	ISK 50 bn (USD 361 million)	70%	Maximum guaranteed loan size of 1.2 billion krona
				Maximum term of 18 months
Ireland	DBEI SME Credit Guarantee Scheme	N/A	80%	A credit guarantee scheme is available in collaboration with major banks in the country (Ulster Bank, Bank of Ireland, and AIB)
				Between E10,000 and E1 million
				Interest rate is the bank lending rate. Guarantee fee initially set at 0.5%
				Refinancing is included
Japan	Part of economic package in response to Coronavirus: "Safety Nets for Financing Guarantee"	N/A	100%	Japan Federation of Credit Guarantee Corporations (JFG) will guarantee the full loan amount for such SMEs under a framework separate from a general financing guarantee
				Approval criteria relaxed so that companies operating for less than 1 year can also apply

Source: Yale Systemic Risk Blog (accessed on July 8, 2020).

III.5 Macroprudential Policies

3.8 Macroprudential interventions (*e.g.*, modification or more flexible accounting rules; prudential criteria for classifying and measuring bank exposures affected by the crisis) have also been extensively deployed to combat the negative effects of COVID-19 and preserve financial stability (Table 3.3). 56 countries have implemented more than 700 macroprudential policies since late January 2020[2]. Such steps effectively lighten capital and other regulatory requirements and/or a less stringent

[2] Source: Yale Systemic Risk Blog (accessed on April 15, 2020)

Table-3.3 : Select regulatory policy measures for the banking sector

Jurisdiction	Government Guarantees	Capital Requirements	Asset classification	Expected loss provisioning	Dividends and other pay-outs
Australia	Yes	Encouragement to use buffers	New guidance	New guidance, introduction of transitional arrangements	Expectation to limit
Canada	Yes	Lower domestic stability buffer, encouragement to use buffers			Expectation to halt increases
EU/SSM	Yes (*)	Release CCyB, encouragement to use buffers		New guidance	Expectation to halt
Japan	Yes	Encouragement to use buffers	Adjust risk weights of certain loans	-	-
United Kingdom	Yes	Release CCyB, encouragement to use buffers	New guidance	New guidance	Expectation to halt
United States	Yes	Encouragement to use buffers, adjust the supplementary leverage ratio	New guidance, definition of restructured debt	Optional suspension, extension of transitional arrangements	Expectation of prudent decisions, smoothening of automatic restrictions

(*): conditions vary across member countries.

Source: Borio,C, & Fernando Restoy (2020) , "Reflections on regulatory responses to the Covid-19 pandemic", Financial Stability Institute (FSI) Briefs, Bank of International Settlements, April. *https://www.bis.org/fsi/fsibriefs1.htm*

supervisory stance. International standard setters (*e.g.*, Basel Committee on Banking Supervision (BCBS)) have also postponed the implementation of new standards and have publicly supported similar steps at the national/multilateral level [Group of Twenty (G20); Financial Stability Board (FSB)].

III.5.1 Policies for Flexibility in Troubled Asset Classification

3.9 Globally, governments and regulators have introduced steps to reduce the costs of loan modifications/restructuring to help borrowers adversely affected by the pandemic. These initiatives also obviate the requirement of additional capital against increased risk under prevailing accounting standards. The BCBS has endorsed these strategies as long as supervisors make sure that banks use them prudently and due disclosures are made to enable market participants to assess the rationale and potential impact of such actions by the banks.

III.5.2 Policies for Easing Impact of Lifetime Expected Loss Accounting

3.10 Latest accounting standards require lenders to conduct forward-looking assessments of expected credit losses (ECLs) over the lifespan of each asset. Since expected-loss models cannot prepare banks for situations where black swan events materialise (*e.g.*, COVID-19), it would be prudent to assume that the potential impact of COVID-19 on bank capital may be more pronounced than they would have been under an incurred-loss model or the earlier accounting approach.

III.5.3 Relief to Insurance Industry

3.11 COVID-19 has had a pronounced impact on the insurance business, which is bracing up for a potential surge in insurance claims, including for business interruption covers, in anticipation of delays in claim submissions because of dislocations. In this context, insurance authorities have encouraged or instructed insurers to conserve capital by either delaying, reducing or cancelling dividend distribution and share buybacks and/or by reviewing variable remuneration policies and considering the postponement of disbursements. The International Association of Insurance Supervisors (IAIS), through its Insurance Core Principles (2019), has advised insurance supervisors to consider putting in place measures to dampen procyclical investment behaviour when designing a risk-based regulatory capital framework. Additionally, many insurance

regulators[3] have taken action to provide operational relief to insurers so as to help them re-deploy resources, maintaining business continuity and intensifying monitoring of financial exposure to COVID-19.

III.5.4 Securities markets

3.12 The International Organisation of Securities Commissions (IOSCO) issued a public statement on May 29, 2020 highlighting the importance of timely and high-quality information on the impact of COVID-19 on securities issuers' operating performance, financial position and prospects. The pandemic's material implications for financial reporting and auditing, including issuers' disclosures, should inform investment decisions. The IOSCO specifically underscored:

a. disclosures of COVID's impact on amounts recognised, measured and presented in financial statements;

b. the reporting of key audit matters and how auditors approach such issues; and

c. balancing flexibility provided by regulators in extending the period for filing financial information, along with the responsibility of providing timely and comprehensive financial information.

III.5.5 Need for an Exit Plan

3.13 The massive challenges caused by the pandemic have required regulators and policymakers to adopt bold and extraordinary approaches, measures and tools. Yet, such regulatory and supervisory responses should not compromise the stability and transparency of the financial system and endanger inter-generational stability. Regulatory forbearance should be complemented with sufficient and due disclosures on creditworthiness and supervisory oversight. A clearly laid out exit plan from the forbearance regime is highly desirable for the assurance of all stakeholders. For instance, the slew of measures aimed at countering the immediate impact of the pandemic has affected banks' assets and liabilities, but the markets have varied reactions to banking stocks across jurisdictions (Box 3.1).

Box 3.1: COVID-19: A Relook at G-SIBs in Key Jurisdictions

Globally, banks - especially global systemically important banks or G-SIBs - are required to provide for potential losses based on the expected credit loss (ECL) approach. Faced with the pandemic, however, the regulators have allowed flexibility in interpreting loss provisions, temporarily sterilising the effect of new rules on regulatory capital and allowing banks to temporarily suspend the application of the new standard. While these are in the nature of regulatory forbearance, it may be of interest as to how markets are reacting to the implementation of such variable policies on loan loss provisions across jurisdictions, given the intricate link between loan loss provisions and the banking sector resilience. Such market responses can be captured through the movements in bank debt pricing [through Credit Default Swap (CDS) prices] as also with the equity price movements.

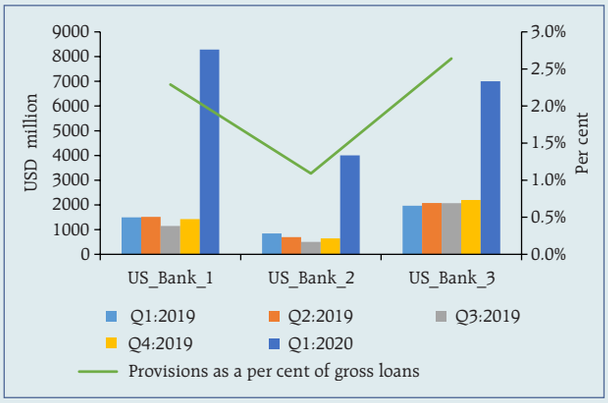
Given that loan loss provisions of major US and European global systemically important banks (G-SIBs) in Q1:2020 are not uniform, there is a possibility of variability in ECL assessments, which may not be insignificant, for similar asset classes. In fact, outstanding loan loss provisions show significant variability even within the same jurisdiction (Charts 1 & 2). Such variability poses challenges for the supervisory oversight.

Equity prices of US and European banks have declined sharply in the wake of the pandemic (Chart 3) while bank CDS spreads both in US and Europe have settled down to levels in the beginning of this year (Charts 4 and 5). Equity price and CDS spreads incorporate information about market expectations of any potential shortfall in asset cover for existing liabilities;

(contd..,)

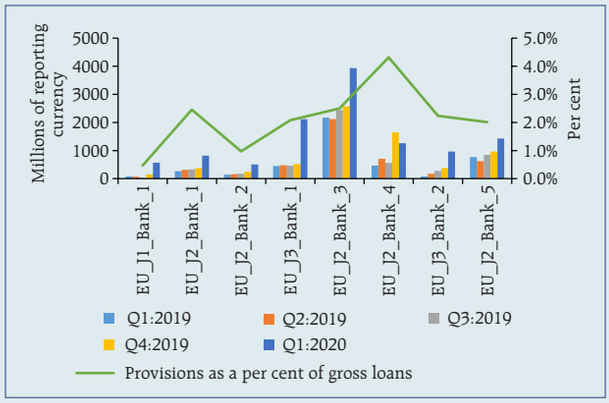
[3] FSI noted actions relating to operational relief for insurers undertaken by 32 insurance regulators globally including India.

Chart 1 : Loan loss provisions - US banks



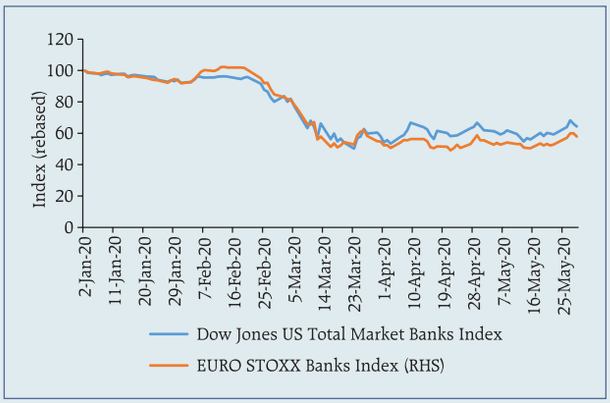
Source: Bloomberg.

Chart 2 : Loan loss provisions – European banks



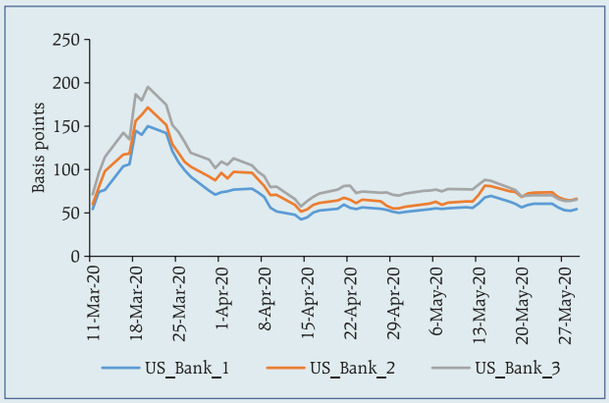
Source: Bloomberg.

Chart 3 : Movement in bank indices in US and Europe (rebased)



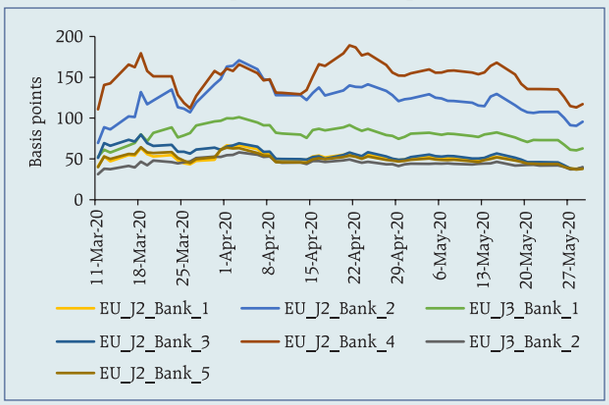
Source: Bloomberg and RBI's staff calculations.

Chart 4 : CDS spreads of US G-SIBs



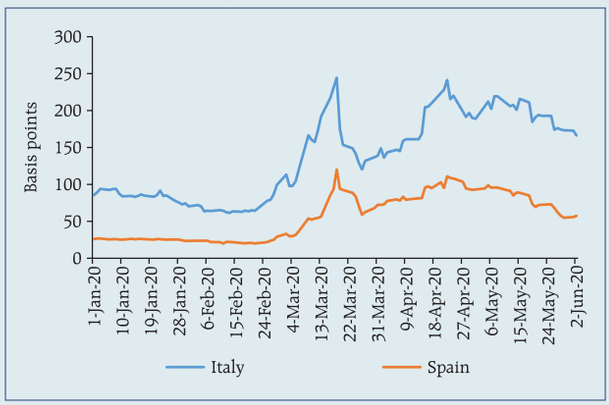
Source: Bloomberg.

Chart 5 : CDS spreads - Major European G-SIBs



Source: Bloomberg.

Chart 6 : Sovereign CDS – Select Eurozone countries



Source: Bloomberg.

additionally, they also embed information on forward looking growth opportunities in the economy, equity prices being the discounted present values of future cash flows. CDS prices of banks, in contrast, reflect the price for insuring their debt and hence represent the default probability i.e. market estimate of solvency of the underlying banks.

Two of the most affected economies in Europe - Italy and Spain - have shown rising sovereign CDS, implying an increased risk of default (Chart 6).

III.6 Domestic Developments

3.14 Since the publication of the last FSR in December 2019, the Financial Stability and Development Council (FSDC) and its Sub Committee (FSDC-SC) have been constantly monitoring the evolving situation through formal and informal interactions. In its 22nd meeting on May 28, 2020 chaired by the Finance Minister, the Council reviewed current global and domestic macroeconomic conditions, financial vulnerabilities, issues relating to NBFCs and credit rating agencies (CRAs), strengthening the resolution framework and cyber security of the financial sector. The Council noted that the COVID-19 pandemic poses a serious threat to the stability of the global financial system. It noted that decisive monetary and fiscal policy actions have stabilised investor sentiment in the short-run, but there is a need for the government and all regulators to keep a continuous vigil on financial vulnerabilities even as efforts are focussed on avoiding dislocation in financial markets.

3.15 At its 24th meeting held on June 18, 2020 the FSDC-SC reviewed major developments in global and domestic economies and financial markets. The Sub-Committee also discussed the setting up of an Inter Regulatory Technical Group on Fintech (IRTG-Fintech); the importance of cyber security across the financial system; and the National Strategy on Financial Education (NSFE) 2020-2025. It deliberated upon the status of and developments under the Insolvency and Bankruptcy Code (IBC), 2016 and the working of credit rating agencies. Overall, given the prevailing extraordinary circumstances, the Sub Committee unanimously resolved that (a) every participating regulator and ministry will continue to remain alert and watchful of the emerging challenges; (b) interact more frequently, both formally and informally, as also collectively; and (c) do whatever is necessary to revive the economy and preserve financial stability.

III.6.1 Initiatives from Regulators

3.16 The RBI, other financial sector regulators and the Government of India (GOI) have taken several steps to mitigate the impact of COVID-19 induced dislocation. Financial sector regulators have taken initiatives spanning monetary stimulus and regulatory regimes to offset the COVID-19 impact. Significant regulatory actions to ease operational constraints due to the COVID-19 induced lockdown as also for maintaining market integrity and resilience in the face of severe risk aversion by market participants have been undertaken by the financial sector regulators (Annex 3).

3.17 The Government of India has, on its part, worked out a support package entailing a prudent mix of sovereign guarantee based schemes, direct fiscal expenditure and longer-term structural policy reforms. The package encompasses a comprehensive 'Atma Nirbhar' (self-reliance) package in five tranches covering measures to create rural employment, infrastructure, support to MSME sector, and creation of an enabling business environment. Other measures include expenditure control such as a freeze on employees' dearness allowance as well as a relief package to support the vulnerable and disadvantaged sections of society, both in kind (free supply of grains) and cash (Direct Benefit Transfer or DBT). Put together, the overall package, including from the RBI in the form of various liquidity measures, is of the order of 10 per cent of GDP. Furthermore borrowing limits of State Governments were increased from 3 per cent to 5 per cent of gross state domestic product (GSDP).

3.18 The major elements of the GOI's policy package include: (i) Fund of Funds for infusing equity into micro, small and medium enterprises (MSMEs), collateral-free loans for standard MSMEs, provision of subordinate debt to those MSMEs which are classified as stressed or NPA; (ii)

Employee Provident Fund (EPF) support to eligible establishments by means of payment of employer and employee EPF contributions till August 2020; (iii) special liquidity scheme for NBFCs/HFCs/MFIs and Partial Credit Guarantee Scheme 2.0 for NBFCs/HFI/MFIs to inject liquidity; (iv) Tax deducted at source (TDS) and tax collected at source (TCS) reduced by 25 per cent of the existing rates for the remaining period of 2020-21; (v) additional re-finance support for crop loan requirement of rural cooperative banks and RRBs through the National Bank For Agriculture and Rural Development (NABARD); (vi) concessional credit *via* Kisan Credit Card (KCC) for PM-KISAN beneficiaries, animal husbandry and fishery-dependent persons to inject additional liquidity; and (vii) Interest subvention of 2 percent on MUDRA Shishu loanee; and (viii) scheme to facilitate easy access to credit for street vendors to restart their businesses.

III.7 Cyber Security

3.19 Over the years, cyber threats have emerged as a major area of concern in the financial sector, more specifically in the context of banking operations involving critical payment system infrastructure. Several milestones have been accomplished in the area of cyber risk management and developing resilience to such threats. Cyber security preparedness requires continuous and synchronous efforts from multiple stakeholders with varied levels of cyber security preparedness. Some of the recent measures include:

(a) centralisation of regulatory and supervisory functions related to cyber security aspects for all supervised entities with the CSITE (Cyber Security and IT Risk) Group of the Department of Supervision, RBI (a comprehensive cyber security framework for UCBs was issued in December 2019 wherein controls were mandated on the basis of digital depth adopted by the UCBs).

(b) mandating base lines requirements for critical service providers to the payment system of the banking sector through the RBI-regulated entities - to start with, instructions were issued mandating baseline cyber security controls for third-party ATM applications switch service providers.

3.20 The banking industry is a target of choice for cyber-attacks. In the post COVID-19 lockdown, there has been an increased incidence of cyber threats. In order to ensure that unconventional, remote working conditions necessitated by the lockdown and adoption of other practices/procedures do not lead to a relaxation of existing cyber security and data protection controls in supervised entities, the RBI has taken several measures. On March 11, 2020, when WHO declared COVID-19 a pandemic, the RBI issued an advisory on March 13, 2020 to all its regulated/supervised entities to *inter alia* ensure that access to systems is secure and critical services to customers operate without disruption. Since March 2020, the RBI issued more than 10 advisories/alerts to supervised entities on various cyber threats and best practices to be adopted. Some of them were issued in close coordination with Indian Computer Emergency Response Team (CERT-In). A series of video conference meetings were conducted in May 2020 regarding cyber security preparedness and broad cyber/IT threats in order to proactively sensitise the top managements of supervised entities.

3.21 For the financial sector, on a proactive basis, CERT-In is tracking latest cyber threats, analysing threat intelligence from multiple sources and issuing advisories and automated alerts to the Chief Information Security Officers (CISOs) encompassing relevant details so that the financial entities may develop a set of effective practices for responding to and recovery from cyber incidents, while enhancing their respective cyber resilience. CERT-In is enabling the finance sector to deal with

cyber attacks by conducting workshops as well as dedicated cyber security exercises and joint cyber security exercises with RBI and IDRBT. CERT-In has carried out 13 exercises for the financial sector till date.

III.8 Payment and Settlement Systems

3.22 The RBI continued its efforts to bring in improvements in existing payment systems and implement measures to ensure business continuity in the context of such pandemic situations for extended periods. The major developments with regards to Payment and Settlement Systems since December 2019 are detailed below.

III.8.1 Launch of NEFT 24x7x365

3.23 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, the RBI made available in December 2019 the National Electronic Funds Transfer (NEFT) system for round-the-clock fund transfer facility. India joined a select group of nations which offer round-the-clock fund transfer facility, others being Hong Kong, United Kingdom, South Korea, Singapore and China. With this, the general public can use the NEFT system any time of the day/night on all days of the year for transferring funds, purchasing goods / services and making utility bill payments.

III.8.2 Business Continuity of Payment Systems

3.24 The COVID-19 pandemic and the resultant lockdown necessitated the triggering of business continuity plans for the smooth running of systemically important and critical payment systems. While the day-to-day operations of the Real Time Gross Settlement (RTGS) and NEFT systems were shifted to the Primary Data Centre to operate under a protected environment, the Clearing Corporation of India Limited, which operates systemically important financial market infrastructure for the money market, government securities and foreign exchange settlements, implemented work-from-home procedures for most of its officials with skeletal staff in the office while keeping ready the on-city-site and remote disaster recovery sites with minimum staff to take over in case of disruption of activities at the primary site.

III.8.3 Setting up the Payments Infrastructure Development Fund

3.25 The Payment Systems Vision 2019-21 of the RBI envisaged creation of an Acceptance Development Fund [now, renamed as Payments Infrastructure Development Fund (PIDF)] to subsidise the deployment of point of sale (PoS) acceptance infrastructure. The focus of the PIDF is to increase the acceptance infrastructure (both physical and digital modes) across the country with emphasis on Tier III to Tier VI centres and the north-eastern parts of the country. The RBI has made an initial contribution of ₹250 crores to the corpus of PIDF covering half the fund and remaining contribution will be from card issuing banks and card networks operating in the country. The PIDF will be governed through an Advisory Council and managed and administered by RBI.

III.9 Resolution and Recovery

3.26 Since the coming into force of the provisions of the Corporate Insolvency Resolution Process (CIRP) with effect from December 1, 2016, close to

Table 3.4: Corporate Insolvency Resolution Process (CIRP)

(Number)

Quarter	CIRPs at the beginning of the quarter	Admitted	Closure by				CIRPs at the end of the quarter
			Appeal/ review/ settled	Withdrawal under Section 12A	Approval of resolution plan	Commencement of liquidation	
Jan-Mar, 2017	0	37	1	0	0	0	36
Apr-Jun, 2017	36	130	8	0	0	0	158
July-Sept, 2017	158	235	18	0	2	8	365
Oct-Dec, 2017	365	144	40	0	7	24	438
Jan-Mar, 2018	438	196	23	0	11	59	541
Apr-Jun 2018	541	249	22	1	14	51	702
Jul-Sept, 2018	702	242	33	27	29	86	769
Oct-Dec, 2018	769	276	13	38	18	82	894
Jan-Mar, 2019	894	382	50	21	20	86	1,099
Apr-Jun, 2019	1,099	301	26	26	26	95	1,227
Jul-Sept, 2019	1,227	582	28	21	32	153	1,575
Oct-Dec, 2019	1,575	613	27	11	35	149	1,966
Jan-Mar, 2020	1,966	387	23	12	27	121	2,170
Total	**NA**	**3,774***	**312**	**157**	**221****	**914**	**2,170**

*These CIRPS are in respect of 3706 Corporate Debtors (CD).
**Excludes one CD which has moved directly from BIFR to resolution.
Source: Compilation using data on NCLT's website.

3800 CIRPs had commenced by the end of March 2020 (Tables 3.4 and 3.5).

Table 3.5: Sectoral Distribution of CDs under CIRPs

Sector	No. of CIRPs (March 31,2020)		
	Closed	Ongoing	Total
Manufacturing	676	851	1527
Food, Beverages & Tobacco Products	76	120	196
Chemicals & Chemical Products	69	85	154
Electrical Machinery & Apparatus	61	51	112
Fabricated Metal Products	39	46	85
Machinery & Equipment	74	94	168
Textiles, Leather & Apparel Products	125	136	261
Wood, Rubber, Plastic & Paper Products	66	114	180
Basic Metals	119	147	266
Others	47	58	105
Real Estate, Renting & Business Activities	307	450	757
Real Estate Activities	56	127	183
Computer and related activities	43	66	109
Research and development	3	2	5
Other business activities	205	255	460
Construction	147	261	408
Wholesale & Retail Trade	168	210	378
Hotels & Restaurants	42	46	88
Electricity & Others	30	87	117
Transport, Storage & Communications	57	55	112
Others	177	210	387
Total	**1,604**	**2,170**	**3,774**

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

3.27 Operational creditors (OCs) triggered 49.65 per cent of the CIRPs, followed by 43.61 per cent by financial creditors and the remaining by corporate debtors (CDs) (Table 3.6).

3.28 As regards the status of CIRPs, 34 per cent of the ongoing CIRPs were delayed beyond 270 days, (Table 3.7).

Table 3.6 : Initiation of the Corporate Insolvency Resolution Process

Quarter	No. of CIRPs Initiated by			
	Operational Creditor	Financial Creditor	Corporate Debtor	Total
Jan-Mar, 2017	7	8	22	37
Apr-Jun, 2017	58	37	35	130
Jul-Sept, 2017	98	99	38	235
Oct-Dec, 2017	65	65	14	144
Jan-Mar, 2018	89	85	22	196
Apr-Jun, 2018	129	102	18	249
Jul-Sept, 2018	126	100	16	242
Oct-Dec, 2018	146	114	16	276
Jan-Mar, 2019	164	197	21	382
Apr-Jun, 2019	154	130	17	301
Jul-Sept, 2019	294	279	9	582
Oct-Dec, 2019	329	267	17	613
Jan-Mar, 2020	215	163	9	387
Total	**1,874**	**1,646**	**254**	**3,774**

Source: IBBI

3.29 About 56 per cent of the CIRPs, which were closed, ended in liquidation and 14 per cent ended with resolution plans. It is, however, important to note that 73 per cent of the CIRPs that ended in liquidation (637 out of 879 of which data is available) were earlier with the Board of Industrial and Financial Reconstruction (BIFR) or defunct and the economic value of most of these corporate debtors had already eroded before they were admitted into CIRP (Table 3.8).

III.10 Non-Banking Financial Companies

3.30 NBFCs complement banks in extending credit in the economy and they are a vital cog in the wheel for extending last mile credit needs. There were 9,543 NBFCs registered with the RBI as on September 30, 2019 (excluding HFCs), of which 82 were deposit-accepting[4] (NBFCs-D) and 274 were systemically important non-deposit accepting NBFCs (NBFCs-ND-SI). As on March 31, 2019, the total assets of NBFCs and HFCs was ₹44.4 lakh crore (NBFCs: 70 per cent; HFCs: 30 per cent), which is approximately one-fourth the size of the assets of the scheduled commercial banks (₹166 lakh crore) (Tables 3.9 and 3.10).

Table 3.7: Status of CIRPs as on March 31, 2020

Status of CIRPs	No. of CIRPs
Admitted	3774
Closed on Appeal / Review / Settled/Others	312
Closed by Withdrawal under section 12A	157
Closed by Resolution	221
Closed by Liquidation	914
Ongoing CIRP	2170
> 270 days	738
> 180 days ≤ 270 days	494
> 90 days ≤ 180 days	561
≤ 90 days	377

Note 1. The number of days is from the date of admission.
2. The number of days includes time, if any, excluded by the Tribunals.

Source: IBBI.

Table 3.8: CIRPs Ending with Orders for Liquidation

State of CD at the Commencement of CIRP	No. of CIRPs initiated by			
	FC	OC	CD	Total
Either in BIFR or non-functional or both	251	285	101	637
Resolution Value ≤ Liquidation Value	308	340	107	755
Resolution Value > Liquidation Value	63	35	26	124

Note: 1. There were 55 CIRPs where CDs were in BIFR or were non-functional but had resolution values higher than the liquidation values.
2. Where liquidation value was not calculated, it has been taken as '0'.
3. Data of 35 CIRPs are awaited.

Source: IBBI.

Table 3.9: NBFCs' Balance Sheets

(Amount in ₹ crore)

Items	NBFC			NBFC-ND-SI			NBFC-D		
	Mar-18	Mar-19	Sep-19	Mar-18	Mar-19	Sep-19	Mar-18	Mar-19	Sep-19
Share Capital and Reserves	6,10,383	6,95,807	7,73,163	5,56,043	6,28,603	6,99,301	54,339	67,204	73,862
Public Deposits	30,439	40,058	47,710	-	-	-	30,439	40,058	47,710
Debentures	8,90,105	9,05,833	9,27,557	8,06,667	8,06,663	8,32,048	83,437	9,170	95,509
Bank Borrowings	4,18,902	6,07,037	6,30,786	3,47,546	5,00,803	5,13,205	71,356	1,06,235	1,17,581
Commercial Paper	1,47,742	1,54,469	1,23,440	1,29,569	1,36,357	1,04,477	18,173	18,112	18,964
Others	5,20,219	6,82,276	7,54,986	4,36,806	5,91,162	6,54,606	83,414	91,114	1,00,380
Total liabilities / assets	26,17,790	30,85,480	32,57,642	22,76,631	26,63,588	8,03,637	3,41,159	4,21,892	4,54,006

Source: RBI Supervisory Returns.

[4] Only 22 NBFCs are allowed to accept deposits as they have investment grade ratings.

Table 3.10: Liability Structure of the NBFC Sector - December 2019

(Amount in ₹ crore)

Particulars	NBFCs with asset size above ₹ 5,000 crore (a)		NBFCs with asset size above ₹ 500 crore but below ₹ 5,000 crore (b)		NBFCs with asset size below ₹ 500 crore (c)		Total (a+b+c)	
	NBFCs with asset size above ₹ 5,000 crore (a)	% of Outside Liabilities	NBFCs with asset size above ₹ 500 crore but below ₹ 5000 crore (b)	% of Outside Liabilities	NBFCs with asset size below ₹ 500 crore (c)	% of Outside Liabilities (%)	Total (a+b+c)	% of Outside Liabilities
Number of NBFCs	102		220		9,289		9,611	
Outside liability	23,58,207		188,941		252,794		27,99,942	
Bank Borrowings	578,193	24.5	64,451	34.1	103,914	41.1	746,558	**26.7**
Debenture	872,748	37.0	34,661	18.3	56,302	22.3	963,711	**34.4**
Inter Corporate Borrowing	91,846	3.9	12,213	6.5			104,059	**3.7**
CP	95,116	4.0	8,535	4.5	13,603	5.4	117,254	**4.2**
Other Outside Liabilities	720,304	30.5	69,082	36.6	78,974	31.2	868,360	**31.0**
Total Liabilities	**29,81,471**		**361,395**		**377,868**		**37,20,734**	

Source: RBI Supervisory Returns.

3.31 Following the credit events of 2019, NBFCs with strong governance standards and resilient operating practices remained operational with market access; however smaller NBFCs and MFIs faced constraints and illiquidity, reflecting inherent fragilities rather than a systemic liquidity crunch. Financial markets have been discriminating between strong NBFCs and weaker ones. These developments have brought greater focus on market discipline and asset quality.

3.32 The RBI issued regulatory guidelines on Ind-AS implementation by NBFCs from 2020-21 onwards. NBFCs/ARCs are mandated to follow board approved policies that clearly articulate and document their business models and portfolios, objectives for managing each portfolio, and sound methodologies for computing expected credit losses (ECL). The audit committee of the board (ACB) should approve the classification of accounts that are past due beyond 90 days but not treated as impaired, with the rationale clearly documented. Also, the number of such accounts and the total amount outstanding and the overdue amount should be disclosed in the notes to the financial statements. NBFCs/ARCs also need to maintain asset classifications and compute provisions as per extant prudential norms on Income Recognition, Asset Classification and Provisioning (IRACP).

III.11 Mutual Funds

3.33 The mutual fund industry's assets under management (AUM) fell by 9.2 per cent at the end of March 2020 over its value at the end of September 2019, with AUM of the equity-oriented schemes declining more than their debt counterparts across the top-30 (T-30) and bottom-30 (B-30) cities (Table 3.11).

Table 3.11 : Assets at the End of the Period– B-30 versus T-30 cities

(₹ crore)

As on	B30 AUM			T30 AUM			Industry AUM		
	Equity	Non-Equity	Total	Equity	Non-Equity	Total	Equity	Non-Equity	Total
31-Mar-20	1,73,686	1,74,481	3,48,167	5,62,389	13,15,646	18,78,036	7,36,076	14,90,127	22,26,203
30-Sep-19	2,12,722	1,90,016	4,02,738	7,18,742	13,29,307	20,48,049	9,31,464	15,19,323	24,50,787
30-Apr-20	1,99,130	1,87,259	3,86,389	6,35,609	13,71,488	20,07,097	8,34,739	15,58,746	23,93,486

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

Table 3.12: SIPs in 2019-20 (October 01, 2019 to March 31, 2020)

Category	Existing at the beginning of the period (excluding STP)	Registered during the period	Matured during the period	Terminated prematurely during the period	Closing no. of SIPs at the end of the period	AUM at the beginning of the period	AUM at the end of the period
	(Lakh)					(₹ crore)	
T-30 Cities	151.48	32.75	6.07	11.66	166.49	1,98,055	1,60,618
B-30 Cities	133.48	26.61	3.31	11.04	145.74	94,265	79,098
Total	**284.96**	**59.36**	**9.38**	**22.70**	**312.23**	**2,92,320**	**2,39,716**

Source: SEBI.

Table 3.13: SIPs in 2019-20 (April, 2020)

Category	Existing at the beginning of the period (excluding STP)	Registered during the period	Matured during the period	Terminated prematurely during the period	Closing no. of SIPs at the end of the period	AUM at the beginning of the period	AUM at the end of the period
	(Lakh)					(₹ crore)	
T-30 Cities	166.19	4.12	1.23	1.93	165.22	1,60,618	1,84,286
B-30 Cities	145.68	3.38	0.68	1.57	148.76	79,098	91,552
Total	**311.87**	**7.50**	**1.91**	**3.50**	**313.98**	**2,39,716**	**2,75,838**

Source: SEBI.

3.34 Systematic investment plans (SIPs) have been favoured by investors (Table 3.12).

3.35 At the end of April 2020, the number of folios through SIPs increased over March 2020 (Table 3.13).

3.36 On the other hand, there was a net outflow of ₹ 7,384 crore from non-SIP investments as on March 31, 2020. In April 2020, both SIP and non-SIP investments recorded inflows (Table 3.14).

Table 3.14: SIP versus non-SIP net inflows

(₹ crore)

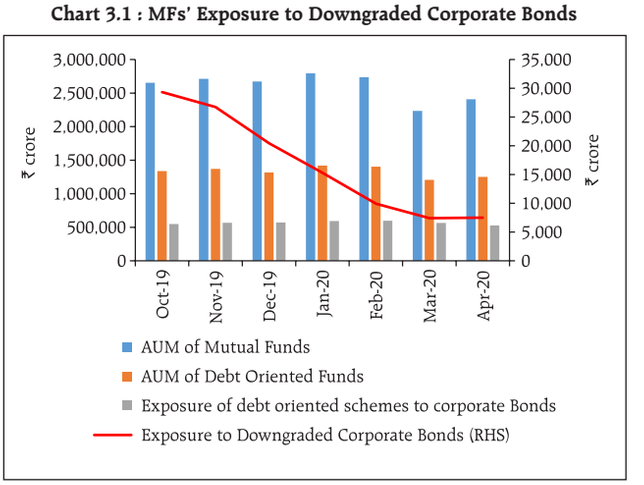
Category	Net Inflows as on		
	September 30, 2019	March 31, 2020	April 30, 2020
SIP	32,625	39,214	7,160
Non-SIP	22,846	-7,384	38,840
Total	**55,471**	**31,830**	**46,000**

Source: SEBI.

III.11.1 Exposure of MFs to Downgraded Corporate Bonds

3.37 While investments in corporate bonds offer higher returns, the risk premium may not be commensurate with the current elevated risk in the corporate bonds market. The exposure of debt oriented mutual fund schemes to corporate bonds rose to 46.9 per cent of total AUM of these schemes at the end of March 2020 from 42.9 per cent at the end of September 2019. The exposure of debt oriented mutual funds to corporate bonds, which have been downgraded, exhibited a steady downward movement in the last 6 months. This exposure was 2.37 per cent at the end of September 2019 which came down to 0.61 per cent in March 2020 and to 0.6 per cent in April 2020 (Chart 3.1).

Chart 3.1 : MFs' Exposure to Downgraded Corporate Bonds



Source: SEBI.

III.11.2 Deployment of Resources by Mutual Funds

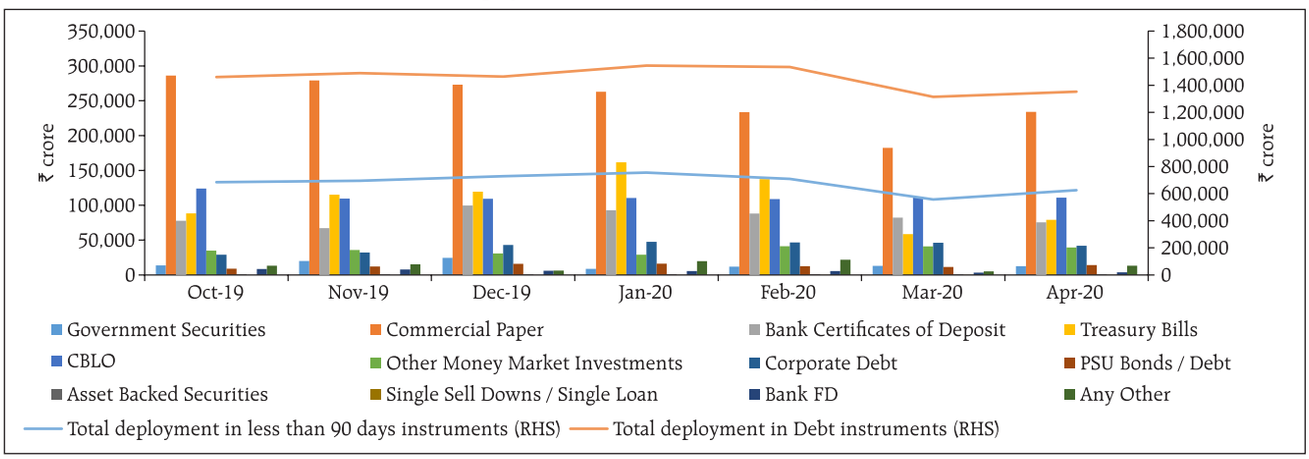
3.38 Mutual funds' total deployment in the equity market in March 2020 (₹ 8,98,472 crore) was sizably lower than in October 2019 (₹ 11,77,565 crore), owing to reduction in value of equities in the wake of extreme uncertainty surrounding COVID-19. However, market conditions and sentiment improved in April 2020 and the equity markets recovered, the with total deployment in the equity market increased in value to ₹ 10,14,909 crore. In the debt segment, MFs' investments in instruments of maturity of 90 days and less - mostly in commercial paper- dwindled since October 2019 and touched a trough in March 2020. In April 2020, however, there was a turnaround (Chart 3.2).

3.39 Investment in medium and long-term instruments (of maturity of more than 90 days) – corporate bonds are preferred the most, followed by PSU bonds - remained broadly stable, although there has been a slow but steady increase in investments in government securities (Chart 3.3).

III.12 Capital Mobilisation - Equity and Corporate Bonds

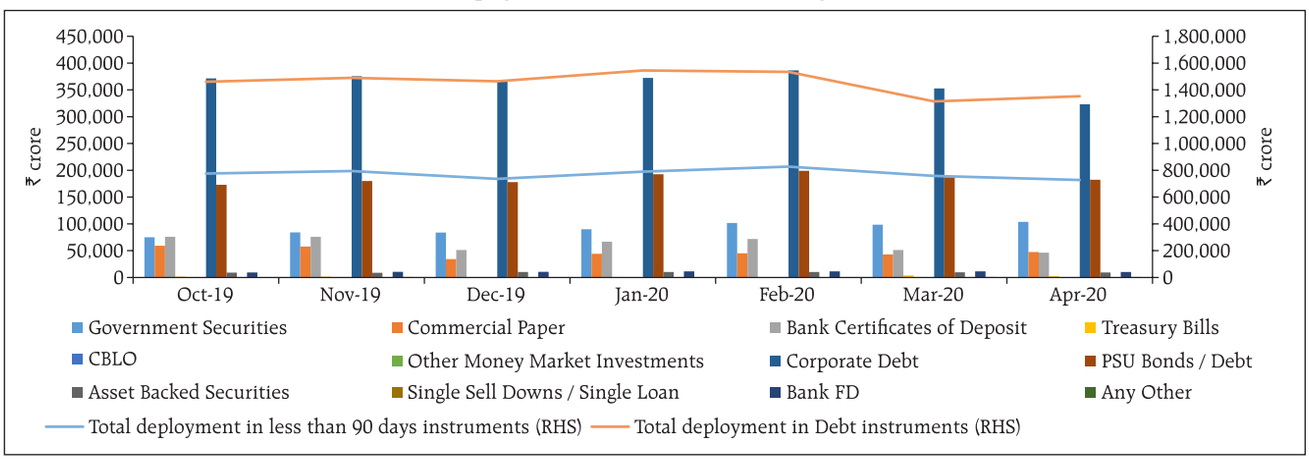
3.40 Total capital raised in primary markets during 2019-20 rose by 11 per cent year-on-year (y-o-y), with

Chart 3.2 : Deployment of Funds in less than 90 days Instruments



Source: SEBI.

Chart 3.3 : Deployment of Funds in more than 90 days Instruments



Source: SEBI.

₹ 3.34 lakh crore raised through both equity and debt issues during January-March 2020, despite volatile market conditions (Chart 3.4).

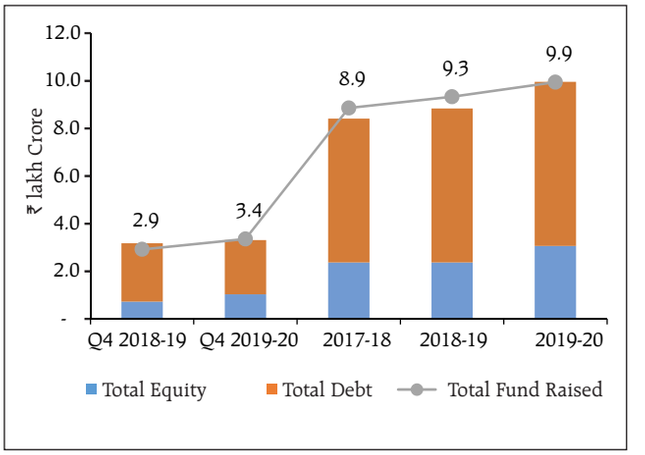
3.41 Within the total funds raised in capital markets during FY 2019-20, the amount raised through equity issues increased by 29.2 per cent mainly due to higher amount raised through public issues, right issues and qualified institutional placements (QIPs), whereas the capital mobilised through debt issues went up by 7 per cent (Chart 3.5 a and b).

3.42 During April 2020, however, both equity and debt issuances went down significantly in terms of numbers and amount in relation to a year ago (Table 3.15).

3.43 During the year, ₹14,984 crore was raised through public issues in the bonds market. ₹ 6.75 lakh crore was raised through private placements of corporate bonds (Chart 3.5b). The major issuers were body corporates and NBFCs, accounting for nearly 55 per cent of the total issuances during the year

Chart 3.4 : Capital Mobilisation in Capital Markets

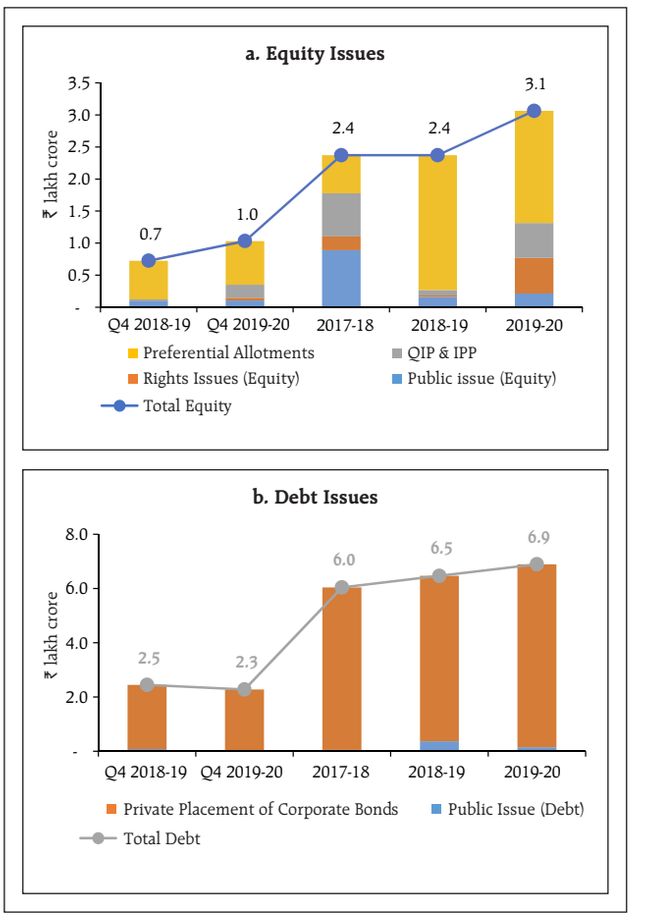
(in ₹ lakh crore)



Source: SEBI (data prepared based on issue closing date).

Chart 3.5 : Capital Mobilisation through Equity and Debt Issues

(in ₹ lakh crore)



Source: SEBI (data prepared based on issue closing date).

Table 3.15: Funds Raised in the Primary Market during April 2020

Particulars	April 2020		April 2019	
	No.	Amount (₹ crore)	No.	Amount (₹ crore)
Public issue (Equity)	3	14	8	3,221
Rights Issues (Equity)	0	0	2	25,012
QIP & IPP	0	0	1	3,173
Preferential Allotments	23	1,108	23	35,828
Total Equity	**26**	**1,122**	**34**	**67,234**
Public Issue (Debt)	0	0	5	2,191
Private Placement of Corporate Bonds	70	54,639	224	70,064
Total Debt	**70**	**54,639**	**229**	**72,255**
Total Fund Raised	**96**	**55,761**	**263**	**1,39,489**

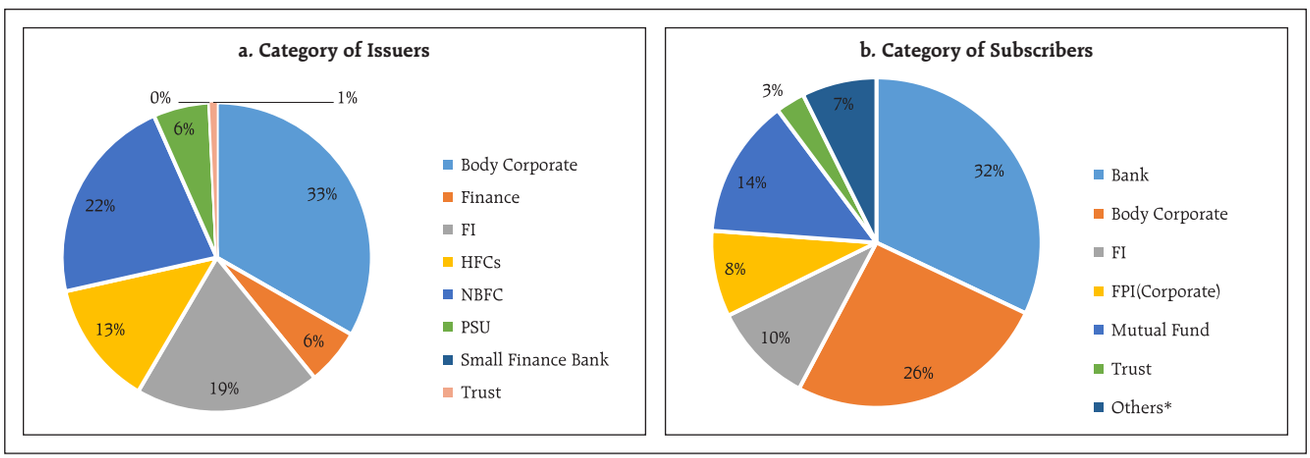
Source: SEBI.

(Chart 3.6a). Banks and body corporates were the major subscribers during the period (Chart 3.6b and Chart 3.7).

III.13 Credit Ratings (October 2019-March 2020)

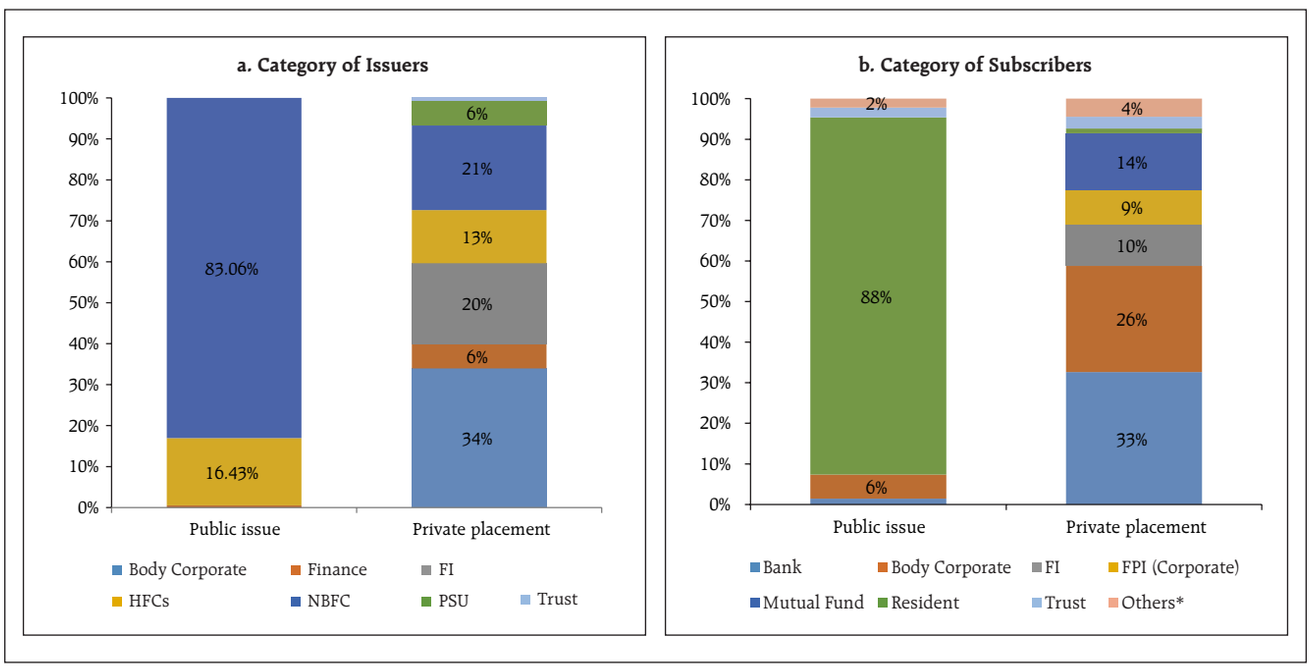
3.44 On an aggregate basis there was a y-o-y increase in the share of downgraded/suspended listed companies during quarters ended December 2019 and March 2020. Downgraded/ suspended CARE rated debt issues of listed companies went up to 22 per cent of total rating action during the quarter ended March 2020, the highest in the last 3 years. CRISIL-rated downgrades/suspensions witnessed a spike to 17 per cent in the December 2019 quarter,

Chart 3.6 : Category-wise Issuers and Subscribers of Corporate Bonds



Note: *Others include AIFs, CM, FIIs, NRIs, residents, HUFs and QIBs.
Source: SEBI.

Chart 3.7 : Category-wise Issuers and Subscribers (Public and Private)



Note: *Others include AIFs, CM, FIIs, NRIs, residents, HUFs and QIBs.
Source: SEBI.

but they went down to 9 per cent during the quarter ended March 2020 (Chart 3.8).

III.14 Commodity Derivatives Market

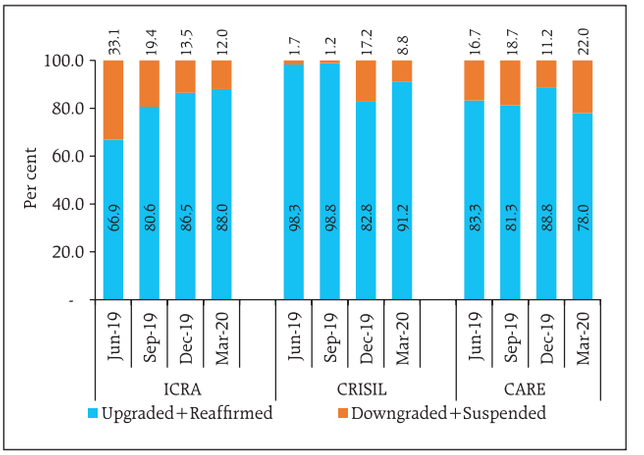
3.45 COVID-19 is expected to drive down commodity prices in 2020, with energy prices being the most impacted so far. Crude oil prices touched a historic low in April 2020 with April crude oil futures settling at negative levels one day before expiry on supply gluts and technical positioning of oil ETFs, despite the production cuts announced by the Organisation of Petroleum Exporting Countries (OPEC) plus.

3.46 Global base metal prices have also fallen, *albeit* by a lesser magnitude, pulled down by the prolonged slump in global manufacturing demand. The slowdown in economic activity (particularly in China) and shutting down of mines and refineries across the world disrupted metal supply chains in Q1: 2020. Global uncertainties and safe-haven flows drove gold prices higher in 2020, with some correction in March (Chart 3.9). Commodity prices are expected to trade softer in 2020 than in 2019. The outlook will depend on the effective containment of the pandemic and relaxation of social distancing measures.

III.14.1 Domestic Commodity Derivatives Market

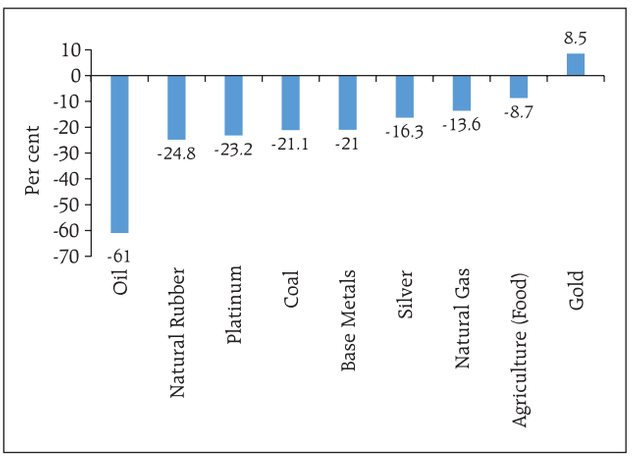
3.47 Most of the physical markets across the country were shut post March 20. Although market activity has resumed in most places by end-April, arrivals have been adversely impacted in the peak of physical market supplies for *rabi* crops (March to May). Wheat, which is the biggest *rabi* season crop, saw a 65 per cent y-o-y decline in mandi arrivals at an all-India level during April 2020, while mustard (-68 per cent), coriander (-75 per cent), castor (-78 per cent), chana (-82 per cent) and jeera (-83 per cent) were also affected. Closure of markets badly impacted trading on the exchanges as well as ancillary functions such as deposits in warehouses.

Chart 3.8 : Debt Issues of Listed Companies in terms of Rating Action - CRA-wise



Source: Individual Credit Rating Agencies

Chart 3.9 : Global Commodity Price Changes in per cent (January 20, 2020-April 21, 2020)



Source: World Bank.

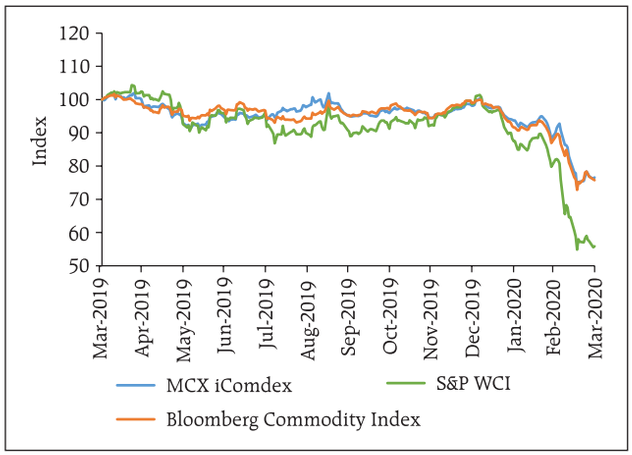
Traded values across major commodities fell sharply by around 40-60 per cent post the lockdown.

3.48 During 2019-20, the benchmark commodity derivative indices fell sharply - the MCX iCOMDEX composite index declined by 22.9 per cent while the NKrishi index decreased by 6.9 per cent The decline in indices was steeper during the last quarter of 2019-20. While the iCOMDEX bullion index increased marginally by 2.6 per cent during January-March 2020, the iCOMDEX crude oil and iCOMDEX base metal indices declined by 63.3 per cent and 16.0 per cent, Movement in domestic and international commodity futures indices during 2019-20 is shown in Chart 3.10.

3.49 Trading activity in the commodity derivatives segment of the exchanges registered an uptick during the year in terms of total number of derivatives contracts traded (23.3 per cent) and aggregate turnover of all exchanges (25.0 per cent). The turnover of futures contracts increased by 24.1 per cent while that of 'options on futures' contracts increased by 61.1 per cent. The aggregate turnover was boosted by the energy and bullion segments (Table 3.16).

3.50 At NCDEX (a leading exchange in agri-derivatives), however, the average daily turnover witnessed a fall from ₹1,488 crore before March 20, 2020 to ₹ 682 crore in the period post March 20, 2020. The open interest on the NCDEX platform fell from around 7.73 lakh units to 4.73 lakh units (around 40 per cent) in the period post March 20, 2020. MCX, which is a leading exchange in non-agri commodity derivatives also saw a similar magnitude of decline in turnover (by 55 per cent); however, the decline in open interest by 7 per cent was lower than on NCDEX. Since the imposition of the lockdown in India, the turnover in all the segments has witnessed a drastic decline (month-on-month) - by 70 per cent in the pan-India turnover in the energy segment

Chart 3.10 : Movement of Domestic and International Commodity Futures Indices



Source: Bloomberg.

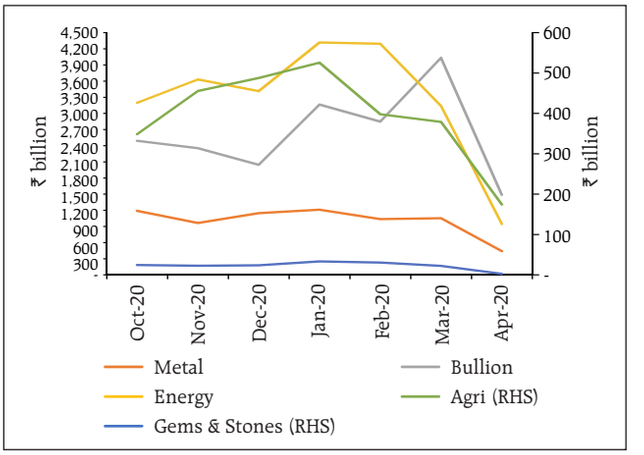
Table 3.16: Segment-wise Turnover in Commodity Derivatives

Period/Turnover (₹ billion)	Agri	Metals	Bullion	Energy	Gems & Stones	Total
H1: Apr 2019-Sep 2019	3,251	9,180	14,010	17,402	120	43,962
H2: Oct 2019-Mar 2020	2,595	6,601	16,938	21,995	157	48,286
Change (%)	-20.2	-28.1	20.9	26.4	30.5	9.8
Share (%) (H1+H2)	6.3	17.1	33.5	42.7	0.3	100.0

Source: SEBI.

in April 2020, by 63.1 per cent and 58.2 per cent, respectively, in the bullion and metal segments, and by 54 per cent in the agri -derivatives segment (Chart 3.11).

Chart 3.11 : A Snapshot of Commodity Derivatives Turnover at Exchanges



Source: Various exchanges

III.15 Insurance

3.51 COVID-19's impact on the insurance sector may take the form of potential increase in life and health insurance claims, concerns about solvency of insurers due to market volatility, asset-liability mismatches and depressed premium collection and revenues. A prudent regulatory framework, greater supervisory oversight of investments through conservative investment policies and asset valuation methods in the Indian insurance sector limited some of these downside risks. A preliminary study by the Insurance Regulatory and Development Authority of India (IRDAI) shows that all insurers will meet the solvency margin as on March 31, 2020. The IRDAI has issued guidelines to all insurers to put in place effective mechanisms to closely monitor COVID-19 related developments, including its impact on companies' risks and financials and also to assess possible business disruption in advance and activate business continuity mechanisms.

3.52 Insurers have also been advised to put in place business continuity plans (BCPs) and crisis management committees to monitor the situation on a real-time basis and adopt necessary measures for minimising business disruptions. Crisis management committees have to provide regular inputs to the insurers' risk management committees, which will evaluate strategic, operational, liquidity, credit, reputational, market and foreign exchange risks, besides the threats stemming from reduction in new business, renewals, capital erosion and claims, which have to be promptly communicated to the regulatory authority. All insurers have been directed to align dividend pay-outs for 2019-20 so as to ensure that they have adequate capital and resources available with them for protecting policyholders' interests.

3.53 The COVID-19 pandemic has refocused attention on the influence of insurance cover on business solvency (Box 3.2).

Box 3.2: Catastrophic Risk Insurance

The COVID-19 global pandemic has refocused attention on the importance of a properly designed insurance cover alongside insurers' ability to handle potential claims for death, hospitalisation, event cancellations and business interruptions. The cost of catastrophes has increased worldwide from USD 30 billion/year in the 1980s to USD 232 billion in 2019. On average, only about 30 per cent of a catastrophe's losses are covered by insurance while the rest are borne by affected individuals, firms and governments. Can insurance mitigate some of these losses?

The pricing of insurance contracts is based on expected loss estimates; however, a sophisticated view of insurance pricing has to take into account strategic actions on the part of the insured. Two types of strategic actions have been distinguished – hidden action and hidden information. Hidden action creates incentives

(Contd.)

of the nature of moral hazard - purchasers of insurance policies will not take the due level of diligence. Hidden information can also lead to adverse selection wherein the insured party has more private information related to insurance pay-offs than the insurer. Even without strategic action, the insurance pay-offs can be correlated-- for an infectious global pandemic, the probability of a person being infected by the virus depends, among other things, on the person being in contact with another infected person *i.e.* such events of infection are non-random. The same holds for catastrophic insurance where geographical proximity may influence insurance claims. Finally, from an investor's perspective, investments in financial instruments with embedded insurance contracts warrant an evaluation of how such returns correlate with the overall returns of the portfolio.

Typically, pay-outs for catastrophic events are uncorrelated with other financial assets, which makes them an ideal investment vehicle for diversifying risks. Yet, as the COVID-19 pandemic demonstrates, there can be insurance contracts for which pay-outs are designed to happen when the rest of investible assets are already under pricing pressures. Such a correlation makes assets with embedded insurance unattractive for investors. Without government intervention, informational asymmetry and correlated pay-outs will ensure the level of insurance for the economy at large to be lower than optimal, which implies that the risks borne by individuals / businesses are higher. Consequently, their consumption stream/ output becomes vulnerable to sudden and idiosyncratic shocks which has attendant welfare and financial stability implications. Hence, a well performing insurance market plays an integral role in smoothening out consumption shocks and increasing general welfare and financial stability.

A vivid example is earthquakes of similar magnitude striking Haiti and New Zealand in 2010. The economic consequences suffered by both the countries differed: Haiti suffered a drop in real growth from 3.5 per cent to (-) 5.1 per cent in 2010 alone along with a decline in exports and outbreak of diseases. In New Zealand by contrast, there was a 50 bps increase in GDP due to the reconstruction of damaged infrastructure. This difference in outcomes was attributed to insurance coverage: in New Zealand 81 per cent of the direct losses were insured while insurance coverage was only 1 per cent in Haiti.

The Indian Perspective

For India, being prone to natural catastrophes, an insurance cover for mitigating the negative financial consequences of these adverse events is crucial, but it is still public sector driven and relatively underdeveloped, potentially a financial strain on the limited resources of the state. A Calamity Relief Fund for each state contributed by the central and state governments in the ratio of 75:25 has been established, based on the average of the ceiling of expenditure for natural calamities in the last 10 years. The government has also been emphasising allocation of resources for disaster mitigation in its annual plans. The disaster management policy of the government addresses prevention, mitigation, preparedness, response, recovery, reconstruction and rehabilitation funded by government resources but does not deal with insurance as a financial mitigant.

Given the lack of purchasing power, lack of interest in insurance and ignorance about the availability of insurance cover in India, public welfare insurance policies become an imperative. Initiatives such as the Pradhan Mantri Fasal Bhima Yojana (PMFBY)-crop insurance, Ayushman Bharat-health insurance and the Pradhan Mantri Jan Dhan Yojana (PMJDY)-life insurance are being used as a social security and social empowerment tools for reducing the financial burden on the government through effective risk transfer solutions. However, the experience has been less than optimum. The IRDAI recommends certain product structures for catastrophe insurance that may be effective but in the final analysis the best solution appears to be government funding (IRDAI, 2019). Given the enormous uncertainties surrounding natural catastrophic (NAT CAT) events, it advocates for government funding the losses and, in turn, purchasing reinsurance solutions. Nevertheless, recent experiences have undermined confidence in reinsurance solutions. Globally, risk pools with government backstop are becoming the preferred mechanism for insuring "un-insurable" extreme risk events including pandemics.

A risk-layered approach in which the government, banks and insurers finance different risks, depending on their size and frequency, may be the best way forward.

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III.16 Pension Funds

3.54 The National Pension System (NPS) is a voluntary, defined contribution, retirement savings scheme designed to enable subscribers to make optimum decisions regarding their future through systematic savings during their working lives. The corpus accumulated during the working life is utilised for old age income of the NPS subscribers.In response to COVID-19, the PFRDA took several steps for supporting subscribers and intermediaries.

3.55 The Authority included COVID-19 among the critical illnesses eligible for partial withdrawals under the National Pension System (NPS). A request placed for partial withdrawals by the subscriber shall be immediately addressed, towards treatment of illness of self/subscriber, his legally wedded spouse, children (including a legally adopted child) or dependent parents as per the regulations.

3.56 The Atal Pension Yojana (APY) is a defined benefit voluntary pension scheme, with subscribers mostly belonging to the unorganised sections of society suffering the most during lock-down and post lock-down periods. Under the APY scheme, subscribers have to contribute to their pension accounts on a monthly/quarterly/semi-annual basis through an auto debit facility from their savings bank accounts. The Authority took cognisance of the difficulties for subscribers to contribute regularly to the scheme during COVID-19. Hence, it was decided to stop auto-debits from savings accounts for APY contributions till June 30, 2020. Also, APY subscribers would not be charged any penal interest if they regularise their APY accounts by depositing such non-deducted APY contributions along with regular APY contributions between July 1, 2020 and September 30, 2020.

3.57 In addition, the Authority also permitted operational relaxations for easing operational constraints induced by the lockdown as under:

(i) Points of Presence (POPs) were permitted to submit the compliance reports (due between March 1, 2020 and June 30, 2020) within 30 days from the normal due date through email;

(ii) Waiver of compensation to be paid to subscribers due to delays in prescribed TATs under guidelines for period March 1, 2020 and April 30, 2020;

(iii) It was decided to allow employers/corporates to authorize the NPS Subscriber Registration Forms submitted by their employees through email instead of physical authentication ; and

(iv) Barring accounts opened though e-NPS, all other PRANs which were opened in the June quarter have been given a timeline for completion of document with CRA till July 30, 2020.

3.58 The National Pension System (NPS) and the Atal Pension Yojana (APY) have shown progress in terms of the total number of subscribers as well as asset under management (AUM)). The number of subscribers in NPS and APY have reached 1.34 crore and 2.11 crore respectively. Assets under Management under NPS and APY have also touched ₹ 4,06,953 crore and ₹ 10,526 crore respectively (Table 3.17).

3.59 The PFRDA continued to work towards financial inclusion of the unorganised sector and low-income groups by expanding coverage under APY. As on March 31, 2020, 403 banks were registered under APY, with the aim of bringing more and more citizens in the pension net.

3.60 Overall, policy authorities have been responding to the COVID-19 pandemic across monetary, liquidity, fiscal and financial regulatory domains to keep the financial system functional and well-oiled, on the one hand and, businesses and households viable and solvent, on the other. However, challenges remain in pandemic-proofing large sections of society, especially those that tend to get excluded in formal financial intermediation, unwinding the stimulus and support packages in a calibrated manner, without disrupting the markets and re-establishing prudential norms in their pre-pandemic stance.

Table 3.17: Subscribers and AUM : NPS and APY

Sector	AUM		Subscribers	
	March 2019 (₹ crore)	March 2020 (₹ crore)	March 2019 (No. in lakhs)	March 2020 (No. in lakhs)
Central Government	1,09,010	1,38,046	19.85	21.02
State Government	1,58,492	2,11,023	43.21	47.54
Corporate	30,875	41,243	8.03	9.74
All Citizen Model	9,569	12,913	9.30	12.52
NPS Lite	3,409	3,728	43.63	43.32
APY	6,860	10,526	149.53	211.42
Total	**3,18,214**	**4,17,479**	**273.55**	**345.55**

Source: PFRDA.

Annex 1

Systemic Risk Survey

A systemic risk survey (SRS), the eighteenth in the series, was conducted during April-May 2020 to capture the perceptions of experts, including market participants, on the major risks faced by the financial system. According to the survey results, all major risk groups *viz.*, global risks, risk perception on macroeconomic conditions, financial market risks and institutional positions were perceived as 'high' risks affecting the financial system (Figure 1).

Within global risks, global growth was categorised as a 'very high' risk. Within the macroeconomic risks group, domestic growth and the fiscal deficit were perceived to be in the 'very high' risk category, while risks on account of reversal of FIIs/slowdown in FDI, corporate sector vulnerabilities, collapsing real estate prices and household savings were perceived to be in the 'high risk' category. Among the institutional risks, the risks on account of asset quality deterioration and level of credit growth were perceived as 'high risk' factors. Cyber risk appeared in the 'high risk' category for the first time since the inception of the survey (Figure 2).

Participants opined that the effects of COVID-19 are likely to remain for 3-5 years and may impact the quality of credit in the books of banks, the general risk taking ability of entrepreneurs, investments in capital markets and real estate, and the saving pattern of households. All these could have an impact on domestic financial stability.

Figure 1: Major risk groups identified in systemic risk survey (April 2020)*

Major Risk Groups	Oct-19	Changes	Apr-20
A. Global Risks		⇧	
B. Macro-economic Risks		⇧	
C. Financial Market Risks		⇧	
D. Institutional Risks		⇧	
E. General Risks		⇧	

Source: RBI systemic risk survey (October 2019 & April 2020).

Note:
Risk Category

Very high	High	Medium	Low	Very low

Change in risk since last survey		
⇧	⇔	⇩
Increased	Same	Decreased

*The risk perception, as it emanates from the systemic risk survey conducted at different time points (on a half yearly basis in April and October), may shift (increase/decrease) from one risk category to the other, which is reflected by the change in colour. However, within the same risk category (that is, boxes with the same colour), the risk perception may also increase/decrease or remain the same, the shift being indicated by arrows . The shift in risk perception pertains to the comparative analysis of two consecutive surveys.

Figure 2: Various risks identified in systemic risk survey (April 2020)*

Risk Groups	Risk Items	Oct-19	Changes	Apr-20
A. Global Risks	Global growth		⇧	
	Sovereign risk / contagion		⇧	
	Funding risk (External borrowings)		⇧	
	Commodity price risk (including crude oil prices)		⇧	
	Other global risks		⇧	
B. Macro-economic Risks	Domestic growth		⇧	
	Domestic inflation		⇧	
	Current account deficit		⇩	
	Capital inflows/ outflows (Reversal of FIIs, Slowdown in FDI)		⇧	
	Sovereign rating downgrade		⇧	
	Fiscal deficit		⇧	
	Corporate sector risk		⇧	
	Pace of infrastructure development		⇧	
	Real estate prices		⇧	
	Household savings		⇧	
	Political uncertainty/ governance /policy implementation		⇧	
	Other macroeconomic risks		⇩	
C. Financial Market Risks	Foreign exchange rate risk		⇧	
	Equity price volatility		⇧	
	Interest rate risk		⇧	
	Liquidity risk		⇧	
	Other financial market risks		⇧	
D. Institutional Risks	Regulatory risk		⇧	
	Asset quality deterioration		⇧	
	Additional capital requirements of banks		⇧	
	Access to funding by banks		⇧	
	Level of credit growth		⇧	
	Cyber risk		⇧	
	Operational risk		⇧	
	Other institutional risks		⇩	
E. General Risks	Terrorism		⇔	
	Climate related risks		⇩	
	Social unrest (Increasing inequality)		⇧	
	Other general risks		⇩	

Source: RBI systemic risk survey (October 2019 and April 2020).

Note:

Risk Category

Very high	High	Medium	Low	Very low

Change in risk since last survey		
⇧	⇔	⇩
Increased	Same	Decreased

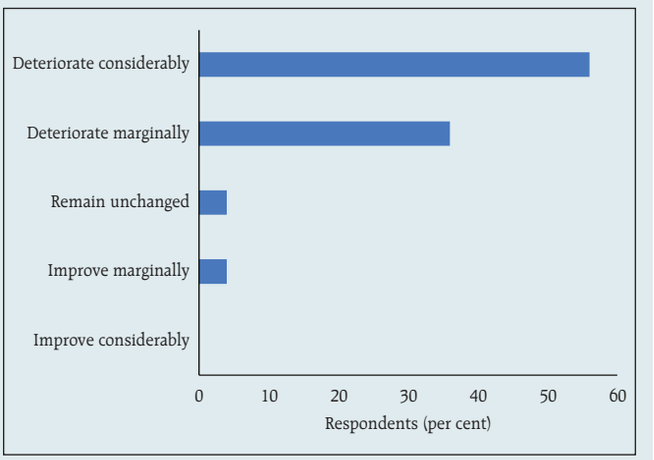
*The risk perception, as it emanates from the systemic risk survey conducted at different time points (on a half yearly basis in April and October), may shift (increase/decrease) from one risk category to the other, which is reflected by the change in colour. However, within the same risk category (that is, boxes with the same colour), the risk perception may also increase/decrease or remain the same, the shift being indicated by arrows . The shift in risk perception pertains to the comparative analysis of two consecutive surveys.

The MSME sector is affected because of lack of cash flows. Low demand, lack of manpower, stuck working capital and lack of capital may lead to further stress on employment. Real estate prices and cash flows on commercial real estate can undergo a major structural correction due to change in working patterns, which will lead to further pressure on real estate developers and lending. Potential margin compression in corporate bonds was seen as increasing leverage, leading to negative impact on credit metrics and consequent rating downgrade that can result in difficulties for refinancing of loans and raising capital.

In the financial sector, the existing stock of non-performing assets in the banking system and bankers' risk aversion remain big worries and impediments to economic growth. Despite measures taken by the Reserve Bank, transmission of liquidity and rate actions is still slow. Coupled with continued risk aversion, the flow of credit to the productive sectors (including NBFC & HFC) remains a challenge, Given that financial services are an integral and important constituent of the credit market, many participants opined that support from RBI would be important in the current environment.

About 56 per cent of the respondents opined that the prospects of Indian banking sector are going to deteriorate considerably 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. About 36 per cent of the respondents felt that the prospects are going to deteriorate only marginally (Chart 1).

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



Source: RBI systemic risk survey (April 2020).

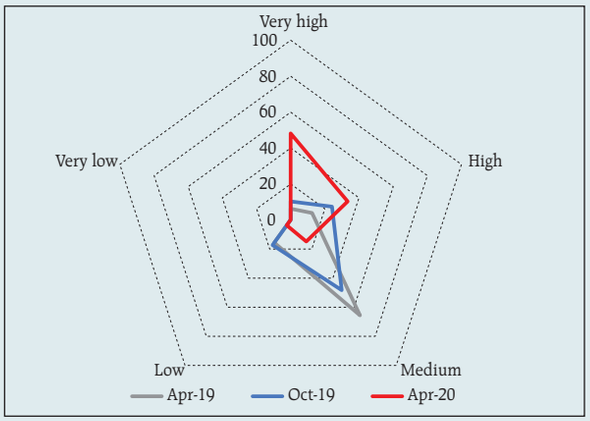
Majority of the participants in the current round of the survey expect a very-high probability of occurrence of a high impact event in the global financial system in the short term (upto 1 year). In the medium term (1 to 3 years) majority of the participants in the current round of the survey assign a 'medium' probability to the occurrence of a high impact event in the global financial system. In the Indian financial system, the participants opined that there is a high probability of occurrence of a high impact event in the short-term but the probability of such an occurrence in the medium term (1 to 3 years) is medium. About 70 per cent of the respondents were not very confident in the stability of the global financial system (Chart 2).

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

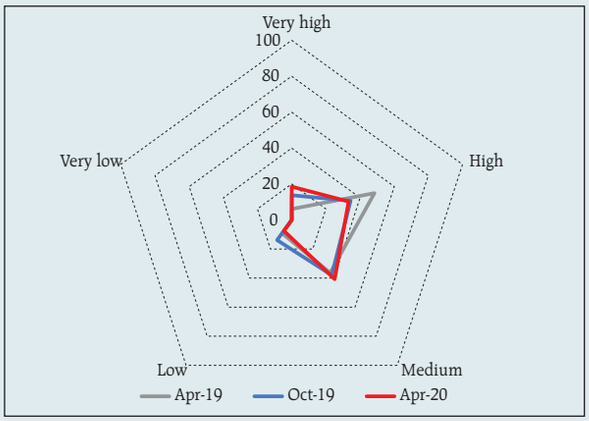
Respondents (per cent)

Probability of high impact event in the global financial system

a. In the short term

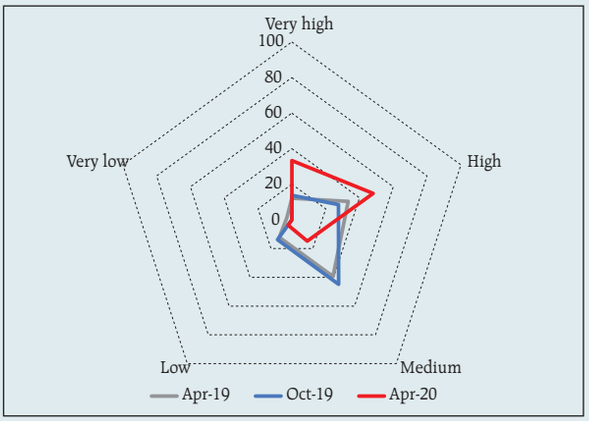


b. In the medium term

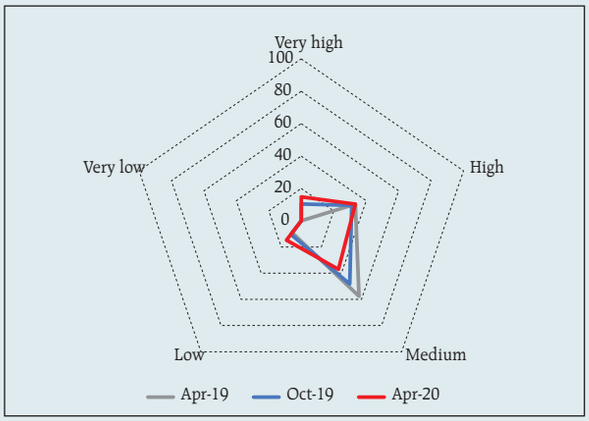


Probability of high impact event in the domestic financial system

c. In the short term

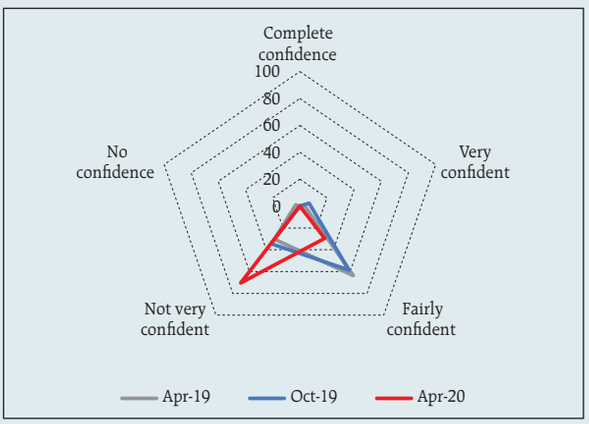


d. In the medium term

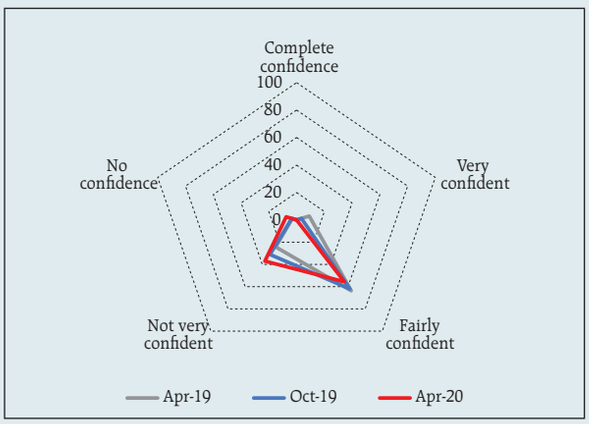


Confidence in the financial systems

e. Stability of the global financial system



f. Stability of the Indian financial system

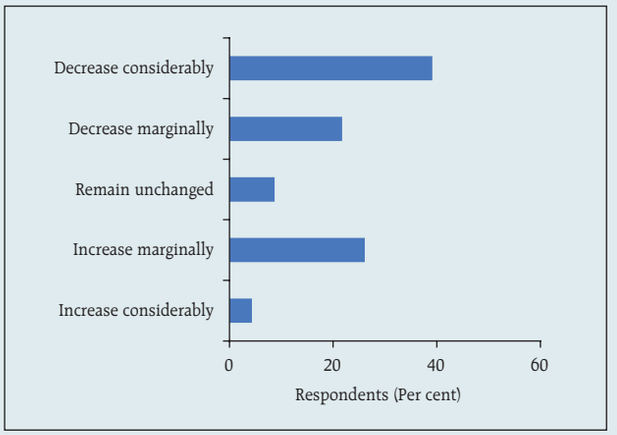


Source: RBI systemic risk surveys (April 2019, October 2019 and April 2020).

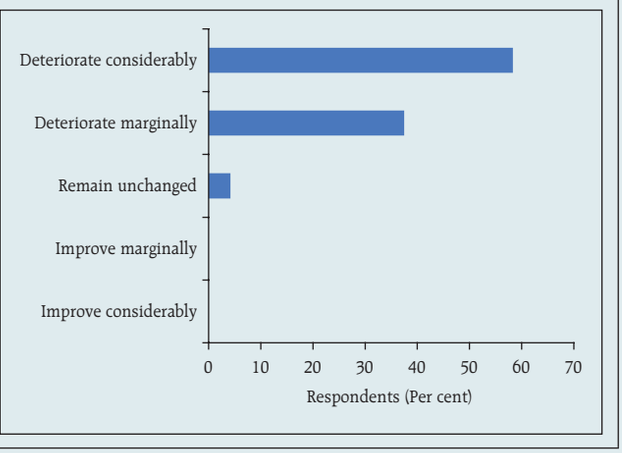
Majority of the respondents were of the view that the demand for credit in the next three months would decrease considerably. Average credit quality is also expected to deteriorate considerably in the next three months (Chart 3).

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

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



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



Source: RBI systemic risk survey (April 2020).

COVID-19 pandemic: Effects and economic recovery

Respondents opined that while most sectors face sizeable and immediate revenue losses, the adverse impact is seen in sectors where consumption spending is discretionary in nature. The survey results point to 5 sectors which are adversely affected by the COVID-19 pandemic (Table 1). Within the tourism sector, about 90 per cent of the respondents mention that the prospects of recovery within the sector in the next 6 months appear bleak. The aviation sector appears to be a close second, with about 85 per cent of the respondents categorising the future prospects as bleak.

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		5	5	90
Construction and Real Estate		37.5	12.5	50
Aviation		7.7	7.7	84.6
Automobiles		50		50
Micro Small & Medium Enterprises		40		60

Source: RBI systemic risk survey (April 2020).

Participants were asked to rank the major financial stability concerns arising out of COVID-19 going forward (Table 2). Supply chain disruptions and decreasing consumer spending/confidence were the top two concerns of the participants, followed by worries about a global recession and the financial impact of liquidity/capital on operations.

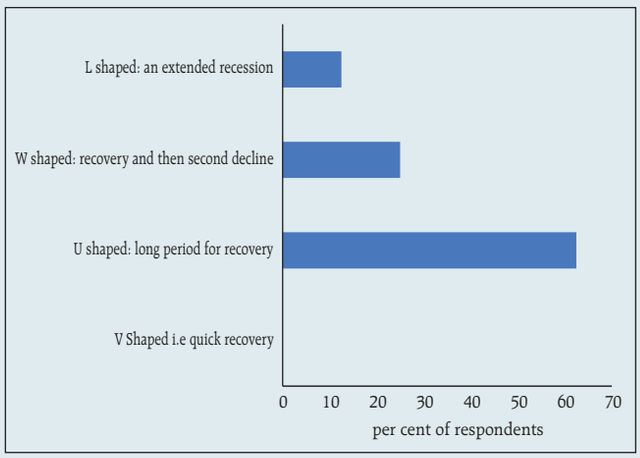
Table 2: Sectors adversely affected by COVID-19 and their future prospects

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

Source: RBI systemic risk survey (April 2020).

About 63 per cent of the respondents predicted that the economic recovery post COVID-19 is likely to be U-shaped i.e., immediate fall followed by a longer period to recover (Chart 4).

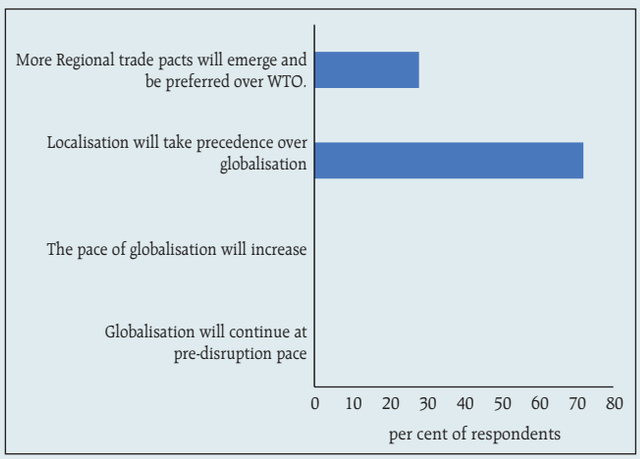
Chart 4: Possible shape of economic recovery (April 2020)



Source: RBI systemic risk survey (April 2020)

72 per cent of the respondents opined that in trade terms going forward, localisation will take precedence over globalisation and more regional trade pacts would emerge and be preferred (remaining 25 per cent) (Chart 5).

Chart 5: Impact on globalisation/global trade (April 2020)



Source: RBI systemic risk survey (April 2020)

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 53 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 (GDP), weighted average lending rate (WALR), CPI (combined) inflation, exports-to-GDP ratio, current account balance to GDP ratio and 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 is adopted to project credit quality, wherein conditional quantile is estimated instead of the conditional mean and hence it can deal with tail risks and takes into account 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:

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

  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 (VAR(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.

In order to estimate the VAR model, slippage ratio, WALR, CPI (combined) inflation, real GDP growth and combined gross fiscal deficit-to-GDP ratio are selected. The appropriate order of VAR is selected based on minimum information criteria as well as other diagnostics and the suitable order is found to be 2. 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:

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

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):

$$SR_t = \alpha_1 + \beta_1 SR_{t-1} + \beta_2 \Delta CPI_{t-1} + \beta_3 WALR_{t-1} - \beta_4 \Delta GDP_{t-2} + \beta_5 \left(\frac{GFD}{GDP}\right)_{t-2} - \beta_6 \left(\frac{EXP}{GDP}\right)_{t-3} + \beta_7 Dummy$$

  Private Sector Banks (PVBs):

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

  Foreign Banks (FBs):

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

- *VAR model*

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

  PSBs: GDP, CPI (combined)-inflation, WALR, CAB- to -GDP Ratio and GFD- to- GDP ratio of order 2.

  PVBs: GDP, real WALR and Exports- to- GDP ratio of order 1.

  FB: CPI (combined)-inflation, WALR and CAB-to-GDP ratio of order 2.

Estimation of GNPAs from slippages

Once, slippage ratio is projected using above mentioned models, the 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 3 per cent during June 2020 and September 2020 quarters and 4 per cent during December 2020 and March 2021 quarters; recovery rates of 3.0 per cent, 2.5 per cent, 3.3 per cent and 2.4 per cent, during June, September, December and March quarters respectively; write-off rates of 4.6 per cent, 4.5 per cent, 6.0 per cent and 6.5 per cent, during June, September, December and March quarters respectively; up-gradation rates of 1.7 per cent, 1.3 per cent, 1.2 per cent and 1.3 per cent during June, September, December and March quarters respectively.

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 and macro stress scenarios are projected by estimating risk-weighted assets (RWAs) using internal rating based (IRB) formula.

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

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

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

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, Mi 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.

The above explained 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 53 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 (and others) selected for the stress test.

Table 2: List of selected sectors

Sr. No.	Sector	Sr. No.	Sector
1	Engineering	10	Basic Metal and Metal Products
2	Auto	11	Mining
3	Cement	12	Paper
4	Chemicals	13	Petroleum
5	Construction	14	Agriculture
6	Textiles	15	Retail-Housing
7	Food Processing	16	Retail-Others
8	Gems and Jewellery	17	Services
9	Infrastructure	18	Others

The 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.

In order to project capital adequacy under assumed macro scenarios, the year-on-year credit growth is assumed as 4 per cent. 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 is projected by appropriately adding or subtracting their components estimated in the previous step and using income tax rate at 35 per cent.

Using the above 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*

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

10. *Basic Metal and Metal Products*

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

11. *Mining and Quarrying*

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

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:

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

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:

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

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:

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

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 and hence impact of deteriorated asset quality under assumed macro shocks on income is captured in this equation. *Dummy* is a time dummy.

Income Tax: The applicable income tax is taken as 35 per cent of profit before tax, which is based on the past trend of ratio of income tax to profit before tax.

Single factor sensitivity analysis – Stress testing

As a part of quarterly surveillance, stress tests are conducted covering credit risk, interest rate risk, liquidity risk etc. and the resilience of commercial banks in response to these shocks is studied. The analysis is done on individual SCBs as well as on the system level.

Credit risk (includes concentration risk)

To ascertain the resilience of banks, the credit portfolio was given a shock by increasing GNPA ratio for the entire portfolio. For testing the credit concentration risk, default of the top individual borrower(s) and the largest group borrower(s) was assumed. The analysis was carried out both at the aggregate level as well as at the individual bank level. The assumed increase in GNPAs was distributed across sub-standard, doubtful and loss categories in the same proportion as prevailing in the existing stock of NPAs. However, for credit concentration risk (exposure based) the additional GNPAs under the assumed shocks were considered to fall into sub-standard category only and for credit concentration risk (based on stressed advances), stressed advances were considered to fall into loss category. The provisioning requirements were taken as 25 per cent, 75 per cent and 100 per cent for sub-standard, doubtful and loss advances respectively. These norms were applied on additional GNPAs calculated under a stress scenario. As a result of the assumed increase in GNPAs, loss of income on the additional GNPAs for one quarter was also included in total losses, in addition to the incremental provisioning requirements. The estimated provisioning requirements so derived were deducted from banks' capital and stressed capital adequacy ratios were computed.

Sectoral Risk

To ascertain the Sectoral credit risk of individual banks, the credit portfolios of particular sector was given a shock by increasing GNPA ratio for the sector. The analysis was carried out both at the aggregate level as well as at the individual bank level. Sector specific shocks based on standard deviation(SD) of GNPA ratios of a sector are used to study the impact on individual banks. The additional GNPAs under the assumed shocks were considered to fall into sub-standard category only. As a result of the assumed increase in GNPAs, loss of income on the additional GNPAs for one quarter was also included in total losses, in addition to the incremental provisioning requirements. The estimated provisioning requirements so derived were deducted from banks' capital and stressed capital adequacy ratios were computed.

Interest rate risk

Under assumed shocks of the shifting of the INR yield curve, there could be losses on account of the fall in value of the portfolio or decline in income. These estimated losses were reduced from the banks' capital to arrive at stressed CRAR.

For interest rate risk in the trading portfolio (HFT + AFS), a duration analysis approach was considered for computing the valuation impact (portfolio losses). The portfolio losses on these investments were calculated for each time bucket based on the applied shocks. The resultant losses/gains were used to derive the impacted CRAR.

Equity price risk

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

Liquidity risk

The aim of the liquidity stress tests is to assess the ability of a bank to withstand unexpected liquidity drain without taking recourse to any outside liquidity support. Various scenarios depict different proportions (depending on the type of deposits) of unexpected deposit withdrawals on account of sudden loss of depositors' confidence along with a demand for unutilised portion of sanctioned/committed/guaranteed credit lines (taking into account the undrawn working capital sanctioned limit, undrawn committed lines of credit and letters of credit and guarantees). The stress tests were carried out to assess banks' ability to fulfil the additional and sudden demand for credit with the help of their liquid assets alone.

Assumptions used in the liquidity stress tests are given below:

- It is assumed that banks will meet stressed withdrawal of deposits or additional demand for credit through sale of liquid assets only.
- The sale of investments is done with a haircut of 10 per cent on their market value.
- The stress test is done under a 'static' mode.

Bottom-up Stress testing: Select banks

Bottom-up sensitivity analysis was performed by 19 select scheduled commercial banks. A set of common scenarios and shock sizes were provided to the select banks. The tests were conducted using March 2019 data. Banks used their own methodologies for calculating losses in each case.

Bottom-up stress testing: Derivatives portfolios of select banks

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

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

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

Table 3: Shocks for stress testing of derivatives portfolio

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

	Domestic interest rates	
Shock 2	Overnight	-2.5 percentage points
	Up to 1yr	-1.5 percentage points
	Above 1yr	-1.0 percentage points

	Exchange rates	
Shock 3	USD/INR	+20 per cent

	Exchange rates	
Shock 4	USD/INR	-20 per cent

2.2 Scheduled 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

Stress tests on credit risk were conducted on non-banking financial companies (including both deposit taking and non-deposit taking and systemically important). The tests were based on a single factor sensitivity analysis. The impact on CRAR was studied under three different scenarios, based on historical SD:

- Scenario I: GNPA increased by 0.5 SD from the current level.
- Scenario II: GNPA increased by 1 SD from the current level.
- Scenario III: GNPA increased by 3 SD from the current 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 GNPAs. The additional provisioning requirement was adjusted from the current capital position. The stress test was conducted at individual NBFC level as well as at the aggregate level.

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: 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 of a graph 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 k_i neighbours the total number of all possible directed links between them is given by $k_i (k_i\text{-}1)$. Let E_i denote the actual number of links between agent i's k_i neighbours, *viz.* those of i's k_i 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. Remaining banks are in 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 core CRAR goes below 7 per cent. The net receivables have been considered as loss for the receiving bank.

Liquidity contagion analysis

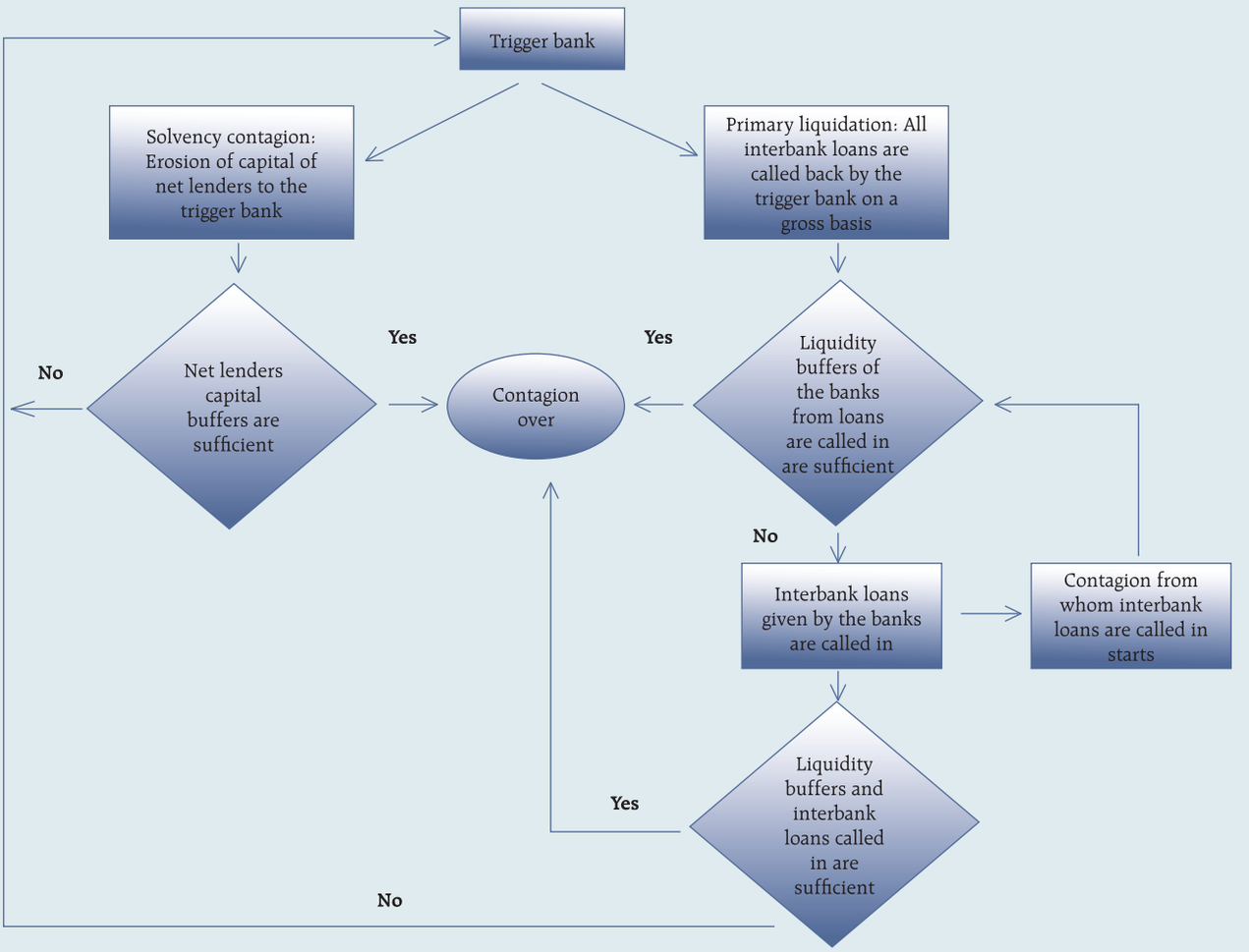
While the solvency contagion analysis assesses potential loss to the system owing to failure of a net borrower, liquidity contagion estimates potential loss to the system due to the failure of a net lender. The analysis is conducted on gross exposures between banks. The exposures include fund based and 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) 16.5 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

Regulatory package – COVID-19

1. The Reserve Bank of India

Liquidity Measures	Rationale/Impact
Targeted long-term repo operations (TLTRO) - RBI conducted term repo auctions of up to 3-year tenor for a total amount of ₹1,00,000 crore for investing in corporate bonds, commercial papers and non-convertible debentures with concession in MTM guidelines.	Borrowing costs in financial markets have dropped to their lowest in a decade on the back of abundant liquidity. Interest rates on 3-month CPs (NBFC), 3-month CPs (non-NBFC) and 3-month CDs have softened by around 320 bps, 365 bps, 472 bps, respectively between March 23, 2020 and June 30, 2020. The spread of 3-year AAA-rated Corporate Bond (CB) over similar tenor government securities has decreased from 320 bps on March 26, 2020 to 114 bps on June 26, 2020 for NBFCs. Lower borrowing costs, coupled with deployment of TLTRO funds, have led to record primary issuance of corporate bonds of ₹2.09 lakh crore in the first quarter of 2020-21.
To enable better transmission of its monetary policy, RBI introduced Long Term Repo Operation (LTRO) under which RBI conducted term repos of one year and three year tenors at policy repo rate. (*LTROs of ₹1 lakh crore each were announced on Feb 06, 2020 and Mar 16, 2020 of which auction for a total of ₹1,25,000 crores have been conducted so far).	Abundant liquidity conditions along with 3-year LTROs have anchored the short-term G-sec yields closer to the policy repo rate. The 3-month T-Bill yield has dropped around 195 bps since LTRO announcement in February and has generally remained lower than the reverse repo rate consistently since March. The 3-year G-sec yield too has dropped by 158 basis points while the 10-year yield has dropped by 74 bps between announcement of LTROs and July 10, 2020. The government securities market has remained resilient and the G-Sec yields have remained in tight-range despite significant enlargement of government borrowing programme and increase in the borrowing limit of state governments.
The policy repo rate was brought down from 5.15 per cent on March 27, 2020 to 4 per cent on May 22, 2020. The Marginal Standing Facility (MSF) rate was reduced from 5.40 per cent to 4.25 per cent while the reverse repo rate under the Liquidity Adjustment Facility (LAF) was reduced from 4.90 per cent to 3.35 per cent. The Monetary Policy Committee (MPC) also decided to continue with the accommodative stance for as long as it is necessary to revive growth and mitigate the impact of COVID-19 on the economy while ensuring that inflation remains within target.	To lower borrowing costs and revive growth prospects.

Liquidity Measures	Rationale/Impact
CRR reduced by 100 basis points to 3 per cent of NDTL. Under MSF, banks were allowed to borrow by dipping up to 3 per cent into SLR.	Reduction in CRR led to injection of liquidity of around ₹1,37,000 crore into the banking system while enhancement in MSF ceiling enabled them for better management of day to day liquidity.

Date	Regulatory Measures	Rationale
March 27,2020	Deferment of interest on working capital facilities.	Minimise the economic fallout.
March 27,2020	Easing of working capital financing.	Minimise the economic fallout.
March 27,2020	Deferment of implementation of the net stable funding ratio (NSFR).	Regulatory relief for banks.
March 27,2020	Deferment of last tranche of CCB.	Regulatory relief for banks.
March 27,2020	Banks permitted to allow a moratorium of 3 months on payment of instalments with respect to term loans.	Minimise the economic fallout.
April 1, 2020	Extension in the realisation period of export proceeds.	For supporting exporters.
April 1, 2020	Extension in the implementation of a countercyclical capital buffer (CCyB) by one year.	Regulatory relief for banks.
April 17, 2020	Increase in Ways and Means advances limits of states/UTs by 60 per cent over and above the levels as on March 31, 2020.	To provide greater comfort to states to undertake COVID-19 containment and mitigation efforts.
May 22, 2020	Extension of timelines for export credit and remittance for imports.	Support exports/imports.
May 22, 2020	Exim Bank extended a line of credit of ₹15,000 crore.	Meet Exim Bank's foreign exchange requirements.
May 22, 2020	Moratorium extension for additional 3 months for term loans till August 31,2020 with relaxation in asset classification norms.	Minimise the economic fallout.
May 22, 2020	Deferment of interest on working capital facilities for an additional 3 months till August 31, 2020 and the interest deferred can be converted into funded interest term loans to be paid be end of the financial year. Relaxation of asset classification norms permitted.	Minimise the economic fallout.

Date	Regulatory Measures	Rationale
May 22, 2020	Ease of computation of working capital finance till March 31, 2021.	For supporting borrowers.
May 22, 2020	Extension of resolution timelines to exclude the period from March 1, 2020 till August 31, 2020.	Regulatory relief for banks.
May 22, 2020	Large exposure framework eased for limit on group exposures.	For supporting companies.
May 22, 2020	Rules governing withdrawal from the Consolidated Sinking Fund (CSF) for states eased to meet redemption of market borrowings.	For supporting state governments.

2. The Securities and Exchange Board of India (SEBI)

Date	Regulatory Measure	Rationale
March 20, 2020	For stocks in the F&O segment with certain criteria, market wide position limits (MWPL) revised to 50 per cent of the existing levels. The rate of margin for such stocks in the cash market segment increased to a minimum of 40 per cent in a phased manner. For non-F&O stocks with certain criteria, minimum margin rate in the cash market segment increased in a phased manner to 40 per cent or maximum intra-day high-low variations during the last one month, whichever is higher.	To ensure orderly trading and settlement, effective risk management, price discovery and maintenance of market integrity.
March 20, 2020	Position limits (short and long) in equity index derivatives revised.	For effective risk management.
March 20, 2020	Introduction of 15 minutes cooling period before flexing of price bands for derivatives stocks introduced in Cash Market and F&O segment.	For effective risk management.
March 23, 2020	Relaxation in timelines for certain periodic compliances with regulatory requirements by trading members / clearing members.	To reduce the compliance burden on market participants.

Date	Regulatory Measure	Rationale
March 23, 2020	Date of implementation of certain policy initiatives pertaining to risk-management framework for liquid and overnight funds, investment norms for mutual funds and valuation of debt and money market securities extended.	To provide temporary relaxation in timeline and compliance requirement.
March 26, 2020	Reduced the trading time in commodity derivative segments of domestic exchanges up to 5.00 pm.	To ensure orderly trading and settlement.
March 26, 2020	Timelines relating to holding of committee meetings such as the nomination and remuneration committees and the risk management committee and stakeholders relaxed by a period of 3 months.	To reduce compliance burden.
March 26, 2020	Companies required to publish certain information such as notice for board meetings and financial results in newspapers. They are exempt from the requirements of publication of advertisements in newspapers.	To reduce compliance burden.
March 27, 2020	The requirement of stock exchanges to disclose open interest and turnover for various categories of participants at the commodity and market levels on a daily basis deferred.	To reduce the compliance burden on market participants.
March 27, 2020	Permitted exchanges/clearing corporations to design and implement their own frameworks for determining the final settlement price (FSP) or due date rate (DDR) in the commodity derivatives segment.	To ensure orderly trading and settlement.
March 27, 2020	Relaxation on change in fresh issue size (IPOs/ rights issues/ FPOs), timeline for compliance with certain provisions of SEBI (SAST) Regulations, 2011 and provisions related to rights issues as contained in SEBI (ICDR) Regulations, 2018.	To provide temporary relaxation in timeline and compliance requirement.

Date	Regulatory Measure	Rationale
March 30, 2020	Extension of timelines for submission of monthly reports by portfolio managers and the due date for regulatory filings for alternative investment funds and venture capital funds.	To provide temporary relaxation in timeline and compliance requirement.
March 30, 2020	Relaxations for CRAs with regard to recognition of default for corporates and extension in timelines for compliance with certain provisions of SEBI.	To reduce the compliance burden on market participants.
March 30, 2020	Relaxation for FPIs from the requirement of submitting original and/or certified documents (including KYC details) to DDPs/ custodians.	For temporary relaxations with respect to compliance requirement.
March 30, 2020	Regulatory limit of borrowing for mutual funds for meeting excessive redemption pressure and temporary liquidity requirements revised from 20 per cent to 40 per cent subject to certain conditions. Relaxation also provided in certain reporting requirements and the dealing room policy.	To meet temporary liquidity requirements.
March 30, 2020	Extended the validity period for all schemes where observation letter was issued by SEBI and was yet to be launched to one year. Also, the deadline for implementation of Stewardship Code for all mutual funds and alternative investment funds extended.	To provide temporary relaxation in timeline and compliance requirement.
March 30, 2020	Based on SEBI's representation on extension of applicability of stamp duty on mutual fund transactions, government issued a notification to defer the applicability of stamp duty by 3 months to be effective from July 1, 2020.	To provide regulatory relief to participants amidst pandemic.
April 6, 2020	Cut-off timing reduced for both subscription and redemption in various mutual fund schemes for a temporary period.	To provide temporary relaxation.

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

March 23, 2020	IRDAI issued two circulars and one press release as the lockdown was unfolding in the financial capital Mumbai: • Clarification that subject to policy terms and conditions, the health insurance policies cover hospitalisation due to COVID-19. • Extension of grace period by 30 days for life insurance premiums payable in March 2020. This was later extended to premiums payable in April 2020. • Simplified and quick claim settlement procedures for COVID-19 related cases and daily monitoring of life insurance claim settlements due to COVID-19. • Utilisation of digital and alternate modes for premium payments and various other services during the lockdown.	For mitigating the effects of the COVID-19 pandemic on the insurance sector.

4. Pension Fund Regulatory and Development Authority (PFRDA)

March 24, 2020	Authorization of CSRF by employer.	Given the COVID-19 induced disruptions and the ensuing work from home norms employers/corporates were allowed to authorize the NPS Subscriber Registration Forms submitted by their employees through email instead of physical mode with certain conditions.

5. The Insolvency and Bankruptcy Board of India (IBBI)

March 23, 2020	In the wake of the COVID-19 outbreak the Supreme Court ordered that the period of limitation in all proceedings shall stand extended w.e.f. March 15, 2020 till further orders.	The Supreme Court took *suo moto* cognisance of the challenge faced by the country on account of COVID-19 and the resultant difficulties that litigants are facing in filing their petitions/applications/suits/ appeals/ all other proceedings within the period of limitation.

March 24, 2020	The Ministry of Corporate Affairs increased the threshold amount of default required to initiate an insolvency proceeding from ₹1 lakh to ₹1 crore to prevent MSMEs from being pushed into insolvency especially in the wake of the outbreak of COVID-19.	Increasing the threshold to prevent MSMEs from being pushed into insolvency especially in the wake of the outbreak of COVID-19.
March 28, 2020	IBBI amended the IBBI (Insolvency Professionals) Regulations, 2016 and IBBI (Model Bye-Laws and Governing Board of Insolvency Professional Agencies) Regulations, 2016. The amendments provide for extensions in certain timelines prescribed under the regulations to ameliorate stakeholders pain in the insolvency ecosystem in the wake of the COVID-19 outbreak.	The amendments provide for extensions in certain timelines prescribed under the regulations to ameliorate stakeholders pain in the insolvency ecosystem in the wake of the COVID-19 outbreak.
March 29, 2020	IBBI amended the Insolvency and Bankruptcy Board of India (Insolvency Resolution Process for Corporate Persons) Regulations, 2016.	For providing that the lockdown period imposed by the Central Government in the wake of the COVID-19 outbreak will not be counted for the purposes of the timeline for any activity that could not be completed due to the lockdown in relation to a corporate insolvency resolution process. This will, however, be subject to the overall time limit provided in the code.

Other (excluding COVID 19 specific) Important Regulatory Initiatives (November 2019-May 2020)

1. The Reserve Bank of India

Date	Measure	Rationale/Purpose
December 23, 2019	**Cap on lending through NBFCs' P2P platforms:** RBI reviewed its directions on lending through P2P platforms and has set a ₹50 lakh cap on the aggregate exposure of a lender to all borrowers across all NBFC-P2P lending platforms at any point of time. A lender investing more than ₹10 lakh across P2P platforms is required to produce a certificate to the P2P platforms from a practicing chartered accountant certifying a minimum net worth of ₹50 lakh. It also mandates that escrow accounts be operated by a bank promoted trustee for transfer of funds need not be maintained with the bank that has promoted the trustee.	For protecting consumer interests.

Date	Measure	Rationale/Purpose
December 31, 2019	**Large UCBs to constitute boards of management**: RBI mandated UCBs with deposit size of ₹100 crore and above to constitute a Board of Management (BoM) comprising experts to assist the Board of Directors (BoD) in formulating policy and other matters delegated to it by the board. Its main functions include recommending action for recovery of NPAs, one-time settlement or compromise settlements, overseeing the management of funds, oversight of internal controls and oversight of internal audit and inspection functions including compliance. The BoM (excluding CEO) will have a minimum of 5 members and a maximum of 12 members. The CEO will be a non-voting member.	Increasing the oversight of UCBs.
January 9, 2020	**Aadhaar based video authentication**: RBI permitted the video based customer identification process (V-CIP) as a consent based alternate method of establishing a customer's identity for customer on-boarding. An official of the regulated entity (RE) performing the V-CIP will record the video as well as capture photographs of the customer present for identification with valid documents such as an Aadhaar card. Live location of the customer (geotagging) will be captured to ensure that the customer is physically present in India.	Leveraging digital channels for the customer identification process (CIP).
March 23, 2020	**Priority sector lending - lending by banks to NBFCs for on-lending:** RBI has extended the priority sector classification for bank loans to NBFCs for on-lending for FY: 2020-21. Bank credit to registered NBFCs (other than MFIs) under respective categories and HFCs for on-lending will be allowed up to an overall limit of 5 per cent of an individual bank's total priority sector lending.	For enhancing credit in targeted segments like agriculture, MSE and housing.

Date	Measure	Rationale/Purpose
March 27, 2020	**Participation of banks in offshore non-deliverable rupee derivatives markets:** RBI allowed Indian banks (having AD-1 license under FEMA,1999) operating in IFSC banking units (IBUs) to participate in offshore non-deliverable forward (NDF) rupee derivative markets. Banks can undertake such transactions through their IBUs or through their branches in India or through their foreign branches.	For improving the depth and price discovery in the forex market by reducing arbitrage between onshore and offshore markets.
March 30, 2020	**Special series of G-secs under the fully accessible route**: RBI opened certain specified categories of government securities (G-secs) under the fully accessible route (FAR) for non-resident investors. Eligible investors can invest in specified government securities without being subject to any investment ceilings. All new issuances of government securities of 5-year, 10-year and 30-year tenures from FY: 2020-21 will be eligible for investment under FAR as 'specified securities'. This scheme will operate along with the two existing routes, the medium-term framework (MTF) and the voluntary retention route (VRR).	For deepening the bond market.
April 20, 2020	**Banks and NBFCs required to carry out money laundering risk assessments periodically:** Recent amendments to KYC directions mandate regulated entities (REs) to carry out the Money Laundering (ML) and Terrorist Financing (TF) Risk Assessment exercise periodically to identify, assess and take effective measures for mitigating its money laundering and terrorist financing risks for clients, countries or geographic areas, products, services, transactions or delivery channels. The REs should take cognisance of the overall sector-specific vulnerabilities, if any, that the regulator/supervisor may share with REs from time to time. REs will also apply a risk based approach (RBA) in mitigating and managing the identified risks and should have board approved policies, controls and procedures in this regard.	For keeping the money laundering (ML) and terrorist financing (TF) risks under check.

2. Securities and Exchange Board of India

Date	Policy Measure	Policy Rationale
October 1, 2019	**Review of investment norms for mutual funds for investments in debt and money market Instruments.** It was *inter-alia* decided that mutual fund schemes will not invest in unlisted debt instruments including commercial papers (CPs), other than (a) government securities, (b) other money market instruments, and (c) derivative products such as interest rate swaps (IRS) and interest rate futures (IRF) which are used by mutual funds for hedging. Mutual fund schemes are, however, permitted to invest in unlisted non-convertible debentures (NCDs) not exceeding 10 per cent of the debt portfolio of the scheme subject to some conditions.	For enhancing transparency and disclosures for investments in debt and money market instruments by mutual funds.
October 10, 2019 and November 28, 2019	**Framework for issuing depository receipts:** A company incorporated in India and listed on a recognised stock exchange in India may issue permissible securities or their holders may transfer permissible securities for issuing depository receipts.	In accordance with Section 41 of the Companies Act, 2013, Companies (Issue of Global Depository Receipts) Rules, 2014, the Depository Receipts Scheme, 2014, Reserve Bank of India notification dated December 15, 2014, Central Government notifications dated September 18, 2019 and October 07, 2019. To ease listing of Indian companies in foreign stock exchanges.
October 15, 2019	**Cyber security and cyber resilience framework for various market participants:** Market participants like KRAs, RTAs and stockbrokers perform some important functions of maintaining KYC records and holding securities. SEBI has prescribed a cyber resilience framework and directed the market participants to take necessary steps to put in place systems for its implementation.	Protecting the integrity of the data and guarding against privacy breaches.
November 4, 2019	**Enhanced governance norms for CRAs:** SEBI *inter-alia* stipulated that the MD/CEO of a CRA will not be a member of its ratings committee and the ratings committee will directly report to a Chief Ratings Officer (CRO). It was also stipulated that the CRA board will constitute two committees -- the ratings sub-committee and the nomination and remuneration committee and the CRO will report directly to the ratings sub-committee.	For enhancing CRAs' governance and accountability.

Date	Policy Measure	Policy Rationale
November 7, 2019	**Creation of a segregated portfolio of unrated debt or money market instruments:** SEBI permitted the creation of a segregated portfolio of unrated debt or money market instruments by mutual fund schemes of an issuer that does not have any outstanding rated debt or money market instruments.	For ensuring fair treatment of all investors in case of a credit event and dealing with liquidity risks.
November 8, 2019	**Introduction of cross-margining facility for offsetting positions in co-related equity indices.**	For facilitating efficient use of collateral by market participants, it was decided to extend cross margining facility to off-setting positions in highly co-related equity indices subject to certain conditions.
November 15, 2019	**Mapping of the unique client codes (UCC) with clients' demat accounts.**	SEBI devised an early warning mechanism to detect diversion/ misappropriation of clients' securities by stock brokers. For facilitating ease of reconciliation, it was considered necessary to map clients' UCCs with their demat accounts.
November 19, 2019	**Collection and reporting of margins by trading member (TM)/clearing member (CM) in the cash segment:** SEBI stipulated that TMs/ CMs in the cash segment will mandatorily collect upfront VaR margins and extreme loss margins (ELMs) from their clients.	For aligning and streamlining the risk management frameworks of both the cash and derivatives segments.
November 29, 2019	**Norms for debt exchange traded funds (ETFs)/index funds:** SEBI prescribed norms applicable to all debt ETFs and index funds tracking debt indices (except debt ETFs / index funds tracking debt indices having constituents as G-secs, T-bills and tri-party repo only). The circular *inter-alia* prescribes norms on the minimum number of issuers in the index, maximum weightage of the issuer, rating of the constituents and replication of debt securities mandated in the index.	For protecting the interests of investors in the security market.
January 3, 2020	**Contribution by a non-defaulting member in the default waterfall of clearing corporations.**	SEBI prescribed operational norms relating to a capped additional contribution by non-defaulting members in the event of usage of core SGF.

Date	Policy Measure	Policy Rationale
January 3, 2020	For **Strengthening the Rating Process** with respect to issuers non-cooperating (INC) ratings, it was *inter-alia* stipulated that if an issuer has all the outstanding ratings as non-cooperative for more than 6 months, then the CRA will downgrade the rating assigned to the instrument of such an issuer to a non-investment grade with INC status. If non-cooperation by the issuer continues for a further 6 months from the date of downgrade to a non-investment grade, no CRA will assign any new ratings to such an issuer till the issuer resumes cooperation or the rating is withdrawn.	For strengthening CRAs' rating processes with regard to 'issuer not cooperating' (INC) ratings.
January 16, 2020	**Introduction of 'Options in Goods'.**	Stock exchanges are now permitted to launch 'Options in Goods' in their commodity derivatives segments. SEBI issued necessary guidelines with regard to the product design and risk management framework to be adopted for such trading.
January 27, 2020	**Review of the margin framework for the commodity derivatives segment:** In light of wide variations in liquidity and volatility among different commodity derivatives, commodities were categorized as per their realised volatility and floor values of initial margin (IM) and the margin period of risk (MPOR) depending on their categories have been prescribed.	To add to the risk management framework in the commodity derivatives segment.
February 24, 2020	Comprehensive review of the margin framework for cash and derivatives segments (except for the commodity derivatives segment) has been carried out.	For bringing more efficiency in the risk management framework.
February 25, 2020	**Margin obligations to be given by way of pledges/re-pledges in the depository system:** SEBI stipulated that the trading member (TM)/ clearing member (CM) will accept securities from clients in the form of collateral by way of margin pledges only. Further, transfer of securities to the demat account of the TM/ CM for margin purposes (that is, title transfer collateral arrangements) is prohibited.	For devising a framework that mitigates risks of misappropriation or misuse of a client's securities available with the trading member (TM)/ clearing member (CM)/ depository participant (DP).

Date	Policy Measure	Policy Rationale
February 26, 2020	Facilitating transactions in mutual fund schemes through the stock exchange Infrastructure.	For increasing the reach of stock exchange platforms investors are allowed to directly access the infrastructure of recognised stock exchanges for purchasing and redeeming mutual fund units directly from mutual funds/asset management companies.

3. The Insurance Regulatory and Development Authority of India

Date	Measure	Rationale/Purpose
January 21,2020	**Implementation of IFRS:** Ind-AS 109 and Ind-AS equivalent of IFRS 17 will be implemented simultaneously along with all other applicable standards. The effective date of implementation will be decided after the finalisation of IFRS 17 by IASB.	For avoiding volatility in financial statements because of an asset-liability mismatch caused by implementing Ind-AS 109 before the implementation of the equivalent of IFRS 17.
January 28,2020	**Guidelines on group health insurance policies on the merger of public sector banks:** Consequent to the merger of public sector banks, a circular was issued to all general insurance companies, health insurance companies and public sector banks. In the guidelines, it is specified that a bank in its capacity as a group organiser can have group insurance arrangements with any number of insurance companies catering to the insurance needs of its customers.	For ensuring a smooth transition of group insurance policies and for protecting the interests of the policyholders of the merged banks.

4. The Pension Fund Regulatory and Development Authority

Date	Measure	Rationale/Purpose
November 1, 2019	Digital signature for online on-boarding in NPS and the Penny Drop Procedure for bank account verifications.	Considering the technological innovations and developments in the online delivery of financial services, in the subscriber's interests, it has been decided to allow POPs to verify applicants' bank accounts through the 'Penny Drop Procedure' where in POP transfers a nominal amount, say ₹1, to the bank account provided and receives the conformation for the transfer along with the applicant's details from the transferee bank. This facility can be extended by POPs for changing subscribers' bank account details with CRA.

Date	Measure	Rationale/Purpose
November 21, 2019	**Change in investment guidelines for NPS schemes:** Permitting pension funds to invest in overnight funds and all such short duration funds as may be permitted by SEBI from time to time.	The Authority decided to allow pension funds to invest in overnight funds and all such duration funds as may be permitted by SEBI from time to time for investment of surplus funds for short term investments, under the category 'Short Term Debt Instrument and related instruments' of investment guidelines for NPS scheme's issues by the Authority.
November 21, 2019	Revised Valuation Guidelines For Valuation Of Securities under NPS Schemes and other Pension Scheme(s) administered by PFRDA.	The Authority has issued revised valuation guidelines for valuation of securities under NPS and other administered schemes by PFRDA. These guidelines provide the guidance mechanism for valuation for securities across all asset type and more specifically for corporate debt where the valuation methodology has been shifted from Matrix Level Valuation to Scrip Level Valuation.
December 2, 2019	**Pension Fund Regulatory and Development Authority (Retirement Adviser) (Fifth Amendment) Regulations, 2019.**	The Proviso (ii) to sub-regulation (b) Regulation 7 of PFRDA (Retirement Advisors) Regulations, 2016 has been omitted to exclude the exemption given to CFP certified professionals to register as Retirement Advisors under National Pension System (NPS).
December 17, 2019	**Clarification: Enrolment of overseas citizens of India (OCIs) in NPS.**	Through this circular, it is clarified that annuity payable by the ASPs to NRIs and OCIs will be taxed at source at rates applicable as per the DTAA (Double Tax Avoidance Agreements) in the country where the annuitant resides.
February 4, 2020	**Pension Fund Regulatory and Development Authority (Pension Fund) (Second Amendment) Regulations, 2020.**	Certain important changes were carried impacting the eligibility and registration of Pension Funds, such as the positive tangible net worth of Pension Funds has been increased to fifty crore rupees from the existing twenty five crores, the aggregate holding of equity shares by a foreign company by itself or its subsidiary companies has been increased upto forty nine percent in line with PFRDA Act, 2013 and Insurance Laws Amendment Act, 2015 and perpetual registration to Pension Funds has been allowed.

Date	Measure	Rationale/Purpose
February 19, 2020	Enhancement of the online contribution facility for NPS-Lite subscribers.	For promoting digital payments and ensuring convenience of NPS-Lite, its subscriber with valid registered mobile numbers can contribute to their NPS-Lite accounts through a specified link. Subscribers who do not have registered mobile numbers can submit a request to their POPs (erstwhile aggregators).

5. Insolvency and Bankruptcy Board of India (IBBI)

Date	Measure	Rationale/Purpose
November 15, 2019	The Central Government notified the Insolvency and Bankruptcy (Insolvency and Liquidation Proceedings of Financial Service Providers and Application to Adjudicating Authority) Rules, 2019.	The Rules provide a generic framework for insolvency and liquidation proceedings of systemically important financial service providers (FSPs) other than banks for their insolvency and liquidation proceedings. Insolvency resolution and liquidation proceedings of non-banking finance companies (which include housing finance companies) with asset size of ₹500 crore or more, as per last audited balance sheets, will be undertaken in accordance with this framework.
November 22, 2019	IBBI notified the IBBI (Insolvency Resolution Process for Personal Guarantors to Corporate Debtors) Regulations, 2019 (Insolvency Regulations) and the IBBI (Bankruptcy Process for Personal Guarantors to Corporate Debtors) Regulations, 2019 (Bankruptcy Regulations).	Insolvency regulations specify the details of the insolvency resolution process for personal guarantors to corporate debtors.
November 28, 2019	IBBI notified the IBBI (Insolvency Resolution Process for Corporate Persons) (Third Amendment) Regulations, 2019.	In the interest of transparency and accountability in conduct of CIRPs and IPs, and for facilitating IBBI, IPAs and IPs to discharge their statutory obligations, the Amendment Regulations require IPs to file a set of forms, covering the life cycle of a CIRP online on an electronic platform hosted on IBBI's website at https://www.ibbi.gov.in

Date	Measure	Rationale/Purpose
December 28, 2019	the Insolvency and Bankruptcy Code (Amendment) Act, 2020 brought into force following key amendments to: **(1)** Interim finance **(2)** Initiation of CIRPs **(3)** Moratorium **(4)** Liability for prior offences and resolution of FSPs.	The Ordinance was promulgated for removing certain ambiguities and ensuring smooth implementation of the processes under the code.
March 21, 2020	The government notified that an IRP/IP will, with effect from the date of its appointment be treated as a distinct person of the corporate debtor and will be liable to take a new registration under the Central Goods and Services Tax Act, 2017 in each of the states or union territories where the corporate debtor was registered earlier within 30 days of the appointment.	This allows companies undergoing resolution under IBC to pay current levies of GST without the mandatory payment of past dues.