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Financial Risk Management of Banks in India – A Study of Indian Banks

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Abstract

The COVID-19 pandemic has had an immediate impact on economic activity, company and individual income, and asset valuation etc. The International Monetary Fund (IMF) has declared the global economy to be in a state of recession! According to the Bank of England, the situation is worse than the financial crisis of 2008. The economic devastation is unprecedented in scope, with far-reaching ramifications for the global economy. The economic impact, according to experts, will permanently disrupt a number of industries, and the transition to a new normal will take several years. The banking industry, in particular, is at the centre of the crisis, posing increased risks that will necessitate significant adjustments in risk evaluation. This article is an attempt to find and view risks from the view point of Reserve Bank of India through a series of Systematic Risk Surveys, which were conducted during the period from April, 2018 to October, 2021. This paper is also shows the detailed explanation about various risks such as “Global Risks, Macro-Economic Risks, Financial Market Risks, Institutional Risks, and General Risks” considered in the survey.

Keywords: Risk Management, Indian Banks, Surveys, Global Risks, Covid-19.

1. Introduction

The banking and financial services industries were shaken by the 2008 financial crisis, prompting a flurry of measures aimed at ensuring the banking system's resilience and stability. On the other hand, the current COVID-19 pandemic has shaken the industry in a different way. Lockdowns, economic downturns, job losses, and probable bankruptcy are still being felt around the world as a result of the pandemic's widespread impact. The “COVID-19 pandemic” will put the strengthened risk management and capital adequacy mechanisms put in place after the 2008 financial crisis to the test, especially since no scenario analysis could have predicted an incident of this magnitude. The COVID-19 situation is expected to draw attention to systemic flaws that must be addressed. This white paper looks at the important risk management areas that banks will need to pay attention to in the short, medium, and long term. It also explains how to address the impact by changing risk management approaches, processes, and systems.

The COVID-19 pandemic has had an immediate impact on economic activity, company and individual income, and asset valuation etc. The International Monetary Fund (IMF) has proclaimed the world to be in recession! The situation, according to the Bank of England, is worse than the financial crisis of 2008. The magnitude of the economic damage is unparalleled, with far-reaching implications for the global economy.

Experts believe that the economic impact would permanently alter a number of industries, and that the transition to a new normal will take several years. The banking industry, in particular, is at the heart of this crisis, with heightened credit risk, and will require considerable changes in risk measurement, loss estimation, and stress testing methods, systems, and models. The flowing are the effects of Covid-19 pandemic.

- **Depreciation in the Value of Financial and Non-Financial Assets:** Individuals, corporations, economies, and governments have all suffered as a result of the lockdown, recession, and loss in national income in terms of revenue, incomes, earnings, tax collection, fiscal deficits, spending, capital flow, and demand for financial and other assets. Except for gold, this has resulted in varied degrees of depreciation of financial and other asset values and financial variables across products and nations.

- **Credit Losses are on The Rise:** Loss of income and increased unemployment are the most serious consequences of the lockdown. Businesses with high operational and financial leverage are being hit hard, and many are filing for bankruptcy, exacerbating demand, supply, and employment situations, and lowering collateral values.
- **Regulatory Responses to the Effects:** Prudential and accounting standards are becoming more flexible thanks to the efforts of regulators, supervisors, and standard-setters. To provide relief to the firms, regulators and governments have proposed a payment moratorium, a reduction of reporting responsibilities, and loan modification schemes. To keep borrowers afloat, regulatory authorities and governments are accepting a higher level of risk at banks, which is a less prudent measure.

2. Preamble

2.1. Existing Credit Risk Management Framework's Limitations

Under the severe stress conditions generated by the pandemic, the existing credit risk framework is insufficient to measure and manage credit risk.

Credit loss is typically calculated using risk metrics such as Probability of Default (PD), Loss Given Default (LGD), and Exposure at Default (EAD). These risk metrics are used by banks to calculate Expected Credit Losses (ECLs) and Required Capital. Banks employ the following measures

1. Forecast Modeling on Economic Conditions;
2. Historical Data and Present State Conditions.

It may be difficult to accurately estimate economic conditions when the economy is closed, resulting in a major portion of portfolio losses shifting to the next stage. To avoid a downward spiral in the face of uncertainty, officials have announced payment vacations during which borrowers' profiles will not be raised to a higher Days Past Due Status (DPDs).

2.2. Existing ALM and Market Risk Management Framework have Limitations.

Depreciation in Asset Value is exacerbated by a lack of Market Liquidity, particularly in emerging market financial assets and lower-quality assets. There is a flight to excellence. As the value, trend, and relationship of financial variables change, treasury, asset liability management (ALM), liquidity, and market risk models, processes, and systems must be revisited.

2.3. Credit Risk Management Has a New Normal

The inability to effectively evaluate risk will be a key impact of the crisis, requiring banks to make considerable modifications to their credit risk management processes and supporting technologies.

On the credit risk management front, we expect the credit risk management team to place a greater emphasis on:

- Re-calibration of credit scoring and rating models to account for the impact of the U, L, and V recovery curves
- Re-calibration of covenants linked to accounting ratios and collateral valuations
- Re-release of limits to end clients based on revised collateral valuations, with strong alignment to the new working capital cycle
- Re-calibration of collection models to account for payments covered by moratorium Because the concept of exclusion will change over time, it will add to the complexity.
- Stress testing and ICAAP simulations are being expanded to encompass pandemic-level intensity scenarios.
- For a given period, regulatory reports will be adjusted to reflect higher capital, higher income, better liquidity, and lower credit losses due to looser requirements. Reports on the impact are being prepared and actual measures to improve upon policies
- A continuous forward-looking assessment of the losses.
- On the technical front, we anticipate the credit risk management team making significant changes to the following systems:

- Core banking systems for identifying and segregating Day Past Due loans;
- Credit scoring and rating models will be re-calibrated with different recovery scenarios; stress testing models and ICAAP will be updated to include new scenarios for severe stress events; collateral valuation and allocation models will be re-calibrated; and the Early Warning Signal for financial covenants will be modified.

2.4. A New Normal in Asset Liability Management and Market Risk Management

- Due to deterioration in asset quality and loss in collateral valuation, banks are projected to experience large short-term liquidity gaps due to depreciation in financial asset prices and non-payment of credit due. The central bank, on the other hand, intends to alleviate the liquidity shortage through discounting and liquidity taps.
- As a result of the change in liquidity sources, ALM and liquidity behavioural models must be re-calibrated, as the old models lack a historical benchmark against which to evaluate the current economic stress.
- Banks must identify and adjust market yield curves, as central banks' intended shifts in the curve on both the repo and reverse repo sides will take time to be reflected in the market.
- Recent market volatility has resulted in a high number of Value-at-Risk (VAR) back-testing violations across the industry. Regulators may temporarily allow the automatic use of a larger VAR multiplier in exchange for a reduction in risks-not-in-VAR capital requirements to reduce the danger of market risk becoming pro-cyclical.
- We foresee major improvements in Liquidity Risk and Market Risk Models, as well as Regulatory Reporting, from the ALM and Market Risk Management teams in terms of technology and measurement.

2.5. Risk Management has Evolved into a New Normal

Banks' risk management techniques and technology are entering a new era, and measurement metrics, processes, and technologies will need to be reinvented. This will necessitate a significant redesign of risk technologies. This is also an opportunity to combine numerous point solutions, add cloud technologies, and update and improve model implementation technology. In the end, this opens up the possibility of automating and industrializing a target-operating paradigm for risk management.

3. Evaluating the Impact on Risk Management

In the aftermath of the COVID-19 crisis, regulators established new liquidity lines to maintain enough cash availability in the financial system and to avoid banks from losing their lending potential. Despite the relief measures taken by regulators and governments, we expect the financial system to undergo significant changes as a result of the COVID-19 issue. Risk management is especially critical during times of crisis to maintain customer trust and protect the financial system's viability.

Assessing the short-, medium-, and long-term impact on various areas, as well as establishing a strategic response centred on improvements to risk management approaches, procedures, and systems, is critical in our opinion.

4. Operational Resilience

In the short to medium term, building operational resilience is critical to enabling the seamless delivery of critical banking services during a crisis like the COVID-19 pandemic. Banks should focus on improving operational resilience, according to regulators in several countries. We expect regulatory authorities from all around the world to eventually impose a similar rule. Building operational resilience goes beyond what banks already have in place for operational risk and business continuity. It calls for the following:

- Identifying business services that, if disrupted, could jeopardise consumer and market integrity
- Establishing disruption tolerance limits
- Testing resilience through a variety of extreme but plausible scenarios
- Developing capabilities and communication plans to recover as quickly as possible from the stress scenario

5. Optimization of Costs and Efficiency

Given the current scenario, the focus will be on lowering costs and enhancing efficiency in the near to medium term. Specific risk use cases that can be solved with robotic process automation (RPA), machine learning (ML), natural language processing (NLP), and cognitive RPA to help risk officers work better will be highlighted. Banks will be able to establish operational resilience as a result of such automation initiatives backed by sophisticated technologies. Because of its capacity to provide operational flexibility through ease of scaling operations and lower expenses associated with maintaining on-premise hardware, cloud adoption will receive a boost. However, before migrating a wide range of risk management applications to the cloud, banks must conduct a cost-benefit analysis to determine actual financial savings.

6. Review of Literature

Sinha. P., Sharma. S., &Sondhi. K. (2013)[1] Authors in their paper "Market Valuation and Risk Assessment of Indian Banks using Black -Scholes- Merton Model" adopted a "Theoretical model" to study the riskiness of banks considering its assets & equity. Authors have concluded that the inconsistency in assets is 3 to 5 times in the private sector banks and this paper also discussed the RBI Regulations relating to risk management in banks.

Maji. S. G., De, U. K. (2015)[2] Authors in their paper entitled "Regulatory Capital and Risk of Indian Banks: A Simultaneous Equation Approach" followed Central Tendency, Regression Analysis and Z-Scores to examine the relationship between Regulatory Capital and Risk of Commercial Banks in India and Impact of other variables on them. The study found that strong inverse relationship between Risk and Capital Adequacy Ratio. There is a positive influence of probability on both capital and risk.

Bhagat K, Gayval I, V H Bajaj[3] Authors have chosen Data Envelopment Analysis, Stochastic Frontier Analysis, Multivariate Nonlinear Model and Alman Z-Score Model in their paper "Measuring Efficiency of Indian Banks: A DEA-Stochastic Frontier Analysis" with the objective of estimating efficiency of Indian Banks. The results revealed that there is a moderate consistency between parametric and nonparametric frontier methods in efficiency measuring.

Ashraf. A., Tariq Y.B. (2016)[4] This paper entitled "Evaluating the Financial Soundness of Banks: An Application of Bankometer on Pakistani Listed Banks" states that as per both models "Bankometer Model" and "Z-Score Model", Bank of Punjab's financial soundness needs to be improved. Authors have argued that Non-Performing Assets identified main determinant of bank risk and indicates high inefficiency level in the banks.

Yap. V. C., Ong H.B., Chan. K.T., and Ang. Y.S. (2010)[5] This study shows that banks risk exposure are affected by liquidity position, domestic market, international market, business operation and credit. This study was conducted to identify the determinants of risks faced by commercial banks in Malaysia in their paper entitled "Factors Affecting Banks' Risk Exposure: Evidence from Malaysia".

Miah. M.D., Sharmeen. K. (2015)[6] This study presents negative relation between capital and efficiency. The article "Relationship between Capital, Risk and Efficiency" found a positive relationship between capital and risk for Islamic Banks. It is also found that there is a positive relation between risk and efficiency for conventional banks.

[1] Sinha. P., Sharma. S., and Sondhi. K. (2013), "Market Valuation and Risk Assessment of Indian Banks Using Black -Scholes -Merton Model", St. Louis: Federal Reserve Bank of St Louis.

[2] Maji. S. G., De, U. K. (2015), "Regulatory Capital and Risk of Indian Banks: A Simultaneous Equation Approach", Journal of Financial Economic Policy, 7(2), 140.

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[4] Ashraf. A., & Tariq. Y. B. (2016), "Evaluating the Financial Soundness of Banks: An Application of Bankometer on Pakistani Listed Banks", IUP Journal of Financial Risk Management, 13(3), 47-63.

[5] Yap. V. C., Ong. H. B. Chan. K. T. and Ang. Y. S. (2010), "Factors Affecting Banks' Risk Exposure: Evidence from Malaysia", European Journal of Economics, Finance and Administrative Science, 121-126

[6] Miah. M. D., Sharmeen. K. (2015), "Relationship between Capital, Risk and Efficiency", International Journal of Islamic and Middle Eastern Finance and Management, 8(2), 203-221.

Dhar. S. K. (2013)[7] Author studied on correlation coefficient to analyse and classify different forms of risks faced by the banking industy in his paper entitled “Enterprise Risk Management in Indian Banks”. This paper provides the empirical evidence that describes Risk Management is compliance driven in Indian Banking Sector and not strategy driven.

7. Objectives

1) To know, identify, and understand different types and status of risks in Indian Banking Sector before, during and after pandemic.
2) To study and present status of identified risks from time to time before, during and after pandemic.
3) To present appropriate suggestions for the benefit of Risk Management System.

8. Research Methodology

This paper is based on secondary data available through Central Bank of India, i.e., Reserve Bank of India website. Various Reports, Publications, Announcements, Scripts have been considered for the study.

9. Research Analysis and Findings

In the broad category of risks to the Indian Financial System, the following are the different types of risks are identified and categorized as per Systematic Risk Survey of Reserve Bank of India.

a. Global Risks,
b. Macro-Economic Risks,
c. Financial Market Risks,
d. Institutional Risks, and
e. General Risks

Global Risks are further classified according to Systematic Risk Survey (SRS) are

a. Global Growth
b. Sovereign Risk / Contagion
c. Funding Risk
d. (External Borrowings)
e. Commodity Price Risk (Including Crude Oil Prices)
f. Other Global Risks

Macro-Economic Risks are further classified according to Systematic Risk Survey SRS) are

a. Domestic Growth
b. Domestic Inflation
c. Current Account Deficit
d. Capital Inflows / Outflows (Reversal of FIIs, Slowdown In FDI)
e. Sovereign Rating Downgrade
f. Fiscal Deficit
g. Corporate Sector Risk
h. Pace of Infrastructure Development
i. Real Estate Prices
j. Household Savings
k. Political Uncertainty/ Governance /Policy Implementation
l. Other Macroeconomic Risks

Financial Market Risks are further classified according to Systematic Risk Survey (SRS) are

a. Foreign Exchange Rate Risk
b. Equity Price Volatility
c. Interest Rate Risk
d. Liquidity Risk
e. Other Financial Market Risks

Institutional Risks are further classified according to Systematic Risk Survey (SRS) are

a. Regulatory Risk
b. Asset Quality Deterioration
c. Additional Capital Requirements of Banks
d. Access to Funding By Banks
e. Level of Credit Growth
f. Cyber Risk
g. Operational Risk
h. Other Institutional Risks

General Risks are further classified according to Systematic Risk Survey (SRS) are

a. Terrorism
b. Climate Related Risks
c. Social Unrest (Increasing Inequality)
d. Other General Risks

Table 1
Ratings of Overall Global Risks from April, 2018 to October, 2021

Global Risks	
April, 2018	Medium
October, 2018	Medium
April, 2019	Medium
October, 2019	Medium
April, 2020	High

[7] Dhar, S. K. (2013), “Enterprise Risk Managements in Indian Banks”.

October, 2020	Medium
April, 2021	Medium
October, 2021	Medium

Source: Systematic Risk Survey Reports, Reserve Bank of India.

As per the survey outcomes, Overall Global Risks are perceived as a "Medium Risk" category during April, 2018 to October, 2021, but during the period April 2020, Overall Global Risks are perceived as "High Risk" category affecting the financial system in India.

Table 2

Ratings of Overall Macro-Economic Risks from April, 2018 to October, 2021

Macro – Economic Risks	
April, 2018	Medium
October, 2018	Medium
April, 2019	Medium
October, 2019	Medium
April, 2020	High
October, 2020	Medium
April, 2021	Medium
October, 2021	Medium

Source: Systematic Risk Survey Reports, Reserve Bank of India.

As per the survey outcomes, Overall Macro-Economic Risks are perceived as a "Medium Risk" category during April, 2018 to October, 2021, but during the period April 2020, Overall Macro-Economic Risks are perceived as "High Risk" category affecting the financial system in India.

Table 3

Ratings of Overall Financial Market Risks from April, 2018 to October, 2021

Financial Markets Risks	
April, 2018	Medium
October, 2018	Medium
April, 2019	High
October, 2019	Medium
April, 2020	High
October, 2020	Medium
April, 2021	Medium
October, 2021	Medium

Source: Systematic Risk Survey Reports, Reserve Bank of India.

As per the survey outcomes, Overall Financial Market Risks are perceived as a "Medium Risk" category during April, 2018 to October, 2021, but during the period April 2019-April 2019 and April 2020-April 2020 Overall Financial Market Risks are perceived as "High Risk" category affecting the financial system in India.

Table 4

Ratings of Overall Institutional Risks from April, 2018 to October, 2021

Institutional Risks	
April, 2018	Medium
October, 2018	Medium
April, 2019	Medium
October, 2019	Medium
April, 2020	High
October, 2020	High
April, 2021	Medium
October, 2021	Medium

Source: Systematic Risk Survey Reports, Reserve Bank of India.

As per the survey outcomes, Overall Institutional Risks are perceived as a "Medium Risk" category during April, 2018 to October, 2021, but during the period April 2020-April 2020 and October 2020-October 2020 Overall Institutional Risks are perceived as "High Risk" category affecting the financial system in India.

Table 5

Ratings of Overall General Risks from April, 2018 to October, 2021

General Risks	
April, 2018	Low
October, 2018	Medium
April, 2019	Medium
October, 2019	Medium
April, 2020	Medium
October, 2020	Medium
April, 2021	Medium
October, 2021	Medium

Source: Systematic Risk Survey Reports, Reserve Bank of India.

As per the survey outcomes, Overall General Risks are perceived as a "Medium Risk" category during April, 2018 to October, 2021, affecting the financial system in India.

Table 6

Ratings of Category Wise Global Risks from April, 2018 to October, 2021

Global Risks / Period	**Global Growth**	**Sovereign Risk / Contagion**	**Funding Risk (External Borrowings)**	**Commodity Price Risk (Including Crude Oil Prices)**	**Other Global Risks**
April, 2018	Low	Low	Medium	High	Low
Oct, 2018	Medium	Low	Medium	High	Low
April, 2019	High	Medium	Medium	High	Low
October, 2019	High	Medium	Medium	Medium	Low
April, 2020	Very High	High	High	Medium	Medium
October, 2020	High	Medium	Medium	Medium	Medium
April, 2021	Medium	Medium	Medium	High	Low
October, 2021	Medium	Medium	Medium	High	---

Source: Systematic Risk Survey Reports, Reserve Bank of India.

From the above Table 6, and As per the survey outcomes, Global Risks such as Global Growth, Sovereign Risk / Contagion, Funding Risk (External Borrowings), Commodity Price Risk (Including Crude Oil Prices), and Other Global Risks are perceived differently by the experts including market participants participated in the series of surveys conducted by RBI during April, 2018 to October, 2021.

As per the survey outcomes, Global Growth Risks are perceived as a "High Risk" category during April, 2019, October, 2019 and October, 2020. During October, 2018-October, 2018, and April 2021 to October, 2021 Global Growth Risks were categorized as "Medium Risk". Here, notable point is that the period April, 2020 was categorized as "Very High Risk" and April, 2018 was categorized as "Low Risk" affecting the financial system in India.

As per the survey outcomes, Commodity Price Risks (Including Crude Oil Prices) are perceived as a “High Risk” category during April, 2020 to October, 2018. Here, notable point is that the period April, 2020 was categorized as “High Risk” and remaining periods were categorized as “Medium Risk” affecting the financial system in India.

As per the survey outcomes, Sovereign Risk / Contagion Risks are perceived as a “Low Risk” category during April, 2020 and remaining periods were categorized as “Medium Risk” affecting the financial system in India.

As per the survey outcomes, Sovereign Risk / Contagion Risks are perceived as a “Low Risk” category during April, 2018 to April, 2019 and April, 2021 to October, 2021. and remaining periods were categorized as “Medium Risk” affecting the financial system in India.

As per the survey outcomes, Other Global Risks are perceived as a “Medium Risk” category during April, 2020 to October, 2020, and remaining periods were categorized as “Low Risk” affecting the financial system in India.

The overall change in the risk perceptions towards Global Risks is described below

Table 7
Change in the Risk Perceptions towards Global Risks from April, 2018 to October, 2021

Global Risks / Period	Global Growth	Sovereign Risk / Contagion	Funding Risk (External Borrowings)	Commodity Price Risk (Including Crude Oil Prices)	Other Global Risks
April, 2018- Oct, 2018	Increased	Increased	Increased	Declined	Declined
Oct, 2018- April, 2019	Increased	Increased	Increased	Declined	Increased
April, 2019- October, 2019	Increased	Declined	Declined	Declined	Declined
October, 2019- April, 2020	Increased	Increased	Increased	Increased	Increased
April, 2020- October, 2020	Declined	Declined	Declined	Declined	Declined
October, 2020- April, 2021	Declined	Declined	Increased	Increased	Increased
April, 2021- October, 2021	Increased	Declined	Declined	Increased	---

Source: Systematic Risk Survey Reports, Reserve Bank of India.

From the above Table 7, it is clear that during pandemic of COVID-19 First Wave; almost all categories of Global Risks are increased except Commodity Price Risks (Including Crude Oil Prices). The effect may be due less demand in the market due to lock down and travel restrictions in India. It is also noted that all other mentioned global risks are decreased expect Commodity Price Risks (Including Crude Oil Prices). This effect may be due to removal of lock down and travel restrictions.

Table 8
Ratings of Category Wise Macro-Economic Risks from April, 2018 to October, 2021

Macro – Economic Risks / Period	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
April, 2018	Medium	Medium	Medium	Medium	Low	Medium	Medium	Medium	Medium	Medium	Medium	Very Low
October, 2018	Medium	Medium	High	High	Low	Medium	High	Medium	Medium	Medium	Medium	Very Low
April, 2019	Medium	Medium	Medium	Medium	Low	Medium	High	Medium	Medium	Medium	Medium	Very Low
October, 2019	High	Medium	Medium	Medium	Medium	High	High	High	Medium	High	Medium	Very Low
April, 2020	Very High	Medium	Medium	High	High	Very High	High	High	High	High	Medium	Very Low
October, 2020	High	High	Low	Medium	Medium	High	High	High	Medium	Medium	Medium	Very Low
April, 2021	High	High	Medium	Medium	Medium	High	High	Medium	Medium	Medium	Medium	Low
October, 2021	Medium	High	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	---

Source: Systematic Risk Survey Reports, Reserve Bank of India.

Table 9
Change in the Risk Perceptions towards Macro-Economic Risks from April, 2018 to October, 2021

Macro – Economic Risks / Period	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
April, 2018 - October, 2018	Increased	Declined	Increased	Increased	Increased	Increased	Increased	Increased	Increased	Increased	Increased	Increased
October, 2018 - April, 2019	Increased	Declined	Declined	Declined	Increased	Increased	No Change	Increased	No Change	Increased	Declined	Declined
April, 2019 - October, 2019	Increased	Increased	Declined	Declined	Increased	Increased	Increased	Increased	Increased	Increased	Declined	Increased
October, 2019 - April, 2020	Increased	Increased	Declined	Increased	Increased	Increased	Increased	Increased	Increased	Increased	Increased	Declined
April, 2020 - October, 2020	Declined	Increased	Declined	Declined	Declined	Declined	Declined	Declined	Declined	Declined	Declined	Declined
October, 2020 - April, 2021	Declined	Increased	Increased	Increased	Increased	Declined	Declined	Declined	Declined	Increased	Increased	Increased
April, 2021 - October, 2021	Declined	Increased	Increased	Declined	Declined	Declined	Declined	Declined	Declined	Declined	Declined	---

Source: Systematic Risk Survey Reports, Reserve Bank of India.

From the above Table 8 & 9, and As per the survey outcomes, Macro-Economic Risks such as 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, and Political Uncertainty / Governance /Policy Implementation Other Macro-Economic Risks are perceived differently by the experts including market participants participated in the series of surveys conducted by RBI during April, 2018 to October, 2021.

As per the survey outcomes, Domestic Growth Risks are perceived as a "High Risk" category during April, 2019-April, 2021, but the period April, 2020 is characterized as "Very High Risk". During remaining periods of the study Domestic Growth Risks were categorized as "Medium Risk". Here, notable point is that the period April, 2020 was categorized as "Very High Risk" due to complete lock down of the nation due to COVID-19 pandemic affecting the financial system in India.

As per the survey outcomes, Domestic Inflation Risks are perceived as a "High Risk" category during October, 2020 to October, 2021. Remaining periods were categorized as "Medium Risk" affecting the financial system in India.

As per the survey outcomes, Sovereign Risk / Contagion Risks are perceived as a "Low Risk" category during April, 2020 and remaining periods were categorized as "Medium Risk" affecting the financial system in India.

As per the survey outcomes, Current Account Deficit Risks are perceived as a "High Risk" category during October, 2018 to October, 2018 and Remaining periods were categorized as "Medium Risk". But the period October, 2020 is categorized as "Low Risk" affecting the financial system in India.

As per the survey outcomes, Capital Inflows / Outflows (Reversal of FII's, Slowdown in FDIs) Risks are perceived as a "High Risk" category during October, 2018 - October, 2018 and April, 2020. Remaining periods were categorized as "Medium Risk" affecting the financial system in India.

As per the survey outcomes, Sovereign Rating Downgrade Risks are perceived as a "High Risk" category during April, 2020. From the period April, 2018-April, 2019 is characterized as "Low Risk". Remaining periods were categorized as "Medium Risk" affecting the financial system in India.

As per the survey outcomes, Fiscal Deficit Risks are perceived as a "High Risk" category during October, 2019-April, 2021, but the period April, 2020-April 2020 is viewed as "Very High Risk". Remaining periods were categorized as "Medium Risk" affecting the financial system in India.

As per the survey outcomes, Corporate Sector Risks are perceived as a "High Risk" category during October, 2018-April, 2021. Remaining periods were categorized as "Medium Risk" affecting the financial system in India.

As per the survey outcomes, Pace of the Infrastructure Development Risks are perceived as a "High Risk" category during October, 2019-October, 2020. Remaining periods were categorized as "Medium Risk" affecting the financial system in India.

As per the survey outcomes, Real Estate Prices Risks are perceived as a "High Risk" category during April, 2020--April, 2020. Remaining periods were categorized as "Medium Risk" affecting the financial system in India.

As per the survey outcomes, Household Savings Risks are perceived as a "High Risk" category during October, 2019--April, 2020. Remaining periods were categorized as "Medium Risk" affecting the financial system in India.

As per the survey outcomes, Political Uncertainty / Governance / Policy I Risks are perceived as a "Medium Risk" category during the entire period of the study April, 2018-October, 2021and Other Macro-Economic Risks are viewed as "Very Low Risk" category affecting the financial system in India.

The overall change in the risk perceptions (Table 9) towards Macro-Economic Risks is described below.

Domestic Growth Risks were "Increased" during April, 2018 to April, 2020 and then declined during the remaining period. Domestic Inflation Rate Risks were declined during April, 2018 to April, 2019 and then increased gradually till October, 2021.

Sovereign Rating Downgrade Risks were "Increased" during April, 2018-April, 2020 and all other periods are characterized as

"Declined". Fiscal Deficit Risks, Corporate Sector Risks, Pace of Infrastructure Development Risks, and Real Estate Prices Risks were also observed the same perceptions as Sovereign Rating Downgrade Risks.

Household Savings Risks were declined during the periods April, 2020 – October, 2020 and April, 2021-October, 2021, whereas all other periods were exhibited perceptions as "Increased". Political Uncertainty / Governance / Policy Implementation Risks were "Increased" during the periods April, 2018-October, 2018, October, 2019-April, 2020 and October, 2020-April, 2021 and were "Declined" during other periods. Whereas Other Macro-Economical Risks were "Increased" during the periods April, 2018-October, 2018, April, 2019-October, 2019 and October, 2020-April, 2021 and were "Declined" during other periods.

Table 10

Ratings of Category Wise Financial Market Risks from April, 2018 to October, 2021

Financial Market Risks / Period	Foreign Exchange Rate Risk	Equity Price Volatility	Interest Rate Risk	Liquidity Risk	Other Financial Market Risks
April, 2018	Medium	Medium	Medium	Medium	Very Low
October, 2018	High	High	Medium	High	Low
April, 2019	Medium	High	Medium	High	Very Low
October, 2019	Medium	Medium	Medium	Medium	Very Low
April, 2020	High	High	Medium	High	Low
October, 2020	Medium	High	Medium	Medium	Very Low
April, 2021	Medium	High	Medium	Medium	Very Low
October, 2021	Medium	High	Medium	Medium	---

Source: Systematic Risk Survey Reports, Reserve Bank of India.

From the above Table 10, and As per the survey outcomes, Financial Market Risks such as Foreign Exchange Rate Risk, Equity Price Volatility, Interest Rate Risk, Liquidity Risk, and Other Financial Market Risks are perceived differently by the experts including market participants participated in the series of surveys conducted by RBI during April, 2018 to October, 2021.

As per the survey outcomes, Foreign Exchange Rate Risks are perceived as a "High Risk" category during April, 2018, and April, 2020. Remaining all other periods was categorized as "Medium Risk" affecting the financial system in India.

As per the survey outcomes, Equity Price Validity Risks are perceived as a "Medium Risk" category during April, 2018, and October, 2019. Remaining all periods was categorized as "High Risk" affecting the financial system in India.

As per the survey outcomes, Interest Rate Risks are perceived as a "Medium Risk" category during all periods from April, 2018 to October, 2021 affecting the financial system in India.

As per the survey outcomes, Liquidity Risks are perceived as a "High Risk" category during all periods from October, 2018 to April, 2019 and April, 2020. All other periods are perceived as "Medium Risk" affecting the financial system in India.

All Other Financial Market Risks were categorized as "Low Risk" to "Very Low Risk" during the study period and negligible effect on financial system in India.

Table 11
Change in the Risk Perceptions towards Financial Market Risks from April, 2018 to October, 2021

Financial Market Risks / Period	Foreign Exchange Rate Risk	Equity Price Volatility	Interest Rate Risk	Liquidity Risk	Other Financial Market Risks
April, 2018-October, 2018	Increased	Increased	Increased	Increased	Increased
October, 2018-April, 2019	Declined	Declined	Declined	No Change	Declined
April, 2019-October, 2019	Declined	Declined	Declined	Declined	Declined
October, 2019-April, 2020	Increased	Increased	Increased	Increased	Increased
April, 2020-October, 2020	Declined	Declined	Declined	Declined	Declined
October, 2020-April, 2021	Increased	Increased	Increased	Declined	Increased
April, 2021-October, 2021	No Change	Increased	Increased	Increased	---

Source: Systematic Risk Survey Reports, Reserve Bank of India.

The overall change in the risk perceptions towards Financial Market Risks (Table 11) is described below.

Foreign Exchange Rate Risks were "Increased" during April, 2018 to April, 2020 and then declined during the remaining period. Domestic Inflation Rate Risks were declined during April, 2018 to April, 2019 and then increased gradually till October, 2021. Interest Rate Risks were "Increased" during the periods April, 2018-October, 2018, October, 2019-April, 2019 and October, 2020 to October, 2021. Remaining the periods was perceived as "Declined".

Liquidity Risks were "Increased" during the periods April, 2018 to April, 2019, October, 2019 to April, 2020 and April, 2021 to October, 2021. Remaining periods was viewed as "Declined". Other Financial Market Risks were "Declined" during October, 2018 to October, 2019 and April, 2020 to October, 2020. Remaining periods was noted as "Increased".

Table 12
Ratings of Category Wise Institutional Risks from April, 2018 to October, 2021

Institutional Risks / Period	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
April, 2018	Medium	High	High	Medium	Medium	High	Medium	Very Low
October, 2018	Medium	High	High	Medium	Medium	High	Medium	Very Low
April, 2019	Medium	Medium	High	Medium	Medium	High	Medium	Very Low
October, 2019	Medium	High	High	Medium	High	Medium	Medium	Very Low
April, 2020	Medium	High	High	Medium	High	High	Medium	Very Low
October, 2020	Medium	High	High	Medium	High	High	Medium	Very Low
April, 2021	Medium	High	High	Medium	High	High	Medium	Very Low
October, 2021	Medium	High	Medium	Medium	High	High	Medium	---

Source: Systematic Risk Survey Reports, Reserve Bank of India.

Table 13
Change in the Risk Perceptions towards Institutional Risks from April, 2018 to October, 2021

Institutional Risks / Period	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
April, 2018 - October, 2018	Increased	Declined	Declined	Increased	Declined	Declined	Declined	Increased
October, 2018 - April, 2019	Increased	Declined	Declined	Increased	Declined	No Change	Increased	Declined
April, 2019 - October, 2019	Declined	Increased	Declined	Declined	Increased	Declined	Increased	Increased
October, 2019 - April, 2020	Increased	Increased	Increased	Increased	Increased	Increased	Increased	Declined
April, 2020 - October, 2020	Declined	Declined	Declined	Declined	Declined	Increased	Declined	No Change
October, 2020 - April, 2021	Declined	Declined	Declined	Declined	Declined	Declined	Declined	Increased
April, 2021 - October, 2021	Declined	Declined	Declined	Declined	Declined	Increased	No Change	---

Source: Systematic Risk Survey Reports, Reserve Bank of India.

From the above Table 12, and As per the survey outcomes, Institutional Risks such as Regulatory Risk, Asset Quality Deterioration, Additional Capital Requirements of Banks, Access to Funding by Banks, Level of Credit Growth, Cyber Risk, Operational Risk and Other Institutional Risks are perceived differently by the experts including market participants participated in the series of surveys conducted by RBI during April, 2018 to October, 2021.

As per the survey outcomes, Regulatory Risks are perceived as a "Medium Risk" category during all periods from April, 2018 to October, 2021 affecting the financial system in India.

As per the survey outcomes, Asset Quality Deterioration Risks are perceived as a "Medium Risk" category during April, 2019. Remaining all periods was categorized as "High Risk" affecting the financial system in India.

As per the survey outcomes, Additional Capital Requirements of Banks Risks are perceived as a "Medium Risk" category during the period from October, 2021 to October, 2021. Remaining all periods was perceived as "High Risk" affecting the financial system in India.

As per the survey outcomes, Access to Funding by Banks Risks was perceived as a "Medium Risk" category during all periods from October, 2018 to October, 2021 affecting the financial system in India.

As per the survey outcomes, Level of Credit Growth Risks was perceived as a "Medium Risk" category during the period from April, 2018 to April, 2019. Remaining all periods was viewed as "High Risk" affecting the financial system in India.

As per the survey outcomes, Cyber Risks was perceived as a "Medium Risk" category during the period from October, 2019 to October, 2019. Remaining all periods was viewed as "High Risk" affecting the financial system in India.

As per the survey outcomes, Operational Risks was perceived as a "Medium Risk" category and Other Institutional Risks was perceived as "Very Low" during all the periods from April, 2018 to October, 2021, affecting the financial system in India.

The overall change in the risk perceptions towards Institutional Risks (Table 13) is described below.

Regulatory Risks were "Increased" during April, 2018 to April, 2019 and October, 2019 to April, 2020. The same were observed as "Declined" during the remaining period. Asset Quality Deterioration Risks were "Increased" during April, 2019 to April, 2020 and remaining periods were noted as "Declined".

Additional Capital Requirements of Banks Risks were "Increased" during the periods October, 2019-April, 2020. Remaining the periods was perceived as "Declined".

Accesses to Funding by Banks Risks were "Increased" during the periods April, 2018 to April, 2019, and October, 2019 to April, 2020. Remaining periods was viewed as "Declined". Levels of Credit Growth Risks were "Increased" during April, 2019 to April, 2020. Remaining periods was noted as "Declined".

Cyber Risks were "Increased" during the periods October, 2019 to October, 2020 and April, 2021 to October, 2021. Remaining periods was viewed as "Declined". Operational Risks were "Increased" during October, 2018 to April, 2020. Remaining periods was noted as "Declined".

Other Institutional Risks were "Increased" during the periods April, 2018-October, 2018, April, 2019-October, 2019 and October, 2020-April, 2021. Remaining periods were noted as "Declined".

Table 14
Ratings of Category Wise General Risks from April, 2018 to October, 2021

General Risks / Period	Terrorism	Climate Related Risks	Social Unrest (Increasing Inequality)	Other General Risks
April, 2018	Medium	Medium	Medium	Very Low
October, 2018	Medium	Medium	Medium	Very Low
April, 2019	Medium	Medium	Medium	Very Low

October, 2019	Medium	Medium	Medium	Very Low
April, 2020	Medium	Medium	High	Very Low
October, 2020	Medium	Medium	Medium	Very Low
April, 2021	Low	Medium	Medium	Very Low
October, 2021	Medium	Medium	Medium	---

Source: Systematic Risk Survey Reports, Reserve Bank of India.

Table 14
Change in the Risk Perceptions towards General Risks from April, 2018 to October, 2021

General Risks / Period	Terrorism	Climate Related Risks	Social Unrest (Increasing Inequality)	Other General Risks
April, 2018- Oct, 2018	Declined	Declined	Increased	Increased
Oct, 2018- April, 2019	Increased	Increased	Increased	Declined
April, 2019- October, 2019	Declined	Declined	Declined	No Change
October, 2019- April, 2020	No Change	Declined	Increased	Declined
April, 2020- October, 2020	Increased	Increased	Declined	Increased
October, 2020- April, 2021	Declined	Declined	Increased	Increased
April, 2021- October, 2021	Increased	Increased	Declined	---

Source: Systematic Risk Survey Reports, Reserve Bank of India.

From the above Table 14, and As per the survey outcomes, General Risks such as Terrorism Risk, Climate Related Risks, Social Unrest (Increasing Inequality) Risk, and Other General Risks are perceived differently by the experts including market participants participated in the series of surveys conducted by RBI during April, 2018 to October, 2021.

As per the survey outcomes, Terrorism Risks are perceived as a “Low” category during April, 2021. Remaining all other periods was categorized as “Medium Risk” affecting the financial system in India.

As per the survey outcomes, Climate Related Risks are perceived as a “Medium Risk” category during April, 2018-October, 2021, affecting the financial system in India.

As per the survey outcomes, Social Unrest (Increasing Inequality) Risks are perceived as a “High Risk” category during the period from April, 2020. Remaining all periods was perceived as “Medium Risk” affecting the financial system in India.

As per the survey outcomes, Other General Risks are perceived as a “Very Low Risk” category during all periods from October, 2018 to April, 2021 and affecting the financial system in India.

The overall change in the risk perceptions towards General Risks (Table 15) is described below.

Terrorism Risks were “Increased” during the periods October, 2018 to April, 2019, April, 2020 to October, 2020 and April, 2021 to October, 2021. The same were observed as “Declined” during the remaining period.

Climate Related Risks were “Increased” during the periods October, 2018 to April, 2019, April, 2020 to October, 2020 and April, 2021-October, 2021. The same were observed as “Declined” during the remaining period.

Social Unrest (Increasing Inequality) Risks were “Increased” during the periods April, 2018 to April, 2019, October, 2019 to April, 2020 and October, 2020 to April, 2021. The same were observed as “Declined” during the remaining period.

Other General Risks were “Increased” during the periods April, 2018 to October, 2018, and April, 2020 to April, 2021. Remaining periods were identified as “Declined”.

10. Conclusions

The COVID-19 pandemic will put the strengthened risk management and capital adequacy mechanisms put in place after the 2008 financial crisis to the test, especially since no scenario analysis could have predicted an incident of this magnitude. Reserve Bank of India, has conducted the series of Systematic Risk Surverys during 2018 to 2021. The risk perception, as shown in the change tables, may fluctuate (increase/decrease) from one category to the other, as a result of the systemic risk survey done at different time periods (on a half-yearly basis in April and October). However, within the same risk category, risk perception can rise, fall, or remain constant, as demonstrated by words. The comparative study of a series of successive polls reveals a shift in risk perception.

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